24th EAA Annual Meeting

BARCELONA, 5-8 SEPTEMBER 2018

REFLECTING FUTURES

Abstract Book

VOLUME II

European Association of Archaeologists

UNIVERSITAT DE BARCELONA

2018 EUROPEAN YEAR OF CULTURAL HERITAGE #EuropeForCulture

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Abstract Book

VOLUME II

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Edicions

552 THE MALTA CONVENTION: THE TIME TO CHANGE IS NOW

Theme: Archaeology and the European Year of Cultural Heritage
Organisers: Guermandi, Maria Pia (Istituto Beni Culturali della Regione Emilia Romagna) - Demoule, Jean-Paul (Professeur émérite de Protohistoire européenne) - Novakovic, Predrag (University of Ljubljana) - Marciniak, Arek (Adam Mickiewicz University Institute of Archaeology)
Format: Round table

The Malta Convention has already been a subject of reflection for a number of years, at least 10. We can therefore say that we are backed by a rather extensive and up-to-date assessments that show first and foremost that the overall situation is highly fragmented, in terms of both legislative or institutional solutions and the methods applied. In general, we can affirm that despite the indisputable progress in terms of our knowledge of the European archaeological scene and landscape the Convention also raises many critical issues. In addition to the problems inherent in discipline and its practice, in this last quarter of a century the cultural, social and political horizon has changed completely. In many countries the competences of archaeologists are increasingly marginalised when it comes to decision-making processes on the one hand, while on the other overall working conditions have worsened in terms both of pay and protection of the profess. Rewriting the Malta Convention appears to be necessary in light of the experience of the past 25 years, both in order to adapt it in response to the problems that have been highlighted and even more so to update it and bring it into line with present-day reality (in terms of the discipline's development and above all from a social and political standpoint). The purpose of our session is to propose a first basis for moving in this direction.

555 USING CIDOC CRM FOR ARCHAEOLOGISTS: FROM THEORY TO CONCRETE PRACTICES

Theme: Theories and methods in archaeological sciences
Organisers: Tuffery, Christophe (Inrap) - Bruseker, George (ICS/Foundation for Research and Technology)
Format: Other - combination of regular session and workshop

Modelizing archaeological data is a way for archaeologists to organise their information in a standard format by reconsidering their relations to their activities on field and out of it. But for most of archaeologists, using a conceptual reference model, such as CIDOC CRM, is not an easy exercise without initial assistance and teaching. We propose to present as most as simply as possible what is CIDOC CMR as major conceptual reference model useable in archaeology, and the only one standardized. This session offers to non-experts to discover basic principles of CIDOC CRM and being able to start using it for a representative archaeological data set.

The session will combine general presentations on CIDOC CRM and its useful extensions in archaeology, case studies and practical exercises.

ABSTRACTS

01 MIGRATING INFORMATION FROM IRANIAN EXCAVATION REPORTS: COMPARING SEMANTIC MARK-UP TO INFORMATION EXTRACTION

Author(s): Eide, Øyvind (Digital Humanities - Historisch-Kulturwissenschaftliche Informationsverarbeitung, Universität zu Köln) - Niknia, Massoomeh (Kharazmi University, Tehran; University of Cologne)
Presentation Format: Oral

The existing knowledge in the field of archaeology is generated in some Iranian cultural heritage institutions. The knowledge generated in an archaeological exploration is not integrated with knowledge generated in other archaeological explorations, and therefore, a large part of the valuable experience and knowledge in this field remains unused, which may lead to the loss of national historic heritage. Excavation reports comprise one of the most important types of archaeological publications. In Iran, they are mostly published as grey literature. Based on previous works starting in the 1990's we are exploring two methodologies for extracting information from excavation reports written in English. The first method is manually encoding the reports into XML documents and then extracting information from the encoded reports. The second method is automatically extracting information directly from the reports. The basis for both methods is that various types of elements that are seen as valuable for future use of information about excavation, based on local experience and international standards. These two methods not only lead to variant levels of reproducibility, but also result in unequal levels of human resources investment. We will also show how texts structured using these two methods can be imported into CIDOC CRM compatible databases. The first method has already been conducted and hopefully we will get results from the second method by submitting the time of final paper conference presentation.

02 USING CIDOC CRM AND COMPATIBLE MODELS TO EXPRESS SPATIAL AND TEMPORAL DATA: FROM PRINCIPLE TO PRACTICE

Author(s): Van Ruymbeke, Muriel (ULg Library, University of Liege) - Nys, Gilles-Antoine (Geomatics Unit, University of Liege) - Hallot, Pierre (DIVA - Faculty of Architecture, University of Liege) - Billen, Roland (Geomatics Unit, University of Liege)

Presentation Format: Oral

CIDOC CRM model allows to express archaeological data's localization thanks to E53 Place entity. On another hand, E52 Time-Span entity allows to express data's chronology. Nevertheless, taking into account CIDOC CRM property quantifiers, temporal information related to archaeological object must be unique, i.e. each archaeological object is associated to one and only one temporal instance. On the contrary, objects can be linked to spatial data as many as necessary. Actually using CIDOC CRM, it is possible to suggest several measurements, several shapes or even several different localizations for a same archaeological object, but it is only possible to suggest one dating for it. Nonetheless, archaeological researches revise frequently datasets and chronological interpretation of archaeological elements. In some cases, it is relevant to keep all the proposed interpretations or temporal information related to each objects.

From now on, thanks to the development of CRMgeo that is fully compatible with CIDOC CRM, it is possible to express for one archaeological object several versions of temporal information and several spatial coordinates. Moreover, CRMgeo extension provides an articulation between CIDOC CRM and GeoSPARQL query language. This connection allows perform spatio-temporal queries based on CIDOC CRM instantiated data.

To achieve a working prototype, we downloaded CIDOC CRM and compatible models owl files on the open-source ontology editor Protégé. We then completed these models with an "in-house" extension proposal. This model is dedicated to store several hypotheses related to archaeological data's functional semantic like CRMgeo does for spatial and temporal information. After the implementation, we populated and illustrated the model with instances derived from a real archaeological case study. In this research, we propose to describe our real case prototype development to bring to light principle benefits but also the challenges to face.

03 CIDOC CRM AND CRMARCHAEO: A VISION OF USE FOR THE "FUTURE"

Author(s): Stead, Stephen (Paveprime Ltd; Southampton University ACRG)

Presentation Format: Oral

Recent work by Holtorf and May et al (2018) has highlighted the simultaneous desire to pass archaeological knowledge on to the "future" and uncertainty about what that "future" will actually want of our vision of the past.

The CIDOC CRM provides a framework for the integration of data from the so-called "Memory Institutions". As such it lays the foundations for integrating data from different communities of documentation practice. In addition CRMarchaeo states that it is "intended to provide all necessary tools to manage and integrate existing documentation in order to formalise knowledge extracted from observations made by archaeologists, recorded in various ways and adopting different standards. In this sense, its purpose is to facilitate the semantic encoding, exchange, interoperability and access of existing archaeological documentation."

Any attempt to regulate archaeological documentation is doomed to failure for two reasons. First is the "three archaeologists- four opinions" meme and the second is the real danger of fossilising the discipline.

So how do integrate access to existing archaeological documentation into a strategy for engaging with the future?

This paper sets out a personal perspective on this question. It draws on over 30 years of designing cultural heritage information systems to lay out a vision of why data may be useful to the shadowy and elusive "future" and perhaps more importantly a motivation for current practitioners to engage in the process.

04 INTEROPERABILITY AND USE OF THE INRAP'S DATABASES THROUGH THE UTILIZATION OF EXTENSIONS OF THE CIDOC-CRM ONTOLOGY (CRMARCHAEO, CRMGEO)

Author(s): Le Goff, Emeline - Tuffery, Christophe (INRAP - National Institute for Preventive Archaeological Research)

Presentation Format: Oral

The national institute of preventive archeological research (INRAP) is the only national public institution of preventive archaeology in France whose mission bases on the recording, the archiving, the distribution and the valuation of archaeological knowledges produced during spatial planning works of the territory.

In this context, the data recorded in the field databases establish essential sources, which require to be harmonized for good conservation and interrogation of archeological sites. Although the archaeological discipline already possesses its frameworks, it cannot aspire to a standardization because the conditions on the ground lead it to evolve.

Of this report emerges the existence of "regionalistic" databases in France, which the use to the CIDOC-CRM ontology allows to harmonize and to query. Archaeology is spatialized, in essence; so, the possibility of using the CRMarchaeo and the CRMgeo extensions of the CIDOC CRM, associated with the commun core of the CIDOC, as well as the existence of the 3M tool, allow facilitating the construction of models of description according to the RDF syntax.

Thus, we realized the mapping or the matching of four databases created from different software, then thought of the elaboration of a non-specialized digital architecture because the same methods tend to organize archaeological surveys and excavations.

This communication will present these matchings having used the 3M application ; then, it will make a synthesis of the difficulties and the assets raised during the use of the CIDOC CRM ontology, whether it is for the description of "Datas" or the generation of "Metadatas". Finally, it will be question of the future development from a module (an XML-RDF version or an OBDA system) will make external interrogation of the Inrap's databases, either by means of servers in networks, or by the cartographic collaborative platform CAVIAR of the Inrap (Catalog of Visualization of the Archaeological Information).

05 FAIR SURVEYS: FROM PILOT STUDY TO IMPLEMENTATION

Author(s): van Leusen, Martijn (University of Groningen) - Haas, Tymon (University of Cologne)
Presentation Format: Oral

Dozens of field walking surveys take place every year across the Mediterranean, using a wide range of approaches and adding to the hundreds of surveys conducted since the 1950s. There is now some degree of consensus about good practice in designing and conducting these surveys, and in processing and analyzing the finds; this is currently being documented by the IMS network of Mediterranean survey practitioners (Bintliff et al. forthcoming). Researchers have long expressed the desire to conduct comparative and complementary analyses across surveys (e.g. Francovich/Patterson 2000, Cherry/Alcock 2004, Launaro 2011) but have so far been frustrated by the (often undocumented) differences between datasets.

In a separate development, ten years of experience with the archiving of survey project data at repositories such as DANS-EdNA (Netherlands) and ADS (UK) is confronting PI's with the realization that the deposited datasets are Findable (i.e. structured metadata about them is available online), Accessible (the archives themselves can be consulted under a system of rights management), and Interoperable (provided in formats that can be read and interpreted); but sadly they are not yet Re-usable – that is, the meaning, scope, and limitations of the data in the archives remains unclear. Thus the last of the FAIR principles is not yet met.

This paper sketches the work done at the University of Groningen to resolve this issue by following the CIDOC CRM route, starting from a pilot study conducted in 2016 to draft and test a Conceptual Reference Model for survey datasets. This was presented and discussed during EAA Maastricht 2017 and at meetings of the CRM Special Interest Group in early 2018. We now present follow-up steps including the results of further extensive tests on colleagues' datasets and a roadmap towards the real goal: high quality Linked Open Access to survey data.

06 AN OUTSIDER'S PERSPECTIVE ON THE ARCHAEOLOGICAL POTENTIAL OF CIDOC CRM

Author(s): Ozturk, Huseyin (ASCSA; College Year in Athens)
Presentation Format: Oral

In 2014-2015, in order to contribute to the design of a technical manual and an on-field documentation system for a field project, I studied the history of archaeological documentation, from the early 20th century diaries to MoLAS style field forms and entirely computational on- and off-field recording systems and databases. Later, while designing a course on digital archaeology in 2017, I got familiar with new and innovative ways of organizing archaeological/cultural data. It is in this latter context that I encountered and examined CIDOC CRM, though I was, as an archaeologist, some two decades late to the CRM world – which seems to be not that unusual.

Since then, I have contemplated the potential of CIDOC CRM in archaeological studies and discussed it with colleagues and students alike. The major pitfalls of such an endeavor seem clear. As correctly indicated in the "session content," a steep learning curve might prove problematic and/or discouraging for the uninitiated archaeologists. Furthermore, questions about its flexibility and, perhaps more importantly, concerns regarding its integrability to existing archaeological data structures should also be addressed for a fruitful collaboration.

In my contribution to this discussion session, I will try to summarize an archaeologist's major concerns regarding such a standardized ontological framework and will propose a way forward with a view to establishing communication between unfamiliar archaeologists and CIDOC CRM specialists.

557 GEOARCHAEOLOGY OF BRONZE AGE EUROPE

Theme: Theories and methods in archaeological sciences
Organisers: Nicosia, Cristiano (Università di Padova, Italy) - Ayala, Gianna (University of Sheffield) - Dreibrodt, Stefan (Institute for Ecosystem Research/CRC1266, University of Kiel) - Niebieszczański, Jakub (Laboratory of Mediterranean Bronze Age Archaeology, Institute of Archaeology, Adam Mickiewicz University, Poznań) - Pető, Ákos (Institute of Nature Conservation and Landscape Management, Faculty of Agricultural and Environmental Sciences, Szent István University)
Format: Regular session

The European Bronze Age is regarded as a period of pre-modern 'globalisation', marking a significant change from the interconnectivity in the Neolithic. Mobility and migrations played a fundamental role in shaping the European Bronze Age, with circulation of people, artefacts, and raw materials (metals, amber, wool) along north-south and east-west axes. This session aims to bring together geoarchaeologists and landscape

archaeologists working on Bronze Age contexts from different parts of Europe to highlight similarities and differences observable at different scales of geoarchaeological research. The following themes will be deal with:

(a) At the micro- or intra site-scale, the application of geoarchaeological methods to specific archaeological features, such as floors, rubbish pits and middens, combustion features, earth-based construction materials, activity areas, etc.

(b) At the site scale, the geoarchaeology of all types of Bronze age sites (e.g., pile dwellings in lacustrine or floodplain settings, sites enclosed by ditches and ramparts, tells), on their distribution patterns and on the landscape modifications they brought about.

(c) At the landscape, regional or supra-regional scale, the challenge to integrate archaeological interpretations with documented palaeo-environmental trends to construct a robust diachronic understanding of landscape development. This new understanding will perhaps enable the detection of processes or triggers (i.e. natural triggers such as climate; human triggers such as societal developments, trade, exchange, pests) driving these key developments.

One additional aim is to allow for the presentation and discussion of records from European sites that are not published in English and therefore failed to reach the larger audience.

ABSTRACTS

01 GEOARCHAEOLOGICAL RECORD OF THE BARROWS STRUCTURE OF THE KOMAROV CULTURE (BRONZE AGE) AND POST-DEPOSITIONAL PROCESSES IN BUKIVNA (WEST UKRAINE)

Author(s): Hildebrandt-Radke, Iwona - Makarowicz, Przemyslaw (Adam Mickiewicz University) - Matwiishina, Zhanna Nikolaevna (National Academy of Sciences of Ukraine)

Presentation Format: Oral

One of the largest concentrations of the Bronze Age Komarov culture is the burial mound in Bukivna, where the surface studies documented 59 barrows. The area is located on the right side of the Dniester River, in the South-Podolian Upland (west Ukraine). Micromorphological soil studies on and below the barrows allow to state that they were created under different environmental conditions. The soils under the barrows show the features of leached black earth soils developed in the conditions of the forest steppe, under the grassy vegetation, in a temperate warm climate with enough precipitation. The black earth character of the soil-forming processes is confirmed by numerous molehills indicating activity of soil fauna. On the surface of the barrows, on the other hand, there are turf-podzolic soils with clearly visible eluvial and illuvial levels and the hardpan layer. This proves the change of environmental conditions between the period in which the communities of barrow builders functioned and the period of the formation of the modern soil profile on the barrow surface. The nature of the soil-forming processes related to the development of modern soil influenced the state of archaeological remains in the barrows as well as the mineral and geochemical composition of their embankments.

The mounds of the barrows are dominated by the silt fraction with admixtures of clays and very fine-grained sands. There is a similar deposit in the upper layers of the barrows, but with larger proportions of sandy fraction and a smaller of the clay fraction, usually better sorted. In the Ukrainian soil-related literature, attention is paid to podsolization as a process contributing to the transfer of clay elements from the eluvial layer and their washing into the illuvial layer. Geochemical analyses indicate the diversity of the content of micro- and macroelements in the barrow sediments.

02 WASTE-DISPOSAL AT THE MBA FORTIFIED SETTLEMENT KAKUCS-TURJÁN MÖGÖTT: INTERGRATING PHYTOLITHS AND MACROBOTANICAL STUDIES

Author(s): Peto, Ákos (Szent István University, Institute of Nature Conservation and Landscape Ecology) - Filatova, Sonja - Kirleis, Wiebke (Kiel University, Institute for Pre- and Protohistoric Archaeology)

Presentation Format: Oral

Based on the similar ceramic style and typography, the homogenous cultural identity that emerged during the Middle Bronze Age (app. 2000/1900–1500/1450 cal. BC) in the central territory of the Carpathian Basin is called the Vatya culture. Populations of this cultural complex inhabited different environments, such as the loess covered Mezőföld directly on the western bank of the Danube, or the sand-dominated flatlands and marshy meadows of the Danube–Tisza interfluve.

From 2013-2016, a house structure of the Vatya culture was excavated at the fortified settlement Kakucs-Turján mögött. First botanical results indicate that the most important economic plant species were einkorn and lentil, followed by barley and field pea, respectively. The presence of only small numbers of weeds and cereal by-products suggests that kitchen-ready cereal grains and legume seeds were present in the house. As of yet, there are no indications that large-scale crop processing took place at the house.

Analysis on phytolith samples taken from two probable waste pits in a different part of Kakucs-Turján mögött has shown the presence of morphotypes indicative for cereal by-products. Consequently, the results suggest that cereal-processing activities did take place in the settlement area. A comparison of the results of the macrobotanical and phytolith analyses might thus provide a greater insight into agricultural activities that took place at the site and in this respect suggest a spatial, functional differentiation.

03 MICROMORPHOLOGY OF RITUAL. GEOARCHAEOLOGICAL STUDIES OF A CREMATION URN AND ACCOMPANYING VESSEL OF THE LUSATIAN CULTURE

Author(s): Krupski, Mateusz (Archeolodzy.org Foundation; Institute of Archaeology, University of Wroclaw) - Hałuszko, Agata (Archeolodzy.org Foundation) - Sady, Agata (Archaeology Department, Silesian Museum) - Malkiewicz, Małgorzata (Institute of Geological Sciences, University of Wrocław) - Grześkowiak, Marek (Institute of Archaeology, University of Wroclaw)

Presentation Format: Oral

The rise of Bronze Age Urnfield cultures resulted in widespread introduction of cremation as a dominant funeral rite across large areas of Europe. The Lusatian culture, a local variant of this phenomenon, thrived in the lands of present-day Poland roughly between 1300 and 400 BC. According to current knowledge, these communities practiced burning of their dead and depositing the remains in the ground – typically in an urn placed in a shallow pit, sometimes with additional vessels; the type and abundance of grave goods differs chronologically. Known cemeteries consist(ed) of hundreds or even thousands of graves and were probably used for considerable periods of time. Still, some aspects of the "Lusatian" funerary ritual remain a mystery: little is known about post-cremation treatment of human remains and their deposition in the urn. Another question pertains to the contents of the accompanying vessels.

Attempting to fill in some of these blanks, we conducted a pilot geoarchaeological study of a cremation urn and accompanying vessel, discovered in a Lusatian culture grave dated to the HaC-period at a cemetery in Rolantowice, near Wrocław, Poland. In order to explore the depositional and post-depositional circumstances, the structural and compositional properties of the vessels infills were investigated by CT scanning, micromorphology, physico-chemical and botanical analyses. Our results suggest that after cremation, which most likely hadn't been too protracted in time, the bone fragments might have been meticulously picked from the pyre and packed into the urn with the aid of crushing. Investigations of the accompanying vessel delivered as yet inconclusive data (some analyses still in progress). A similar research protocol applied on a larger scale, with targeted sampling in different zones of cemeteries and at cemeteries of various chronology, may provide promising information about possible changes of funerary ritual in time.

04 SEDIMENTOLOGICAL INVESTIGATIONS OF A BRONZE AGE HOUSE: A GEOARCHAEOLOGICAL STUDY OF A HOUSE STRUCTURE IN KAKUCS-TURJÁN MÖGÖTT (HUNGARY)

Author(s): Niebieszczanski, Jakub (Adam Mickiewicz University in Poznań) - Pető, Ákos (Szent István University, Gödöllő) - Hildebrandt-Radke, Iwona (Adam Mickiewicz University in Poznań) - Serlegi, Gábor (Hungarian Academy of Sciences) - Jaeger, Mateusz (Adam Mickiewicz University in Poznań) - Kulcsár, Gabriella (Hungarian Academy of Sciences) - Staniuk, Robert - Taylor, Nicole (Kiel University) - Galas, Joanna (Adam Mickiewicz University in Poznań)

Presentation Format: Oral

The following presentation concerns the results of a geoarchaeological study of a defensive settlement from the Middle Bronze Age in Hungary. The research project KEX (Kakucs Archaeological EXpedition) combined a variety of non-invasive and interdisciplinary methods with precise excavations. The interdisciplinary approach was aimed at recognizing and investigating, macroscopically and on-site, the remains of habitation-related practices in the second millennium BC which are invisible on the surface

Spatial organization of the settlement was investigated by means of magnetometry, ERT, GPR and drillings for a preliminary characteristic of archaeological features. A complimentary intra-site evaluation of the sedimentological record of prospected house structures was also carried out.

The latter was purposely applied as a combination of magnetometry-based spatial analyses for targeting archaeological features. Raster evaluation was applied for distinguishing particular house structures. It provided the basis for a targeted excavation project.

The level representing house structures was selected for granulometric and geochemical analysis. Investigated was the sedimentary environment and functional properties of the house structure.

Geoarchaeological investigations discovered a division of sedimentological parameters outside and inside the investigated structure, with sorting and mean grain size of the deposit being the key markers. Distribution of compounds (P, Zn and Cu) provided supplementary information on the intensity of the sedentary activity.

Synergy of the acquired data (geophysical imagery, archaeological planigraphy, sedimentological and geochemical investigations) has proven to be a valid interdisciplinary methodology for studying site formation processes and spatial differentiation of multi-layered settlements in the Carpathian Basin.

05 FOUR POSTDEPOSITIONAL PROCESSES IN THE BRONZE AGE TELL BORSODIVÁNKA-NAGYHALOM, (HUNGARY) AND THEIR GEOARCHAEOLOGICAL AND ARCHAEOLOGICAL IMPLICATIONS

Author(s): Röpke, Astrid (Ur- und Frühgeschichte, Universität zu Köln) - Pusztainé Fischl, Klára (Miskolci Egyetem) - Kienlin, Tobias (Ur- und Frühgeschichte, Universität zu Köln)

Presentation Format: Oral

Intense anthropogenic deposits create specific geochemical environment. In particular tells are known for complex and continuous habitation. In general they are composed of formal and informal floors as well as domestic waste. However, in the case of Bronze Age Tell Borsodivánka-Nagyhalom the stratigraphy is very heterogeneous indicating a pre-settlement phase, habitation and layered middens. This results in different geochemical environments. Four different postdepositional processes with characteristic micro-

morphological features and geochemical signatures can be observed: translocation of clay, formation of apatite, decalcification and silicification. Under the tell sediments translocation of clay takes place in a former colluvial layer, visible by clay coatings. The soil is covered by an occupation deposit consisting of all kinds of waste such as dung, macro remains, fish and animal bones, burnt material, chert. Apatite is formed as well as macro remains were mineralized by calciumphosphate. Processes which occur in highly phosphorous deposits. Formal floors are composed of lime causing decalcification. Secondary calcite coatings and hypocoatings are proven in thin section. The most uncommon process is silicification in the midden deposits which have been repeatedly covered with plant fragments of Poaceae. Opal silica from phytoliths has been dissolved and silicified whole plant fragments. Our results indicate that different man-made deposits trigger and might even accelerate specific geochemical dynamics.

06 GEOARCHAEOLOGICAL OBSERVATIONS AT THE MBA SITES OF THE DANUBE-TISZA INTERFLUVE (HUNGARY)

Author(s): Peto, Ákos (Szent István University, Institute of Nature Conservation and Landscape Ecology, Gödöllő) - Serlegi, Gábor (Hungarian Academy of Sciences, Research Centre for Humanities, Institute of Archaeology, Budapest) - Niebieszczański, Jakub (Adam Mickiewicz University, Institute of European Culture, Poznań) - Jaeger, Mateusz (Adam Mickiewicz University, Institute of Archaeology, Poznań) - Molnár, Marianna (Szent István University, Institute of Nature Conservation and Landscape Ecology, Gödöllő) - Kulcsár, Gabriella (Hungarian Academy of Sciences, Research Centre for Humanities, Institute of Archaeology, Budapest)

Presentation Format: Oral

Based on the similar ceramic style and typography, the homogenous cultural identity that emerged during the Middle Bronze Age (app. 2000/1900–1500/1450 cal BC) in the central territory of the Carpathian Basin is called the Vatya culture. The settlement network of the Vatya culture implies fortified, multi-layered tells and open air horizontal settlements in various size and inner structure. These archaeological sites are not only important parts of the cultural heritage of the Carpathian Basin, but are significant elements of the natural heritage. The importance of these structures lies within the potential of studying their buried soils and anthropogenic sediments. Data gained by the means of soil scientific methods not only forms the basis of environmental historical conclusions, but reveals mosaics of the interaction between ancient human populations and their environment.

By the means of shallow geological corings the stratigraphy of four Bronze Age settlements were identified (Kakucs–Turján mögött, Kakucs–Balla-domb; Dabas–Dabasi szőlők; Dömsöd–Leányvár). To accomplish the horizontal and vertical mapping of these sites high resolution and focused coring series were planned based upon the geophysical prospection of the sites. The coring series aimed at precisely identifying the soil properties, the stratigraphy of the anthropogenic and natural sediments of the settlements and is surroundings, but also to facilitate our understanding of the site formation processes within the geographical setting of the Danube-Tisza Interfluve.

The modern soil cover of the site was characterised based on on-site soil description protocols (macro-morphological description) and basic laboratory measurements (H%, TOC%, Ptotal, pH [HOH, KCl], salt%, CaCO3%, KA). By implementing high-resolution coring series, we were able to precisely identify the stratigraphy and possible processes of site formation of different Bronze Age sites within the Danube–Tisza Interfluve.

07 GEOARCHAEOLOGICAL INVESTIGATION OF TELL SITE NEA RAEDESTOS TOUMBA IN ANTHEMOUS VALLEY (NORTHERN GREECE): LANDSCAPE CHANGES ON AN ALLUVIAL PLAIN

Author(s): Niebieszczanski, Jakub - Hildebrandt-Radke, Iwona (Adam Mickiewicz University in Poznań) - Vouvalidis, Konstantinos - Syrides, Georgios (Aristotle University in Thessaloniki) - Czebreszuk, Janusz (Adam Mickiewicz University in Poznań) - Andreou, Stylianos (Aristotle University in Thessaloniki) - Pappa, Maria (Ephorate of Antiquities of Thessaloniki Region)

Presentation Format: Oral

The archaeological site of Nea Raedestos, located in the Anthemous River Valley (Central Macedonia, Northern Greece), comprises a tell (a specific hill-like form of settlement known as toumba) from the Bronze Age and remains of a Neolithic settlement buried beneath. The position of the tell on the alluvial plain prompted a multidisciplinary geoarchaeological investigation to reconstruct the influence of landscape changes on prehistoric settlement in the valley, with an emphasis on alluvial sequences. Using the ERT survey and vibracoring in the close vicinity of the site, a different sedimentary environments were documented, including water body sediments, flood deposition, terrestrial pre-Holocene deposits and anthropogenic sediments. In result it appeared that the oldest habitation layers at the site being dated to the Middle and Late Neolithic, were located at the edge of a small periodically drying water body surrounded by ruderal vegetation adjacent to the settlement. The diatom analysis revealed the probable saline/brackish (ground) water supply of this water body. This water body functioned up to the Early Bronze Age, when it was fulfilled and buried by flood sediments thus indicating landscape change. The flooding phase at Nea Raedestos was simultaneous to an increase in fluvial aggradation in the Thessaloniki Plain at the beginning of 3rd millennium BC. Thus, it was possible to conclude that the settlement from the Later Bronze Age functioned in different environment than the one from the Early Bronze Age and Neolithic.

Following presentation focuses on the geoarchaeological potential for investigating the Bronze Age tell sites, in order to reconstruct their natural environment, as well as it brings up the data concerning the reconstruction of settlement patterns and its changes.

08 HOW GEOARCHAEOLOGICAL AND MULTISCALAR APPROACH PROVIDES NEW INSIGHT ABOUT RAPID-CLIMATE CHANGES AND SOCIAL DYNAMICS CONSEQUENCES ONTO MEDITERRANEAN LANDSCAPES DURING BA

Author(s): Glais, Arthur (LETG-Caen at Normandy University) - Lespez, Laurent (LGP-University of Paris-East Créteil) - Lopez-Saez, José-Antonio (Archaeobiology Group, Institute of History, CCHS, CSIC, Madrid) - Darcque, Pascal - Tsirtsoni, Zoï (Arscan, Maison de l'archéologie et de l'Ethnologie, University of Paris 10, Nanterre) - Malamidou, Dimitra (Ephorate of Prehistoric and Classical Antiquities, Greek ministry of culture, Kavala)

Presentation Format: Oral

The research is conducted in Northern Greece onto two distinct but connected river basins, the southern part of lower Strymon Valley and his last tributary (Angitis) draining the former Tenaghi-Philippon marsh, 30 km to the east. Four terrestrial cores, will be presented in order to bring new information about climate instability and social dynamics occurred in the region during Bronze Age. Two cores spaced from 2km each other were carried out in the wetland between the Tenaghi-Philippon former marsh and the multi-period tell of Dikili Tash currently investigated by archaeologists. We attempt to use these archives to identify periods of landscapes and socio-cultural changes around the inhabited area. Another two cores, equally spaced from 2km each other, are situated on the riverbank of contemporary large river systems (Strymon and Angitis) into Lower-Strymon-Valley. The latter fluvio-lacustrine deposits (from 7 to 10 meters thick) describing the interval between 3200 to 800 cal BC (EBA to Antiquity in this region) offer a significant potential for high-resolution palaeoenvironmental studies. They give us new insight into the complex puzzle of Human-Environment relationships at this cultural time.

For each sequence, two sources of palaeoecological investigations have been conducted: geomorphological and palynological. They give an overview of climate variability in the Eastern Mediterranean, particularly for some RCCs episodes and thereafter a comprehensive view of anthropogenic responses and impacts on the vegetation cover.

This case study highlights the interest to (1) combine geomorphological with palynological evidence and multiscalar approach to discuss on the Climate/Environment/Society relationships. (2) It points out the necessity to assess the effects of specific farming practices as of the Climate Change on the dynamics of mosaic landscapes. This long term analysis about Bronze-Age landscape dynamics provides (3) food for thought to fill the archaeological shortcoming for this period, guiding the future investigations.

09 FROM DEPOSIT TO SOCIAL PRACTICES: INTEGRATED MICROMORPHOLOGICAL ANALYSIS OF FLOOR SEQUENCES AT MIDDLE BRONZE AGE ERIMI-LAONIN TOU PORAKOU, CYPRUS.

Author(s): Amadio, Marialucia (University of Reading, School of Archaeology, Geography and Environmental Science; Italian archaeological project at Erimi-Laonin tou Porakou)

Presentation Format: Oral

Floors are key data-set of cultural evidence in archaeological contexts as they offer potentials for detecting and interpreting the spatial conventions, through which economic and social relationships are represented and negotiated during the life-history of buildings and settlements. In this study, floor sequences from the Middle Bronze Age site of Erimi-Laonin tou Porakou (c. 1950-1650 BC), in the southern region of Cyprus, have been analysed though an interdisciplinary approach based on integration of stratigraphic, micromorphological, spectroscopic (FTIR) and geochemical (XRF) analyses. The methodological framework applied in this study is aimed at generating an interdisciplinary data-set with which to analyse the study context at different spatial and temporal scale and to investigate the socio-cultural and economic transformations at Erimi-Laonin tou Porakou during Middle Bronze age Cyprus by analysis of:

- source materials, properties and technologies in the manufacture of floors as indicators of accessibility and selection to natural resources, labour organisation and technological specialisation;

- impact of environment, activities and events on floor surfaces as indicators of continuity and change in use of space and related socio-cultural and economic implications.

The multi-scalar data-set provided an effective framework to reconstruct every-day practices in the construction, use and maintenance of floor plasters within buildings, and to examine the importance of these routine activities in the formation and reproduction of socio-cultural identities, roles and relations at Middle Bronze Age Erimi-Laonin tou Porakou.

10 URBAN NEIGHBOURHOODS AT BRONZE AGE KNOSSOS: GEOARCHAEOLOGICAL INVESTIGATIONS OF THE KNOSSOS GYPSADES PROJECT

Author(s): Ayala, Gianna (University of Sheffield) - Bogaard, Amy (University of Oxford) - Hatzaki, Eleni (University of Cincinnati) - Pouncett, John (University of Oxford)

Presentation Format: Oral

Despite more than a century of continuous archaeological research at Knossos, the occupation of the area surrounding the palace is still poorly understood. Arthur Evans's excavation strategy created a distorted picture of the town, dominated by elite buildings floating in a largely unexplored urban landscape. The research conducted since 2014 by the members of the Knossos-Gypsades project, a synergasia between the Herakleion Ephoreia and the British School at Athens, has uncovered several structures and outdoor occupation spaces dating to the Bronze Age, including an internal burnt storage room and two external middens. This presentation

will focus on the methods and preliminary results from systematic geoarchaeological sampling within and around the structures. Methods including sediment analysis (magnetic susceptibility, particle size, organic content and pXRF), micromophology along with coring form the backbone of the geoarchaeological sampling and analysis. This data is placed within the broader excavation strategy including environmental sampling and geophysical research. The results of this research have provided a rare opportunity to investigate, at high resolution, the formation and duration of these complex deposits as well as the occupation history of the structures themselves. These different data sets combine to provide a unique understanding of a Bronze Age Knossian neighbourhood. These datasets will hopefully offer an invaluable contribution into the broader discussions of Mediterranean Bronze Age cityscapes and the domestication of the countryside.

11 WASTE HEAPS IN THE EBA PILE DWELLING OF LUCONE (N. ITALY): TOWARDS A GEOARCHAEOLOGY OF DAILY ACTIVITIES

Author(s): Nicosia, Cristiano (Dipartimento dei Beni Culturali, Università di Padova) - Dal Corso, Marta (Inst. of Prehistoric and Protohistoric Archaeology and CRC1266 Scales of Transformation, Kiel University) - Baioni, Marco (Museo Archeologico della Valle Sabbia – Fondazione "Piero Simoni", Gavardo) - Mangani, Claudia (Museo Civico Archeologico "G. Rambotti", Desenzano del Garda)

Presentation Format: Oral

The Lucone settlement is one of the pile dwellings belonging to the UNESCO "Prehistoric Pile Dwellings around the Alps" serial transnational site. Its chronology is well-established thanks to dendrochronology on the numerous vertical and horizontal wood elements recovered. The earliest fellings date to the year 2034 BCE and the latest to the year 1967 BCE, placing the inhabitation of the site in the Early Bronze Age, and more precisely in the "Polada" culture. Yearly excavation campaigns begun in 2007 and highlighted the presence of several finely stratified or laminated "heaps", containing large quantities of archaeological materials. The heaps are convex-shaped or sometimes more laterally spread out, resulting in a lenticular morphology. They are attested in both the phases of occupation identified at the site (separated by an episode of destruction by fire) and are often superimposed to each other. These heaps are important witnesses of the activities taking place on the platforms, which are never preserved in most pile dwellings. They have been made object of a combined study employing soil micromorphology and phytolith analysis, integrating the evidence from excavation. The results are evaluated in terms of daily activities, choice of combustibles, use of earth-based construction materials, waste management, and environment of deposition.

12 DEGRADED EARTH-BUILDING MATERIAL OF A RECENT BRONZE AGE HUT: SEDIMENT CHARACTERIZATION THROUGH COMBINED GEOARCHAEOLOGICAL ANALYTICAL TECHNIQUES AT BROGLIO DI TREBISACCE

Author(s): Magno, Laura Matilde (Université Catholique de Louvain)

Presentation Format: Oral

Tracing evidences of earth-made construction material in very weathered and eroded archaeological deposit may be challenging for archaeologist, especially during excavation.

The application of geoarchaeological laboratory techniques proved to be effective in the investigation of the sediments related to the occupation and the abandonment of a hut-structure in the Recent Bronze age site of Broglio di Trebisacce (Cosenza, Southern Italy).

The research focused, in particular, on the study of the order of the calcite crystal structure and on the structural alteration of the clay mineral components. Sediments have been characterized by combining analytical techniques such as micromorphology, Furier transforms infrared spectrometry (FTIR) and X-ray fluorescence spectrometry (XRF) and carbonate insoluble fraction. Several control samples of clay collected from deposits near the site have been used for a series of burning experiments in order to analyze clay behavior under heat stress. Experimental results have been then compared to those coming from the archaeological record.

Overall, resulting data show how the earth construction material used for the hut is characterized by sediments derived from the yellow natural substratum mixed with anthropogenic material such as ash and plaster. They also proved that the abandonment/collapse of the structure cannot be related to strong burning event since the clay material looks not altered by heat.

13 THE LATE BRONZE AGE SETTLEMENT OF FONDO PAVIANI (ITALY) IN ITS TERRITORIAL SETTING. GEOMORPHOLOGICAL ISSUES, IN-SITE ANALYSIS AND SETTLEMENT DYNAMICS

Author(s): Nicosia, Cristiano - Dalla Longa, Elisa - Cupitò, Michele - Leonardi, Giovanni (Dipartimento dei Beni Culturali, Università di Padova)

Presentation Format: Oral

The Bronze Age settlement dynamics in the lowest part of the Veneto plain (North-Eastern Italy) have been long at the centre of scientific debate. The settlements of this area played an important role in the emergence and growth of the "Terramare Culture". Moreover, they had a particular development between 13th and 12th century BCE, when some key-sites survived the general crisis of the Po Valley, and a reassessment of the settlement system took place. This process led to the birth of the "Frattesina system" (from the eponym site) since the 12th century BCE. We investigated the reasons of this settlement pattern change between the 13th and the 10th/9th century BCE through a multi-scalar approach, considering: a) geomorphological issues; b) in-site geomorphological

and archaeological analysis; c) general settlement dynamics of the area. Our case-study is the fortified settlement of Fondo Paviani (14th-12th/11th century BCE), investigated since 2007. This site was the central place of a large territorial polity in the 14th-13th century B.C. It controlled other fortified and non-fortified sites within a complex hydrographical net involving the paeleo-channels of rivers between the Alps, the Garda Lake, the Po river and the northern Adriatic Sea. This socio-political role and the geographical position explain the richness of the settlement and the large volume and extent of its international relationships (from Central Europe, to peninsular Italy, to the Eastern Mediterranean) testified in the archaeological record. Our study integrates geomorphological and paleo-environmental data with archaeological and micromorphological evidence (using a microstratigraphic-processual analysis to verify the hypotheses about the formation processes of the deposit). This allows for a privileged perspective not only towards the understanding of the specific setting of Fondo Paviani, but also in order to make some inferences on the location choices of other sites in the study area.

14 CONNECTING MATTER FLUXES AND HUMAN BEHAVIOR IN BRONZE AGE MULTI-LAYERED SETTLEMENTS FROM ANATOLIA TO CENTRAL EUROPE

Author(s): Martini, Sarah (Institut fuer Ur- und Fruehgeschichte Kiel) - Dreibrodt, Stefan (Institute for Ecosystem Research University of Kiel)

Presentation Format: Oral

By the beginning of the Bronze Age tells and multi-layered settlements are recognized across a vast section of the Eurasian continent, stretching from the Indus Valley in the East to the Atlantic in the West and from Germany down to Anatolia. As an outcome of generations continuously inhabiting the same area and constructing their surroundings on the remains of earlier habitation, tells represent excellent sites in which to examine intra-site diachronic changes in human behavior and to compare inter-site/inter-regional behaviors staged in a similar setting. Furthermore, the layering of anthropogenic sediments produced by human-based matter fluxes, which forms these settlements, provides an excellent opportunity for geoarchaeologists to apply their methods. While geoarchaeologists and archaeologists have developed numerous models of human behavior based on both geochemial signatures and the micro-remains of anthropogenic activity, data is often viewed in a relative, qualitative manner. The quantification of geoarchaeological data can both significantly change and expand interpretations.

In this paper we compare matter fluxes representing the human behavior from multi-layered settlements with Bronze Age occupation – Niederröblingen (Germany), Fidvar (Slovakia), Jagnilo (Bosnia-Herzegovina), Bresto (Bulgaria), Asagi Pinar, and Arslan Tepe (both Turkey) – forming a transect from Northern Europe to Turkey based on the quantification of geochemical and micro-artifact proxies. An emphasis is placed on identifying intra-site diachronic changes reflecting a difference in human behavior starting in the Bronze Age and the existence of a Bronze Age pre-modern "globalization" recognizable through on-site geoarchaeology is questioned. Do we see significant changes indicating a new, pan-European set of human behaviors that can be connected with a Bronze Age "globalization"? Do local solutions and behaviors present in the Neolithic/Chalcolithic remain important? What role does the vast difference in environmental setting along this transect play?

15 BOOM AND BUST CYCLES DURING THE BRONZE AGE? PALYNOLOGICAL EVIDENCE FROM THE NORTH EUROPEAN PLAIN.

Author(s): Feeser, Ingo - Dörfler, Walter - Kneisel, Jutta (Institut fuer Ur- und Fruehgeschichte Kiel)

Presentation Format: Oral

The concept of boom and bust cycles in archaeology has become increasingly discussed during the last decades with the widespread use of radiocarbon dates as proxy for population density. Hereby it is used to refer to evidence for large scale, regional to over-regional, demographic changes with phases of population growth followed by a distinct decline.

A further approach allowing a detailed cross-regional diachronic comparison of demographic developments is offered by the combined evaluation of palynological records. The increasing availability of high quality records, with respect to dating uncertainties and temporal resolution, even allows the synchronization and comparison on a short-term, sub-centennial resolution.

In this paper we present evidence for population changes during the 3rd to 1st millennium BC based on well- dated, high-resolution pollen diagrams from annually laminated lake sediments along a west-east transect from northern Germany to Greater Poland. Based on the spatial extent of changes regional vs. over-regional population dynamics can be identified. At present our results suggest a general growth phase (boom) at centered around 2000 cal BC and at least two phases of over-regional population decline at around ca. 1500 and 1100 cal BC. A comparison with selected archaeological and climate proxies aims at identifying potential environmental and/or cultural factors and drivers behind these developments.

16 GEOARCHAEOLOGICAL INVESTIGATIONS OF DANISH CELTIC FIELDS

Author(s): Nielsen, Nina (Museum Silkeborg) - Kristiansen, Søren Munch - Ljungberg, Thomas (Department of Geoscience, Aarhus University) - Løvschal, Mette (Department of Archaeology and Heritage Studies, Aarhus University)

Presentation Format: Oral

In the past decade, a number of geoarchaeological investigations have been conducted on selected Danish 'Celtic fields'. This type of prehistoric field system was used throughout large parts of northwestern Europe in the Late Bronze Age and Early Iron Age and

was characterized by a netlike pattern of field boundaries, in the form of low banks or lynchets, that enclosed small fields. Some field systems were after abandonment overgrown by forests or heaths – presumably in the first centuries AD – and left undisturbed until today.

A series of recent investigations have been conducted on some of these preserved field systems in woodlands as well as in heathlands. Through geoarchaeological analyses and geochronological dating, it has been possible to obtain more information about manuring practices and the chronological dimensions of the Celtic fields. The applied methods include multi-element analysis by ICP-MS, micromorphology, µXRF, pollen analysis, and radiocarbon and OSL dating. The analyses were carried out on soil samples taken from vertical sections through field boundaries and, regarding the geochemical analyses, also on representative samples of topsoil from several fields. The latter sampling strategy made it possible to investigate the intra-site variation of manuring practices. Lidar maps proved essential for identifying natural, undisturbed reference sites.

In this paper we not only present our scientific results, but also discuss our experiences regarding the application of the different methods and sampling strategies.

17 SOME PECULIARITIES OF ENVIRONMENTAL HISTORY DURING THE CENTRAL EUROPEAN BRONZE AGE AS DEDUCED FROM SOILS AND SEDIMENTS

Author(s): Dreibrodt, Stefan (University of Kiel, CRC 1266/ Institute for Ecosystem Research)
Presentation Format: Oral

Compilations of historical soil erosion records reflect climate variability during the early Holocene and the past intensity of land use since the onset of agriculture.

In Germany, there is a clear increase of field use since ca. 7.500 yrs. Since then, a general long-term trend of increasing soil erosion indicates an expansion of agricultural fields. Nevertheless, there are some obvious deviations from this long-term trend.

One of these deviations, surprisingly, is visible during the central European Bronze Age. After a clear maximum of erosion during the Late Neolithic (ca. 2450 BCE) a decreasing intensity of land use is indicated until the onset of Urnfield culture around 1350 BCE. Pronounced minima are visible at ca. 2050 BCE (aftermath of 4.2 ka phase?) and at ca. 1550 BCE (Unetice collapse). A comparison along a south-north gradient shows that the signal of ca. 2050 BCE is visible across all of Germany, whereas the minimum at ca. 1550 BCE is not visible in southern Germany. There, rather increased land use intensity is indicated. Similar patterns are visible in lake sediments and pollen diagrams from central Europe. Thus, looking from the regional perspective of landscape history we might ask: Do the observed differences reflect changes in Bronze Age land use intensity and/or subsistence strategies?

Another Bronze Age phenomenon in central Europe is the onset of intensive flooding activity in the river valleys after ca. 2250 BCE. Since we find around that time the first indication for severe erosion at mountain sites we might ask, too: How large is the Bronze Age role in late Holocene central European alluvial activity? (Until today?)

To foster a better understanding of human-environmental transformations during the Bronze Age across Europe, it is suggested to compare regional phenomena as the outlined examples with developments in other European regions.

18 THE SETTLEMENT OF LA DOU (NE IBERIAN PENINSULA) DURING THE LATE BRONZE AGE: AN INTEGRATED GEOLOGICAL AND ARCHAEOLOGICAL APPROACH

Author(s): Cámara Manzaneda, Javier - Saña, Maria (Universitat Autònoma de Barcelona, Departament de Prehistòria) - Alcalde, Gabriel (Universitat de Girona, Departament Història i Història de l'Art) - Navarrete, Vanessa - Pons, Enriqueta - Revelles, Jordi - Rosillo, Rafael (Universitat Autònoma de Barcelona, Departament de Prehistòria) - Sala, Roger (SOT Archaeological Prospection) - Yousef Pouran, Kaveh (Universitat Autònoma de Barcelona, Departament de Prehistòria)
Presentation Format: Oral

This paper presents the correlation between the geophysical survey data and the archaeological excavation results obtained for the archaeological site of La Dou (Vall d'en Bas, NE Iberian Peninsula), occupied during the Late Bronze Age (1200-900 cal BC). The site was discovered in 2005, identifying an open-air Neolithic settlement dated from the 5th millennium BC. The application of magnetic and GPR surveys in 2009-2011 and its subsequent excavation also revealed a Late Bronze Age human occupation represented by a large ditch with a burnt layer inside. The layer was characterized by a high amount of organic matter and different archaeological remains: pottery vessels broken inside, faunal and plant remains, sun-dried clay, metal and lithic artefacts and charred wood remains. Latter fieldwork results have also revealed the ditch was related to different alignment of post holes identified in the geophysical map which could belong to a building.

The aim of this work is to present the results of the interdisciplinary research combining the 3D digital model of the site with the geophysical survey map as well as the ditch stratigraphy and spatial analysis of each category of archaeological remains. The results obtained by the integrated analysis has finally improved our knowledge about La Dou site during its last occupation phase: which was the formation process of the burnt level inside the ditch, how it was linked with a hypothetical building structure and what were the social practices involved in the formation of the site.

19 MICROSTRATIGRAPHIC ANALYSIS IN THE DITCHED ENCLOSURE OF PERDIGÕES SITE (PORTUGAL)

Author(s): Milesi, Lara - Gutiérrez-Rodríguez, Mario (Universidad de Granada. Facultad de Filosofía y Letras) - Duarte, Carlos (Universidad de Cantabria)

Presentation Format: Oral

Iberian neolithic and chalcolithic ditched enclosures have been study under different perspectives and incorporating new methodologies throughout the last two decades. However, none profound research has been done in the study of the sedimentary formation processes of the deposits that fill almost all their features – mainly ditches and pits.

The paper presents the first microstratigraphical study carried out in the filling of one of the late chalcolithic ditches of Perdigões site (ditch 2). The research aims to test microstratigraphical analysis efficacy as part of a necessary multiproxy approach to the interpretation of this complex archaeological contexts. Methodology and results of 15 thin sections will be discussed considering: i)sedimentary components, ii) microfacies analysis and iii) postdepositional processes. Discussion will include evidences of vegetation clearance, refuse deposits, and colluvial deposits. Also, short-term and long-term formation processes will be proposed for natural and anthropic deposits. This information will be related to indirect evidences of a bank structure located next to the ditch and decreases of human activity in the area nearby the structure during some periods.

The results will also be discussed in the context of the southern Iberian prehistoric enclosure phenomenon end, that is coinciding with the transition to new cultural traits associated to Bronze Age societies.

a. MULTIDISCIPLINARY RESEARCH OF THE ARCHEOLOGICAL MINING AND METALLURGICAL COMPLEX OF THE BRONZE AGE SYRLIBAY (KAZAKHSTAN).

Author(s): Noskevich, Vladislav (Institute of Geophysics, Ural Branch of RAS, Ekaterinburg) - Tkachev, Vitali (Institute of the steppe UB RAS, Orenburg) - Yuminov, Anatoli (Institute of Mineralogy, Ural Branch of RAS, Miass) - Baitleu, Darkhan (Branch of the Institute of Archeology. A. Kh. Margulan in Astana)

Presentation Format: Poster

The discovery of the Mugalzhar mining and metallurgical center of the Late Bronze Age, whose activity is related to the production of the metal of the Kozhumberdy cultural group on the western flank of the Andronovo cultural-historical community, actualized the task of ascertaining the mechanisms for the functioning of this historical metallurgical formation. Studies have shown that groups of archaeological monuments of various categories (settlements, burial grounds, cult objects) form compact micro districts, confined to ancient mining workings on copper. To solve this problem, the brightest complex of monuments in the middle reaches of the Sarlibay River was chosen. The proposed work is devoted to interdisciplinary research of the Sarlibay archaeological micro district. A series of monuments of the Late Bronze Age was found on a 4 km long section. Detailed geological and geophysical research and archaeological excavations revealed two copper mines, an unfortified settlement, several mounds and a sanctuary with petroglyphs. On one of the mines consisting of three quarries, GPR survey was carried out and a model of the ancient surface of the mine was constructed, which estimated the amount of mined ore and smelted copper. On the territory of the sanctuary, a "ringing" stone was discovered. He was named for his unique ability to make a high, sonorous sound when struck, like a blow on a railway rail.

b. MUD 'N' ROLL IN THE TERRAMARE: MICROMORPHOLOGICAL ANALYSIS OF WHEEL RUTS AT THE BRONZE AGE VILLAGE OF QUATTROCASE (CREMONA, ITALY)

Author(s): Peinetti, Alessandro (Laboratoire Archéologie des Sociétés Méditerranéennes, UMR 5140 (CNRS, Univ. Paul Valéry Montpellier 3, MCC); LabEx Archimede; Università di Bologna) - Wattez, Julia (INRAP) - Bronzoni, Lorenza (AR/S Archeosistemi soc. coop.)

Presentation Format: Poster

The rests of a Bronze Age village has been investigated at Quattrocase (Casalmaggiore, Cremona district, Northern Italy) by preventive archaeology in 2016. The material culture, typical of the "Terramare culture", refers to the central and the final phase of the Middle Bronze Age (about 1550-1340 BC). The excavated area probably corresponds to the periphery of the site, showing some dwellings, a large area without buildings and a ditch coupled with a palisade. The stratigraphy is here well preserved but quite undifferentiated and homogeneous, probably corresponding both to the life and abandonment of the site.

An undisturbed sample of sediments for micromorphological analysis has been collected during the excavation, in order to characterize the activities performed in this peripheral area of the site and to understand the formation processes leading to the observed undifferentiated stratigraphy.

The micromorphological analysis show the presence of a courtyard area more or less cleaned and maintained at the beginning of the occupation. After, the traces of a pathway and wheel ruts characterize the sampled area. The wheel rut shows the marks of compression made by the passage of a wheel, alternated to the partial infilling of the rut in dry or moist climatic conditions. The aim of this poster is to describe and make a model about the traffic and the trampling traces recognized at the micro-scale. Wheel traces will be also commented by the geoarchaeological and archaeological literature on the subject.

558 WETLANDS VS. DRYLANDS? CHALLENGING DIVIDES AND CHANGING ARCHAEOLOGICAL PERSPECTIVES ON PREHISTORIC WETLAND SITES, LANDSCAPES AND SOCIETIES

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Huisman, Floor (Durham University) - Naumov, Goce (Center for Prehistoric Research / Goce Delčev University)
Format: Regular session

Prehistoric wetland sites have great potential for informing us about the past as they tend to provide better preservation than dryland sites. Yet this potential is currently not fully realised as many wetland sites and societies are studied in isolation. This divide, although noted by many scholars, continues to exist, mostly due to our modern perceptions of these landscapes and the people who live here as 'different' from drylands and their inhabitants. Thus, our notions about landscape and environment are the primary reference for understanding social diversity, leading to biased perspectives on prehistoric societies.

Rather than assuming such differences and isolating wetland sites and communities, we need to develop methods and theories that allow us to study wetland(er)s in relation to dryland(er)s. For instance, by studying the landscape settings of wetland and dryland sites through new scientific methods, which demonstrates that some landscapes were altered recently and not as different as originally proposed. Recent comparative studies of wetland and dryland material culture also indicate exceptional similarities and confirm the established networks between societies that were previously considered different. Even in cases where there were real differences between wet and dryland landscapes and communities, it is unlikely that wetlanders lived in complete isolation, urging us to consider their role and place in the wider socio-cultural landscape. Therefore, we invite papers that present new perspectives on wetland sites and communities in relation to dryland(er)s. Methodological and theoretical approaches breaking down the wetland/dryland divide and drawing wetland(er)s out of isolation are particularly welcome.

ABSTRACTS

01 WETLANDS VS. DRYLANDS? CHALLENGING DIVIDES AND CHANGING ARCHAEOLOGICAL PERSPECTIVES ON PREHISTORIC WETLAND SITES, LANDSCAPES AND SOCIETIES

Author(s): Huisman, Floor (Durham University) - Naumov, Goce (Center for Prehistoric Research; Goce Delčev University)
Presentation Format: Oral

Prehistoric wetland sites have great potential for informing us about the past as they tend to provide better preservation than dryland sites. Yet this potential is currently not fully realised as many wetland sites and societies are studied in isolation. This divide, although noted by many scholars, continues to exist, mostly due to our modern perceptions of these landscapes and the people who live here as 'different' from drylands and their inhabitants. Thus, our notions about landscape and environment are the primary reference for understanding social diversity, leading to biased perspectives on prehistoric societies. Rather than assuming such differences and isolating wetland sites and communities, we need to develop methods and theories that allow us to study wetland(er)s in relation to dryland(er)s. For instance, by studying the landscape settings of wetland and dryland sites through new scientific methods, which demonstrates that some landscapes were altered recently and not as different as originally proposed. Recent comparative studies of wetland and dryland material culture also indicate exceptional similarities and confirm the established networks between societies that were previously considered different. Even in cases where there were real differences between wet and dryland landscapes and communities, it is unlikely that wetlanders lived in complete isolation, urging us to consider their role and place in the wider socio-cultural landscape. Therefore, we invite papers that present new perspectives on wetland sites and communities in relation to dryland(er)s. Methodological and theoretical approaches breaking down the wetland/dryland divide and drawing wetland(er)s out of isolation are particularly welcome.

02 A SEMI-DRY DUTCH PREHISTORY?

Author(s): Muller, Axel (ADC ArcheoProjecten)
Presentation Format: Oral

The Dutch delta is famous for its wonderful wetland sites, especially the Mesolithic sites in the river area on submerged river dunes. On the edges of the Rhine-Meuse Delta there are numerous contemporary drylands sites. The relation between these two areas and their sites have been the subject of many studies.

One of the challenges for these studies, is the relative small number of wetland sites that have been excavated. However in the last 15 years some large scale projects were conducted in wetland contexts.

These recent CRM excavations in the delta, on early prehistoric (Mesolithic) sites, are located in submerged cover sand areas or on the edges of rivier systems. Although these sites are currently often situated in a typical wetland setting (covered by thick layers of peat and clay and under groundwater), the excavations showed that many of these sites were located in typical drylands, so we miss the ecological data and artefacts from organic materials.

However, palynological data from geological features such as fossil oxbow lakes, closely related to these sites, can supply very important data about the contemporary landscape and ecological settings. Therefore we can gain insight in the possibilities to

explore these areas in the early prehistory and compare them with the typical wetland sites from the submerged river dunes and the drylands on the edges of the delta. These palynological resources can alter our view on the Dutch semi-dry wetlands.

In the presentation I will discuss three case studies on wetland sites (Dronten, Well Aijen and Kampen) where most of the information about the landscape comes from these palynological resources.

03 BEYOND LAKE VILLAGES: INVESTIGATIONS AT BURGAESCHISEE (SWITZERLAND) AND NEW INSIGHTS IN NEOLITHIC SETTLEMENT, LAND USE AND VEGETATION DYNAMICS.

Author(s): Hafner, Albert (Institute of Archaeological Sciences, University of Bern; Oeschger Centre for Climate Change Research, University of Bern) - Tinner, Willy - Rey, Fabian - Laabs, Julian (Institute of Plant Sciences, University of Bern; Oeschger Centre for Climate Change Research, University of Bern)

Presentation Format: Oral

Interdisciplinary research within the "Beyond lake villages: Studying Neolithic environmental changes and human impact at small lakes in Switzerland, Germany and Austria" project focused on Neolithic settlement activities, human impact on the environment and vegetation history in three alpine foreland areas with small lakes (Central Switzerland, Westallgaeu, Germany and Salzkammergut, Austria). Laminated sediment sequences form the basis for palaeoecological time series on Holocene vegetation, land use and fire dynamics that reach unprecedented time resolutions and precisions. Here we propose to present research results from the Swiss project part of the "Beyond lake villages" project at Lake Burgaeschi on the Swiss Plateau. Our research focused on Neolithic wetland sites on the lakeshores, sites on (dry) mineral soils in the hinterland and the Holocene vegetation of the lake basin. The earliest traces of agriculture start with the onset of the 5th millennium BC, landnam phases were likely coupled to climate dynamics, with warm and/or dry conditions resulting in more intense agriculture and settlement expansion, while cold and/or wet conditions resulted in land abandonment and forest closure. The joined interpretation of palaeoecological and archaeological results shows the establishment of sedentary agro-pastoral societies around 5000-4800 BC in the Burgaeschisee area. Palaeoecological proxies show clear cycles of fire-based deforestation followed by successional forest recovery stages.

04 A SPARK IN THE DARK. 'LA MARMOTTA' LAKESHORE VILLAGE IN THE FRAMEWORK OF THE IMPRESSED WARE NEOLITHIC

Author(s): Mazzucco, Niccolo' (Université Paris Lumières postdoctoral fellow, UMR 7055 PreTech, CNRS / Université Paris Nanterre) - Mineo, Mario (Museo delle Civiltà - Museo Preistorico Etnografico) - Gibaja, Juan Francisco (Archaeology of Social Dynamics group - ASD, Milá i Fontanals Institution - IMF-CSIC) - Mozota, Millán (Archaeology of Social Dynamics group - ASD, Milá i Fontanals Institution - IMF-CSIC) - Gassin, Bernard (TRACES, UMR 5608, CNRS / Université de Toulouse II Jean-Jaurès)

Presentation Format: Oral

The lakeshore settlement of 'La Marmotta' (Anguillara Sabazia, Metropolitan City of Rome) represents one of the earliest evidence of seafaring farmers in the Italian Peninsula (ca. 5900-5600 cal BC) and one of the earliest lakeshore villages of the entire Central Mediterranean Basin. The site is unique for the richness and variety of organic materials preserved (i.e. foodstuff, wood and plant crafts, house remains, pirogues, etc.), especially if compared with the rest of Early Neolithic settlements in the Italian Peninsula, and, more in general, in the Central and Western Mediterranean area. Nevertheless, due to several reasons, the site has still been little integrated within the debate on the Neolithization process. How can the huge amount of data obtained from La Marmotta be transposed to the surroundings, contemporaneous, dryland sites? This is a compelling challenge, especially considering that often no comparable records exist in the archaeological contexts characterized by drier preservation conditions. In this presentation we will focus on the flaked stone assemblage and on the several wooden sickles recovered from this settlement. The integration of both records can help us understanding the harvesting techniques adopted during the Early Neolithic, providing a fundamental reference for the rest of Impressed Ware sites of the Central and Western Mediterranean area.

05 WETLAND VS DRYLAND SITES: ANIMAL MANAGEMENT PRACTICES DURING THE EARLY NEOLITHIC IN WESTERN MEDITERRANEAN

Author(s): Navarrete, Vanessa - Saña Segui, Maria (Laboratory of Archaeozoology. Universitat Autònoma de Barcelona)

Presentation Format: Oral

Animal management strategies present a high variability degree during the Early Neolithic. This variability has been characterized mainly by the following parameters: number of exploited animal species, wild and domestic component of assemblages and animal productions exploited (meat, wool, milk…). A comparison between Early Neolithic wetland and dryland sites from the Mediterranean region and from the Alps has been carried out. The main objective is to test if animal management strategies in wetland environments present a specific pattern compared to dryland sites. In addition to the characterization of animal production strategies practiced during the early Neolithic in wetland environments, the role and influence of lake environment in subsistence strategies of the first farming societies will be evaluated. The results reveal the factors involve in the composition of assemblages, the site type and the characteristics of the environment (terrestrial or lacustrine). The evaluation of the impact that the different taphonomic processes have had on the settlement allows verifying if the representation of the social dynamics is affected. In addition to the characterization of animal production strategies practiced during the early Neolithic in wetland environments, the role and influence of lake environment in subsistence strategies of the first farming societies will be evaluated.

06 TELLS IN WETLANDS: RECONSIDERATION OF LANDSCAPES AND NETWORKS IN THE NEOLITHIC BALKANS

Author(s): Naumov, Goce (Museum of Macedonia; Center for Prehistoric Research)
Presentation Format: Oral

Commonly the tells were perceived as settlements established in drylands and consequently were studied as such. But the recent research indicate that highest density of the Balkan tells was in the valleys that were Neolithic wetlands, but dried in the 20th century due to the strategy of melioration in many countries. The recently modified environment induced altered perspective of tells and focused the research more on the settlements and not on their surroundings. Nevertheless, the current geoarchaeological research in Konya (Turkey), Thessaly (Greece) and Pelagonia (Republic of Macedonia) specify the wetland character of valleys inhabited by the first farming societies that were establishing the tells since the Early Neolithic. In the process of Neolithization, besides the advantages such like agriculture, stock-breeding, daub dwellings, pottery, figurines and new tools, the Anatolian farmers that settled the Balkan Peninsula also introduced the life on tells particularly located in the wetlands. Gradually these tell societies developed solid networks with communities inhabiting the lakeside pile-dwellings that were previously studied as isolated units due to diverse environmental features. Therefore this paper will be focused on the Balkan Peninsula and Thessaly, Pelagonia, Korça, Mačva and Lower Danube in particular in order to reconsider the tells and their wetland environment, as well as the networks some of these societies had with pile-dwellings in the regions of Amindeon Basin and Lake Ohrid.

07 LINKING DRYLAND AND WETLAND AT THE VIVERONE MIDDLE BRONZE PILE-DWELLING SITE

Author(s): Jennings, Benjamin (University of Bradford)
Presentation Format: Oral

The prehistoric site of Viverone, has been known about for many decades, with excavations recovering many artefacts, including assorted metalwork items and abundant ceramics.

Recent excavations at the Viverone Middle Bronze Age pile-dwelling, a member of the "Prehistoric Pile Dwellings Around The Alps" UNESCO World Heritage Status Sites, aimed at gaining a greater understanding of the environmental and cultural context of the settlement, have highlighted the inter-connections between the prehistoric populations residing on the lake-shore and those further inland.

Ceramic typological studies and metal analysis demonstrate links to societies both locally in northern Italy, and further afield in central and northern Europe.

On and off site environmental analysis, enabled by sediment coring, has highlighted the development of the environmental setting over time, changing from a sand bar area to the present offshore situation.

Ongoing dendrochronological analysis, in addition to the excavation and identification of cultural layers, have helped to define the potential duration of the settlement occupation.

The recent excavation has demonstrated the potentially significant role that this settlement played in linking northern Italy to northern Europe. Although the settlement does not continue in to the Late Bronze Age, the area appears to have held significance during this period with artefacts still found. However, where the pile-dwellers occupied after the end of the settlement remains unknown.

08 INVESTIGATING HUMAN OCCUPATION OF LAKESIDE SETTLEMENTS USING PALAEOENTOMOLOGICAL TECHNIQUES; AN IRON AGE CASE STUDY FROM BLACK LOCH OF MYRTON, SCOTLAND

Author(s): Davies, Kimberley - Whitehouse, Nicola (Plymouth University) - Allison, Enid (Canterbury Archaeological Trust) - Cavers, Graeme - Crone, Anne (AOC Archaeology Group) - Brown, Antony (University of Southampton)
Presentation Format: Oral

Black Loch of Myrton is an Iron Age lochside settlement situated in south-west Scotland. It consists of a number of round house structures constructed on peat/fen material at the margins of a small, productive loch. Here we present palaeoentomological data from archaeological excavation deposits from a single structure at the site, excavated in 2015. The main aim of the palaeoentomological work is to inform our understanding of the living conditions on the site, the environmental context in which the site was constructed and explore wider implications for our understanding of lakeside settlements of this period.

Beetles, flies and ectoparasites (e.g. fleas) indicate decomposing floor litter layers and the presence of dung materials within the house structure. Of particular interest is the presence and persistence of a dry synanthropic insect fauna, typically associated with roofing and thatching, that are commonly found in settlement sites of later time periods. Such communities likely reflect links with larger settlements, whilst understanding how these taxa became adapted to synanthropic environments is likely crucial to our understanding of prehistoric rural sites such as Black Loch of Myrton and their interactions between nearby dryland communities and how these developed through time. Additionally, there are species associated with storage of cereals that are typically viewed as Roman introductions within the Iron Age deposits, suggesting more diverse and long distant links than previously appreciated. We explore these themes within the context of other wetland sites of similar age to define a rural wetland settlement indicator package.

The results of this work form part of a larger archaeological project to study patterns in construction, function and longevity of these Iron Age wetland sites and to place them within the context of the wider prehistoric landscape.

09 LIVING ON WATER: EARLY IRON AGE LOCH DWELLING AT LOCH TAY, SCOTLAND

Author(s): Stratigos, Michael - Cook, Gordon - Hamilton, Derek - Jacobsson, Piotr (SUERC - University of Glasgow)
Presentation Format: Oral

Crannogs were a feature of the Scottish wetland landscapes since sometime in the earlier Iron Age to the early modern period. However, despite over a century of study, these sites are only beginning to be integrated into narratives of Scottish history and later prehistory. Living on Water is a three-year project conducting underwater excavation to develop a social history of life on Loch Tay. Our understanding of the Early Iron Age (800-400 BC) in this region is dominated by crannogs, but we still have a relatively poor grasp of their emergence and development. The project is addressing this through building a high-precision chronology for the earliest lake dwellings of Loch Tay, Perthshire, through the combination of radiocarbon dating, dendrochronology and Bayesian analysis on structural timber material excavated from six crannogs in the loch. Within the Loch Tay region, the high-resolution chronology will provide a firm foundation from which basic, but still unresolved, questions can be addressed to integrate crannogs into a wider understanding of the Scottish Iron Age, such as;

1. Were any of the crannogs within the same loch occupied at the same time?

2. What relationships did crannogs have to the wider terrestrial landscape and how did this change through time?

3. What specific practices can be identified at these sites, how these practices relate to the site surroundings and how do they change through time?

This paper will review the methodologies and results of the Living on Water project from the first year of the project.

10 THE PARADOXES OF WETLAND PERCEPTIONS - BEFORE AND PRESENT

Author(s): Pantmann, Pernille (Museum of North Zealand)
Presentation Format: Oral

Danish Iron Age wetland sites are studied in high numbers these years. Yet, several paradoxes emerge. Amongst others the continued need of segregating wetlands from drylands when they are often closely related. In Denmark, wetlands have repeatedly been perceived as markers of the settlement limits, hence rarely been excavated. However, recent excavations and studies of wetlands have revealed that some of them were indeed part of the settlement structure. They had multiple functions: rubbish disposals, peat cuttings, breaking of bog bore iron, sacred activities, and probably hay and reed harvesting as well. Some wetlands even fulfilled several functions simultaneously.

Despite the many examples of profane resources that the wetlands supplied, the wetlands still maintain a position as "sacred places" in the minds of many scholars. The attention to the sacred activities in the wetlands has caught far more interest than the profane activities, whereby the traditional idea of the wetlands as particular sacred is maintained. The fact that some wetlands even show signs of being used for both sacred and profane activities simultaneously seems to be neglected.

The separation of the sacred and the profane activities maintain the idea of the wetlands as marginal areas thus reflecting the modern perception of wetlands rather than the Iron Age perception, despite numerous archaeological examples. During the last 200 years, Danish agriculture has strived for efficient drainage of as many wetlands as possible hence turning them into fertile agrarian land. The wetlands are in a modern capacity considered useless. However, agriculture as well as valuation of nature was different during the Iron Age, suggesting that wetlands were used and perceived differently than today.

This presentation is based upon a current Ph.D. thesis regarding differences in wetlands perception and valuation during the Iron Age compared to the modern period.

11 WHY LIVE ON THE LAKESHORE? SOME INTERNATIONAL, INTERDISCIPLINARY AND THEORETICAL THOUGHTS ON THE MATTER

Author(s): Verdonkschot, Jadranka (Universität Tübingen; Universidad de Alcalá)
Presentation Format: Oral

The theme to this session is discussed through the assessment of four archaeological case studies (Egolzwil 3, Switzerland; Hörnle IA, Germany; La Draga, Spain and Dispilio, Greece) and two anthropological examples of pile dwellings (the Ribeirinhos, Amazon Floodplains/Brasil and Amsterdam, the Netherlands). The exploitation of different kinds of resources, the relationship of the lake-dwellers with the landscape and ritual evidences are all taken into account, contributing thoughts to the discussion why people would settle lakeshores in distinct regions, considering the influence of the lake on their life and identity and a broader assessment of culture and identity as a „liquid" concept. This line of research was inspired by the observation that most explanations for initial wetland settling in prehistoric archaeology are overly simplified in current literature. Existing tendencies often rely on environmentally deterministic and exclusively practical arguments. This study aims to contribute a higher diversity of arguments. Moreover, as several regions are represented, this study assessess a broad and diverse lakeside settling panorama. This work does not aim to reach a definitive answer, a single reason explaining the settling of the lakeshore, but should rather be viewed as a theory-based excercise that tries to move beyond conceptual and modern borders.

561 ARCHAEOLOGICAL INDICATORS FOR THE IDENTIFICATION OF MEDIEVAL JEWISH POPULATIONS

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Eiroa, Jorge (Universidad de Murcia) - Milanese, Marco (Università degli Studi di Sassari)
Format: Regular session

In recent years, the study of medieval Jewish communities from the archaeological record has changed significantly. In the past, all the studies have been focused almost exclusively on epigraphy, cemeteries and religious buildings (synagogues and ritual baths or mikva'ot), but in the last decade new strategies of research are making it possible to identify the presence of Jewish population in medieval archaeological contexts (distinct from religious or funerary). An innovative research line aims to an archaeological identification of Jewish presence with intensive topographic use of written sources in relation to stratigraphic contexts. On the other hand, despite the difficulties in characterizing the material culture of Jewish communities (if that were possible), the identification of ceramic Hanukkah oil lamps in domestic contexts or the development of zooarchaeological analysis (that enables the identification of diets and alimentary practices typical of Jewish populations, Sechita and Kashrut) are giving successful results in some Spanish, French or Italian archaeological sites. This session will deal with the results of the application of these two research strategies and any other that allows the identification of the presence of Jewish populations in domestic contexts, through the study of concrete cases related to archaeological sites of any European country as well as the North of Africa.

ABSTRACTS

01 INTRODUCTION TO THE SESSION: ARCHAEOLOGICAL INDICATORS FOR THE IDENTIFICATION OF MEDIEVAL JEWISH POPULATIONS

Author(s): Eiroa, Jorge (Departamento de Prehistoria, Arqueologia, Historia Antigua e Historia Medieval, Universidad de Murcia) - Milanese, Marco (Dipartimento di Storia, Scienze dell'Uomo e della Formazione, Universitá degli Studi di Sassari)
Presentation Format: Oral

Although the archeology of the Jewish minority has a huge historiographic tradition, our knowledge of the material culture of the Jewish populations during the Middle Ages is based almost exclusively on the study of their cult buildings (the synagogues) and their funerary spaces. This type of archeology, in its monumentalism, does not allow us to characterize Jewish populations or identify the presence of Jews in archaeological contexts. That is why this session tries to bring together those researchers who, in recent years, have brought to light new strategies, in different territories, which allow us to make the leap from a monumentalist archeology to an identity archeology. This session will deal with the results of the application of new research strategies that allow for the identification of the presence of Jewish populations in domestic contexts, through the study of concrete cases related to archaeological sites of any European country as well as the North of Africa. The study of ceramic Hanukkah oil lamps in domestic contexts, the zooarchaeological analysis (that enables the identification of diets) or the application of advanced topographic and documentary analysis are some of the new recently opened roads that deserve to be contrasted and discussed in the session.

02 THE JEWISH QUARTER IN CATALAN ALGHERO

Author(s): Milanese, Marco (University of Sassari - Department of History, Humanities and Education)
Presentation Format: Oral

The study of the Jewish presence in Alghero—Sardinia's second Jewish community after Cagliari— is totally a work in progress. The first Jewish families settled in Alghero in 1322, but a stronger Jewish presence in Sardinia started with the Aragonese conquest of the island, which took place in 1323–1324, and continued along all of XIVth century. Jewish arrived in Alghero from Catalonia, Aragon, Majorca, Castile, and Sicily, but even from Provence and Languedoc.

The aljama (Jewish quarter) of Alghero was situated in the vicinity of the port, in the northwest section of the city, the present Piazza di S. Croce and that of Alghero's old civic hospital. Today, this vast sector of the historical city has been undertaken to an extensive urban transformation, with an important program of urban archaeology. According to several written sources, the Jewish quarter extended around the synagogue; in it were ubicated large "palazzi" of the more important families (such as the Carcassona and the Cohens), but also multistoried houses with shops and storerooms on the ground floor, courtyards, and gardens. This variety in building typology corresponds to the articulated social stratification of the aljama, and was confirmed in recent archaeological investigations. After the 1492 expulsion of the Jews, the Jewish quarter of Alghero was in a general state of decay, although buildings and ruins were still in use.

A problem arises with regard to the material culture of Alghero's Jewish community and the lack of specific identifying features between archaeological finds. The absence of manufactured items of a religious nature, material culture with explicitly Jewish connotations, suggest a more specific archaeological project focusing on verify Jewish presence through archaeology.

03 HANUKKAH LAMPS: PROPOSAL FOR CLASSIFICATION AND ANALYSIS FROM THE LATE MEDIEVAL CERAMIC FRAGMENTS FOUND IN LORCA (MURCIA, SPAIN)

Author(s): Eiroa, Jorge (Departamento de Prehistoria, Arqueologia, Historia Antigua e Historia Medieval de la Universidad de Murcia) - González, José (Archaeologist)

Presentation Format: Oral

During the Festival of Lights or Hanukkah (commemorating the rededication of the Second Temple in Jerusalem at the time of the Maccabean Revolt against the Seleucid Empire), the Jews used multiple oil lamps, which were lit for eight days at sunset and which are called Hanukkiot (singular: Hanukkiah). For some years, some ceramic pieces found in Spain during the excavation of medieval archaeological contexts linked to the Jewish minority (in sites such as Tudela, Zaragoza, Burgos, Lleida or Teruel), which are being formed by several ceramic oil lamps united in a serial way, they have been identified as Hanukkiot.

The detailed study of the fragments of Hanukkiot found during the systematic archaeological excavation of the Jewish quarter of the castle of Lorca (Murcia), dated in the XIV and XV centuries, allows us to establish a rough typology and shed light on some questions that are being debated: its identification (questioned in some works based on the written documentation conserved), its representativeness (considered too high) or its restitution (debate about the number of lamps). The analysis of these materials from Lorca, a Jewish quarter of the Castilian border with the Nasrid kingdom of Granada, reveals the importance of multiple Hanukkah lamps as archaeological indicators of enormous value for the identification of Jewish populations in domestic archaeological contexts.

04 CERAMIC VESSELS USED FOR THE CELEBRATION OF PASSOVER FROM THE LATE MEDIEVAL JEWISH QUARTER OF LORCA (MURCIA, SPAIN)

Author(s): González, José (Archaeologist)

Presentation Format: Oral

In the context of ancient Jewish quarters, the archaeological record reveals that material culture hardly shows any distinctive traits of these communities. Only those elements tied to the religious and cultural spheres provide clear signs of identity pointing to a Jewish population, whether in terms of liturgical objects of the synagogue or ones used for celebration in the household.

The various archaeological projects undertaken in recent years at the castle of Lorca (Murcia, Spain) have uncovered part of an urban complex that comprised the ancient Jewish quarter, along with its synagogue. The results of the archaeological excavations include copious material that allows us to understand the domestic life of this Late Medieval religious minority. Pottery is the main material that has been recovered and the multiple fragments of oil lamps used for the celebration of Hanukkah stand out among the ceramic assemblage. These oil lamps represent the main archaeological indication found at the Jewish quarter of Lorca that shows that religiousness was present in the household sphere.

Along the same lines, as far as domestic contexts go, we ponder two other possible cases, namely two platters or dishes that were likely used for the celebration of the Jewish Passover (Seder Pesach). The goal of this paper is to present an analysis of these two objects focusing on two aspects related to the source of their production and their archaeological context: 1) a series of morphological traits and decorative motifs that tie them to the characteristic Jewish household goods; 2) a function consistent with the presentation of certain symbolic foods served for supper, in accordance with the Jewish rite.

05 ARCHAEOLOGICAL INDICATORS OF THE DAILY LIFE OF THE JEWISH COMMUNITY AT MOTA DE CASTRILLO, (BURGOS, SPAIN)

Author(s): Negredo García, Maria - Palomino Lazaro, Ángel (Patrimonio Inteligente S.I.) - Moreno García, Marta - Peña Chocarro, Leonor - Pérez Jordá, Guillem (Instituto De Historia, CSIC)

Presentation Format: Oral

Historical documents point to the year of 1035 as the origin of Mota del Castrillo's settlement, when the Jewish community was removed from the neighbouring village of Castrojeriz (Burgos, Spain). According to the same sources, this population group stayed there until they were allowed to come back to the original aljama in 1311. From then onwards the quick decline of the Mota site began. Such precise dates provide an excellent chronological framework for the abundant archaeological finds recovered.

Above all, pottery stands out with productions that correspond to the late medieval models present in the territory of Castilla, although the occurrence of specific pieces of the Hebrew ritual associated with the festivity of Hanuka, in particular the numerous ceramic oil lamps identified as hanukiya, constitute a clear cultural indicator. Furthermore, the faunal remains reflect practices of the culture of this kind of communities. The dominance of livestock, particularly goats followed by cattle and sheep, is clearly evident. Also the presence of domestic fowl shows that a variety of meats were consumed, while the scarcity of suids and wild taxa probably relates to monitoring of dietary rules dictated by the Jewish religion. Butchery marks and anatomical profiles (i.e., dominance of anterior over back legs) demonstrate a large degree of standardization as well.

The strong rural character of this community is reflected in the archaebotanical record, too. The high proportion of cultivated cereals (naked wheat, hulled barley and rye), well adapted to local ecological conditions, their significant variety and among the fruits the abundant number of grape seeds recovered suggest an important development of agricultural activities.

06 THE ARCHAEOLOGY OF THE ROMAN PRAETORIUM AND THE MEDIEVAL JEWISH QUARTER OF COLOGNE

Author(s): Otten, Thomas (Museum)

Presentation Format: Oral

The presentation deals with the museological aspects of how to present an authentic place, the in situ-presentation of the archaeological site of the roman Praetorium as the heart of the Lower German Limes and the medieval Jewish quarter of Cologne, its chronology, topology and its contextual objects.

MIQUA will open its doors to the public in 2021. Nearly 2000 years of city history will come alive, manifested in an archaeological site covering more than 6000 m² with features and finds from the roman period up to the 20th century. The core exhibition will be placed underground, in the excavation site with a four phased Praetorium from the first century AD and the medieval Jewish quarter with an also four-phased Synagogue and Mikveh from the early 11th century. The exhibition will present the stories of the buildings but also of the people who lived there.

An important role plays the presentation of the original objects placed nearby their origin place of finding. Regarding the approach of an archaeological identification of Jewish presence interacting with the use of written sources there is for example a convincing evidence in the material of the pogrom of 1349 and the well documentated stratigraphic contexts in the excavations. The second conceptional principle is not only to present reconstructions to the public, but to let the visitors take part in understanding, in constructing and discussing different solutions of reconstructions. For a better understanding there will be shown different results of a well-documentated reconstruction process, which is based on a web-tool developed together with the university's of Darmstadt/Germany and Budapest/Hungary.

07 THE JEWISH MEDIEVAL CEMETERY OF BOLOGNA: NEW DATA AND CHANCES FOR RESEARCH

Author(s): Di Stefano, Valentina - Curina, Renata (Soprintendenza Archeologia Belle Arti e Paesaggio di Bologna) - Buonamico, Laura (Cooperativa Archeologia)

Presentation Format: Oral

The Archaeological Superintendence of Bologna (Italy) has recently investigated a large cemetery, in use between the 14th and 16th centuries and located in the historic center of the city. Due to the total absence of epigraphic markers and the scarcity of pottery, a careful analysis of the traces, as well as of the absences, have been combined in order to reconstruct the religious identity of over 400 buried, integrating the archaeological method with the anthropological and demoethnoanthropological one. The medieval Jewish cemetery of the city has been identified through the integrated study of archive sources and historical cartography, the topographic analysis of the cemetery's spatial organization, the elements derived from the taphonomic analysis of individuals. In addition, the Jewish Community of Bologna has provided an expert support with regard to the history of religious and ritual traditions.

The different research methods have allowed recognize the cemetery as the "Orto degli Ebrei", as it is mentioned among the historical sources. The cemetery was wrecked according to the Pope's decision to destroy the tombstones and tombs to erase the memory of Jewish people.

The archaeological excavation, supported by the investigations carried by the anthropologists of the University of Bologna, has returned the material consequences of those nefarious measures, documenting the voluntary damage of the bodies. It has been also possible to identify the effects of the expulsion of Jews people from the Pontifical State. The findings have also confirmed that later the cemetery area was donated to the nearby monastery of St. Peter Martyr and that Christian burials were placed in the space of the earlier Jewish ones, applying different ritual rules. Based on an integrated multidisciplinary approach, the archaeological investigation of the Bologna Jewish Cemetery offers a new tool to build the path for a conscious collective memory of the city.

08 ISAAC PROJECT. ADN ET ISOTOPES: PROPOSING NEW METHODS FOR THE IDENTIFICATION OF MEDIEVAL JEWISH CEMETERIES

Author(s): Blanchard, Philippe (Inrap; UMR 5199 PACEA; EHESS) - Deguilloux, Marie-France (Bordeaux University; UMR 5199 PACEA) - Herrscher, Estelle (CNRS; UMR 7269 LAMPEA)

Presentation Format: Oral

The archaeology of Judaism has increased considerably in recent years with the development of preventive archaeology in Europe. However, the recognition of certain remains, especially funerary remains, is sometimes not easy in areas frequented and used by Christians and/or Muslims. It can sometimes be difficult to assign skeletons to a specific community.

The IsAAC project (Isotopes and DNA: New Approaches to Jewish Cemeteries) aims at carrying out isotopic and paleogenetic analyses of skeleton collections from Jewish, Christian and Muslim cemeteries in Europe in order to compare the results and observe the specificities of each group.

The palaeogenetic approach will greatly benefit from the extensive database available concerning the genetic diversity of extant jewish communities from Europe and Middle-East. The data compiled have regularly demonstrated very specific gene pools modeled by successive founder effects, combined to various degree of endogamy and admixture with local non-Jewish groups. The comparison of the maternal and paternal gene pool of the ancient populations targeted in the present project with extant (non)-Jewish groups should in consequence permit to discuss their attribution to Jewish communities.

The biochemistry tool uses carbon and nitrogen stable isotopes to restore the food supply of many prehistoric and historical populations. While relations between religion and food practices have been approached from the isotopic tool for the Catholic religion, few have been interested in the two other monotheistic religions of the Mediterranean basin: Jews and Muslims. Relatively to the influence of religion on diet, this work has demonstrated a differential contribution of animal proteins, marine resources or even millet cereal. The objective of isotopic analyses would therefore be to identify food practices specific to each community for a given territory and a given period.

09 FROM HOUSEHOLD WASTE TO HANUKKAH: THE STUDY OF DOMESTIC MATERIAL CULTURE FROM THE VLOOIENBURG DISTRICT IN AMSTERDAM, CA. 1600-1800

Author(s): Stolk, Marijn (University of Amsterdam)
Presentation Format: Oral

This paper will present the first results of the study of the material culture that was uncovered from the 17th and 18th century cesspits at the site of Vlooienburg, Amsterdam. The Vlooienburg district was the place where Sephardic Jewish immigrants settled around the 1600's and in this way formed the beginning of the development of the Jewish quarter in Amsterdam. The research results include the analysis of the ceramics that were used for cooking, food preparation and food consumption on a household level. Central in this research approach is the question whether it is possible to discover differences in ceramic assemblages between Jewish and non-Jewish households, when taking in account the use of distinct artifacts for the separation of meat and dairy products, according to the Jewish dietary laws. Next to this the identification of typical Jewish objects, such as Sabbath lamps or kosher lead seals, used for the marking of meat, will be highlighted. The preliminary outcome of this exploration will contribute to the discussion about the eventual characterization of the material culture of medieval and early modern Jewish communities.

This research is part of the broader Diaspora and Identity research project of the University of Amsterdam, the City of Amsterdam, office for Monuments and Archaeology, in collaboration with the Jewish Historical Museum.

562 COMPARATIVE MICROREGIONAL RESEARCH IN BRONZE AGE CENTRAL AND EASTERN EUROPE: THEORIES, METHODS AND FUTURE PERSPECTIVES

Theme: Theories and methods in archaeological sciences
Organisers: Czukor, Peter (Eötvös Loránd University, Institute of Archaeological Sciences, Budapest; Móra Ferenc Múzeum, Szeged) - Bodnár, Csaba (Eötvös Loránd University, Institute of Archaeological Sciences, Budapest; Museum of Fine Arts, Department of Classical Antiquites, Budapest) - Fejér, Eszter (Freie Universität Berlin, Institut für Prähistorische Archäologie, Berlin) - Polányi, Tamás (Northwestern University, Department of Anthropology, Evanston; Archaeologist and Project Manager SWCA Environmental Consultants)
Format: Regular session

The most successful approach to study the organisation of early complex societies is through diachronic, multi-disciplinary, multi-scalar projects aimed at the investigation of entire microregions. This approach enables the study of social phenomena in their wider context, with results that are inconceivable through projects focusing either on microscale archaeological patterns, or broad regions following tropes of early culture-historical narratives. The contextual variability resulting from the application of intensive comparative methods in various microregions could inform us about changing, conflicting ideas, identities and alternative articulations of social, political and economic processes. By revealing such multivocality and complexity of past societies systematic microregional studies expose social dynamics and facilitate new research questions to be addressed.

Following the collapse of the Iron Curtain a diversity of microregional archaeological approaches to Central and Eastern European Bronze Age societies have been developed articulating different elements of postprocessual archaeologies with national archaeological traditions. Our objective is to provide a platform for Bronze Age archaeologists working in Central and Eastern European countries to discuss the virtues of varied and often contradicting microregional approaches. We encourage contributions focusing on various aspects of microregional archaeological research: intra- and inter-site archaeological analyses of domestic and ritual activities, mortuary behaviours, depositional practices, consumption and production, or holistic landscape and environmental studies. Presentations providing critical comparative analyses of different microregional projects are especially welcome.

ABSTRACTS

01 COMPARATIVE MICROREGIONAL RESEARCH IN BRONZE AGE HUNGARY: INTRODUCTION TO SESSION

Author(s): Czukor, Peter (Móra Ferenc Múzeum, Szeged; Eötvös Loránd University, Institute of Archaeological Sciences, Budapest) - Bodnár, Csaba (Eötvös Loránd University, Institute of Archaeological Sciences, Budapest; Museum of Fine Arts, Department of Classi-

cal Antiquites, Budapest) - Fejér, Eszter (Freie Universität Berlin, Institut für Prähistorische Archäologie) - Polányi, Tamás (Northwestern University, Department of Anthropology, Evanston; Archaeologist and Project Manager SWCA Environmental Consultants)
Presentation Format: Oral

The most successful approach to study the organisation of early complex societies is through diachronic, multi-disciplinary, multi-scalar projects aimed at the investigation of entire microregions. This approach enables the study of social phenomena in their wider context, with results that are inconceivable through projects focusing either on microscale archaeological patterns, or broad regions following tropes of early culture-historical narratives. The contextual variability resulting from the application of intensive comparative methods in various microregions could inform us about changing, conflicting ideas, identities and alternative articulations of social, political and economic processes. By revealing such multivocality and complexity of past societies systematic microregional studies expose social dynamics and facilitate new research questions to be addressed. Following the collapse of the Iron Curtain a diversity of microregional archaeological approaches to Central and Eastern European Bronze Age societies have been developed articulating different elements of postprocessual archaeologies with national archaeological traditions. The objective of this introduction paper is to present the theoretical background for Session no. 562 and to discuss the virtues of varied microregional approaches applied by Bronze Age archaeologists working in Hungary. Focusing on microregional perspective we will consider such fields of archaeological research like intra- and inter-site analyses of domestic and ritual activities, mortuary behaviours, depositional practices, landscape and environmental studies etc.

02 EARLY BRONZE AGE SETTLEMENT AGGLOMERATION IN MIKULOVICE (EASTERN BOHEMIA). A MICROREGION PROFITING FROM IT'S POSITION ON A LONG DISTANCE ROUTE

Author(s): Langova, Michaela - Ernée, Michal (AU - Institute of Archaeology of the Academy of Sciences of the Czech Republic)
Presentation Format: Oral

The site of Mikulovice is situated on the traditional route from Bohemia to Moravia and also to Poland which is also known from Early Medieval written sources. An isolated hillock in Mikulovice which provides a wonderful view of the surrounding Elbe lowland couldn´t be passed unnoticed as far back as in prehistory. At the beginning of the Bronze Age, an intensively settled agglomeration of about 25 km^2 arose there.

The newly excavated Early Bronze Age inhumation cemetery with more than 100 graves at the base of the Mikulovice hillock provided an extraordinary chance to find out more about the role of this agglomeration. Despite the relatively small (but intensively) settled area and its location on the periphery of the Bohemian Únětice culture, the graves were very richly equipped and almost half of them contained imported "exotics" and highly valued commodities such as Baltic amber, sea shells, gold, bronze, stone industry etc.

A multi-disciplinary approach to the complex evaluation of the cemetery on the background of the finds from the whole microregion brought new light into our knowledge about the Early Bronze Age society. It has indicated much about the interregional long-distance connections, networks, exchange, trade and mobility of people and objects as well as about the Early Bronze Age. The character of the finds in the connection with the strategic position of the agglomeration indicates that the long-distance route had to be in use already during that time.

03 COMMUNITIES OF PRACTICE IN THE EARLY BRONZE AGE CARPATHIAN BASIN – THE POTENTIAL OF MICROREGIONAL POTTERY RESEARCH

Author(s): Bodnár, Csaba (Eötvös Loránd University, Institute of Archaeological Sciences, Budapest; Museum of Fine Arts, Department of Classical Antiquites, Budapest)
Presentation Format: Oral

In the nearly three decades after the collapse of the Iron Curtain, archaeology in Central and Eastern Europe has experienced essential changes in terms of how to recognize patterns in the archaeological record and how to understand the social behavior responsible for them in the past. Several new questions have arisen, and new ways of explanation as well as new methods of exploration and analysis have spread. One of the most striking elements of these changes is a shift in the spatial focus of archaeological analysis from grand, regional narratives of previous culture-historical agenda to more detailed meso-/micro-scale studies.

My aim in this paper is to provide a short overview, both theoretical and methodological, of Early Bronze Age pottery research conducted from a microregional perspective during the last decades in the Carpathian Basin. Based on the comparison of ceramic assemblages from different areas in Early Bronze Age Hungary, I would like to discuss the potential of ceramic vessels in reconstructing past social networks, past communities of practices (such as those of pottery consumption and production) that were operating on a micro- and meso-scale. The comparative study of the archaeological record from two microregions reveals various previously unnoticed similarities and differences in the material culture of EBA communities which cannot be properly explained from the umbrella-like perspective of archaeological culture theory.

04 BEYOND LARGE SCALE EXCAVATIONS: FROM SINGLE SITE TO SETTLEMENT PATTERN IN THE BRONZE AGE OF SOUTHERN CARPATHIAN BASIN

Author(s): Kalafatic, Hrvoje - Šiljeg, Bartul (Institute of Archaeology, Zagreb) - Hršak, Tomislav (Archaeological museum Osijek)
Presentation Format: Oral

Eastern Croatia is a region situated between three mayor central european rivers: Dunav, Drava and Sava. It is optimal for archaeological landscape research due to its characteristics as it is a lowland area with fertile land divided on large agricultural plots. Fertile soil provided important basis for the human occupation and large plots provide better visibility of archaeological remains.

The satellite imagery and aerial photography data were analyzed and compared with results of systematic field survey. Regular usage of UAVs significantly increased discovery of new sites. The result is identification of large network of archaeological sites throughout the area. Majority of discovered sites can be attributed to the Bronze Age and Neolithic. Some known and excavated sites could for the first time be viewed more accurately, in their entirety and within their landscape.

On the other hand, in past decade extensive archaeological excavations were conducted on several Bronze age sites in the this part of Croatia. Longitudinal shape of highway and pipelines makes cros sections through significant portions of the landscape so archaeology got opportunity to have deep insight in land occupation during all over the time.

Results of these excavations combined with data obtained by remote sensing and field survey provide completely new insight on land occupation, settlement pattern and subsistence strategy in the Bronze Age.

It is confirmed that large contemporary settlements are situated at much smaller distance than previously tought and furthermore it is shown that distance pattern is also regular. It seems that in Late Bronze Age of this region we can talk about one of peaks in population density over human history.

05 THE LONG AGE OF BRONZE - LOWER ODER REGION IN LATE BRONZE AGE AND EARLY IRON AGE

Author(s): Slusarska, Katarzyna (Institute of Archaeology and Ethnology University of Gdańsk)
Presentation Format: Oral

The Bronze to Iron age transition is associated with substantial changes in nearly all aspects of human life - starting from technology to funeral rites, which are more evident in the archaeological record of the south Baltic zone. People stopped to build large barrow cemeteries and buried their dead in cist graves dispersed loosely along the valley's edge. The plain pot containing ashes was replaced with containers showing a different degree of anthropomorphism. The funeral rite modifications are accompanied by a less recognized change in settlement structures and economy. However, Lower Oder region shows slightly different dynamics. The Bronze Age started with delay gaining full expression within Urnfield period. Similarly, the end of Bronze Age is also shifted here into the end 1 half of I millennium BC. Environmental data attest synchronous climate shift and subsequent change in vegetation around half of I millennium BC.

Geologically Lower Oder region is quite young. It was shaped by the last glacial period which is expressed not only in landform but also it mosaic soil and vegetation cover. The climate is generally impacted by two major factors - Atlantic air masses and Baltic sea. All these elements mentioned above shaped a quite diverse micro-regional strategy in terms of economy and settlement patterns.

This paper evaluates the current state of research on late Bronze and early Iron Age change in both archaeological and environmental perspectives.

565 ECCLESIASTICAL LANDSCAPES IN MEDIEVAL EUROPE. A COMPARATIVE APPROACH

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Sanchez-Pardo, Jose Carlos (University of Santiago de Compostela) - Marron, Emmet (Newcastle University) - Tiplic, Ioan Marian ("Lucian Blaga" University of Sibiu) - Tiplic, Maria (Institute for Social Sciences and Humanities Sibiu)
Format: Regular session

Churches and monasteries are one of the most commonly studied structures in Medieval Archaeology and thousands of excavations have provided insights into their architecture and material culture across Europe. However it has been much less explored how this wide variety of Christian buildings (chapels, local churches, monasteries, oratories...) influenced (or were influenced by) their surrounding landscapes in physical, economic, political or symbolic terms. There has been a reluctance to look up from the site plans and to consider the wider context in which the site was founded and functioned. This session will explore this topic by means of different case studies from across Medieval Europe in order to highlight and discuss the variety of relations and contexts between ecclesiastical buildings and their surrounding medieval landscapes. Topics to be covered include (but are not limited to): the interrelation between different groups of churches, the archaeology of dependences outside the monastic walls, the physical transformation of the landscapes by ecclesiastical institutions (new crops, marshland drainage, bridges, the setting up of new economic activities like mining, salt production), strategies of Christianisation of the landscapes and the adaptation of pre-Christian sacred elements. In addition to the papers presented, a final discussion will be promoted in order to identify similarities and differences among the cases explained in this session.

01 THE RISE OF THE PARISH SYSTEM IN TRANSYLVANIA. AN ARCHAEOLOGICAL VIEW

Author(s): Tiplic, Maria Emilia (Institute of Social Sciences and Humanities Sibiu, Romanian Academy)
Presentation Format: Oral

According to most of the scholars, the establishment of a Latin rite bishopric in Transylvania is dated to around 1009 and was attributed to the Hungarian king St Stephen. In specialized literature, there are discussions about the location of the Transylvanian bishopric residence in the first decades of its existence. In this respect, two main hypotheses were formulated: some researchers assume the presence of the bishopric residence, in a first stage, in northwestern Transylvania, others suppose its existence at Alba Iulia, in southwestern Transylvania. The charters and the archaeological evidences indicate the presence of the Catholic bishopric seat in Alba Iulia only from the end of the 11th century. There are noteworthy discussions related to the moment of the adoption of Christianity and a number of questions concerning the process of Christianization in Transylvania. The first half of the 11th century still marks a period of few conclusive proofs regarding a wide spread Christianity in Transylvania. Furthermore, there is no room for a discussion about an ecclesiastic structure. In such a context, this paper explores the issues regarding the beginnings of the parish system. The analysis starts from the archaeological evidences with reference to the emergence and the spread of the churchyard cemeteries to the written sources and sacral architecture which witness a parish organization.

02 CHRISTIANIZATION AND TRANSFORMATION OF RELIGIOUS LANDSCAPE IN (WEST) BOHEMIA

Author(s): Cechura, Martin (The Museum of West Bohemia in Pilsen)
Presentation Format: Oral

The paper offers a detailed view of the origins of Christianization in West Bohemia and the transformation of the cultural landscape from the 9th to the 13th century. The beginnings of the Christianization of the Bohemian tribe and the first manifestation of the Christian faith are associated with the ruling family of the Premyslids, but the process of spreading Christianity to the countryside is still very little known. Based on the comparison of archaeological, historical and building-historical sources, attention is paid to the transformation of the funeral ritual, the buildings of the oldest churches, their spatial distribution and the formation of the parish network. The changes of early medieval burial, the relationship of the oldest churches to non-church burial grounds and the formation of church cemeteries are explored. Furthermore, the contribution is dedicated to the foundation of the oldest churches in the landscape and their founders. The different founding strategies of different social groups (the duke, the church, the nobility) and the ways of expressing ofsocial power through these structures are observed. All these phenomena are monitored in the context of the political and economic development of society in the early Middle Ages. The results of archaeological research have changed the traditional view of the origins and spread of Christianity in the Czech lands.

03 WAYS OF FAITH: FINDING THE MEDIEVAL CHRISTIAN LANDSCAPE IN THE ISLE OF MAN

Author(s): Johnson, Andrew (Manx National Heritage)
Presentation Format: Oral

Until the introduction of a parochial system at some point in the twelfth century, the religious landscape of the Isle of Man was characterised by small chapels, burial grounds and associated monuments and features, such as stone crosses and wells. About 170 chapels and more than 200 crosses are known, within an island of just 580 km².

Previous researchers have focussed on relating the chapels and their position in the landscape to the historical pattern of landholding, but ongoing investigation suggests that routeways through the landscape also played a significant role in their location.

The majority of sites are situated in the agricultural lowlands, which extend inland and upslope to a mountainous interior. Current work is focussed particularly on sites of chapels and wells located on the coastal margin, where access to the sea suggests not only opportunity for longer distance communication around the Irish Sea and potential roles in pilgrimage, prayer and purification, but also for trade and beach markets.

The location and nature of such sites are being explored through the use of GIS and historical map regression. The same techniques provide the opportunity to 'look up' from the sites to see whether routes extended beyond such landing places, which is of particular significance if pilgrimage is to be realistically considered as an aspect of the early medieval religious landscape in the Isle of Man. In the absence of detailed or scientific dating for the majority of these sites, this approach also offers the opportunity to investigate to what degree they might form a contemporary network connected by routes through the landscape.

04 LANDSCAPES OF CHRISTIANIZATION: EMERGENCE AND EVOLUTION OF ECCLESIASTICAL POWER IN TUSCAN COUNTRYSIDE DURING LATE ANTIQUITY AND THE EARLY MIDDLE AGES

Author(s): Castrorao Barba, Angelo (University of Palermo) - Castiglia, Gabriele (Pontifical Institute of Christian Archaeology) - Menghini, Cristina (University of Siena)
Presentation Format: Oral

The historian Cinzio Violante in 1980s in his wide overview on the formation of cura animarum structures in Central and Northern

Italy, almost exclusively based on written sources, defined rural Tuscany as a place in which the ecclesiastical foundations were few and rare. After a period in which Late Antique and Early Medieval rural churches were poorly known, during the last decades archaeological data about ecclesiastical landscape are increased. The aim of this paper is to frame the phenomenon of emergence, diffusion and evolution of rural churches and monasteries between 5th and 9th century in Tuscany. The archaeological evidences of Christianization of Tuscan countryside date back to late 4th / early 5th century and are mainly connected to the topographical continuity of Roman sites such as villas (Pava) and roadside settlements (San Genesio). Also in the suburbs of some cites (Lucca, Florence) Christian buildings were built in 5th and 6th century. The 7th century appears like a period of transition to the new dynamic scenario of the 8th century with the growth of foundations (churches and monasteries) encouraged by ecclesiastical and aristocratic power. The role of the Church, therefore, is not to be underestimated in order to reconstruct the processes of change in settlement patterns between Roman age and the Late Antiquity and the 'new shapes' of Early Medieval landscapes.

05 THE LATE ANTIQUE ECCLESIASTICAL SETTLEMENT OF HITOS (TOLEDO, SPAIN)

Author(s): Sánchez Ramos, Isabel (UCL Institute of Archaeology) - Morin de Pablos, Jorge (AUDEMA Madrid)
Presentation Format: Oral

This paper aims to present the current research carried out during the last two years in a large residential, ecclesiastical and funerary complex located at Los Hitos (Orgaz, Toledo, Spain). The goal is also to communicate findings from recent fieldwork and the excavations that were developed in the summers of 2016 and 2017. The site of Los Hitos is a relevant rural and religious complex related to the local elites of the Visigoth capital of Toledo that was founded near the Roman roads and other late antique churches. The Regnum Gothorum in the Iberian Peninsula was consolidated since the middle second half of the 6th c. An ambitious cultural and legislative program, perfectly elaborated, was set into action in order to reach the new unification of ancient Roman Hispania. Archaeological and documental records prove a monumentalization process of Toledo and its territory throughout the 7th c., which explains most of the findings involving decorative sculpture in Toledo and the countryside up to date. In the framework of current research, the archaeological remains of this architectonical ensemble can be considered as an excellent case study of the emergence of new local elites and the cultural landscapes. The site had undergone some transformations regarding functions and architectural design from his foundation and its later occupations as mausoleum and patrimonial church, and there are also evidences of occupation during the medieval period.

06 INTERDISCIPLINARY APPROACH TO THE ARCHAEOLOGY, BIOARCHAEOLOGY AND HISTORY OF THE RURAL CHURCHES OF AIGUAFREDA AND VALLDANEU (BARCELONA), 7TH-12TH C. AD

Author(s): Garcia, Arnau (McDonald Institute for Archaeological Research. University of Cambridge) - Ciurana, Judit (Institut Català d'Arqueologia Clàssica) - Oliver, Jaume (Universitat de Girona) - Roig, Jordi (Euskal Herriko Unibertsitatea) - Gallego, Abel - Colominas, Lídia (Institut Català d'Arqueologia Clàssica) - Gómez, Rocío (Arrago, sl.) - Gómez, Joan - Polonio, Tania (Institut Català d'Arqueologia Clàssica) - Giralt, Santiago (Institut de Ciències de la Terra Jaume Almera. Consejo Superior de Investigaciones Científicas)
Presentation Format: Oral

Situated in small valleys within a mountainous region, the churches of Sant Martí d'Aiguafreda and Sant Julià del Congost (Barcelona) are two of the countless examples of the medieval rural chapels dotting European territories. The on course archaeological excavations, in the context of a multidisciplinary research program, are uncovering a significant record about the characteristics of these sites in a chronological frame that goes from Antiquity to Feudal world.

This paper will analyse (1) the topographical articulation of those Early Medieval churches and their associated cemeteries from the local and regional perspectives, (2) the chronology of the processes involved in the formation, transformation and consolidation or abandonment of the ecclesiastical and cemeterial spaces, and (3) the cultural assemblages associated to the different phases and how it reveals local communities integrated into short and long-distance networks.

The study cases will illustrate and put on discussion some of the characteristic problems at interpreting the rural world in the Early Middle Ages: on one hand, an elusive archaeological and historical record, masked by the monuments and documents produced during the feudal period. On the other hand, the common questions about the continuity/ change of communities and institutions, the economic fundamentals, the often called "local elites" or the role played by the Church and the State. And, on top of that, the pre-conceptions and myths that have influenced the historiography. It is after all on these Early Middle Ages rural Chapels that were projected the mythical origins of modern identities, from the "Christian roots" of Europe to the foundations of both national and local communities.

07 RURAL MONASTERIES AND WILDERNESS IN CAROLINGIAN NORTHERN ITALY (8TH-9TH CENTURY AD): FOREST, WATER AND ECCLESIASTICAL LANDSCAPES

Author(s): Panato, Marco (The University of Nottingham)
Presentation Format: Oral

The 8th and 9th centuries AD Po valley (northern Italy) represents an ideal case study area in which to analyse the link between monastic institutions and the rural landscape. In fact, the increase in forest, changes in river courses, the increase in watery environments – such as swamps and marshes – and the abandonment of previous Roman and late antique settlements formed a new

landscape in which early medieval rural monasteries became the main actors in the exploitation and administration of the incultus, the wilderness. The proliferation of such monasteries allows us to recognise similar features in the patterns of appropriation and control of the landscape that seem to characterise this particular period and territory.

However, the Carolingian conquest of northern Italy in the second half of the 8th century complicates the picture. It is not easy to recognise Carolingian material evidence in both urban and rural contexts, and archaeological surveys of rural monasteries of the end of the 8th and the 9th century do not shown any changes linked to the presence of the new rulers of northern Italy. That said, especially looking at the written sources, new foundations – or re-foundations – of monastic settlements in the countryside are evident. From the 9th century in particular, it is possible to note a spread of rural monasteries in peripheral, wild and uninhabited areas. How far this process can be defined as "Carolingian" is arguable and will be discussed in this paper. Alongside the most well-known sites like Nonantola (Emilia), Leno (Lombardy) and Pomposa (Veneto), other, 'minor' monasteries will be assessed in order to understand a deliberate plan – if there was one – for the exploitation of the wilderness, thereby extending the state of knowledge for future discussion.

08 PREACHING TO THE CONVERTED: RECONSIDERING THE ROLE OF COLUMBANUS' MONASTERIES IN THE CHRISTIANISATION OF THE RURAL LANDSCAPE

Author(s): Marron, Emmet (Newcastle University)
Presentation Format: Oral

The desertum is a regular motif in narrative accounts of the foundation of early medieval monastic sites – a remote wilderness, where the holy man and his followers can extricate themselves from the distractions of secular life and achieve a greater level of spirituality. The original monastic desert was that of St. Anthony in Egypt, however the term is used regularly in saint's lives in relation to monasteries founded in Post-Roman western Europe.

As a result of the ubiquity of this term in the accounts of early monastic leaders, monastic foundations were traditionally seen as being at the vanguard of the process of Christianisation in the Post-Roman rural landscape. It is increasingly becoming clear, however, that this is to overlook the role played by early rural churches whose establishment may have been the action of local episcopal powers, private landowners or local communities themselves.

The monasteries founded by the Irish monk St. Columbanus in France and Italy have been subject to the same consideration, due to the descriptions given of their foundation by Columbanus' hagiographer Jonas. This paper will present the results of the Marie Curie funded ChroMoLEME project (The Character of Monastic Landscapes in Early Medieval Europe) which is conducting a range of investigative techniques including remote sensing, excavation and Historic Landscape Characterisation on three of these sites, at Annegray, Luxeuil (Haute-Saône, France) and Bobbio (Italy). It will be shown that far from being founded in a desertum, these sites were inserted into a landscape that was not only inhabited, but one in which the process of Christianisation was already underway. What were the mechanisms by which these new foundations took part in this wider process? In what way did the sites of Columbanus interact with pre-existing cult sites, both Christian and pre-Christian?

09 TOWARDS AN APPROACH TO STUDY THE DEVELOPMENT OF HIGH-ALTITUDE SITES: THE SAINT-MONT, MONASTERIUM HABENDUM (VOSGES, FRANCE)

Author(s): Chenal, Thomas (Ville de Besançon - CNRS UMR6298 Artehis)
Presentation Format: Oral

The archaeological site of Saint-Mont, located in the Vosges Mountains in Eastern France, represents the earliest monastery founded in the Merovingian kingdom of Austrasia. The Monasterium Habendum, as it appears in the hagiography of the founding saints, was established c.620 A.D., in the remains of a Merovingian 'villa', most likely an aristocratic saltus. The monastery was then moved to the remains of an abandoned casturm, thought to be of Late Antique date, on the summit of a 720m high mountain. This elevated site, measuring 12.5 hectares and surrounded by a rampart measuring 800m in length, would become the location of a wealthy double monastery, housing both monks and nuns. The foundation went on to become an exclusively female house at the time of the Carolingian Reform of 820, at which point it was transferred to valley of Remiremont, not far from the Moselle river, only 3km from its original foundation and forming the centre of the modern town.

Our presentation will demonstrate how the topography of this site, from its foundation down to the French Revolution, can be better understood by using a range of complementary techniques, including topographical surveys, GPR, architectural archaeology, drone surveys, geo-archaeological surveys, test trenching and the complete excavation of an exceptionally preserved Merovingian funerary church.

By combining a wide range of survey methods with the historical and archaeological evidence of an important site, is it possible to discern the means by which this multiphase settlement altered the landscape of both the mountainous area and the town itself down to the modern day? What can the complex process of establishment of a foundation as preeminent as Saint-Mont, conditioned by not only religious needs, but also historical, political, economical and environmental factors, tell us about how to approach the development of other little known Early Medieval sites?

10 THE LANDSCAPE IMPACT OF EARLY MEDIEVAL STONEBUILDING IN VAL MÜSTAIR

Author(s): Hueglin, Sophie (Foundation Pro Monastery St John Muestair; Newcastle University) - Cassitti, Patrick (Foundation Pro Monastery St John Muestair)

Presentation Format: Oral

The monastery of St John at Muestair and its surroundings have been subject to intense investigations into the history of the building and the the wider landscape. While it is mainly figurative murals from around A.D. 800 that caused the site to be declared UNESCO world heritage in 1983, it is at the same time one of the best studied monastic complexes. Written sources are extremely rare especially in the early phases, but series of dendrochronological data allow to fix many of the medieval building periods with a high precision. The general provenance of the building materials on a local scale is well studied, but many details – for example the preparation procedures, the location of lime kilns, the wall cubatures or the transportation efforts – remain unclear.

Part of these questions are being addressed with the project „Mortar Technology and Construction History at Müstair Monastery" funded by the Swiss National Research Foundation. Archaeologists, restauration scientists and geologists work together to characterise different varieties of mortar from different building periods and to compare them with the raw materials available in the surrounding valleys. The aim of the project is not only to find out about the mortars, their composition and properties, but also about builders and patrons and the impact of these early stone building projects on society and landscape.

11 EXPLORING THE MEDIEVAL MONASTIC LANDSCAPES OF SAMOS ABEY (NW SPAIN)

Author(s): Sanchez-Pardo, Jose Carlos (Universidade de Santiago de Compostela)

Presentation Format: Oral

Monasteries are iconic symbols of the medieval landscapes across Europe. But it is often forgotten that they were also active agents in shaping and transforming their surrounding environments. The little archaeological research existing on monastic landscapes has mainly focused on the more monumental evidence for the Late Medieval Period, largely neglecting the period before the "feudal revolution". However, the rather short references from the monastic charters, when preserved, let us think that monasteries were crucial in the radical environmental transformations happened in many european regions well before the year 1000 AD, through the colonization of lands, the introduction of new agrarian technologies, and the construction of associated structures like mills, fisheries or salt factories.

This presentation will examine the impact of Samos abbey (Lugo, Galicia, NW Spain) in its surrounding territory during the Middle Ages. Samos abbey was probably funded between 6th and 7th century AD and played a crucial role in the royal politics of the Asturian-Lion Kingdom (8th-12th centuries AD). This explains why this monastery soon become the owner of an important number of properties in different parts of NW Iberia. As part of the TERPOMED project ("Territory and monastic power in early medieval Europe") funded by a Galician Regional Government Excellence Research Project, archaeological, historical and paleoenvironmental work has been carried out in different areas around the abbey: archaeological survey, excavation of agrarian terraces, pollen and paleopollution analysis, the study of textual sources, GIS and spatial analysis, Optically Stimulated Luminiscence dating and landscape analysis. All this work leads us to reconsider the role of Samos abbey in shaping not only its surrounding medieval landscape but also other more distant areas by means of the control of "satellite" properties.

12 THE LANDSCAPE OF RIEVAULX ABBEY, A CISTERCIAN ABBEY IN NORTH YORKSHIRE, ENGLAND

Author(s): Horsfield, Freya (University of Durham)

Presentation Format: Oral

The ecclesiastical buildings of Rievaulx Abbey (Yorkshire), the first Cistercian house in the North of England, have attracted substantial scholarship and draw visitors from around the world. Yet the landscape associated with the abbey has received much less attention. This is surprising given the complex nature of the relationships between Cistercian houses and landscape. Cistercian monasteries developed an historic reputation for mastery of hostile terrain, which both supported its economic operations and satisfied symbolic requirements for monastic practice. This practice and reputation were important to the long-term success of the Cistercian Order, which by 1153 had established around 350 houses across Europe, from Norway to the Levant.

Previous documentary research suggested that Rievaulx reclaimed a substantial area of marshland, enabling this land to form the core of a substantial farming operation in the Vale of Pickering, North Yorkshire. On that basis, the Vale of Pickering was suggested as one of the few Cistercian granges thought to have been founded entirely on "waste" land, as many other granges were thought to have been founded only partially on "primeval land" (Donkin 1978).

Ongoing research is however suggesting a much more complex narrative for Rievaulx's Vale of Pickering land. Rievaulx's mastery of the waste may have been overestimated, but this land did become important for the abbey's farming operations. The Vale of Pickering was also politically important, as a liminal area given to the monastery by King Henry II following the anarchy of King Stephen's reign. Based on interdisciplinary research including the integration of large-scale remotely-sensed data, the nature and extent of the physical transformation by Rievaulx of this land is being assessed afresh. The emerging results offer a case study through which to better understand how both the physical and symbolic landscapes were influenced and used by a major Cistercian house.

13 MONASTIC LANDSCAPES IN THE ISLE OF MAN: AD 1100 TO 1540

Author(s): Davey, Peter (University of Lilverpool)
Presentation Format: Oral

In the 12th century the Isle of Man was the southernmost outpost of the Norwegian world as the centre of the 'Kingdom of Man and the Isles'. In 1134 King Olaf 1, as part of a modernising policy to bring his kingdom into wider European norms, founded a Savignac (later Cistercian) monastery, Rushen Abbey, in the south of the island. This was the first reformed order establishment in the Scandinavian world. Recent archaeological excavation and extensive fieldwork throughout the island has raised a number of issues about the abbey's origins and function. In particular the territory of the three main estates granted to the abbey has been subject to detailed field survey. The present-day landscape of the Isle of Man has been found to preserve extensive remnants of its prehistoric and medieval structure. This can be related to contemporary written surveys such as the 1286 limites and an outstandingly full set of 15th century and later rent books. A number of questions will be considered. Did the estates already exist? Is there evidence for pre-existing monastic activity? Were the abbeylands managed differently from the rest of the island? What was the impact of the monks' arrival on the wider landscape?

14 RESHAPING AN EARLY-MEDIEVAL CHRISTIAN COMMUNITY IN THE ÀGER VALLEY (SPAIN). NEW DATA FROM THE ARCHAEOLOGICAL EXCAVATIONS

Author(s): Porcheddu, Antonio - Brufal Sucarrat, Jesús (Universitat de Lleida)
Presentation Format: Oral

Between 2014 and 2015, the University of Lleida carried out an archaeological excavation at the Ager Valley (Lleida, Spain) on the early medieval site called Santa Coloma. The importance of this excavation is due to the more precise chronological data that have been collected thanks to the finding of some intact burials. The radiocarbon dating of the human remains allowed the precise chronological positioning of a sarcophagus typology. This endorsed also the correlation with other spare findings and important archaeological sites of the Catalonia region, such as El Bovalar (Tarragona).

Thanks to this excavation, we have been able to depict a more clear understanding of an early Christian community that populated the valley between the fifth and the eight centuries AD. These data are crucial to the understanding of the role played by the central place of the valley (Ager) and the persistence of the same Christian community during the Islamic domain occurred between the eight and the eleventh centuries AD. In this presentation, the data collected from the archaeological excavation and the results of the analysis of the sacred landscape around the Ager Valley between the V and the VIII centuries will be exposed in order to give a general understanding of the early medieval settlement dynamics.

15 ON THE EDGE - EXCAVATIONS AT PERTH WHITEFRIARS 2014-2017

Author(s): Hall, Derek (Stirling University)
Presentation Format: Oral

Founded in 1262, the Carmelite friary of Tullilum lies at least 1.5km west of the medieval burgh of Perth in Scotland, unlike Perth's three other religious houses (Dominican, Franciscan and Carthusian) which were built just outside the town walls. The author first excavated the western end of the friary church and the eastern side of the East range in 1982 before the initial development of the site for light industrial development, 35 years later he has just completed the excavation of the remainder of the complex prior to further development. Archaeological evidence is suggesting that the friary was beginning to fail by the mid 14th century and that it was only the involvement of the Bishops of Dunkeld and his rebuilding of a large part of the friary that enabled it to keep operating until the Scottish Reformation of 1559. This paper will consider the possible reason for the friary's unusual location in relation to the medieval burgh, the intelligent use of the local topography to provide a fresh water supply, the unique involvement of a major Scottish Bishopric in the operation of a Mendicant house and summarise a range of unusual burial practices that were revealed within the church.

16 THE RELATIONSHIP BETWEEN URBAN RELIGIOUS INSTITUTIONS AND PROVINCIAL SETTLEMENTS: RELIANCE AND SUPPORT IN LATER MEDIEVAL BEVERLEY, YORKSHIRE

Author(s): Bromage, Sam (University of Sheffield)
Presentation Format: Oral

The later medieval provincial townscape was largely a product of the specific local and regional political, religious, and economic situations. These developmental pressures are perhaps best expressed by the actions and attitudes of the guilds, religious institutions and town corporations that dominated urban organisation during this period.

This paper will examine the influence of provincial urban religious communities on the later medieval townscape. It will primarily assess the pre- and post-Dissolution provincial urban environment of the town of Beverley, Yorkshire. This will be explored through the reaction of those urban stakeholders still extant following the Dissolution and the potential of this comparative method to inform on the role of religious institutions within the later medieval town.

At its peak, Beverley was one of the most significant centres of cloth production and export in the North East but would experience a prolonged period of economic decline from the late 14th century. Despite this, on the eve of the Dissolution, Beverley still supported four major religious institutions: the Dominican and Franciscan friaries, the preceptory of the Knights Hospitaller and the Minster of

St John. All of these had, to a greater or lesser degree, contributed to the town's organisation and economic productivity prior to their suppression.

By combining the available published archaeological reports, surviving primary historical documentation, and grey literature it will be possible to provide a more complete understanding of Beverley immediately prior to and following the Dissolution. More specifically, through comparative assessment, it will be possible to identify the role of the religious institutions of Beverley within the later medieval urban environment.

17 THE ECCLESIASTICAL LANDSCAPE OF MOUNTAIN RANGE NORTHWESTERN SLOVAKIA. CASE STUDY OF NITRIANSKE PRAVNO SITE

Author(s): Hornak, Milan (VIA MAGNA Ltd.)
Presentation Format: Oral

The territory of the North-western Slovakia is composed of several mountain ranges with distinctive river basins. This type of territory is also represented by the Turiec basin with the major water body of the Turiec river, surrounded from both North, West and East by the mountains of average altitude up to 1700 m.

Archaeological understanding of the ecclesiastical landscape between twelve and thirteen centuries, in the region formed by long wide valley bordered with mountains, was traditionally based upon a concept of networks among small "rural" churches built in lower altitudes of Turiec basin under the influence of the local Premonstratensians monastery. It was hardly ever thought that ecclesiastical monuments could be built in the elevated, higher altitude areas.

This view was seriously challenged by our ongoing research project of excavatin of Romanesque church, which have been underway since 2016 on the site of Nitrianske Pravno - Vyšehrad, which literary translates as „Upper Castle. " The Romanesque church, measuring roughly 20 m x 15 m, was found on a site with altitude of 700 m above sea level, which is known primarily as a prehistoric fortified settlement and a castle from High Middle Ages. It's position in the cultural landscape was subjected to our study based on interpretation of LIDAR data – digital elvation model, structures of roads and terraces.

In the presented report, using a case study of the Nitrianske Pravno - Vyšehrad site, we will try to reconstruct combination of the archaeological, geographic and historical sources concerned with the ecclesiastical landscapes in the mountainous environment of the North-western Slovakia.

18 THE CZECH REPUBLIC BETWEEN EAST AND WEST: THE FORM AND INSPIRATIONAL RESOURCES OF MEDIEVAL CHURCH ARCHITECTURE

Author(s): Cechura, Martin (The Museum of west Bohemia in Pilsen)
Presentation Format: Oral

Church archeology has a relatively long tradition in the Czech Republic. In the 1950s, the research of the oldest churches gained a new impetus thanks to extensive archaeological research in the major centers of the Great Moravian state. Interpretation of the results of these researches was, of course, dependent on the level of knowledge at that time and the prevailing historical paradigm. The main focus was on the supposed Byzantine influences mediated by the missions of Constantine and Methodius. After the break-up of the Great Moravian state, the tradition of Byzantine construction was also sought in the environment of early medieval Bohemia. Much less attention was paid to the form and inspirational sources of early medieval architecture in Bohemia. The analysis was submitted only to some of the oldest and most significant buildings, especially from the Prague Castle and the oldest Premyslid domains. A large group of small churches spread out in the countryside remains the focus of attention. Questions from founders, builders, and inspirational sources are not systematically studied. Particularly in border areas, such as The border with Bavaria and Saxony, it is clear that inspiration was neither simple nor straightforward. Interesting results for the understanding of this process can also be found in the research of possible influences of Czech architecture on the oldest architecture in Poland. Although the historical research is based on the direct influence of Bohemia on the Christianization of Poland, in the form of the oldest architecture, this influence does not materialize.

19 THE ARCHAEOLOGY OF ROMANESQUE CHURCHES FROM TRANSYLVANIA (11TH TO 13TH C)

Author(s): Tiplic, Ioan Marian (Lucian Blaga University of Sibiu) - Tiplic, Maria Emilia (ICSU Sibiu)
Presentation Format: Oral

Curently in Transylvania are more than 200 churches, most of them beeing built in 13th-14th century, most if them have been built as a basilicas, but there are a few small circular churches (rotundas). The most important of them and archaeological researched are in Orastie, Geoagiu, Alba Iulia, Sibiu, beside of the others presume have been built in Cisnadie, Sighisoara, Saschiz.

The archaeology of eccleziastical architecture from Transylvania dated back in the middle of 19th Century when in the south of Transylvania (mostly in Alba Iulia, Sibiu, Brasov) were made some interventions at the churches, but a more closed and organized reserches started after the WWII.

Mostly these researches were made by art historian and architects and in some cases by archaeologists.

In the last 20-25 years due to the works made on many churches had had the chance to be archaeological researched. During this

researches were discovered more informations about the chronology, the first construction phases.

Our intentions is to provide an overview on the state of art referring to the church archaeology in Transylvania and to point out some new archaeological discoveries made in last 10 years.

The main focus of the presentation will be on the first romanesque churches built in Transylvania and on the new researches carry on at the rotundas and the first basilicas from South Transylvania.

20 ARCHITECTURAL INTERFERENCE IN MEDIEVAL TRANSYLVANIA (THIRTEENTH TO FIFTEENTH CENTURIES)

Author(s): Istrate, Daniela Veronica ("Vasile Pârvan" Institute of Archaeology, Bucharest)
Presentation Format: Oral

This paper focuses on the fashion in which Transylvanian Orthodox church architecture was influence by the predominantly Catholic religious landscape of the region.

Transylvania was a province of the Medieval Kingdom of Hungary, having a complex ethnic and religious structure, which resulted in a sundry ecclesiastical landscape, dominated by Catholic churches. Ecclesiastical architecture flowered particularly from the thirteenth century onwards, under the influence of the Late Romanesque and Gothic styles. Imposing churches, which show the input of Central-European construction sites, were erected in the urban centres, while modest churches were raised in the rural environment, unpretentious both in their proportions and in their stylistic achievements, an amalgamation of Romanesque and Gothic. Orthodox churches architecture, dominated by single-nave churches ended in rectangular apses, is a component of this last category. Byzantine layouts or Byzantine-inspired layouts are rare occurrences, a state of affairs that reflects the isolation of the Orthodox communities (especially after 1204) and the pressures exercised by the Catholic society in its attempts to diminish or even eliminate the Orthodox faith. Orthodox churches assumed the global shapes of Catholic architecture, individualizing them through interior partitions and especially through murals that are utterly specific to the Byzantine culture.

My paper is intended as a summary of this phenomenon, with an emphasis upon the focal aspects of the architectural intersection between Catholic and Orthodox churches.

a. SIDILLÀ (GIRONA). FROM ROMAN VILLA TO MEDIEVAL SETTLEMENT

Author(s): Ripoll, Gisela (Universitat de Barcelona) - Tuset, Francesc (University of Barcelona) - Mesas, Imma (Project research member ECLOC) - Benseny, Josep (University of Barcelona) - Molist, Núria (Museu d'Arqueologia de Catalunya)
Presentation Format: Poster

Sidillà (Sant Llorenç de les Arenes, Baix Empordà) is a site located on a small hill near the River Ter, known from the mid-20th century, with the notable characteristic of having been buried under a fluvial dune by the mid 11th century. As part of the ECLOC project (Ecclesiæ, cœmeteria et loci (sæc. VIII-XI). Sancti Cirici de Colera, Sidilianum, Olerdola / Esglésies, cementiris i hàbitats (segles VIII al XI). Sant Quirze de Colera, Sidillà, Olèrdola) (Quadrennial research projects in archaeology and palaeontology 2014-2017, Num. Exp. 2014/100480, Generalitat de Catalunya), a number of archaeological excavations have been carried out with great success which have radically modified the former interpretation of the site. Excavations in the church, the settlement and the necropolis have been combined with a geophysical survey to establish the extent of the buildings. Numerous radiocarbon dates have been key elements in establishing the chronological sequence of occupation.

Sidillà is a good example of the transformation during late Antiquity of the domestic space of a rural villa into a small rural nucleus centred on a parish church. In the far northern section of the hill where Sidillà is situated there is an funerary area associated with the Roman villa, the latter being located on the other side of the hill, opposite. Here there is a large funerary monument – a private family mausoleum – built at the end of the 4th or early 5th century over an earlier necropolis. To the south a church was built prior to the 8th century associated with a necropolis which was in use up to c. AD 1000. Later, this funerary space was taken over by buildings. The entire complex was then engulfed by a fluvial dune around the middle of the 11th century, forcing the inhabitants to relocate to a new settlement.

b. THE MEDIEVAL MONASTERY OF SANT QUIRZE DE COLERA (GIRONA). DOCUMENTARY EVIDENCE, ARCHAEOGRAPHY AND NEW APPLIED TECHNOLOGIES

Author(s): Ripoll, Gisela - Tuset, Francesc - Benseny, Josep (University of Barcelona) - Carrero, Eduardo - Rico, Daniel (Universitat Autònoma de Barcelona) - Molist, Núria (Museu d'Arqueologia de Catalunya)
Presentation Format: Poster

A first, necessary evaluation and interpretation of the monastic complex of Sant Quirze de Colera (Rabòs d'Empordà, Alt Empordà), following numerous excavations carried out during architectural restoration works, were major results of work undertaken over 1997-2012. Subsequently, as part of the ECLOC project (Ecclesiæ, cœmeteria et loci (sæc. VIII-XI). Sancti Cirici de Colera, Sidilianum, Olerdola / Esglésies, cementiris i hàbitats (segles VIII al XI). Sant Quirze de Colera, Sidillà, Olèrdola) (Quadrennial research projects in archaeology and palaeontology 2014-2017, Num. Exp. 2014/100480, Generalitat de Catalunya), further essential steps were established for the understanding of the chronostratigraphical and architectural sequence of the vairious buildings of this benedictine monastery, located on the southern slopes of the eastern Pyrenees.

Diverse methods have been employed in order to integrate, recover and interpret data from the previous excavations, resulting in their digitalisation, geo-referencing and vectorisation in a database and GIS platform. In addition, the collection and study of the important, dispersed documentary archive from the 9th to 18th centuries has begun, new plans of the site have been carried out with a CAD system and extraordinary graphic information has been generated through photogrammetry and 3D models obtained from buildings. The first results of this work, by no means completed, have established a new chrono-stratigraphical sequence and provided the means to elaborate a new reading and interpretation of the site.

c. OLÈRDOLA (BARCELONA). SANT MIQUEL AND SANTA MARIA AND THEIR INTERACTION WITH THE MEDIEVAL CIVITAS AND THE CASTRAL TERRITORY

Author(s): Molist, Núria (Museu d'Arqueologia de Catalunya; Equip de recerca en arqueologia i arqueometria de la Universitat de Barcelona - ERAAUB) - Ripoll, Gisela (Universitat de Barcelona; Equip de recerca en arqueologia i arqueometria de la Universitat de Barcelona - ERAAUB) - Esteve, Xavier (Equip de recerca en arqueologia i arqueometria de la Universitat de Barcelona - ERAAUB)
Presentation Format: Poster

The medieval civitas of Olèrdola, located on the top of a geostrategic hill, is organized into a main area inside the roman and medieval walls and an extensive outer neighborhood. Both spaces are endowed with a church, a cemetery and several agriculture, livestock and housing structures. It is dated from the 9th century to the early 12th century. The pre-Romanesque church of Sant Miquel, located in the upper part of the enclosure, had parish functions. It was built over a previous 9th century necropolis. Outside walls, Santa Maria concentrates the cemetery and the urban settlement around it. Both churches are landmarks, in contrast to the other non-visual churches.

Located 50 km southern Barcelona, the castral territory of Olèrdola stands as an example of organizational policy of the new conquered area, the Penedès. At the beginning of the 10th century it had been incorporated into the earldom county of Barcelona, having as a main buildings the castle and the parish church of Sant Miquel. This church had eight smaller churches (including Santa Maria) scattered throughout a big terminus castralis around 200 km2.

The written documentation regarding the churches has been contrasted with the recent archaeological excavations at Sant Miquel (project for the restoration of the church, 2005-2008) and at Santa Maria, which has work in progress, in the framework of the ECLOC project (Ecclesiæ, cœmeteria et loci (sæc. VIII-XI). Sancti Cirici de Colera, Sidilianum, Olerdola / Esglésies, cementiris i hàbitats (segles VIII al XI). Sant Quirze de Colera, Sidillà, Olèrdola) (Quadrennial research projects in archaeology and palaeontology 2014-2017, Num. Exp. 2014/100480, Generalitat de Catalunya). These actions have allowed to carry out an in-depth study of the construction and chronology of both churches, the necropolis around and its role in the urban articulation in a border place.

566 TALES OF ISOTOPES FROM IBERIA: PAST, PRESENT AND FUTURE PERSPECTIVES

Theme: Theories and methods in archaeological sciences
Organisers: Salazar García, Domingo Carlos (Department of Human Evolution, Max-Planck Institute for Evolutionary Anthropology; Department of Geological Sciences, University of Cape Town; Grupo de Investigación en Prehistoria IT-622-13 - UPV-EHU / IKERBASQUE-Basque Foundation for Science) - López-Costas, Olalla (Group Earth System Science, Department of Soil Science, Universidade de Santiago de Compostela; Archaeological Research Laboratory, Stockholm University) - Tornero-Dacasa, Carlos (Institute of Human Paleoecology and Social Evolution)
Format: Regular session

The Iberian Peninsula is a crossroads between Africa and Europe, the Mediterranean and the Atlantic. Its importance both in the present and the past for human cultures and civilizations is uncontested. Iberian Prehistory, History and Archaeology are, thus, of great relevance when studying past populations and individual lifestyles. In this sense, isotopic analyses are aiding in shedding light on many crucial aspects of human activities from Iberia's past. During the last decade, isotopic analysis on bioarchaeological remains (i.e. humans, fauna, plants) has seen a boost in its application in this region, discovering a complex scenario connected to the diverse cultural backgrounds, wide climatic transitions and biogeographical resource differences existing in Iberia. As a result, our detailed knowledge on past human dietary patterns, territorial mobility, animal husbandry, farming and other aspects of our ancestor's lives is today broader than years ago. With this session we would like to bring together all researchers applying these analytical techniques to generate knowledge on Iberia's past to discuss the relevance of past projects, discover on-going investigations, explore convergences with other disciplines/techniques, and create an Iberian research network to promote collaboration in the field for future new projects.

01 RABBITS AS PALEOENVIRONMENTAL PROXIES: A STABLE ISOTOPES ANALYSIS OF RABBIT (ORYCTOLAGUS CUNICULUS) TISSUES FROM LAPA DO PICAREIRO (PORTUGAL)

Author(s): Carvalho, Milena (University of New Mexico; ICArEHB) - Jones, Emily (University of New Mexico) - Meiggs, David (Rochester Institute of Technology) - Benedetti, Michael (University of North Carolina Wilmington) - Haws, Jonathan (University of Louisville)

Presentation Format: Oral

Neanderthals and anatomically modern humans (AMH) adapted to a series of environmental changes during the Late Pleistocene that affected their subsistence strategies, technology, mobility and settlement patterns. Explanatory models such as the Ebro Frontier Model propose that Neanderthals were adapted to woodland environments while AMHs preferred open landscapes. Late Neanderthal survival in southern Iberia may have been possible due to relatively mild conditions during MIS 3, while Heinrich Events, especially H4, created harsh climatic conditions that may have reduced Neanderthal populations below survival thresholds. Thus, reconstructions of paleoenvironmental conditions to which Neanderthals and AMHs were subjected are key to understanding the adaptive behavior of both groups. Here, we present a preliminary environmental reconstruction using data from Lapa do Picareiro (Portuguese Estremadura). This site contains evidence of late Neanderthal survival after H4 as well as AMH occupations after 34 ka cal BP. Recent studies demonstrate that leporid bone carbonate and collagen act as good paleoenvironmental proxies linking δ13C and δ15N values with temperature variables, while δ18O values correlate with mean annual precipitation and relative humidity (Somerville et al. 2018). Ratios of δ13Capatite sampled from leporid tooth enamel, on the other hand, can shed light on seasonal shifts between C3 and C4/CAM vegetation (Wicks et al. 2015). This paper presents preliminary carbon, oxygen and nitrogen isotope results from European wild rabbit (Oryctolagus cuniciulus) tooth enamel and bone tissue (where possible) from Middle and Upper Paleolithic deposits of Lapa do Picareiro. These data are compared to isotope ratios obtained from red deer (Cervus elaphus) tooth enamel samples recovered from the site to assess paleoenvironmental changes during the Pleistocene; we then compare the isotopic results to other paleoclimate indicators from Picareiro such as magnetic susceptibility and sediment particle size.

02 PALAEOLITHIC PALEOENVIRONMENTS IN THE CANTABRIAN REGION: INTEGRATING STABLE ISOTOPE ANALYSIS WITH WIDER ENVIRONMENTAL PROXIES

Author(s): Jones, Jennifer (University of Aberdeen) - Marín-Arroyo, Ana B. (IIIPC, Universidad de Cantabria) - Richards, Michael (Simon Fraser University)

Presentation Format: Oral

During the Last Glacial Maximum (LGM) ice sheets covered vast swathes of Northern Europe, and populations were pushed further south. The Cantabrian Region of Northern Spain was an important refugium for humans, plants and animals during this time. From the LGM onwards an increase in the density of archaeological sites is seen, in addition to cultural changes such as the creation of rich cave art assemblages. Until recently little has been known about the exact environmental conditions experienced by human and animals during the later Upper Palaeolithic. Characterising these conditions is key to understanding the region's importance throughout this time.

Animal bones are ubiquitously found in Middle and Upper Palaeolithic cave sites in the region, and carbon and nitrogen analysis of animal bone collagen has been found to be a powerful indicator of past environmental conditions, especially when integrated with more traditional environmental proxies (e.g. pollen, anthracology, micro- and macro-fauna). This paper explores the value of integrating stable isotope analysis with more environmental archaeology datasets to reconstruct Palaeolithic environments the Cantabrian Region. By combining stable isotope evidence with other environmental proxies, it is possible to characterise conditions surrounding individual sites during the moments in time that they were being occupied, as well as the broader regional conditions. By using this approach, it is possible to determine the impact of changing environments on Palaeolithic human and animal behaviour in this archaeologically important region.

03 SERIAL INSIGHTS INTO MESOLITHIC-NEOLITHIC DIETS IN NORTHERN IBERIA: STABLE CARBON AND NITROGEN ISOTOPE ANALYSIS ON SEQUENTIAL DENTINE SECTIONS

Author(s): Higuero Pliego, Antonio (Grupo de Investigación SCOPE. Instituto Internacional de Investigaciones Prehistóricas de Cantabria - IIIPC. Universidad de Cantabria-Gobierno de Cantabria-Banco Santander) - Salazar-García, Domingo C. (Grupo de Investigación en Prehistoria IT-622-13 - UPV-EHU/IKERBASQUE-Basque Foundation for Science) - Schulting, Rick (School of Archaeology. University of Oxford) - Arias, Pablo (Grupo de Investigación SCOPE. Instituto Internacional de Investigaciones Prehistóricas de Cantabria - IIIPC. Universidad de Cantabria-Gobierno de Cantabria-Banco Santander)

Presentation Format: Oral

Previous studies using carbon and nitrogen isotope analysis from human and faunal remains have addressed how human dietary patterns and lifestyles at the onset of the Neolithic changed between the last hunter-gatherer and first farming communities. However, this information lacked a high temporal resolution due to the substrate analysed, bone bulk collagen, averaging the last decade or so of an adult's diet. In this communication, we present carbon and nitrogen stable isotope analysis on collagen from dentine. Specifically, we apply a methodology known as incremental dentine analysis, based on high-resolutuion sequential sampling of dentine

along the axis of the tooth root, which provides information about the diet of the individual during the formation of that section. By this method, we obtain dietary profiles from each tooth that reflect the diet of the individual at sub-annual resolution and so can document changes associated with different moments of life such as childhood, adolescence and young adulthood. Furthermore, this approach allows us to obtain information on seasonal resource consumption, as well as on breastfeeding and weaning practices from past populations. We have studied human remains from the Late Mesolithic site of Los Canes (Asturias) and the Early Neolithic site of Cueva de Barcenilla (Cantabria).

04 ORIGINS OF AGRICULTURE IN THE WESTERN MEDITERRANEAN: INSIGHTS FROM δ13C VALUES OF CEREALS ASSOCIATED TO EARLY NEOLITHIC FARMING

Author(s): Aguilera, Monica (University of Lleida) - Pèrez, Guillem (CCHS-CSIC) - Ferrio, Juan Pedro (CITA-CSIC) - Araus, José Luis (University of Barcelona) - Buxó, Ramón (Museo de Arqueología de Cataluña, Barcelona) - Peña-Chocarro, Leonor (Escuela Española de Historia y Arqueología, CSIC, Rome) - Voltas, Jordi (University of Lleida)

Presentation Format: Oral

The spread of agriculture during the Early Holocene seems to be the result of cultural and demographic diffusion of the agricultural package, but environmental factors may have also played a role in speeding the dynamics of the early agricultural societies, at least in the Mediterranean Basin, where aridity was already present at the beginning of the Holocene. The earliest agricultural sites all have in common their "oasis" pattern: a set of spatially limited but highly productive environments. The spread of agriculture may have involved the replication of the environmental conditions where cultivation emerged, with sites tied to particular pockets of well-watered terrains. Nevertheless the archaeological record does not at the moment clearly support or counter the association of early cultivation sites with climatic stress.

Carbon-13 analyses of cereal seeds (> 220, more abundant than other remains in the archaeobotanical record) allow estimate the crop water availability (WA) during grain –filling. These cereal analyses from 15 archaeological sites from the second half of the 6th millennium BCE of Iberian Peninsula suggest site-dependent conditions of WA at the adoption of agriculture. Additionally, the prevalence of a relatively wet climate during the establishment of agriculture in the north-western Mediterranean (i.e. slightly more humid than present) points to its embracement as a direct consequence of culturally driven diffusion rather than a phenomenon triggered by environmental conditions that could have prevented a safe continuation of hunting and gathering activities.

05 ON THE BOUNDARY: FIRST STEPS TO DECIPHER THE LONG-TERM DIETARY CHANGE PRODUCED BY THE INTRODUCTION OF AGRICULTURE IN IBERIA

Author(s): Fontanals-Coll, Maria (BioArCh-University of York) - Cubas, Miriam (Department of Archaeology- Sociedad de Ciencias Aranzadi; BioArCh-University of York) - Peyroteo-Stjerna, Rita (Department of Organismal Biology, Uppsala University.) - Colonese, André - Llorente-Rodríguez, Laura - Lucquin, Alex - Craig, Oliver (BioArCh-University of York)

Presentation Format: Oral

The Mesolithic-Neolithic transition in the Iberian Peninsula is marked by the introduction of livestock and domesticated crops which modified the subsistence strategies in an unprecedented manner. Stable carbon and nitrogen isotope analysis have been essential to this discussion, but most of the debate has resolved around single case studies. In this paper we review the isotope literature to provide with a regional and long-term perspective of the dietary implications of the Neolithic expansion in the Iberian Peninsula. The large quantity of data available provides an opportunity to use the distinctive isotopic signatures to debate the impact of agriculture to the diet from the Mesolithic to the Late Neolithic-Chalcolithic (ca. 8000-3000 cal BC), allowing the larger geographical and chronological comparison on palaeodietary patterns in the Southwest of Europe. These comparisons give us a broad vision of their similarities and dissimilarities. The isotope results highlight some interesting aspects of the human subsistence strategies and some social preferences pointing towards a considerable diversity in human diet during the Mesolithic, ranging from marine to terrestrial resources. The introduction of domesticates is correspondent with a decline in marine isotope signatures, which became undetectable in the Late Neolithic, possibly due to a plain consolidation of the new economic practices.

06 MOBILITY IN MOITA DO SEBASTIAO (PORTUGAL) MESOLITHIC HUMAN GROUP. THE ANALYSIS OF 87SR/86SR AND δ18O

Author(s): Díaz-Zorita Bonilla, Marta (Institut für Ur-und Frühgeschichte und Archäologie des Mittelalters, Tübingen Universität) - Subirá, M. Eulália (Departmento de Biología Animal, Biología Vegetal y Ecología. Autonomous University of Barcelona) - Bocherens, Hervé (Institut für Geowissenchaften, Tübingen Universität; Senckenberg Center for Human Evolution and Palaeoenvironment, Tübingen.) - Bicho, Nuno (Universidade do Algarve) - Gibaja, Juan (CSIC. Institution Milá and Fontanals)

Presentation Format: Oral

Moita da Sebastiao is located in Muge Valley (Portugal) and represents one of the best known Mesolithic sites in Europe thanks to the great number of human skeletal remains recovered. Most of these remains were documented during the archaeological excavations carried out at the end of the 19th century (Meiklejohn et al., 2009).

Radiocarbon analysis yielded dates between 7950 and 7300 cal BP (Bicho et al., 2010). In order to better understand the site formation, analysis of 87Sr/86Sr and δ18O on 10 human individuals from Moita da Sebastiao has been performed. In order to calculate the

local range we have used the enamel and bone values and the local range for this site ranges from 0.7093-0.7098 (2σ). The range is so restricted that all of the individuals are showing values within this local range and mobility cannot be inferred. Results for δ18O on dental enamel showed a mean of -4.2‰ ± 0.4 (1σ) and the range is -4.7‰ to -3.5‰.

Both the enamel and the bone samples are quite homogeneous and are reflecting the same access to water sources. Carbon isotope results showed a mean of -12.2‰ ± 0.5 (1σ) for the enamel samples (n=8). These results also suggest a similar source of dietary carbon probably based on C3 resources.

The comparison of results of 87Sr/86Sr vs. δ18O showed indeed that all of the individuals from Moita do Sebastiao are coming from the same geological background and getting access to the same local water sources. Based on the comparative analysis, it is quite clear that there are no inmigrants at this site. In addition, when comparing the δ13C dental enamel values to the δ18O, all the individuals cluster suggesting that the carbon isotope sources in the diet as well as the water resources are the same for all of them.

07 THE IMPACT OF NEOLITHISATION IN THE DIET OF IBERIAN PREHISTORIC POPULATIONS THROUGH THE ANALYSIS OF δ13C AND δ15N STABLE ISOTOPES

Author(s): Cintas Peña, Marta (University of Seville) - Díaz-Zorita Bonilla, Marta (University of Tübingen)
Presentation Format: Oral

The development and application of new biochemical techniques in the research of Prehistoric Archaeology has altered our vision of past societies in a decisive way. The study of diet through the analysis of stable isotope on bone collagen (δ13C and δ15N) is an example of it. The aim of our paper is to identify changes on subsistence strategies of people during the Late Iberian Prehistory. With this objective, we have made a comparative analysis of compiled available data for Iberia from Mesolithic hunter-gatherer groups until Copper Age agro-pastoralist communities. Information comes from human and faunal remains from 26 different archaeological sites from diverse ecological zones in Iberia. With regard to chronology, 13 of them are Mesolithic, 7 Neolithic and 6 Chalcolithic. The results of our analysis reveal a major transformation in the diet as a consequence of the Neolithisation and the introduction of domesticated plants and animals in the Iberian peninsula between the 6th and the 4th millennia BC. In addition, we have analyzed the contextual bioarchaeological data in terms of sex and age estimation to infer possible social differences related to subsistence patterns, specially weaning, the adaptation of children to an adult diet or distinct dietary patterns based on gender.

08 EXPLORING CHALCOLITHIC AND BRONZE AGE DIET AND ANIMAL HUSBANDRY IN THE NE OF THE IBERIAN PENINSULA: AN ISOTOPIC APPROACH

Author(s): Viñas, Laura - Saña, Maria (Department of Prehistory, Autonomous University of Barcelona) - Aguilera, Isidro (Museum of Zaragoza) - Alexander, Michelle (BioArCh, Department of Archaeology, University of York)
Presentation Format: Oral

Stable isotope analysis has proven to be an invaluable tool for reconstructing dietary patterns in archaeological populations. However, the isotopic analysis of animal remains in relation to husbandry practices has not often been the focus of extensive investigation. Here we present stable carbon (δ13C) and nitrogen (δ15N) isotope analysis of human and animal bone collagen from multiple sites dating to the Chalcolithic and Bronze Age in the north-east of the Iberian Peninsula with the aim of exploring potential dietary changes. Animal data is emphasised and examined in relation to the environment and husbandry. ZooMS was also used for identification of fragmentary remains and particularly for separating sheep from goat.

The findings shed new light on the diversity of animal management strategies in a geographical area and chronological period that has thus far received little attention from isotopic studies. In general, the isotopic results are highly variable, particularly for nitrogen, and carbon isotope values indicate a C3 baseline. Significantly, however, high δ13C values consistent with the intake of 13C-enriched C4 plants (likely millet) have been identified among certain animals dating to the Late Bronze Age. This has important consequences for the interpretation of human diet, providing some of the earliest evidence for C4 crop exploitation in the area.

09 LIFE IN RURAL AND COSMOPOLITAN SPHERES: MULTI-ISOTOPIC INVESTIGATION OF LATE ANTIQUITY POPULATIONS FROM SOUTHERN PORTUGAL

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Presentation Format: Oral

Four Late Antiquity populations established in south Portugal during the 4th-8th cent. AD were investigated for understanding the influence of Romanization on their way of life. The Late Antiquity populations of Monte da Cegonha, Sao Cucufate and Alpendre dos Lagares settled on Roman villae, while Mertola was an important trading centre located on the most northern navigable point of the Guadiana river.

The way of life in question relates to the dietary habits of these populations. Which sort of plants were they used to eat, how much meat composed their diet, did they rely on river/marine resources and what was their degree of mobility are questions that can be

solved looking into the skeletons of these individuals.

In this study, we analysed skeletons of males and females, mostly adults, who registered the dietary habits of the last decade of their life into their bones. Most of the protein intake was stored in the organic part of their bones (collagen), while the mineral fraction (apatite), reflects all dietary components, i.e., carbohydrates, lipids and proteins. We deciphered their diet measuring the carbon isotopic ratios of collagen and apatite, which mirrors that of C3 versus C4 plants, whose composition differs according to their photosynthetic pathways. Nitrogen isotopic ratios of collagen was used for decoding their trophic level. Finally, bone apatite oxygen isotopic ratios were used for investigating whether or not they had access to similar water sources, which can provide insight into their mobility.

Around 60 human bones as well as 60 faunal samples were analysed. Contemporaneous fauna, wild and domestic, associated to each site was concomitantly analysed for establishing a proper local baseline for each human settlement. This allows to discuss dietary habits and mobility patterns independently from environmental contexts. Additionally, these results are also interpreted in terms of husbandry practices.

10 DIETARY SHIFTS AT THE LATE ANTIQUITY TO THE EARLY MIDDLE AGES TRANSITION IN THE NORTHEAST IBERIAN PENINSULA

Author(s): Tornero, Carlos (Institute of Human Paleoecology and Social Evolution - IPHES) - Casté, Bruno - Malgosa, Assumpció - Jordana, Xavier ((Unitat d'Antropologia Biològica, Dept. BABVE, Universitat Autònoma de Barcelona)

Presentation Format: Oral

The transition between Late Antiquity and the Early Medieval period in the Northeast Iberian Peninsula was characterized by several demographic and socio-political changes. Different peoples (Germanics and North Africans) settled in this region in successive migratory waves. The impact of these population movements on the customs and cultural habits of the local population has been scarcely explored. Here, we explore dietary changes of the population buried in the necropolis of the Sant Pere Churches of Terrassa (Barcelona) during the Visigoth and Carolingian periods (5th to 10th centuries). Our study investigates carbon and nitrogen stable isotope values in bone collagen from 75 human samples related to both periods. Faunal remains were also analyzed to define the local baseline of the trophic food chain for the human paleodietary reconstruction. Results show an influence of terrestrial sources in diet not revealing the influence of the sea on the human diet during both periods. Both populations here analyzed describe a diet based on C3 terrestrial resources with a major protein component. There is no evidence of the consumption of C4 plants in their diet. However, the occasional consumption of freshwater resources cannot be ruled out, specially during the Visigoth period. While δ13C values remain stable through both periods, a shift in mean human δ15N values provides evidence for a significant change in diet in the Carolingian, probably through an attenuation of animal protein in diet. Differences between male and female adult individuals remains stable within both periods, although Visigoth males and Carolingian females represent major opposite ends. Finally, an important factor ruling our isotopic data is related with grave typology, where more complex funerary structures documented during the Visigoth period where used by male individuals with a high requirements in animal-protein through life.

11 EXPLORING DIET IN A RURAL COMMUNITY OF THE EARLY MIDDLE AGES: SANTA MARÍA DE TEJUELA (BURGOS)

Author(s): Jiménez-Brobeil, Sylvia A. - Maroto, Rosa M. - Laffranchi, Zita (University of Granada) - Delgado Huertas, Antonio (IACT - CSIC)

Presentation Format: Oral

Osteological material from the medieval necropolis of Sta. María de Tejuela, better known as Villanueva de Soportilla (Burgos-Spain), was studied from a bioarchaeological and isotopic perspective (δ15N and δ13C). In the cemetery more than 300 burials were located of which approximately one third contained human remains. These are tombs excavated in the rock with different typology, all dating back to the Early Middle Ages. The cemetery belonged to a community of Christian peasants, in a rural enclave far from political and power centers.

We selected 48 human ribs samples and 11 animal samples from the near site of S. Martín de Lantarón for isotopic analysis with the aim of exploring diet and lifestyle condition in this population. We also performed 14C dating that ranged between the 8th and 10th centuries. The analyzes were carried out at the Stable Isotope Laboratory of the Andalusian Earth Sciences Institute, following the protocol of Bocherens.

The δ13C collagen values of the 48 selected individuals range between -19.4 ‰ and -16.9 ‰ (V-PDB) with a mean of -18.4 ± 0.6 ‰ (V-PDB) while their δ15N data vary between 8.0 ‰ and 10.2 ‰ with an average of 9.4 ± 0.5 ‰ (AIR). Isotopic delta values of the fauna samples pointed to an exclusive consumption of C3 plants (≈20.3 ‰ V-PDB). The δ13C values of humans are characteristic of a diet with vegetables type C3 and those of δ15N suggest a slightly increased consumption of proteins of animal origin. There are no differences between the diet of males and females. This study is a fundamental contribution to the study of the High Medieval populations of the north of the Iberian Peninsula.

This paper has been supported financially by the Research Project HAR-2016-75788 funded by the Spanish Government.

12 DIET AND HIGH STANDARD OF LIVING IN LUGO CATHEDRAL: ISOTOPIC AND PALAEOPATHOLOGICAL APPROACHES

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Presentation Format: Oral

The Pilar chapel is one of the richest inside Lugo Cathedral (Galicia, NW Spain). Its construction was funded by noble families and it is believed their relatives, as well as bishops and chaplains, were buried there. An archaeological intervention in 2007 discovered six tombs with a minimum of 14 skeletons dated between AD 13th to 16th centuries. Two burials were restricted for infant inhumations (n=6) and the rest were occupied by mature male adults (n=8). Metric, non-metric, paleopathological and multi-isotopic (δ13Ccol, δ15Ncol, δ34Scol, δ13Cbiop, δ18Obiop) analyses were performed in human (n=12) and animal (n=4) samples. Individuals show characteristics of high standard of living, including presence of marine fish in diet and diseases such as DISH (Diffuse idiopathic skeletal hyperostosis). An osteochondroma was found in one of the adult´s ilia. Traumatic injuries were common (herniation of the discs, vertebral fractures, ossified hematoma, etc), skeletons showing marks compatible with medical treatment. Adults present a tall stature regarding contemporary Iberian and Galician series, and enriched 15N values (up to 15.7‰, Δ human-animal=6.8‰) that suggest important consumption of animal protein. Written sources related to the Cathedral economy and activities are in line with the observed results, including some violent episodes between the bishopric, the bourgeoisie and the peasantry.

13 LIFE IN A PEASANT COMMUNITY OF THE LATE MIDDLE AGES THROUGH SIA: LA MAGDALENA IN BANIEL (SORIA, SPAIN)

Author(s): Grandal-d'Anglade, Aurora (Instituto Universitario de Xeoloxía, Universidade da Coruña) - Muñoz Ugarte, Lucía - Sarkic, Natasa - Herrerín, Jesús (CD Physical Anthropology, Universidad Autónoma de Madrid)

Presentation Format: Oral

La Magdalena in Baniel (Soria) is a depopulated area on the banks of the Duero River. It was a small village whose origin was the Castilian repopulation of the lands conquered from al-Andalus in the second half of the 11th century. In order to favour colonisation, the settlers were exempt from a large amount of feudal taxes that in those days harassed the Castilian peasants.

In 2014, the works on an irrigation channel exposed a group of 22 tombs in the current depopulated area of Baniel, from which the remains of 26 individuals (males, females and children) were recovered. The typology of the burials (slate tombs, without any kind of grave goods), place the graveyard between the 14th and 15th centuries. There are few studies of this period in rural communities in the interior of the Iberian Peninsula. The interest of this study is to find out what the living conditions were, assumed beforehand to be more advantageous than in a classical feudal system.

The anthropological and isotopic study of 21 individuals reveals a high degree of inbreeding and few differences in the type of feeding. The diet was based on cereals, but with a certain contribution of proteins of animal origin. They suffered from intense and continuous periods of dietary stress and a high incidence of septic oral diseases. Females were mostly engaged in craft activities, while males' activities would include jobs that required more physical strength. Their economic system would be based on agriculture and livestock, in addition to craftsmanship.

14 COMPARING ISOTOPE DATA BETWEEN HEALTHY AND DISEASED INDIVIDUALS FROM MEDIEVAL TOMAR, PORTUGAL

Author(s): Curto, Ana (University of Kent; CIAS) - Mahoney, Patrick (University of Kent) - Maurer, Anne-France - Barrocas-Dias, Cristina (HERCULES Laboratory) - Fernandes, Teresa (University of Évora; CIAS) - Fahy, Geraldine (University of Kent)

Presentation Format: Oral

This study explores the relationship between diet and infectious diseases in human skeletons by analysing bone collagen stable isotope ratios (carbon and nitrogen) from 56 human adult tibiae from Tomar (central Portugal), while it was under the Military Orders domain (11th – 17th centuries). Stable isotope data (δ13C and δ15N) from individuals without signs of infectious diseases or physiological stress (n=33) were compared with individuals with skeletal lesions (periostitis and/or osteomyelitis; n=23) suggestive of infectious diseases. The skeletons with lesions were also grouped into healed tibial perostitis (n=7), generalised unspecific infections (n=5) and generalised specific infections (n=2). There was a significant difference between skeletons with unspecific generalised infection (more than one bone affected) and skeletons with only healed tibial periostitis ($p<0.003$) or without lesions ($p<0.004$). The skeletons under study were also grouped by age (young, mature and old adults) and within the young adult group there is a difference, with statistical trend towards significance ($p<0.09$), between the young adults with and without lesions. There are stable isotope differences between healthy and diseased individuals suggesting different diets before the disease, which may have affected their susceptibility to pathogens. These dietary differences, observed at Tomar, between healthy and diseased skeletons are more noticeable in young adults. The results suggest that while unspecific generalised infections are a sign of ill health and poor diet, healed periostitis may be an indicator of good health and a diet richer in animal protein, particularly aquatic protein.

15 EATING IN SILENCE: ISOTOPIC APPROACHES TO NUNS´ DIET OF THE CONVENT OF SANTA CATALINA DE SIENA (BELMONTE, SPAIN)

Author(s): López-Costas, Olalla (Earth System Science research group. Fac. de Bioloxía - Universidade de Santiago de Compostela; Archaeological Research Laboratory, Stockholm University; Laboratory of Anthropology, Department of Legal Medicine, Toxicology and Physical Anthropology, Faculty of Medicine, University of Granada) - Sarkic, Natasa (Dpto. Biología. Facultad de Biología. Universidad Autónoma de Madrid) - Grandal-d'Anglade, Aurora (Instituto Universitario de Xeoloxía, Universidade da Coruña) - Herrerín López, Jesús (Dpto. Biología. Facultad de Biología. Universidad Autónoma de Madrid)

Presentation Format: Oral

The advances in geochemical and physical anthropological studies have provided new tools to reconstruct ancient lifestyles, especially on those minorities not commonly mentioned in the texts. In comparison with males, little is known about everyday life in female monastic communities and how it changed over time. Here we present a paleodietary (δ13C and δ15N in bone collagen) study of human (n=53) and animal (n=13) remains recovered from Santa Catalina de la Siena in Belmonte (Cuenca, Central Spain). Two funerary areas used by Dominican nuns were sampled: one dated in the 16th (n=28) and 17th (n=15), and the other dated in 19th-20th(n=10) centuries AD. The isotopic values suggest the presence of different management strategies or diverse ecosystems origin in the animals consumed at the convent. Human sample reflects a terrestrial diet with presence of C4 plants (millet, maize or sugar cane). The 16th and 17th century individuals show a continuous shift in δ15N (9.7-12.7‰), with no isotopic differences according to period, age or pathologies (osteoporosis, periostitis and brucellosis). The 19th- 20th century series are divided in two groups: a) one that fits into previous centuries trend with higher δ15N possibly related to a large access to animal protein; and b) a second group with elevated δ13C values (up to -15.7‰). Different customs in the assumed homogeneous monastic life are discussed as possible sources of isotopic variation, including access to luxury products such as animal protein or sugar, or practice of food abstinence periods, especially popular on those communities according to texts.

16 TIME TO START AN IBERIAN ARCHAEOISOTOPE ASSOCIATION?

Author(s): Salazar García, Domingo Carlos (Grupo de Investigación en Prehistoria IT-622-13 - UPV-EHU/IKERBASQUE-Basque Foundation for Science; Department of Human Evolution, Max-Planck Institute for Evolutionary Anthropology) - López-Costas, Olalla (Group Earth System Sciences - GI-1553, Universidade de Santiago de Compostela; Archaeological Research Laboratory, Stockholm University; Laboratory of Anthropology, Department of Legal Medicine, Toxicology and Physical Anthropology, Faculty of Medicine, University of Granada) - Tornero, Carlos (Institut Català de Paleoecologia Humana i Evolucio Social - IPHES)

Presentation Format: Oral

During the last decade, isotopic analysis on bioarchaeological remains (i.e. humans, fauna, plants) has seen a boost in its application in the Iberian Peninsula, discovering a complex scenario connected to the diverse cultural backgrounds, wide climatic transitions and biogeographical resource differences existing in this region of the Western Mediterranean. As a result, our detailed knowledge on past human dietary patterns, territorial mobility, animal husbandry, farming and other aspects of our ancestor's lives in Iberia is today broader than years ago. Each time more researchers, both local and non-local, apply stable isotope analysis on Iberian archaeological remains, and a plethora of projects and Doctoral Thesis are coming up. In this context, we consider necessary for the Isotope community working in Iberia to establish a network in which to share knowledge and contacts. New debates about ethic aspects, equipment acquisition, the relationship with institutions, and the demand of a scientific and ecological approach, are now more than ever necessary. We do think that creating an Association is a good start to promote collaboration and quick transfer of knowledge amongst the isotope community. With this slot we would like to open the discussion of this possibility to the people present in the session who work on stable isotope analysis in any Iberian country.

a. CORRELATION BETWEEN STATURE AND STABLE ISOTOPES

Author(s): Maroto, Rosa M. - Roca, María G. - Espinar, Manuel - Román, Carmen M. (University of Granada)

Presentation Format: Poster

A medieval osteological sample (n=20) from the rural community of San Baudelio of Berlanga (Soria, North of Spain) was studied from a bioarchaeological and isotopic (δ15N and δ13C) perspective. The cemetery was dated by Radiocarbon between the 11th and the mid-13th centuries AD. The main objective of this poster is to present the finding of a positive correlation between stature of the individuals and δ13C values.

The isotopic δ15N and δ13C values were obtained by Bocherens procedures from rib bone collagen. Analyzes were performed in the Andalusian Earth Science Institute (IACT-CSIC). The stature was calculated using Olivier-Tissier (1975) formulae. Statistical analysis was performed with the program SPSS.

The found correlation between stature and δ13C values may be related to the fact that the shortest individuals are precisely those with the more positive values. These skeletons are also those dated in the first half of the 13th century AD. The reduced size of the sample did not allow valid conclusions, because it is impossible to know for sure if these individuals, with a presumably somewhat different diet, have a different origin or the first half of the 13th century AD brought a change in the type of vegetable consumed.

This poster has been financially supported by the Research Project HAR-2016-75788 funded by the Spanish Government.

b. STUDYING ROMAN DIETARY PATTERNS AND MEAL FUNERARY RITUALS IN THE VILA DE MADRID NECROPOLIS (BARCELONA) THROUGH OSTEOLOGICAL AND ISOTOPIC ANALYSES

Author(s): Colominas, Lídia (Catalan Institut of Classical Archaeology) - Salazar-García, Domingo Carlos (Grupo de Investigación en Prehistoria IT-622-13 - UPV-EHU/IKERBASQUE-Basque Foundation for Science; Department of Geological Sciences, University of Cape Town)

Presentation Format: Poster

The afterlife in the Ancient Roman religion was the milestone that had to be reached once dead after passing through several rituals. These were very important, as they ensured the protection of the deities and the memory of the deceased. Part of these rituals consisted of funerary offerings and banquets that were held on the day of the burial, in festivities and stipulated days. The faunal remains recovered inside the graves and around them are evidences of these rituals. Their study will allow us to determine the meat portions consumed in the funerary banquets and those that were offered to the deceased, allowing therefore to know if the meal funerary rituals developed in the necropolis implied food that differed from everyday dietary habits. This is the goal of our study.

To accomplish it, we have analysed the archaeozoological and the anthropological material from the necropolis of Vila de Madrid (Barcelona, Catalonia). This necropolis was used between the first half of the 2nd century AD and mid 3rd century AD. We have analysed 343 faunal remains documented in the occupation floor of the necropolis and in the insides of the graves, as well as carbon and nitrogen stable isotope ratios on bone collagen from 53 faunal specimens and 42 humans in it buried. This combined dietary approach will allow us to compare the funerary offerings and banquets developed in the necropolis with the main types of protein resources that the deceased consumed during life.

567 THE THIRD DIMENSION. ANIMAL REPRESENTATIONS IN THE PAST

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Zeman-Wisniewska, Katarzyna (Institute of Archaeology, Cardinal Stefan Wyszynski University in Warsaw) - Recht, Laerke (McDonald Institute for Archaeological Research, University of Cambridge) - Agolli, Esmeralda (Department of Archaeology and Culture Heritage, University of Tirana)

Format: Regular session

Animals pervade our lives, both today and in the past. From the smallest bug through pets and agricultural animals to elephants and blue whales, the animals themselves, animal-derived products and representations of animals can be found everywhere in our daily lives. This session focusses on the representations of animals in the past: How were animals represented in iconography, and what do these representations tell us about the role and function of both animals and the representations themselves? How did humans and animals interact in the ancient world and how do these interactions impact animals and humans?

We encourage researchers to explore these questions through the iconography of animals (figurines, zoomorphic vessels, seals and seal impressions, plaques, wall paintings etc). We are especially interested in new approaches to examining these items. This can for example be by using technologies like 3D models to emphasise the dimensionality of objects and what this can reveal. It can also be with theoretical and interdisciplinary approaches that examine the intersection of the human and the animal - for example, devices or contraptions designed to contain/control or decorate an animal. We also encourage papers that challenge notions of animals purely as objects, but instead take a less anthropocentric perspective that focusses more on the condition and behaviour of animals and how these can be 'read' in the iconography.

The main focus is the Eastern Mediterranean and the Near East, but papers from all areas and periods are welcome.

ABSTRACTS

01 CATEGORIZATIONS OF ANIMAL REPRESENTATIONS IN THE PALAEOLITHIC AND EARLY NEOLITHIC OF SOUTH-EASTERN AND CENTRAL EUROPE

Author(s): Becker, Valeska (Westfalische Wilhelms-Universitat Munster)

Presentation Format: Oral

In the early farming communities of south-eastern and central Europe, animal representations are a) rather rare, b) so stylized that it is sometimes quite difficult to even determine the species, c) usually smaller than life, and d) mostly limited to clay as the raw material that was used to create them. These features place them in stark contrast to the vivid, life-like animal representations of the Palaeolithic hunter-gatherer societies. The presentation aims to outline the differences between the concepts of animal representation in the Palaeolithic and the Neolithic with respect to the material they were made of, their mobility resp. immobility, their stylization or orientation by nature and eventually also their possible functions, for example regarding utilitarian, symbolic, humanistic or dominance-oriented motivations). Utilitarian functions would encompass any use of animals for the fulfillment of basic needs, whereas symbolic functions serve to communicate culturally shaped contents. Humanistic functions serve the need for community and relationships, and dominance-oriented motivations involve the wish to dominate and control. Especially symbolical functions

will be highlighted in the presentation. An interpretation of the animal representations in the early Neolithic and the Palaeolithic will only be possible when we take into consideration the different ways of life and the natural environments of prehistoric societies.

02 EXTRAORDINARY CREATURES – HOW DO WE IDENTIFY PREHISTORIC ANIMALS?

Author(s): Jonuks, Tonno (Estonian Literary Museum)
Presentation Format: Oral

Animal figurines and representations often attract our attention and are in the centre of archaeological interpretations. Identifying the species of animals represented and valued helps us to study how did past societies understand their environment, express their moral and ethical values, entertain themselves etc. The central question here is how to identify the animal who is represented either in a figurine, a pendant or depicted on rock-panels or artefacts?

While clear methodology exists to identify species on the basis of osseous collections, interpreting of art is more complicated. If sources for mental culture are not known we tend to identify animal representations according to our modern knowledge of biology. This seems reasonable and justified for us but may be erroneous in interpreting past cultures. Identifying animals in art often depends on other sources besides archaeological finds. For example knowledge of mythology suggests that mythological beings were used allegorically to express ethical and moral norms. But mythological animals could have also existed for these past societies. By using several examples from Northern and Eastern European archaeology I wish to demonstrate how animal representations that have safely been interpreted in the frames of modern taxonomy, may actually be identified as mythological beings and thus change broader interpretative system behind them

03 ZOOMORPHIC TERRACOTTAE OF THE HALAF PERIOD. MIRRORING REALITIES OF 6TH AND 5TH MILLENNIUM UPPER MESOPOTAMIAN AGRICULTURAL SOCIETIES OR IMAGINARY FLOCKS?

Author(s): Scheyhing, Nicola (none)
Presentation Format: Oral

The typological evidences of Late Neolithic and Early Chalcolithic material groups of the Near East are preferential categorized by the usage of high quality painted pottery as well as by the occurrence of terracotta figurines. A type fossil of the 6th and 5th millennium Halaf period are highly stereotype anthropomorphic figurines displaying presumably mainly females. These objects have been discussed comprehensively since their first appearance at the early excavations in Tepe Gawra, Tell Halaf or Apachiyah in 1910s and 1920s. Much lesser attention was put on the zoomorphic figurines of the same dating and context, though they appear in similar number (for example, at the eponym find spot Tell Halaf, 32 of 90 Terracotta objects from the Late Neolithic and Early Chalcolithic context could be considered as zoomorphic). Whilst the anthropomorphic figurines are interpreted as venerated items with a clear link to rituals, the interpretation of the zoomorphic figurines is less concrete.

The Halaf cultural group is most likely considered as been carried by a society of farmers and foragers inhabiting small settlements as well as living as seasonal pastoralists. For such a lifestyle, animals must been considered as a main factor of subsistence, with an immanent impact on settlement structure and their constancy, as well as for social structures. In my talk, I give an overview about different types of terracotta animal representations, discuss different matters of interpretations depending on their find context and draw a comparison to the representation of faunal remains from halafian contexts.

04 TRANSFORMATIONS OF ANIMAL SYMBOLISM IN ANATOLIA DURING NEOLITHIC PERIOD

Author(s): Türkcan, Ali Umut (Anadolu Üniversitesi)
Presentation Format: Oral

The Neolithic studies are shifting away from rigid artefact analysis to an understanding of beliefs and rituals during one decade. In this regard, animal representations (wall paintings, figurines, bucranium projections, reliefs and rock paintings right coming through Upper Paleolithic tradition) and these animal groups' taxonomy on faunal evidence are getting important in Neolithic Studies. The multiciplity of human-animal relations, their symbolism and association with the social domain, ritualised practises and classification systems have hardly been tackled in archaeological literature. However, anthropological and historical accounts point to the centrality of the cultural and social importance of animals for local communities.Animals were integral components of human existence in many more domains than today.

The absence of many carnivores which are dominant representational figures, on faunal taxonomy are also similar on Upper Mesopotamian PPNB figurine assemblage.In a way, on the light of Nevali Çori and Göbekli tepe examples, a sense of wild landscape symbolism consisting of big carnivores and birds seem to be reserved to monumental reliefs in so-called monumental "Cult Buildings" as a case.

This study is a discussion and a survey of changing attitudes of Animal Symbolism from Göbekli tepe to Çatalhöyük within diiferent media from monumental works to the household contexts.

Does the changing representational agenda of animals represent the shift from Hunting Rites to Domestication process or a more complex relations of the Neolithic Societies of Anatolia?

05 NEOLITHIC VESSELS WITH ANIMAL CHARACTERISTICS: MODIFICATIONS OF MATERIAL CORPOREAL SINGS, NEGOTIATIONS OF CLAY BODYSCAPES

Author(s): Voulgari, Evangelia (Laboratory Teaching Staff, Department of Archaeology, School of History and Archaeology, Aristotle University of Thessaloniki)

Presentation Format: Oral

Stemming from the study of the late Neolithic pottery from Dispilio, Northern Greece, this paper proposes a theoretical and methodological approach in an effort to shed light on the social significance of vessels decorated with animal characteristics. In the ceramic assemblage of this lakeside settlement a variety of vessels resembling animals has been found, amongst which a remarkable number of the so-called rhyta, a peculiar class of shallow, slanted vessels on four legs, with large vertical handles. Their enigmatic form, unique decoration and territorial spread -from southern Greece through Albania to northern Italy, to Lipari and the Aeolian Islands, and to Kosovo and central Bosnia- have puzzled many researchers and led to a number of theories. The ceramic assemblage of Dispilio gives the opportunity to examine these "peculiar" vessels alongside not only other zoomorphic representations but also anthropomorphic and "x-morphic" ones. Taking vessels with animal characteristics as a baseline, I shall attempt to propose an alternative approach, seeing vessels' surfaces as the contact zones between humans, things and animals, where exchanges and interaction take place through representation. These zones of interaction, where the boundaries of worlds jostle each other, are considered as the outcome of bodyscapes' negotiations, distinguished from the flesh and blood they seek to imitate and enframed by human desire in order either to leap or to emphasize the dichotomies between human–animal or animate –inanimate.

06 HUMAN-EQUID RELATIONS IN THE ANCIENT NEAR EAST: A VIEW FROM BELOW

Author(s): Recht, Laerke (The McDonald Institute for Archaeological Research, University of Cambridge)

Presentation Format: Oral

This paper explores what animal figurines in general, and the three-dimensional perspective in particular, can reveal about human-equid encounters in the third millennium of the upper Khabur region. Figurines are the most ubiquitous type of equid representation in the ancient Near East. Despite this, they rarely receive much attention outside specialised coroplastic studies. In this case study, the aim is to use the figurines to examine how humans viewed and interacted with equids, and what was considered significant in the creation of the figurines.

Animal figurines can often appear standardised and lacking in detail, to the extent that even basic species identification is not always possible. However, a closer look shows that many do in fact offer much information about how an animal was perceived in ancient times, human interventions and even signs of animal agency. For ancient Near Eastern equid figurines, this information can be found in, for example, the manner in which the anatomy of the animal is rendered, equid-specific postures and gestures, and in the details of tack, harnessing and grooming.

The advantage of the three-dimensional medium is that we may see the animal from all angles. 'A view from below' refers to this: literally speaking, looking at an equid figurine from below can provide information about human management of animal breeding practices and distribution of gender. Other angles or 'views' provide additional insights. 'A view from below' also refers to an understanding of animals as social actors, and any signs of equid agency that might be detected in the study of the figurines.

07 WHY THE LONG FACE? HORSE HEADDRESSES OF THE FROZEN TOMBS OF SIBERIA AND THEIR RELATION TO OWNERSHIP AND TERRITORIALITY

Author(s): Stümpel, Anna-Elisa (University of Groningen)

Presentation Format: Oral

Commonly referred to as 'Scythians' in literary sources, the archaeological record of these Eurasian nomads shows a vast diversity across the regions once occupied by them, ranging from Central Inner Asia to the Eastern European Steppes, suggesting a differentiation into local groups. A uniting element between these local deviations is the appreciation of their horses, which is reflected in their burial customs: either horse equipment or the animals themselves were buried alongside their owners, together with their other worldly belongings. Amongst others, this behaviour can be observed in five large burial mounds located in Pazyryk Valley, South Siberia, belonging to the archaeological group of the Pazyryk Scythians. These five large burial mounds (kurgans) are assumed to have belonged to the elite, the clan chiefs respectively. Within these burials, various well-preserved horse corpses were found together with their complete riding outfits, some even with headdresses, next to the human burials.

Based on 'social zooarchaeology' and the available material culture, in this paper I want to argue that horses had a special, elevated meaning in Pazyryk society, which exceeded their function as means of transport/draught animals and source of raw materials and dairy. Based on this premise and theories put forward by Sykes (2014) and Argent (2010), I want to suggest that the motifs chosen for the riding outfits and headdresses are linked to a territorial organisation. Especially the horses wearing the headdresses acted as dynamic territorial markers, since the headdresses (and riding gear) were fashioned individually for every clan, which disposed each of a specific inventory of motifs. Usually, the headdresses are interpreted as accessories for rituals, however, I want to suggest that the headdresses displayed the coat of arms of each clan. This would mean that the horses carried not only humans but also meaning in the cultural Scythian landscape.

08 REALISTIC AND STYLIZED REPRESENTATIONS OF ANIMALS IN THE FOREST MESOLITHIC OF THE UPPER VOLGA REGION (SITE ZAMOSTJE 2)

Author(s): Lozovskaya, Olga (Institute for the History of Material Culture, Russian Academy of Science, Laboratory for Experimental Traceology; Sergiev Posad State History and Art Museum Preserve)

Presentation Format: Oral

Among the Late Mesolithic and Neolithic (without agriculture) settlements of the Eastern European forest zone, the material culture of which is rich in "mobiliary art" objects, the lake settlement Zamostje 2 occupies a unique place thanks to a very rich assemblage (more than 100,000 items) and an excellent state of preservation.

Hundreds of decorated artefacts made of stone, bone, antler, and wood have been preserved in the waterlogged cultural layers of the site. Most of them are related to domestic tools and weapons (knives, daggers, arrowheads and spears, pins, etc.); however, non-utilitarian objects are present as well.

Zoomorphic sculptural figurines and voluminous tool parts made from bone, antler or wood can be compared to some animals (elk, wild boar), birds (ducks and ?), or amphibians (snake), which were either a game (confirmed by numerous faunistic kitchen remains) or "cult" objects related to ideological concepts and / or abstract notions. The functional purpose of the implements, which reveal schematic representations of these animals, may indicate the latter.

We will present both a few almost realistic representations of animals and their stylized images, in the context of artistic activity of the Mesolithic population in the site and in comparison with some similar examples from other settlements of the region.

09 AN EYEWITNESS ACCOUNT OF ICE AGE DEER ON CRETE: THE ASPHENDOU CAVE PETROGLYPHS

Author(s): Strasser, Thomas (Providence College) - Murray, Sarah (University of Toronto) - Geer, Alexandra (Naturalis Biodiversity Center) - Ruprecht, Louis (Georgia State University) - Kolb, Christina (Freelance Archaeological Illustrator)

Presentation Format: Oral

The earliest figural art known from Greece was dated to the Neolithic period (ca. 8,5 to 5 thousand years ago). A recent study of a herd of quadrupeds among a larger group of petroglyphs at Asphendou Cave on the island of Crete, however, suggests that such art has a longer history in the Aegean basin. First published over forty years ago, the debate concerning the quadrupeds' age has lain dormant for decades. Applying new technology and new paleontological data to the study of the petroglyphs allows a number of novel insights. The analysis of 3D models provides clarity regarding the sequence of engravings and shows that the herd of quadrupeds must be the oldest element of the iconography. Comparison of the iconography to recently discovered fossil data found subsequent to the previous publications concerning Asphendou demonstrate that the quadrupeds in the engravings represent an extinct dwarf endemic deer (Candiacervus ropalophorus). In light of newly produced images, coupled with recent archaeological data, we re-assess the dating of the petroglyphs and argue that the engravings of the quadrupeds were made in the Late Pleistocene, or Upper Palaeolithic. These animals therefore represent the earliest figural art yet discovered in Greece as well as provide the first evidence that places the humans and the deer together.

Several styles of representation, possibly reflecting different artists' hands, are identifiable. While the motivations of the artists are speculative, it is safe to assume that the deer were sufficiently significant in their lives to warrant realistic depiction. Furthermore, the artists were careful enough in their observations and the transference of those observations to the canvas of the cave floor to enable an accurate scientific identification of the species -- the now extinct Ice Age deer, Candiacervus ropalophorus.

10 ANIMAL AGENCY IN COMMUNAL PRACTICES: REPRESENTATIONS OF BOVINE AND DEERS IN WESTERN SICILY (10TH-6TH CENTURIES BC)

Author(s): López-Bertran, Mireia (Universitat de Valencia) - Ferrer, Meritxell (Universitat Pompeu Fabra)

Presentation Format: Oral

In the last decades the study of the interaction between humans and animals has turn into a solid discipline, particularly the analysis of their material traces from a zooarcheological methodology. However, most of these studies present a strongly anthropocentric and subsistence perspective, considering the animals as mere passive agents, both as objects of human "consumption" or symbolic resources. The so-called "animal-turn" is currently changing these ideas and strengthen animals as subjects and challenge the traditional view of animals as passive beings.

The main aim of this presentation is to analyse the relationship between animals and humans from a non-exclusively anthropocentric point of view. We consider animal-human interaction as mutually constructed and strongly relational. To do this we will focus on amphorae and jugs with representations of humans, animals and hybrids identified in the western Sicilian material record from the 10th to the 6th centuries BC. More specifically, the materials from ritual contexts of Monte Iato, Polizzello, Entella and Monte Polizzo will be considered. The study of these vessels enables to explore these interactions not only through consumption practices, but also through the transformative capacities undertook in communal ritual practices. Going beyond the utilitarian interpretations of animals, we are mostly interested in animals as ontological subjects that engaged with humans in an array of different ways.

11 HORNS AND AXES

Author(s): Whittaker, Helene (University of Gothenburg)
Presentation Format: Oral

This paper is intended as a contribution to the discussion on the symbolic relationship between humans and animals in prehistory. My main focus will be on the representation of cattle in Cretan iconography in the Late Bronze Age. The starting-point for my discussion will be the association between double axes and cattle, which can be seen in different types of representations, and would seem to have a very particular meaning. Very often only the head of the animal is depicted and there seems to be a specific emphasis on the horns. It is also noticeable that the horns can be shown in many different ways. Comparative evidence, in particular from eastern Africa, suggests that the association between horns and axes can be interpreted as a reference to the shaping of the horns of the animal. This practice has a long time-depth and it is believed that it can be traced far back into prehistory. I will discuss the significance that the practice of shaping the horns of cattle into desirable shapes may have played in the Cretan Bronze Age. In the last part of the paper, I will discuss more generally the modification of the appearance of animals for aesthetic and other reasons in the context of the relationship between animals and humans.

12 COMADREJA, COMADRONA ('WEASEL', 'MIDWIFE'): VOTIVE WEASELS AS LIKELY INDICATORS OF A FEMALE HEALING TRADITION IN MINOAN CRETE

Author(s): Zimmermann-Kuoni, Simone (Trinity College Dublin)
Presentation Format: Oral

The weasel, called 'little midwife' in several languages (e. g. Spanish comadreja), is intimately bonded with women and birth in the historical, ethnographic and linguistic records, a connection which has long puzzled scholars. This paper draws from primary sources to shed light on that intriguing bond. It argues that the weasel was a sacred attribute of ancient Mediterranean goddesses presiding over birth (e. g. Eileithyia, Hekate, Leto) because the animal provided a drug used to facilitate parturition, the largest single cause of death for women in pre-modern societies. The weasel-based drug belonged to the pharmacopoeia of midwives, practitioners with broad healing competence who performed their art (techne) within the cult of goddesses made in their own image: divine midwives (i. e. birth goddesses) who in iconographic and textual sources display the therapeutic attributes (e. g. animals, plants, instruments) emblematic of their human counterparts. The study of such attributes can therefore bring to light overlooked female healing lore bespeaking of women's neglected contribution to the early history of medicine.

Practices related to healing are attested at Pestophas (Crete, early 2nd millennium BC), a Minoan peak sanctuary yielding figurines of weasels that have traditionally been interpreted as pests/vermin. Within the context of ancient midwifery traditions, we examine materials from Petsophas, as well as the broadly contemporary Temple Repositories of the palace of Knossos including a weasel skull. And conclude that both assemblages strongly point to the cult of Eileithyia, the earliest divine midwife documented in Crete. Rather than pests then, weasels may have been pharmacological animals in female medicine since prehistoric times in the Aegean.

13 THE MINOAN MONKEY: OFFSPRING OF THE NEAR EAST?

Author(s): Pareja, Marie (University of Pennsylvania; Dickinson College)
Presentation Format: Oral

The Offering to the Seated Goddess fresco from building Xeste 3 at Akrotiri on Thera is among the best preserved wall paintings from the Aegean Bronze Age. Located in a ceremonial structure, the painting shows a young girl depositing crocus stamens into a basket behind a blue monkey, who stands on hind legs and offers stamens to a large, seated female figure. A leashed griffin stands behind the seated goddess, completing a scene that is considered completely Minoan in nature. Many parallels between the roles and appearances of Minoan and Egyptian monkeys are well attested in scholarship, but the possible relationships between Minoan and Near Eastern monkeys, particularly in light of this wall painting, have not yet been thoroughly explored.

Bronze Age Near Eastern figurines, plaques, hairpins, and glyptic arts preserve depictions of monkeys that fulfill a myriad of roles, including but not limited to those of their Minoan counterparts. In contrast, however, Near Eastern texts survive with reference not only to monkeys as exotic pets, but as gifts between elites, agents of healing, and sometimes even harbingers of the supernatural. These primates are frequently identified in glyptic art as participants in Presentation Scenes, and they often appear between the approaching supplicant(s) and a seated figure. These small-scale, highly portable scenes from the Near East may have served as the basis for at least the composition of the Minoan Offering to the Seated Goddess fresco.

This discussion first examines the iconography and roles of monkeys in Near East. Next, the ways in which the role of the monkey in Minoan art may be more closely associated with the animal's role in Near Eastern than Egyptian art will be illustrated through the close examination of text, iconography, trade, and possible faunal evidence.

14 HOW MANY TENTACLES? OCTO-PUS AND X-PUS IN GREEK BRONZE AGE: A NEW ARCHAEO-ZOOLOGICAL APPROACH

Author(s): Alberti, Lucia (Istituto di Studi sul Mediterraneo Antico - CNR Italy) - Bello, Giambattista (University of Bari)
Presentation Format: Oral

The Mediterranean common octopus, Octopus vulgaris, was an important symbolic icon in the Greek Bronze age, although its con-

notation is not fully understood. This cephalopod is one of the 13 autochthonous octopods living in the Mediterranean and the most easily observable because it can be found in very shallow waters.

During the Late Bronze age (ca. 1600-1100 BC), octopuses are very widespread motifs in pottery, paintings, jewellery and so on: in some cases the naturalistic details suggest they were submitted to a sort of 'scientific' observation. In the so called Marine Style for example (Late Minoan IB, ca. 1500-1450 BC), unquestionably the depicted octopod species is Octopus vulgaris, sinuously embracing the pot surface. But few centuries later (Late Minoan IIIB-C, ca. 1300-1100 BC) octopus representations are rather very stylized.

In agreement with its scientific and vernacular names – e.g. Greek: χταπόδι, English: octopus – the actual Octopus vulgaris has eight arms (or tentacles). However, in many Bronze age representations, the common octopus is figured with a variable number of arms, including odd numbers which disrupt its natural bilateral symmetry: we can find octopuses with 4, 6, 7, 8, 9 and also 10 tentacles.

Why does iconography seem to conflict with nature? And what is the real consistency of traditional beliefs about octopus regeneration, related to the marked regenerative capabilities of its arms, which re-grow after being mutilated by predator bites?

Through an integrated analysis of archaeological contexts, iconographies with 'wrong' tentacles number, zoological identification and biological features, the paper will explore ways of representations, human-animal interactions and possible symbolic meanings of this so fascinating animal.

15 BIRD-SHAPED VESSELS OF BRONZE AGE CYPRUS AS THREE-DIMENSIONAL OBJECTS

Author(s): Zeman-Wisniewska, Katarzyna (Institute of Archaeology, Cardinal Stefan Wyszynski University in Warsaw)
Presentation Format: Oral

Cyprus is home to nearly 400 bird species, and is annually visited by millions of birds during great spring and autumn migrations. This paper discuss presence of birds in Cypriot prehistoric culture, with an example of Bronze Age bird shaped vessels (askoi) representing a rich variety of island's avifauna, from numerous ducks and pigeons to rare examples of partridge, vulture and owl. They include vessels of simple forms, just generally resembling a water bird (duck?), along carefully modelled objects, which allow us a precise species identification. When identification is possible it often reveal species and subspecies, which still are characteristic for Cyprus, even endemic, or nowadays endangered. Careful study of this vessels assemblage and their context (when possible) provides insight to practical and symbolic role, which birds played in lives of prehistoric inhabitants of Cyprus. Another aspect of these objects, which is going to be discussed is their three-dimensionality. These are things which were meant to be manipulated, touched, and seen from different angels, they also had a practical function, which was pouring liquids (and that also could be done differently, depending on where the openings were). This paper is an attempt to answer questions how the three-dimensionality affected both meaning and function of bird-shaped askoi and how can it be included in modern research and perception of these objects, i.e. with the aid of 3D-models.

16 ANIMAL FIGURES ON 12TH C. BC PICTORIAL POTTERY FROM CYPRUS

Author(s): Lekka, Anna (Greek Ministry of Culture)
Presentation Format: Oral

The period ca. 1200 B.C. is a critical one for the Eastern Mediterranean as a result of prevailing conditions of political turmoil. Cyprus did not remain a passive recipient but became an important player in the new horizon of the Eastern Mediterranean after the Collapse of the old empires. Cypriot pictorial pottery of the 12th c. BC marks the transitional period between the end of the Late Bronze Age and the beginning of the Iron Age. The figurative motifs of the Pictorial White Painted Wheelmade III pottery derived mainly from the animal kingdom: birds, fishes, seahorses, horses, bulls, lions, goats, deer, boars, dogs, hedgehogs. Motifs from the fauna are also common: palm trees, pomegranates, different kinds of flowers and the sacred tree, which, most of the times, are combined with animal motifs.

Cypriot potters have adopted various elements from different place of provenance according to their taste and needs. Local styles have been formed by the combination of decorative elements originated from the Aegean world, the Syro-palestinian coast and Anatolia. This exchange of animal figures stifles to innovation and indicates a line of communication between different regions of the Eastern Mediterranean and the Near East.

Although, the interpretation of the images starts from the environment and its relation to human activity and the dietary habits, images visualize ideas. Our research include the study of texts in an attempt to interpret animal representations. The study of a vast number of myths and traditions leads to interesting conclusions concerning the religious syncretism.

17 THE SHAPE OF IT: AESTHETIC CHOICES AND ANIMAL ONTOLOGIES IN SCANDINAVIAN SOUTHERN TRADITION BRONZE AGE ROCK CARVINGS

Author(s): Lawrence, Joanna (Department of Archaeology, University of Cambridge)
Presentation Format: Oral

Here I present a portion of my ongoing PhD research on human conceptualisations of non-human animals in the Southern Tradition of Bronze Age rock carvings from Sweden and Norway. Thousands of animal figures are carved in the exposed bedrock across this landscape, providing a rich yet underutilised source for investigating human-animal relations in prehistory. The figures are simplified,

idealised, and sometimes stylised, and every part of the carving is painstakingly and intentionally created, shaped into physical manifestations of human ideas and intention. In this paper, I focus on the aesthetic and schematic choices made in depicting animals.

I first consider how the defining visual characteristics chosen for animal carvings could have been influenced by animals' real-life behaviours and roles in society. Each type of animal is identifiable by specific characteristics: oxen by curving horns, and horses, deer, and dogs by similar perky ears but distinguishable tails. The selection of specific body parts that are emblematic or definitive of an animal may reflect not only visual identifiers, but symbolically represent qualitative ones as well.

Second, I analyse aesthetic connections between the shapes of animals and other figures in the carvings, for example between horses and ships or ox horns and hand gestures. I explore how interpreting these visual similarities as devices that relate the objects metaphorically can provide insight into prehistoric perceptions of the essential natures of these animals.

Finally, I discuss how the carvings as material culture served to both reflect and negotiate human conceptualizations of non-human animals, and consider how these concepts might have manifested in everyday interactions between humans and animals in prehistory.

18 DOGS OF ROMAN BRITAIN: SECULAR, SACRED OR CONSUMED?

Author(s): Franicevic, Branka (University of Oxford)
Presentation Format: Oral

Evidence on the role of the domestic dog in everyday life in Roman Britain is scarce. Archaeological evidence indicates that dogs had been consumed or/and used in ritual practices during Britain's Iron Age, but little is known as to whether this practice continued in the period of Roman conquest. Inevitably, new material cultures were introduced to indigenous Britons by Romans, and the Empire is known to have used dogs as companions, protectors and hunters, but not for consumption. This project proposed a zooarchaeological framework of study by focusing on three facets that are archaeologically accessible: iconography, imagery and osteology. An aim was to assess the significance the domestic dog had within Iron Age and Romano-British society. This framework was illustrated by comparing animal iconography with osteological evidence from major Iron Age and Romano-British archaeological sites in southern Britain and Yorkshire from the early Iron Age (c.700BC) to the late Roman period (c.AD450).

Numerous depictions of dogs in Roman artwork ranging from statues to pottery point to high-status of dogs in Roman society. Osteological results further indicate a large increase of dog numbers in indigenous British households from the Iron Age throughout the Roman period.

This demonstrates that dogs of all ages lived with humans and were kept in good health. It informs us that dogs were used as a food source alongside other domestic animals to a limited extent during the Iron Age in the south of Britain, a practice that decreased significantly in the Roman period in both tested regions. This analysis may demonstrate the link between cultural practices and cultural beliefs, connecting the study to broader anthropological research.

a. THE ICONOGRAPHY "FLYING GALLOP" AND ITS REPRESENTATION IN THE BURIAL RATES OF THE EURASIAN BRONZE AGE

Author(s): Usmanova, Emma (Buketov Karaganda State University, Saryarka Archaeological Institute) - Chechushkov, Igor (Department of Anthropology, University of Pittsburgh)
Presentation Format: Poster

The significance of horse for the Bronze Age societies of Inner Eurasia highlighted by its widespread in rituals and iconography. The common plot is a pair of horses depicted in the posture of "flying gallop". This artistic concept is a representation of a swift running animal known and developed by many cultures, including the Egyptian iconography and the Classic European Art of the 18th and 19th centuries. (Edgerton 1936). This highly recognizable plot also widely known from the Rock Art of Inner Eurasia, which is traditionally dated to the Bronze Age (Novoshenov 2012). The case of the Novoil'inovskiy 2 Cemetery (the Lisakovsk District, Kazakhstan) helps to shed light on this problem and provides a basis for evaluation if the attribution of the iconographical evidence to the Bronze Age is correct. A 15-20-years old stallion and a 10-15-years-old mare were found under the Late Bronze Age kurgan mound (the Petrovka archaeological culture), buried together in the separate pit. The arrangement of horses in the pit is sophisticated and highly symbolic, representing the posture of "flying gallop." We believe that the posture of "flying gallop" in this case recalls the image of a harnessed team pulling a chariot--the common plot for the Eurasian Rock Art. Two radiocarbon measurements of samples from the Kurgan Mound allow the chronological control. These ages correspond to the calendar age ranges of 1956 cal BC to 1885 cal BC (68%) and 1890 cal BC to 1774 cal BC (68%). Thus, the iconography of horses in "flying gallop", indeed, could have appeared in Eurasia in the Late Bronze Age. Circa 2000 B.C. the horses became a crucial part of the early complex societies and became a common part of ritual rates and iconography.

b. DISPLAYING SYMBOLS OF POWER – LIONS REPRESENTED ON ARMOUR IN ANCIENT MACEDONIA

Author(s): Del Socorro, Nathalie (Université Paris X Nanterre; ArScAn)
Presentation Format: Poster

Due to a lack of written sources, objects found in funerary context constitute the main source of information about the region of Macedonia during the VIth and Vth centuries B.C. Many necropoleis have been excavated recently, allowing many important dis-

coveries. Yet, even if these objects have been published, many aspects pertaining to their function and symbolism are still to be explored. For instance, numerous elements of weaponry (offensive and defensive) are remarkably ornate but the iconography displayed has seldom been interpreted.

This poster proposes to explore some aspects of the lion figure displayed on items of armoury, particularly helmets and breastplates. These figures were engraved directly on the armour or embossed in gold foil and then assembled on the items. The variations observed indicate that each object was crafted or modified individually. The omnipresence of lion figures is particularly important as it is characteristic of the region and emphasizes the social status of the deceased. Comparing the different styles used in each figure allows us to obtain a more general view of this iconographical element.

The fact that precious elements of weaponry could be buried along with their owners indicate a form of economic wealth. Moreover, the symbolism displayed by the figures could probably refer to a high social rank.

568 FOOD AND DRINK IN ARCHAEOLOGY: MULTIDISCIPLINARY APPROACHES TO PAST FOOD PRACTICES (PART 1)

Theme: Theories and methods in archaeological sciences
Organisers: Hondelink, Merit (University of Groningen) - Delaney, Sarah (University of York) - Champion, Louis (University College of London - UCL; Royal Museum of Central Africa Tervuren- MRAC) - Mayor, Anne (Laboratoire Archéologie et Peuplement de l'Afrique - APA; Unité d'anthropologie du Département de génétique et évolution de l'Université de Genève - GENEV) - Vieugue, Julien (UMR CNRS 7055 Préhistoire & Technologie)
Format: Regular session

Throughout human history, food has been – and still is – an integral part of life. In recent years, the importance of preserving knowledge about food and food practices of (sub-recent) past societies has been acknowledged not only by researchers from different fields, but also by UNESCO when food-related traditions were included in the UNESCO Intangible Cultural Heritage list. This acknowledgment of food, and the practices associated with it as intangible heritage, forms part of the acknowledgment that the study of food is a proper research field in its own right. When studying past food and alimentary practices, archaeologists consult and apply a range of methodologies from different disciplines, including but not limited to anthropology, biology, chemistry, history and physics. The fact that past food practices can be studied from a multitude of different disciplines, be it from the humanities, social sciences or natural sciences, may have a negative effect on the integration of research results.

This session focuses on bringing together research on past food practices, comprising of production, storage, procurement, preparation, consumption and deposition from studies examining evidence from across the globe. This session aims to encompass multiple different bioarchaeological methods, focussing on archaeobotany, zooarchaeology and the consumption of animals. We encourage papers showcasing results that show promising findings for other specialists to incorporate in their own research projects.

ABSTRACTS

01 IDENTIFYING THE DIFFERENT COOKING PRACTICES: CONTRIBUTION FROM THE STUDY OF ETHNOGRAPHIC POTTERY IN AFRICA

Author(s): Mayor, Anne (Laboratoire Archéologie et peuplement de l'Afrique, Unité d'anthropologie) - Vieugue, Julien (CNRS, Paris X Nanterre) - Regert, Martine (CNRS, CEPAM Nice) - Garnier, Aline (Université de Paris Est Créteil Val de Marne)
Presentation Format: Oral

Because it may be used for storing, transporting and preparing foodstuffs, pottery represents a key evidence of the food practices of past societies. Ceramic vessels have, however, been rarely studied for reconstructing the ancient culinary habits. The function of archaeological pottery proves to be difficult to identify, particularly because of the lack of interpretative references. To fill this gap, we have performed the study of used pottery from Central Mali collected in 1995 by the MAESAO team and then the analysis of ceramic vessels in Eastern Senegal. The typometry (shape, size, capacity) and use-traces (residues and attritions) of 233 pottery having various functions (storing water, boiling millet beer, etc.) were first documented in the field before the residues of 10 used pots are the subject of thorough analyses in laboratory (lipids and phytoliths). This integrated approach, conducted between typometry, traceology, chemistry and botany, has enabled the establishment of a large ethno-archaeological reference focused on the function of pottery. Research has particularly revealed how the pottery shape, the visual aspect of carbonized residues as well as the concentration of lipids made it possible to distinguish the different cooking procedures that are still present in West Africa (boiling, roasting, steaming and frying). This study offers new perspectives for identifying the culinary practices of African societies that has been mainly approached through the analysis of faunal and botanical remains.

02 LOCAL VITIS EXPLOITATION IN THE SOUTHERN ITALY BRONZE AGE? THE CASE OF GROTTA DI PERTOSA (CAMPANIA, ITALY)

Author(s): Breglia, Francesco (Scienze del Patrimonio Culturale, Università del Salento; C.R.S.) - Grasso, Anna Maria - Fiorentino, Girolamo (Laboratorio di Archeobotanica e Paleoecologia, Università del Salento)

Presentation Format: Oral

Grotta di Pertosa (Campania, Italy) is a natural karst cave where, during the middle and recent Bronze Age, a pile-dwelling settlement was established. Many archaeological evidence suggests that near the entrance of the cave flourished a thriving village, located to control an important natural transit route. Here, four samples of waterlogged and anoxic soil have been taken during an archaeological survey and then analysed. Unburned grapevine seeds, pedicels and rachis fragments have been found. Because the origin of viticulture in Italy during the Bronze Age is still being debated, we have investigated the domestication status of the grape pips found here. This investigation is undertaken by evaluating their shape and morphometric features through computer image analysis. The morphological quantitative variables measured are then analysed by stepwise LDA, in order to identify some "groups". For the study of pedicels and rachis fragments we took into account their characteristics and their state of preservation. This has allowed us to obtain information about the processing techniques of the bunches, supposedly used in the production of wine. Our paper produces new insight to check if also this area of Campania region may have played a role in the process of secondary domestication of the vine.

03 NEW EVIDENCE ON THE DEVELOPMENT OF MILLET, RICE AND FONIO ECONOMIES IN THE NIGER RIVER BASIN: ARCHAEOBOTANICAL RESULTS FROM MALI

Author(s): Champion, Louis (University college of London - UCL, Royal Museum of Central Africa - MRAC Belgium)

Presentation Format: Oral

The Niger River is second only to the Nile in length in Africa, and has hosted dense populations of agriculturalists including in historical times the kingdoms of Songhay and Mali. This is also the region to which the origins of the Niger-Congo language family, including its Bantu offshoot is attributed. Despite this archaeobotanical evidence for the development of agricultural systems based on both indigenous crops, Pearl millet (Pennisetum glaucum), cow-pea (Vigna unguiculata), fonio (Digitaria exilis) and African rice (Oryza glaberrima), and introduced crops, such as sorghum (Sorghum bicolor) and cotton (Gossypium sp.) has remained limited. In particular the role of multiple crop systems, that included both the wet (rice) and the dry (millets), has not been directly documented archaeobotanically. Here I present new archaeobotanical results from 4 sites in Mali (Sorotomo, Sadia, Togo Mare Diabal,& Windé Korodji) that suggest larger populations and population centres developed only once as agriculture diversified beyond pearl millet cultivation to include multiple cereals, as well as cowpea and cotton. Flotation results indicate that sites of the First Millennium BC were dominated by pearl millet evidence, which can be related to the earlier origins of this crop to the Northern Mali. However by the early centuries AD, the additions of sorghum, fonio and rice correlate to increasing urbanism, a pattern revealed by evidence in sites from the inland Niger Delta. This highlights the role of agricultural diversification in promoting urbanisation and state formation.

04 A MULTIPROXY APPROACH TO THE STUDY OF ROMAN DIETS DURING LATE ANTIQUITY

Author(s): Fernandes, Ricardo (Max Planck Institute for the Science of Human History; McDonald Institute for Archaeological Research) - Nava, Alessia (Department of Environmental Biology, Sapienza University of Rome) - Hamann, Christian - Larsen, Thomas (Leibniz Laboratory for Radiometric Dating and Stable Isotope Research) - Roberts, Patrick (Department of Archaeology, Max Planck Institute for the Science of Human History) - Wang, Yiming (Leibniz Laboratory for Radiometric Dating and Stable Isotope Research) - Coppa, Alfredo (Department of Environmental Biology, Sapienza University of Rome) - Bondioli, Luca (Service of Bioarchaeology, Museum of Civilizations)

Presentation Format: Oral

Given an emphasis on historical sources the vast majority of the people that lived within the Roman world remain voiceless. In their aid, isotopic analysis of archaeological human remains is used to quantify diet, nutrition, and mobility. Nonetheless, available Roman isotopic data is still sparse and periods of contrasting forms of political and social organization remain unexamined.

Burials from a Roman villa complex next to the Via Labicana (within modern day Centocelle, Rome) offer an opportunity to reconstruct the lifeways of late antiquity Romans. Following osteological analysis, radiocarbon and multiple isotopic measurements were made on bone mineral and collagen and on single amino acids. Caloric contributions from food groups were quantified using a Bayesian mixing model (FRUITS) and relied on a database (IsoArcH) of isotopic values for roughly coeval food remains.

Radiocarbon dates revealed that the burial site was in use prior to late antiquity. Isotope results showed that the individuals likely lived for several years in the region prior to death. Most had diets that were poor in animal protein. Main energy sources were plant foods with an uncertain minor contribution from millet. Overall the results reveal impoverished diets. If this reflects socio-economic status, a cultural choice, or a more general trend within late antiquity will be discussed and addressed in future research.

05 CULINARY PRACTICE AND COMMUNITY LIFE AT KIRIKONGO: MIXED METHODS APPROACHES TO THE ARCHAEOLOGY OF WEST AFRICAN FOODWAYS

Author(s): Dueppen, Stephen - Gallagher, Daphne (University of Oregon)
Presentation Format: Oral

In the West African savanna, as elsewhere, foods play a central role in structuring everyday activities and important events. Key to understanding preparation and consumption in economic, religious and political context is consideration of how different classes of material culture (artifacts) and organic remains lend distinctive insights to create more complete reconstructions of foodways. This paper examines the relational articulations of pottery, fauna, and carbonized seeds and fruits at the long-lived site of Kirikongo (ca. 100-1700 CE), located in the Mouhoun Bend of Burkina Faso. Kirikongo is an ideal site at which to explore foodways at multiple spatial and temporal scales, as it is composed of multiple house mounds with well-preserved stratified architectural layers sealed by crushed laterite floors. Consequently, this high resolution sequence with minimal bioturbation incorporates myriad in situ deposits derived from food production, storage, processing, and consumption. Data include storage, cooking, and serving pots; stone and iron food production and preparation tools; faunal remains reflecting diverse herding and hunting strategies; and carbonized evidence of plant cultivation, management, and processing. By integrating the diverse perspectives offered by different lines of evidence, this analysis demonstrates how more complete characterizations of foodways can provide insights into the ways in which they shaped and were shaped by politics, gender roles, social organization, environmental processes, and local tastes.

06 DIET AT THE LUQUE CASTLE (CÓRDOBA, SPAIN) IN THE CONTEXT OF THE MILITARY BORDER IN AL-ANDALUS IN THE 13TH CENTURY

Author(s): Alonso-Valladares, Moisés (University of Granada) - Valenzuela-Lamas, Silvia (CSIC-IMF)
Presentation Format: Oral

One of the most defining aspects to culturally characterise human groups is the food they eat. Food testifies of the obedience or the transgression of certain religious precepts, and may reflect adaptations to the environment. In this sense, the analysis of the dietary habits of the Medieval Islamic communities settled in the Iberian Peninsula has revealed interesting aspects of everyday life, thus allowing us to better understand them and their changes through time. Several zooarchaeological studies show that Andalusi communities had a particular meat consumption pattern that differentiated them from other contemporary groups, especially Christians. This is visible in the archaeological record because the lack of pork, the predominance of sheep and goat and the scarcity of cattle remains.

The archaeological excavations carried out between 2003 and 2011 at the Luque Castle (Córdoba, Spain) brought to light a garbage dump dated from AD1240. This was the moment immediately after the Christian conquest of the settlement, when the Castilian control of the castle substituted the previous Islamic dominance, promptly sealing the previous layers. This paper will present the study of the garbage dump, which allows us to characterise the feeding practices of the Muslim communities settled there and the impact that the conquest and the arrival of an important military contingent had in their food habits. Aspects as hypophagia or the alteration of the regular consumption pattern will be addressed in the light of the results obtained from the zooarchaeological analysis of the garbage dump of the Luque Castle.

07 FISH, FRIARS AND OTHER FOOD STORIES: RECONSTRUCTING DIETSCAPES IN MEDIEVAL ABERDEEN USING STABLE ISOTOPE ANALYSIS

Author(s): Czére, Orsolya (University of Aberdeen) - Britton, Kate (University of Aberdeen; Max Planck Institute for Evolutionary Anthropology)
Presentation Format: Oral

The first half of the second millennium was highly transformative throughout Scotland, characterised by an increase in population mobility, the elevated importance of Christianity and the appearance of the first royal burghs. By the 12th Century, Aberdeen had a thriving port and was growing into an economically and culturally vibrant town, owing its social, religious and economic diversity in part to its active overseas trade networks and the fast-paced development of the North Sea fishing industry and commodities trade. Until the onset of the Reformation, Aberdeen was also home to four prominent friaries as well as numerous churches (kirks) and other ecclesiastical centres; recent excavations at a number of these sites from across the city have yielded numerous skeletal remains, providing an unparalleled opportunity to investigate life and death in the medieval maritime city using bioarchaeological approaches. In this project, we use stable isotope approaches to investigate dietary variability in medieval Aberdeen, particularly with regards to the consumption of marine fish. Our preliminary results attest to the strong influence of religion on the diets of the local population, as well as differences through time and between different social groups. Drawing on the abundant archaeological and historical evidence available from the city, as well as the new dietary isotope data, this talk will explore ongoing research into the social and dietary landscapes of Medieval Aberdeen.

08 IDENTIFICATION OF CHARRED MEDIEVAL CARYOPSES

Author(s): Mircea, Cristina (Department of Molecular Biology and Biotechnology, Faculty of Biology and Geology, Babes-Bolyai University, Cluj-Napoca; Molecular Biology Center, Interdisciplinary Research Institute on Bio Nano Sciences, Babes-Bolyai University, Cluj-Na-

poca) - Potârniche, Tiberiu (National History and Archaeology Museum, Constanta) - Mircea, Ioan-Gabriel (Department of Computer Science, Faculty of Mathematics and Informatics, Babes-Bolyai University, Cluj-Napoca) - Rusu, Ioana - Kelemen, Beatrice (Department of Molecular Biology and Biotechnology, Faculty of Biology and Geology, Babes-Bolyai University, Cluj-Napoca, Romania; Molecular Biology Center, Interdisciplinary Research Institute on Bio Nano Sciences, Babes-Bolyai University, Cluj-Napoca)
Presentation Format: Oral

Historically, the most important vegetal food staple comprises different cereals, which are frequently found in European archaeological contexts, from Roman to medieval time. The taxonomic identification of ancient plant material found on archaeological sites is fundamental to its interpretation in terms of past plant use and agricultural practices. Most commonly, archaeological grains are preserved charred due to exposure to heat (auto-combustion). The thermal factor, changes the orientation of starch molecules within the caryopses, determining changes in the morphology and difficulties for further correct identification.

The present study aims to investigate charred cereal, deposited in an LR II amphora, recovered from the Capidava fortress, situated in the southeastern part of Romania, on the right shore of the Danube, between Axiopolis and Carsium (Constanta County). The vegetal material was primarily investigated morphologically and molecularly (targeting the chloroplast trnL (UAA) intron) for species identification. Further morphometric analyses were conducted for the evaluation of changes in shape due to charring and the attempt was made to determine the temperature at which the carbonization occurred. The study also introduces a computational approach towards the species identification process in the form of an algorithm that compares digital photos of grains and establishes the best similarity between a grain under study and benchmark photos of previously described species.

09 THE DIET OF A HOUSEHOLD IN LATE AND POST-MEDIEVAL BRUSSELS: MULTIDISCIPLINARY ANALYSIS OF CESSPITS FROM CAFÉ GREENWICH, BRUSSELS

Author(s): Speleers, Lien - De Cupere, Bea (Royal Belgian Institute of Natural Sciences, OD Earth and History of Life) - Deforce, Koen (Royal Belgian Institute of Natural Sciences, OD Earth and History of Life; Flanders Heritage Institute) - Degraeve, Ann (Department of Archaeological Heritage, Brussels Regional Public Service)
Presentation Format: Oral

During renovation works in the cellar of a famous art nouveau building in the centre of Brussels -Café Greenwich- three late and post-medieval cesspits were discovered and excavated by the archaeological team of the Brussels-Capital region. Two cesspits, one dated to the 14th/15th century and the other to the beginning of the 16th century, still contained several layers of excellently preserved organic fill deposits. These were entirely sampled for archaeozoological, palynological, macrobotanical and paleoparasitological analyses. Some individual coprolites were collected for analyses as well. The integrated study gives information on human diet and health, and waste management. Indirectly, it also sheds light on social and economic status.

In medieval times cesspits were not only used as dump for human faeces but often to discard various domestic waste as well. However, the fills of the analysed Brussels structures seem to consist almost exclusively of cess. The sieving residue subsists largely of small fruit pips. Ceramics and other archaeological objects were rare. Densities of archaeozoological remains vary considerably from one layer to the other. The faunal record consists generally of very small bones, mainly fish but also small songbirds and chicken and a large quantity of tiny unidentifiable bone fragments affected by the digestive process. The macrobotanical study reveals a large variety of plant foods: more than 40 species of economic plants were observed. Analysis of pollen significantly enlarges this spectrum with diverse species from which only leaves and/or flowers have been eaten. Furthermore the palynological study suggests the consumption of honey. The plant spectrum comprises several exotic and more expensive products while the faunal assemblage points to more common households.

10 TRACING FOOD CULTURE FROM THE CESSPITS OF MEDIEVAL TARTU, ESTONIA

Author(s): Haak, Arvi (Tartu City Museum; University of Tartu, Department of Archaeology)
Presentation Format: Oral

In studying the medieval urban space, the cesspit deposit lead to several aspects of the lives of one-time inhabitants of these households. The favourable preservation conditions in Tartu have allowed collecting and analysing organic remains, as well as several food-related items, from a significant number of cesspits. By combining results of bioarchaeological, zooarchaeological, stratigraphic and item-based analyses, the collected data can be combined into micro-scale integrated generalisation of food practices at one particular urban household. The focus of the presentation will be on the complications regarding the integration process, both on the micro-scale, and in linking these results with material available for the urban scale in general.

The case study will focus on a pit excavated in the central town area, at 12 Munga Street, already in the year 2000. The pit revealed different chronological stages of significantly distinctive content, probably connected to successive occupants at the site. This situation is compared to a few earlier analysed sites, to reach a more complex understanding of use-life of the cesspits. However, to what extent can these changes be followed in the sources used for studying food culture? While food is often connected to status, do the conclusions based on the existence of several indicators of luxury remain credible when taking into account the integrated picture revealed from the cesspit material? Finally, what are the chances of combining the results reached from analysing the cesspits with other excavated remains from the same property?

11 FOOD CONSUMPTION AT THE OUDE MANNENHUIS: ARCHAEOBOTANICAL CESSPIT ANALYSIS OF AN EARLY MODERN OLD MEN'S HOME IN DELFT, THE NETHERLANDS

Author(s): Hondelink, Merit (University of Groningen)
Presentation Format: Oral

In 2005 a rescue excavation was carried out at the Voldersgracht 21, situated in Delft, the Netherlands. Here, the foundations of the Oude Mannenhuis (Old Men's Home) were discovered. It was founded in 1411 and stayed in use until the end of the 18th century.

The presence of stoneware, porcelain, glass and metal objects in the excavated cesspits indicate that the elderly men living in this Oude Mannenhuis were not poor, though not extremely wealthy either. Each individual had his own room including a private cesspit. All cesspits under study show finds concerning food preparation, such as (small) cooking pots and pans, and many seeds, fruits and zoo-archaeological remains.

In order to understand what the inhabitants of the Oude Mannenhuis ate and how this changed in the course of time, we analysed the archaeobotanical remains from ten cesspits, dated between 1400-1700. The residue after wet sieving included an abundance of waterlogged edible plant remains, as well as some mineralized and charred seeds and fruits. We found the bulk of the residue consisted of different fruit species, though a variety of cereals, herbs, vegetables and spices were also present.

A potential shift in diet, following the emergence and integration of new food items due to an increased global trade market, cannot be recognized based on the macro-archaeobotanical analyses. Even during the Dutch Golden Age, when prices for exotic food items fell and became affordable to the middle classes, the occupants seem to have had a preference for foodstuffs that had been consumed for decades and even centuries.

a. POSSIBLE COOKING METHODS FROM THE STUDY OF NEOLITHIC COMBUSTION STRUCTURES IN SYRIA

Author(s): Albukaai, Diaa Eddin (Archéorient UMR5133)
Presentation Format: Poster

As a source of heat and light, hearth is a unifying element within a community. However, its major contribution in social life is the possibility of cooking food. It improves the daily menu of prehistoric populations and allows, in particular, to preserve meat through the smoking technique. During the Neolithic period, hearth is an important and recurrent element in the archaeological settlements in the Near East. His study offers a wide range of information for archeology (architecture, cooking practices, plant resources, domestic space organization, etc.).

In this paper, we are going to present the different types of combustion structures from five Neolithic sites, spread over the entire Syrian territory (Jerf el Ahmar, Tell Abr and Halula Tell, Wadi Tumbaq 3 and Tell Aswad). These sites have delivered a wide variety of combustion structures. The study of the morphological characters observed on the archaeological material, the typological study and the ethnographical comparison of the structures of combustion in the Middle East and other regions, allow to propose some interpretations on the different modes of cooking in Neolithic societies. In addition, we will replace the combustion structures in their spatial and architectural contexts, in order to show differences between domestic and collective spaces.

b. BOTANICAL EVIDENCE OF MALT FOR BEER PRODUCTION IN 5TH – 7TH CENTURY UPPÅKRA, SWEDEN

Author(s): Larsson, Mikael (Lund University)
Presentation Format: Poster

The excavation of a low-temperature kiln structure at an affluent Iron Age regional center, Uppåkra, located in southern Sweden, revealed from archaeobotanical samples and its context evidence of malting in the process to make beer. Carbonized germinated hulled barley grain (Hordeum vulgare) was recovered from the kiln structure itself and from the surrounding occupational surface. Located somewhat from the central area of the site, where previous excavations have uncovered hall-buildings, a ceremonial structure and several smaller houses, the investigated kiln was situated in an area on the site that is absent of remains to indicate a living quarter. Activities using kilns have instead primarily been linked to this area and archaeological finds are mainly of charred crops remains. We argue that the germination of grain was deliberate and that the kiln was used to stop the germination process by drying or roasting the grain. In line with other observations for some fixed building patterns and functions on the site, it is probable that also kilning to produce malt was carried out at a designated area, and for as much as several centuries. This points to a specialized malting activity in this area of the settlement, and in contrast to household level, this was likely aimed for large-scale beer production. With the status of the Uppåkra site as a major economic center in the region, it is possible that large-scale beer production was intended for feasting or/and trade.

c. A MATTER OF FISH ANATOMY IN THE BALTIC SEA

Author(s): Kivikero, Hanna (University of Helsinki)
Presentation Format: Poster

The anatomical distribution of bones is important when understanding zooarchaeological assemblages. When interpreting fish assemblages in the Baltic Sea, interpretations of anatomical distribution of bones are often taken from other parts of the world. For

instance, the anatomical distribution of cod is adapted from the knowledge we have of preparation of stockfish, but we really have less information how the smaller Baltic Sea cod was processed for storage. Also, dried and salted pikes were traded widely but it is unknown how these fish products were processed. This paper aims to discuss the problem through looking at two castle sites, Kastelholm in the Åland islands and Raseborg in southwestern Finnish coast, from late medieval and early modern period in the northern Baltic Sea. A combination of zooarchaeological assemblages, castle accounts, Kings orders and cook books are used in order to understand the processing of cod and pike. It is also important to consider if the fish were fresh or preserved when cooking, as the elements may vary with fresh and dried or salted products. In Kastelholm cod and pike have been obtained by the castle fishermen and by taxing peasants, In Raseborg cod has mainly been imported and pike caught by castle fishermen. Understanding the anatomy of these two species in castles may help to interpret other assemblages.

d. BAKERY IN BARCINO. THE PRESENCE OF ORVIETTO MILLS AND A FURNACE

Author(s): Carme, Miró (Servei d'Arqueologia de Barcelona - ICUB) - Peña, Yolanda (UNED) - Huertas, Josefa (Archeologist)
Presentation Format: Poster

The comunication is about the bakery's knwoledge in the roman city of Barcino, currently Barcelona. Since the 50's of the twentieth century, some exemples of mill flour were found in the archaeological campanigns, as a part of a production space or as a part of the roman wall, both examples in the Museum of the History of Barcelona (MUHBA). The last years, another examples have been located, in diferent actions around the ancient city. All these mills are from the quarries of Orvietto. Fortunately, at the Avinyó street, one of these mills was, probably, part of a late roman bakery, identified thanks of the find of part of a furnace. The furnace is a direct heating of square-shaped type and circular internal structure with domed cover. Its mesures mean that it can not been considered as a family furnace. As an annoying activity for the population , this production area was located at the edge of the pomerium, in the intervallum on the city, just in one of the corners of the wall. Nowadays, this bakery could be the only exemple of this type in the city and surroundings, but we also explain another evidences of this type of production.

e. SNAKE ON THE PLATE. CHOSEN ASPECTS OF SNAKE CONSUMPTION IN LATE MEDIEVAL EUROPE

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

In late medieval Europe, snakes or reptiles in general were commonly associated with many negative powers. They were often representations of sin, wickedness, uncleanness and venomousness, so it is not surprising that they weren't exactly perceived as a source of food, at least not for good and civilized people. In late medieval works, examples of snake eaters can be found mostly among tormented souls of sinners suffering in purgatory or hell, or among strange and wild races inhabiting unknown lands. Symbolic meaning of eating those creatures was clearly negative: live snakes were perceived as the most unclean and unholly food, and eating them was clearly humiliating and degrading.

Despite of those negative connotations, snakes were also connected with healing. They were a source of variuos magical and medical components, and sometimes even eaten - for example, medieval friar known as Nicolas of Poland stated in his Experimenta that all people should "eat serpents whenever it is possible to get them" because "the snake meat has many medicinal virtues". In his work, he gave a detailed instructions for preparing snake's flesh, including skinning, portioning and cooking. It appears that in some circumstances, snakes could be treated as a source of food or more precisely, as an important element of a healthy medieval diet. The following poster presents various aspects of medieval consumption of snakes, as well as a couple of new perspectives for archaeology and archaeozoology related to this topic.

571 WHAT HAVEN'T YOU FOUND? 'BLANK AREAS' AND THE VALUE OF NEGATIVE EVIDENCE

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Thomas, Roger M (University of Oxford) - Darvill, Timothy (Bournemotuh University) - Luth, Fritz (Deutsches Archaologisches Institut)
Format: Regular session

How can finding nothing be interesting for an archaeologist? This session will explore this apparently odd idea. The notion of 'blank areas' is well-recognised in archaeology (e.g. gaps in distribution maps) but there is often an unanswered question about them - are such blanks real, or are they the product of a lack of archaeological work or low archaeological visibility?

Now, though, large-scale development-led excavation and extensive geophysical survey are allowing us to say with confidence whether particular areas really are 'blank' or not - to say as much about what is NOT present ('negative evidence') as about what is there.

Such 'negative patterns' can take different forms. There may be a complete absence of archaeological material of any kind in any area. More frequently, though, it will be an absence of evidence for certain periods, or of certain kinds of site of feature which are commonly found in other areas.

Recognising the value of negative evidence opens up new interpretative possibilities. We may be seeing zones of forest, pasture or waste

– resources that may been highly important economically or symbolically, but used in ways that leave no archaeological trace. Chronological patterns of presence and confirmed absence may document episodes of colonisation and abandonment in particular regions.

This session will seek to explore the relatively new concept of 'confirmed negative' archaeological evidence from a variety of perspectives, both theoretical and practical.

ABSTRACTS

01 WHAT HAVEN'T YOU FOUND? BLANK AREAS AND THE VALUE OF NEGATIVE EVIDENCE

Author(s): Thomas, Roger (School of Archaeology, University of Oxford) - Darvill, Tim (Bournemouth University) - Lüth, Fritz (Deutsches Archaologisches Institut)

Presentation Format: Oral

Until quite recently, the idea that archaeologists might think it was interesting to find nothing would have seemed very strange. Now – as the range of papers submitted for this session shows – there is considerable interest in the linked archaeological concepts of 'blank areas' and 'negative evidence'.

This introductory paper aims to set the scene for the rest of the session. We will consider the following topics:

- The intellectual framework for consideration of blank areas: essentially, one which is rooted in landscape archaeology.

- The reasons for the recent upsurge of interest in this subject: especially, the advent of very large-scale development-led archaeology which is looking at whole landscapes, including the 'empty spaces' between individual monuments.

- The differing levels of confidence with which we can identify negative evidence (largely a function of the techniques being used) and the varying forms it can take (absence of any evidence at all, absence of evidence for just certain periods, and so on).

- How awareness of the potential of negative evidence, and of the existence of blank areas, can be of value both for understanding past societies and for managing the archaeological resource.

We will also consider whether the new interest in negative evidence signals a wider shift in archaeology. Are we starting to recognise much more fully how our understanding of the past is shaped by the history, patterning and character of our archaeological observations? Recording the cases in which we don't find anything is just as important as recording the things we do find.

02 BLANK AREAS IN ARCHAEOLOGY: A TOOL FOR KNOWLEDGE, A FRAMEWORK FOR PLANNING

Author(s): De Davide, Claudia - D'Andrea, Ascanio - Sepio, Daniele - Wicks, David (Akhet srl)

Presentation Format: Oral

The understanding of negative evidence in archaeological contexts is undoubtedly a key point in both the reconstruction of ancient landscapes and the study of their transformations during the different historical periods. It is no longer sufficient to talk simply about blank areas, instead it is necessary to assign a series of qualitative and quantitative attributes to negative archaeological elements, especially when they are used to inform decisions related to the development of new infrastructure in the modern landscape.

Starting from the experience acquired during the last decade on large scale excavation and infrastructure projects together with impact assessment studies undertaken in the mountainous territory of the Aosta Valley, a region of NW Italy with a complex stratigraphy dating from at least the V millennium BC until today, we would like to analyze not only how archaeological blank areas can become not only a useful tool to aid practical decision-making, but also an instrument that could help with the creation of a distribution model of land-use and its changes across time.

Using spatial analysis tools for GIS data processing, and the integration of different kinds of records, not only archaeological but also morphological, geological, historical and for example those related to water-distribution, together with the results of stratigraphical investigation, we would like to consider the possibilities for experimenting with simulation and new decision-making processes in order to facilitate both the comprehension and the reconstruction of ancient landscapes.

03 ABSENCE MAKES THE HEART GROW FONDER: IN SEARCH OF MISSING PERIODS IN THE PISIDIAN LAKE DISTRICT USING A GEOSPATIAL APPROACH

Author(s): Willett, Patrick (University at Buffalo; University of Leuven) - Carleton, Chris (Simon Fraser University) - Vandam, Ralf - Poblome, Jeroen (University of Leuven)

Presentation Format: Oral

The Sagalassos Research Project has conducted numerous intensive surveys in the territory surrounding the antique site over the past three decades. Results of these efforts have shown there to be substantial gaps in the archaeological record in certain landscapes, both at particular times and in particular forms. There are especially notable disparities between the highland areas around the modern village of Dereköy and lowland areas of the Burdur Plain. In order to better understand these patterns, a locally adaptive model of archaeological potential (LAMAP) based on the existing survey results has been employed for the territory. This approach has allowed the project to gain insight on areas that have yet to be surveyed (or are unable to be surveyed for some reason), and to target lacunae in our knowledge of certain periods and land uses, which have otherwise eluded detection using more tradition

means. This geospatial strategy has shed light on the 'blank areas' in the archaeological record, helping to reveal whether they are in fact real or not, provided insight into land use and settlement strategies for periods throughout the territory, and delivered guidance for future pedestrian survey and excavation efforts. This approach has further implications for research directions which include addressing 'blank areas' in the paleoenvironmental record.

04 MOVING INLAND

Author(s): Evans, Christopher (University of Cambridge)
Presentation Format: Oral

This contribution will outline off-river-valley prehistoric sequences upon inland gravel terraces within the Cambridge Region of England's East Anglia. With the later Bronze Age widely marking their colonization horizon, the processes of this moving inland — and what this involved in terms of both 'staking' and 'knowing lands' — will be addressed. Relevant to the session's theme is what this implies for these inland terraces' pre-Bronze Age usage, particularly the dynamics of Neolithic 'visitation' and tasking. Their faint / casual use traces reflects upon the character of riverside 'pit cluster landscapes' elsewhere and, by way of contrast, the extent to which such clusters actually do reflect short-stay 'permanent' settlement.

Crucial in all this are the issues of water resourcing and the degree to which springs provided year-round supply within inland locales. Often amounting to long-term 'hot spots' in otherwise designated 'blank lands', the 'pull-attraction' and the nature of associated deposition with such major springheads will also be explored.

Finally, gauging the intensity of landscape-usage ultimately comes down to scaling / resolution and recovery techniques. In the long span of time, there would be few areas that went entirely un-utilised: no genuine 'blanks', as opposed to just our inadequate recovery methods.

05 SIGNIFICANT ABSENCES AROUND EARLY METAL PERIOD LAKESHORE CAIRNS IN FINLAND

Author(s): Saipio, Jarkko (University of Helsinki)
Presentation Format: Oral

A few hundred suggested Early Metal Period (c. 1900 BCE–300 CE) ritual/burial cairns are known on the lakeshores of the Finnish Lake District. Archaeologists generally refer to these stone cairns by an old demotic name "Lapp cairns". Inferences about these cairns are currently limited by the fact that less than 30 of them have actually been proven as prehistoric ritual structures by properly documented finds. Naturally, such a limited number of attested cases cannot alone provide conclusive evidence of significant absences in or around Lapp cairns. However, the attested cases feature striking similarities that are typically absent in suggested Lapp cairns that have turned out to be other kind of stone structures upon excavation. These similarities allow definition of specific criteria for likely Lapp cairns among the unattested cases. Application of these criteria reveals interesting vacuums of other types of archaeological sites around likely and attested Lapp cairns. Notably, it seems clear that Early Metal Period inhabitants of the Finnish Lake District did not built cairns near Neolithic rock painting sites. Furthermore, it appears that spatial relations between Lapp cairns and contemporary dwelling sites were controlled by a set a restrictions related to local topography. Ostensible exceptions to these rules may represent a previously unknown category of sites that were in fact not settlements.

06 LANDSCAPES BETWEEN SETTLEMENTS: OFF-SITE AREAS AND THE MODELING OF ROMAN AGE SETTLEMENT STRUCTURES IN CENTRAL PANNONIA

Author(s): Vágvölgyi, Bence - Serlegi, Gábor - Marton, Tibor - Jakucs, János - Gortva, Gergely - Oross, Krisztián (Institute of Archaeology, Hungarian Academy of Sciences)
Presentation Format: Oral

Theoretical models of past human landscapes have become more and more detailed and accurate in recent years. Growing accuracy and availability of historic and environmental spatial datasets and the widespread use of GIS methods contributed fundamentally to this process, as they help us in one of the key figures of it: understanding the drivers and factors of human habitation through the analysis of settlement patterns.

Mapping out these patterns has therefore become an essential part of our research on the social dynamics of Roman era southern Transdanubia, concentrating mainly on Hungary's Tolna, Somogy and Baranya counties. By utilizing recent advances in non-invasive site detection techniques (such as GPS-aided large-scale field surveys), we have examined a number of micro-regions in the area, each as similar in their environmental and observation characteristics as possible. We then surveyed these areas in their entirety. These surveys gave us the opportunity to map out not only the complete distribution of sites and find material in these regions, but also the empty areas between the different settlements. While these off-site areas were often excluded from the analysis of past surveying efforts, they form an integral part of any human landscape as the parts utilized by the inhabitants of local settlements. They may also indicate various social or economic factors that could influence where and how people settled. As such, the analysis of these areas is vital not only to the understanding of these complex human landscapes, but to their modeling as well.

The presentation aims to discuss our approach to these off-site areas, the impact of their incorporation into the assessment of micro-regional structures and the creation of a more accurate model on central Pannonia's Roman landscape.

07 NO ARCHAEOLOGICAL SIGNIFICANCE? 7200 NEGATIVE EXCAVATIONS IN IRELAND

Author(s): McLaughlin, Rowan (Queen's University Belfast)
Presentation Format: Oral

Ireland is fortunate to have a national (cross-border) database of virtually every excavation ever undertaken on the island since 1969. Included in this are sites where archaeologists were given watching briefs to monitor topsoil stripping in advance of development, but where nothing was found. Indeed, of the 22,000+ licenced archaeological excavations undertaken on the island of Ireland from the period 1969 to 2014, over one third of these were classified as being of 'no archaeological significance'. Most studies in predictive modelling attempt to find parameters of the landscape that correlate with the presence of archaeological features. In this paper I take an alternative approach, and study the landscape of negative evidence in Ireland, aiming to find factors that can be gleaned from comparative spatial datasets that heighten the likelihood of not finding archaeology at a given site. Using a GIS, the factors examined were soil type and wetness, topographical setting (aspect, slope, etc), geology, hydrology, distance to coast, among others. The results however indicate that although some physical parameters do bear influence on the presence or absence of archaeology, they are not the dominantly important ones. Instead, the more important factors include the kind of development that funded the excavation; road projects are particularly successful in 'finding' archaeology. The results imply that modern day development pressures are far from independent of the networks of the past, whose remains are encountered wherever the past and the present intersect.

574 SUBURBIA AND RURAL LANDSCAPES IN MEDIEVAL SICILY

Theme: Mediterranean seascapes
Organisers: Utrero Agudo, Maria de los Angeles (Consejo Superior de Investigaciones Científicas - CSIC) - Castrorao Barba, Angelo (University of Palermo) - Mandalà, Giuseppe (Consejo Superior de Investigaciones Científicas - CSIC)
Format: Regular session

Studies on Medieval Sicily are currently renewed by research undertaken by different teams from various regions of Europe (Italy, Spain, United Kingdom, Austria, Poland). Post-roman Sicily is a sort of palimpsest of Mediterranean dynamics in which continuity, transformation, innovation and resilience were connected to a wider frame of political change: role in the Byzantine State, Islamic conquest, Norman domain and the emergence of Swabian.

The challenge of approaching Medieval Sicily with this proposal is to analyse and interpret the materiality of these many 'transitions' on archaeological records.

This session aims to show the main results of those ongoing archaeological and historical works at medieval suburbia and rural sites of Sicily. It is thus intended to update traditional views regarding the evolution of this territory from Late Antique to the Middle Ages by bringing into consideration new data recovered from archaeological excavations undertaken in several sites across Sicily, new information coming from the review of written accounts and new reflections from contrasting both material and documentary records.

In particular, the session will address the following topics:

- Dynamics of rural settlement patterns.
- Suburbium between countryside and city.
- Landscape of power: churches, monasteries and palaces.
- Material culture and economic trajectories beyond the cities.

This session will be therefore a necessary space of discussion between the different European scholars currently engaged in the study of Medieval Sicily in order to compare data, results, methods and new theories.

ABSTRACTS

01 THE SUBURBAN LANDSCAPE OF PALERMO IN ISLAMIC AND NORMAN AGE

Author(s): Vassallo, Stefano - Battaglia, Giuseppina (Soprintendenza Beni Culturali di Palermo)
Presentation Format: Oral

Palermo, after the Byzantine age went through, in the Islamic and Norman age (IX-XII), an extraordinary phase of deep and radical transformations. The archaeological investigations carried out by the Soprintendenza of Palermo in recent years, in different points of the city and its immediate periphery, are providing important data in order to redesign the transformations of the urban landscape and the settlement In the immediate suburbs of town.

In particular, it was possible to ascertain that in relation to the limits of the city, well defined within the perimeter of the fortifications realized in Norman age, the Islamic city had a much wider extension, and were structured, probably, in neighborhoods, central and "peripheral" very vital, some of which fortified, as it would seem from reading the historical documentation.

It is now possible to indicate also some sectors of the Islamic city destined to the productive activities, thanks to the discovery of furnaces datable in the 10th-11th century or of structures connected to other handicraft activities. Another important element concerns the funeral aspect, since we have a more reliable picture of the distribution of the cemetery areas of Islamic age.

The ever increasing knowledge of decorated ceramics, so-called glazed, in its passage between the Islamic and Norman ages, also allows us to acquire new elements to define some characteristics of the organization of Palermo in Norman age. Recent investigations in the historical center, and in the area outside the fortifications, throw new light on some aspects related to the great buildings of Ruggeriana age, both in the City Heart (Palace of Normans) and in the immediate periphery of Palermo of the Kingdom of Ruggero II, as at Maredolce and in the territory of Altavilla, where the exploration of one of the first Norman churches of the island is underway.

02 AT THE EDGE OF MEDIEVAL PALERMO: THE COMPLEX OF SAN GIOVANNI DEI LEBBROSI IN CONTEXT

Author(s): Mandalà, Giuseppe (Instituto de Lenguas y Culturas del Mediterráneo y Oriente Próximo CSIC) - Utrero Agudo, Maria de los Angeles (Escuela de Estudios Arabes CSIC)

Presentation Format: Oral

This paper aims to present the undergoing research of the complex of San Giovanni dei Lebbrosi (Palermo), where a Norman church and a hospital were built outside the city walls upon a (presumably) previous Islamic settlement.

This site is located to the south of Palermo, on the ancient right bank of the river Oreto, at one of the main access points to the city. Written sources and new data indicate that the territory of Palermo was densely inhabited during the 9th-12th centuries, with neighbourhoods, mosques and other buildings located both inside and outside the city walls, though unfortunately these have not yet been discovered or thoroughly investigated. It is within this state of the art that the research of San Giovanni dei Lebbrosi, a complex hitherto mostly ignored by modern research, must be understood.

With the aim of better understanding San Giovanni and the transition of this area of the city from the Islamic to the Norman period, and thanks to four successive projects (2014-17) funded by the Spanish government (Ministerio de Eduación, Cultura y Deportes) and The Barakat Trust (Univ. of Oxford), we have been able to carry out a photogrammetric drawing survey of the site, an archaeological analysis of the standing structures, an excavation of the south-western area of the church and documentary analyses.

Preliminary results reveal that the church and the hospital were probably coeval and formed part of the building programme promoted by Roger II in the first half of the 12th century, rejecting thus the late 11th-century chronology defended by traditional scholarship for the church. This information does not affect only the comprehension of the site of San Giovanni, but also of the royal architecture of Norman Sicily in terms of characterization, resources and organisation of labour, among others aspects.

03 TOWN AND COUNTRY IN FATIMID SICILY (10-11TH CENTURY)

Author(s): Carver, Martin (University of York) - Molinari, Alessandra (University of Rome Tor Vergata)

Presentation Format: Oral

Palermo is a flourishing city and as a result of ongoing development new contacts are made every year with its rich Islamic and Norman buried past. Castronovo di Sicilia in central Sicily has been under intensive archaeological investigation since 2014, and has so far revealed a sequence of occupation that includes a Byzantine agri-town (6/7th century), a Byzantine fortress (8/9th century), an Arabised rural centre of the the 9/11th century and 12-13th century citadel and town. Our paper summarises what is known from archaeological work in the Fatimid city of Palermo (10/11th century) and compares it with the same period at Castronovo di Sicilia in the light of recent excavations. We describe, contrast and reflect upon how the respective pictures are moderated by the site formation processes and modes of investigation, and the ways that cultural distinctions between rural and urban settlements in Sicily may be interpreted and further explored.The evidence used comprises, at Palermo, the results of rescue excavations and their assemblages of pottery, animal bones and human bones, and, at Castronovo, excavations on Monte Kassar and at Casale San Pietro, building recording on Monte Kassar and Colle San Vitale, and investigations of landscape and hydraulic systems in the present town of Castronovo and its neighbouring valleys. The research is being conducted under the ERC Research project Sicily in Transition (sictransit).

For references and further information see http://sicilyintransition.org

04 LONG-TERM OCCUPATION OF A MEDIEVAL RURAL SETTLEMENT IN SICANI MOUNTAINS (C-W SICILY): NEW DATA FROM CONTRADA CASTRO (CORLEONE, PALERMO)

Author(s): Castrorao Barba, Angelo - Miccichè, Roberto (University of Palermo) - Pisciotta, Filippo (University of Palermo; Aix-Marseille University) - Marino, Pasquale (Bona Furtuna LLC) - Aleo Nero, Carla - Vassallo, Stefano (Soprintendenza BB.CC.AA. of Palermo) - Bazan, Giuseppe (University of Palermo)

Presentation Format: Oral

The "Harvesting Memories" project focuses on the study of long-term landscape and settlement patterns change – in Sicani Mountains rural district (central-western Sicily) – as a result of diachronic interactions between socio-economic human factors and environmental and ecological trends. A new hilltop site has been identified during field survey in Contrada Castro (Corleone, Palermo). The settlement pattern linked to the selection of reliefs and hills as places for controlling rural districts seems to have changed in the Roman age, when it was characterized by intensive occupation of low-lying lands associated with potential agricultural produc-

tivity and proximity to road networks. A shift in settlement pattern with the rise of agglomerated hill-top settlements during the Early Middle Ages is a global phenomenon also occurred in Sicily. This paper aims to show the long-term sequence of the excavation (started in spring 2017) in the site of Contrada Castro. The main evidences date back to the Middle Ages with dry-stone structures related to the Islamic and Norman age (9th-12th c. AD) resettling a place already occupied during Byzantine period (infant burial) and also by a Late Archaic/Classical indigenous settlement (6th-5th c. BC). The investigation of this new rural site provided insight into longue durée patterns at hilltop rural settlements in Sicily between Antiquity and the Middle Ages.

05 CONTESSA ENTELLINA: A RURAL VS. URBAN MEDIEVAL LANDSCAPE IN INNER WESTERN SICILY

Author(s): Corretti, Alessandro (Scuola Normale Superiore)
Presentation Format: Oral

In the last decades, the Scuola Normale Superiore has made archaeological surveys in the territory of the municipality of Contessa Entellina (Palermo, Sicily), and has been dealing excavations in the main settlement, the town of Entella. This wide range research, centered both on landscape settlement and on the principal urban site, enables a comparison between rural and urban settlement patterns in the same area.

Since the early 2nd century AD, the town of Entella - lying on a steep plateau barely endowed with water - is abandoned in favor of rural sites (villae and villages) situated in places better suited for agriculture and nearer to water courses and roads. After a decrease of settlement in late byzantine age, the Arab conquest sees a rise in sites number, dimension and richness. We assist to both continuity of occupation of major late antique sites, and foundation of new settlements. While in the 9th and 10th centuries there is no clear evidence of reoccupation of strong sites, at the end of 10th-early 11th century a new large and structured settlement - a town? - appears again on top of the plateau of Entella.

In the following centuries (11th-beginning of 12th centuries) a diffused and rich rural settlement exists side-by-side with a town, possibly the see of local administration, though the surroundings of Entella are now void of settlements. At the end of Norman rule, Entella will absorb refugees both from the near countryside and from eastern Sicily and from Palermo, standing as a fortress in an almost empty landscape.

06 THE MADONIE MOUNTAIN AREA, EAST OF PALERMO, IN NORMAN TIMES: FROM IDRISI TO ARCHAEOLOGY

Author(s): Cucco, Rosa Maria (Soprintendenza BB.CC.AA. Palermo)
Presentation Format: Oral

The Madonie Mountains, in Sicily, extend from the North coast to the heart of the island. This area was of great importance from Prehistoric to Medieval times and several archaeological sites bear witness to the various chronological phases.

The entire area has not yet been fully explored , although archaeological surveys have been carried out on some parts, mainly along the Valley of the North Imera river. Excavations were carried out on Prehistoric, Hellenistic, Imperial, Late Roman rural sites - particularly associated with the agro-pastoral economy of the land- and Medieval villages and castles. In several cases, the researches, some of which is still ongoing, were carried out in collaboration with the Superintendence of Palermo, Italian and Foreign universities and interested communities.

Via Messina Montagne is the road that goes across the area and was built during the rule of the Byzantine State. It became indispensable for the transport between Palermo and East Sicily and in the Norman conquest of the island.

The Islamic geographer Idrisi, author of "Il Libro di Ruggero" used this road to cross the Madonie range. We will also visit the ancient towns of the Madonie and we attempt to gain an understanding of late antiquity to Medieval times through the archaeological findings.

07 CHANGES IN THE SOCIO-RELIGIOUS LANDSCAPE OF SICILY AFTER NORMAN CONQUEST IN THE LIGHT OF EXCAVATIONS AT THE SITE ALTAVILLA MILICIA

Author(s): Mozdzioch, Slawomir (Institute of Archaeology and Ethnology of the Polish Academy of Sciences) - Szubert, Barbara (University of Opole; University of Wrocław) - Moździoch, Ewa (University of Wrocław)
Presentation Format: Oral

The Altavilla project concerns the history of local cult centre - the church and the Italo-Greek monastery - known as Santa Maria di Campogrosso. Centre for Late Antique and Early Medieval Studies in Wrocław started excavations in the area in connection with implemented, based on an agreement on scientific cooperation with Soprintendenza BB.CC.AA. di Palermo, research programme on the role of the Normans in shaping the cultural image of medieval Europe.

Archaeological works are intended i.a. to clarify the chronology of the site. In the literature concerning the site in question there are different versions of dating of the church extending from the 11th century to the 15th century.

Preliminary excavations led to the unearthing the external face of southern wall of the church and the adjacent cemetery. The problem of chronology of the church is inseparable from the dating of the cemetery, which was established after the construction of the temple. Amongst the 30 graves, three children's graves were encountered. The coins discovered in children's tombs as well as the

C14 dating of bones allow to determine the chronology of the beginnings of construction of the church for the end of 11th or first half of the 12th century. What's interesting, the form of the church shows close ties with the architecture of the continent, unlike other churches of Western Sicily at that time.

Determining the chronology of the church, unearthing the remains of the monastery, identification of the nature of the relationship between Christians of both rites and the Islamic population, study on the pottery against the background of artefacts of this type acquired during other excavations, study on a rich set of mason's marks - all these results constitute an important data for research of material culture of the so-called Norman period in Sicily.

08 WATER MANAGEMENT, TERRITORIAL ORGANIZATION AND SETTLEMENT IN TRAPANI MOUNTAINS

Author(s): Martin Civantos, Jose Maria (Universidad de Granada) - Bonet García, Mª Teresa - Corselli, Rocco (Arqueoandalusí. Arqueología y Patrimonio S.L.)

Presentation Format: Oral

Irrigated agriculture has been traditionally a common place for Islamic Sicily historiography. Data have come usually from written sources, and the Conca d'Oro area around Palermo has attracted most of the attention due to the importance of the city. Nevertheless, rural areas are showing interesting and complex water management systems still standing or disappeared but closely related to Islamic settlement organization. New archaeological data are demonstrating the importance and social significance of irrigation as part of a socioecosystem introduced with the Arab conquest. Recent research developed by the FP7 MEMOLA project in the Trapani Mountains has provided new evidences of these transformations and the historical relationship between past societies and natural resources. That relationship is part of a specific social organization different from the feudal one that came after the Norman conquest. Differences between both social formations can be detected archaeologically as well as landscape transformations throughout time. But differences can be also detected inside the Islamic context and are again related to different settlement patterns. At the same time could be also related to the relationship between peasant communities and the Islamic State. In this sense, fortification has also an important role in interpretation, including not only qalat (castles), but also collective fortified granaries like Pizzo Monaco (Custonaci), excavated in the last four years in the MEMOLA project framework (www.memolaproject.eu).

09 CASTLE CONSTRUCTION IN WESTERN SICILY: LABOR MOBILIZATION IN THE MEDIEVAL MEDITERRANEAN

Author(s): Kirk, Scott (University of New Mexico) - Kolb, Michael (Metro State University of Denver)

Presentation Format: Oral

In this paper we examine variability in the mobilization of labor for the medieval castles of western Sicily built between the eleventh and seventeenth centuries. We believe differences in labor investment over time reflect: 1) changes in the number and social rank of castle builders, and 2) differences in the strategic and economic importance of castles. In previous work, we have determined that the perimeter area of a castle correlates positively with labor investment (Kolb et al. 2018). We establish a rank order of castles based on labor investment, incorporating historical data on ownership as well as dates of construction and expansion, in order to estimate differences in architectural wealth within the context of social change experienced by the Sicilian aristocracy. Results suggest that early Sicilian castles built by invading Normans seem to represent "founding citadels" used to project the territorial claims of the newly formed Norman Kingdom of Sicily with comparatively less labor invested. In subsequent centuries, we believe that these strategically located monuments were expanded through the use of increased labor costs and used by feudal lords to effectively monopolize further balkanization of individual landholdings in order to control access to nearby productive resources to the economic advantage of a few ruling families.

10 ARCHAEOLOGICAL SURVEY AND RECONSTRUCTION OF RURAL LANDSCAPES IN SICILY: NEW DATA FROM NORTHERN AND SOUTHERN SICILY

Author(s): Burgio, Aurelio (University of Palermo)

Presentation Format: Oral

The aim of this paper is to analyze some aspects about the distribution of population in three distinct areas of Sicily (the basins of Northern Imera and Alesa rivers, in the North; Cignana and its district in the South), where in the last thirty years the University of Palermo has carried out intensive and systematic archaeological surveys. The focus is on continuity and discontinuity from Roman to early-medieval times, and on the connections between rural sites and route network. The latter shows some differences with respect to the Roman time, whose structure is well known by ancient Itineraria (like Itinerarium Antonini and Tabula Peutingeriana); the system of the Norman Age is different, focused on new nodes, not always the same of Late Antiquity; various kind of settlements, like villages, xenodochia, hospitalia and little rural churches, are located along the principal routes, usually near the most important crossroads, and sometimes along the so-called vie francigene.

A lot of paths may be linked with archaeological sites (especially large villages of Late Roman times, and smaller settlements of Norman Age) and local names; from this point of view very interesting is the Northern Imera river basin and its surroundings, where toponyms like Chiesazza and Trinità can be related to the properties of the Teutonic Knight of the Magione Church in Palermo.

11 RURAL SETTLEMENT IN THE HINTERLAND OF AGRIGENTO FROM LATE ANTIQUITY TO MIDDLE AGES

Author(s): Rizzo, Maria (Parco Archeologico e Paesaggistico della Valle dei Templi)
Presentation Format: Oral

The paper is aimed at discussing the results of some research carried out in the hinterland of Agrigento, with different objectives and methodologies, surveys and excavations, realised in the context of well-defined research projects or carried out during major public works projects. These data, although heterogeneous, may be used to reconstruct the settlement trends in the investigated area, from Late antiquity to Medieval times. We observe the spread of rural villages in the fifth century, at the same times as the birth of several emporia near the mouth of the small watercourses connecting the inland to the coast; the continuity in site location to the 7th and 8th centuries of some largest settlement, that maintained a role as economic and administrative central place, highlighted in the important site of Colmitella by the presence of several wheat storage pit, and whose archaeological evidence attests continued trade relations with North Africa, together with an enhanced connection with Byzantium; the spread of a number of small sites in the 8th century, that will disappear during 10th century, when we observe the rise of large villages, most of which in the same sites that maintained a central role during the previous ages . The settlement dynamics emerging will be also compared with the results of recent investigations about the Late Antiquity and Early Medieval ages in the urban centre of Agrigento.

12 PIAZZA ARMERINA: THE ISLAMIC SETTLEMENT AND ITS PITS

Author(s): Barresi, Paolo (Università Kore Enna) - Pensabene, Patrizio (Università La Sapienza Roma)
Presentation Format: Oral

During the recent restoration works at "Villa del Casale" (Piazza Armerina, Sicily), and the renovation of roofing (2007-2012), 38 pits were found, with circular mouth, diameter roughly m 1-1,20, mainly disposed along the outer perimeter of the late Roman villa, full of earth and ceramics dating within XI and XII century. Some of those pits were already dug in the first excavations (1940-53), when the archaeologists explained them as water wells aiming to the low water table, but we believe, that almost the less deep of these pits can be identified as food storage pits, going out of use and being filled with rubbish.

The storage system inside earth ground dug pits has been used in the Eastern world for long time, but we can recognize it in many written and archaeological sources of medieval age, being usually put in relation with the diffusion of similar technologies from Maghreb area, since the 9th century. Recent analyses (L. Arcifa), though, rather underline how this variety of storage come again into use already in Byzantine age, when the relationships between centre and periphery of the Empire become less strong. The pits found between 2007 and 2008 at Piazza Armerina can be used to shed light on this aspect of food storage and its relationship with the house building.

13 THE MAKING OF FRONTIER IN 9TH CENTURY. ROCCHICELLA DI MINEO (CT) AND RURAL LANDSCAPES IN EASTERN SICILY

Author(s): Arcifa, Lucia (University of Catania)
Presentation Format: Oral

Archeological investigations and surveys carried out during the last decade allow us to draw a profoundly renewed picture of the settlement in early Medieval Sicily.

Refined archaeological markers, with particular regard to the VIII and the IX centuries, show the process of territorial diversification between the western and eastern part of the island: in contrast to a strong decrease in western Sicily, there is a substantial resumption of settlements in the eastern and central-southern areas.

In this context, the case study of Rocchicella is inserted and represents an important exemplification of the problems of the Middle-Byzantine phase, strongly conditioned by the ongoing competition between the two empires in the central Mediterranean, Byzantium and Islam.

This new structure is the result of the policies of the Byzantine empire and represents the precondition for the formation of the Arab-Byzantine border during the IX and X centuries. Its articulation, while is still little known on the archaeological level, is well documented by Arab sources and geographers, who referred to it using the concept of taġr ("border district"). The archaeological approach to this reality has just begun and will need to verify the concrete effects of the aforementioned policies on a complex territory still largely inhabited at the arrival of Muslims.

14 ETNA NORTH-WESTERN SLOPE BETWEEN LATE ANTIQUITY AND MEDIEVAL TIMES. A PRELIMINARY APPROACH

Author(s): Gennaro, Andrea (Università degli Studi di Catania)
Presentation Format: Oral

Despite the human presence in the North-West side of Etna goes back to the Neolithic Age, archaeological interest has never been strong and archaeologists have extensively studied only the prehistoric cave occupation. The western flank is much less known than the southern and eastern ones; probably, this situation is related to the paucity of systematic archaeological investigations carried out in this vast area. Even Paolo Orsi, the father of Sicilian archaeology, could brought to light just a thermal complex, in 1905,

located in Erranteria district (territory of Bronte) but unfortunately now lost. The discovered part dated to Late-Roman period, consisted in three rooms with polychrome mosaics and can be referred to one of the villae scattered throughout the populated and cultivated area. However, in the last few years the picture has begun to change, with the Upper Simeto Valley Project and excavations undertaken by Soprintendenza di Catania.

Bringing into consideration new data recovered from unpublished studies and new projects, this paper aims to discuss the dynamics of rural settlement patterns in Etna's north-western slope. In addition, focusing on material culture, it will be possible to follow some key-themes as the Christianization of this area, the militarization of the volcanic landscape or the role played by secondary centers.

a. NEW DATA ON THE LATE ROMAN AND EARLY MEDIEVAL RURAL SETTLEMENTS IN THE EREI UPLAND, CENTRAL SICILY

Author(s): Valbruzzi, Francesca (Soprintendenza BB.CC.AA. - Enna)
Presentation Format: Poster

The contribution examines late roman and early medieval contexts identified through a systematic survey activity conducted in the western part of the Erei upland, central Sicily. These researches, carried out over the last twenty years, particularly along the Imera meridionale river valley, have in fact allowed the acquisition of significant data on the rural settlements of the late Roman and Byzantine ages. The widespread presence of ARS wares suggests the presence of real pottery routes: the Erei rural settlements, therefore, developed in close connection with the system of accumulation and transport of agricultural production of the internal plateau, which, through a dense routes network, were carried to the loading ports, becoming part of the wider Mediterranean trade system. In the northern Erei, where the Nebrodi piedmont valleys allow the passage to the Tyrrhenian coast, a diffused settlement pattern is documented by the presence of small rock-cut necropolis. The available archaeological data allow to delineate the dynamics of rural occupation in this internal area of Sicily: in the middle imperial age (II-III century AD) a strong expansion phase of the small and medium settlements is documented. Between the end of III and the first half of IV there is a clear contraction of the smaller sites, while few larger settlements still developed, placed at strategic points of the road network. Between the end of IV and the first half of V a substantial recovery of the rural settlements is attested, even if small, documented by the widespread presence of Vandalic African ceramics; few of these survive the crisis of the end of the century, until the Byzantine age. For the early medieval phase, the survey data will be compared with the evidence yielded from the recent stratigraphic excavation at the urban site of Enna and at the settlement of Case Bastione.

576 CLIMATE CHANGE AND HERITAGE (CCH)

Theme: Archaeology and the European Year of Cultural Heritage
Organisers: Martens, Vibeke (NIKU - Norwegian Institute for Cultural Heritage Research; CCH) - Biehl, Peter F. (CUNY Buffalo; CCH) - Dalen, Elin (Norwegian Directorate of Cultural Heritage; CCH)
Format: Discussion session

This Roundtable is a continuation of the first roundtable organized by the EAA Task Force on Climate Change and Heritage (CCH) in Maastricht 2017 and will discuss (1) guidelines and an action plan for an EAA Community on Climate Change and Heritage; (2) 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; (3) recommendations concerning ways to enhance the EAA's effectiveness in addressing the multiple challenges posed by climate change to archaeological heritage and to formalise collaborations with other international associations on a global scale.

ABSTRACTS

01 FROM LOCAL TO GLOBAL

Author(s): Martens, Vibeke (Norwegian Institute for Cultural Heritage Research)
Presentation Format: Oral

How might researchers and heritage management agencies contribute to climate change adaptation on local, municipal scale as well as on national and global scale? An interdisciplinary response will be necessary as these questions are extremely complex and cannot be answered from one discipline alone. To adapt to a changing climate and still try to preserve heritage sites will require meteorological data, geological studies, conservation science and archaeology as a minimum. And if or when this is achieved on a local or national scale, how may it then be upgraded to international and global scale?

This Roundtable is a continuation of the first roundtable organized by the EAA Task Force on Climate Change and Heritage (CCH) in Maastricht 2017 and will discuss (1) guidelines and an action plan for an EAA Community on Climate Change and Heritage; (2) 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; (3) recommendations concerning ways to enhance the EAA's effectiveness in addressing

the multiple challenges posed by climate change to archaeological heritage and to formalise collaborations with other international associations on a global scale. This paper intends to start off the round table discussion, creating the discussion framework.

02 WHAT CAN WE DO? ADDRESSING THE CHALLENGES POSED BY CLIMATE CHANGE

Author(s): Dawson, Tom - Hambly, Joanna - Graham, Elinor (University of St Andrews; The SCAPE Trust)
Presentation Format: Oral

A variety of approaches has been devised for managing heritage sites at risk from climate change. In June 2018, heritage mangers from the USA and Scotland joined together to debate possible strategies. Their discussion was based around visits to a range of threatened Scottish heritage sites, interspersed with a number of workshops. The heritage examined ranged from graveyards in Edinburgh to eroding settlement mounds on the coast of Orkney. Over a ten-day period, representatives from Historic Environment Scotland, the US National Park Service, the Florida Public Archaeology Network, several different community groups, Scottish Local Authorities, the SCAPE Trust and the University sector discussed the scale and range of problems that climate change poses. The discussion focused on carved stone monuments, stone buildings and coastal sites at risk from erosion and flooding, and the group looked at methodologies for assigning value to heritage and considered different ways of assessing risk and prioritising action. Approaches adopted in different countries for ranking sites and assessing priority were debated and the application of different systems was tested in real-life situations, allowing the group to compare and contrast methodologies. The discussions and workshops are leading to the preparation of statements and guidance for use by heritage managers and others, and this paper will present the preliminary results - with the aim of promoting further discussion.

This programme of research was supported by the Scottish Universities Insight Institute

03 SUPPORTING COMMUNITIES TO ASSESS THEIR HISTORIC PLACES CONCERNING RISKS FOR AND VULNERABILITIES OF THE ENVIRONMENTAL IMPACTS OF CLIMATE CHANGE

Author(s): Hermann, Carsten (Historic Environment Scotland) - Boro, Marte (Riksantikvaren) - Haugen, Annika (Norsk institutt for kulturminneforskning) - Sigurðarson, Guðmundur Stefán (Minjastofnun Íslands) - Sonehag, Therese (Riksantikvarieämbetet)
Presentation Format: Oral

Running from 2017-2020, Adapt Northern Heritage (ANH) is a project supporting communities and local authorities to adapt northern cultural heritage to the environmental impacts of climate change and associated natural hazards through community engagement and informed conservation planning. Undertaken by Historic Environment Scotland, Minjastofnun Íslands, Norsk institutt for kulturminneforskning and Riksantikvaren, with funding from Europe's Interreg Programme for the Northern Periphery and Arctic, the project is developing, amongst other outputs, an online tool to assess the risks for and vulnerabilities of historic places, in order to start plan adaptation measures when and where required.

Unlike other studies, which focus solely on the impacts of natural hazards, the conceptual assessment method underlying the ANH tool also considers the slow, cumulative degradation processes, which are increasingly affecting historic places, such as increased precipitation, wind-driven rain, freeze-thaw damage and thawing of permafrost. Thereby, the ANH tool will be able to achieve more holistic assessments. ANH's approach is based on and advances existing assessment methods from the sectors of risk assessment, heritage management and emergency management, including sources such as ISO, ICCROM and Blue Shield. The method is based on commonly accepted assessment concepts, such as risks being the result of exposure and vulnerability assessments. This will increase its intersectoral acceptability. Working with locally 11 based or operating Associated Partners, the method will be tested and demonstrated in 10 case study in Iceland, Ireland, Norway, Russia, Scotland and Sweden.

This discussion contribution will provide a brief overview of the concept of ANH method, as a useful basis for discussion, the feedback of which will help to ensure the method's transferability to contexts outside northern Europe and improve the method prior to the transcription of the prototype into a user-friendly online software tool.

04 USING CULTURAL HERITAGE AND HISTORICAL ANLYSES FOR CURRENT AND FUTURE PROBLEMS WITH WATER

Author(s): Vreenegoor, Ellen (Cultural Heritage Agency of the Netherlands) - Bruijn, Gerda (Culural Heritage Agency)
Presentation Format: Oral

The importance of historical maps and cultural heritage for modern climate adaptation strategies.

The Netherlands are part of the Rhine-Meuse-Scheldt delta. The majority of the country is low lying and thus prone to flooding. That is the reason why the Netherlands has a long tradition of water management.

The National Public Works Agency of road and water management (Ministry of Infrastructure and Water) and the water boards try to create extra space for the rivers and streams, but also try to get rid of too much water as soon as possible. That means that along the rivers all trees and shrubberies have to move to lead the water through. And in smaller streams all remains of watermills, locks and shacks have to be removed for the same purpose.

If we look closer to the historical water systems these elements are situated most of the time at the best places in de river or stream. We study the possibilities to re-use that systems and elements for storing water in periods of too much water (flooding)so

we can re-use it in dry periods.

We make analyses using historical maps to understand the water system and the changes made through the centuries. With this historical knowledge we can find new solutions for current and future problems with water.

05 CLIMATE CHANGE RESEARCH

Author(s): Biehl, Peter F (University of Buffalo, SUNY)
Presentation Format: Oral

This presentation will scrutinize Climate Change Research (CCR) in archaeology and its impact on and application in the heritage sector. It will also contextualize CCR in the current political discourse including its funding support, policies, and legislation. It will finally discuss the current framework of teaching CCR in universities and disseminating its results to the public.

06 UPDATE ON SAA CCSAR COMMITTEE: CCH ROUNDTABLE

Author(s): Jensen, Anne (University of Alaska Fairbanks; Bryn Mawr College/UIC Science LLC)
Presentation Format: Oral

To provide a basis for discussions, I will give a brief overview of activities of the Committee on Climate Change Strategies and Archaeological Resources of the Society for American Archaeology (essentially the SAA version of the CCH committee). I will briefly touch on possibilities for increased cooperation between CCSAR and CCH.

582 URBAN BIOARCHAEOLOGY: CONSUMPTION AND TRADE IN ROMAN AND MEDIEVAL TOWNS

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Riera, Santiago (Dept. History and Archaeology. Section Prehistory and Archaeology. University of Barcelona) - Miró, Carme (Archaeological Service of Barcelona) - Livarda, Alexandra (Department of Classics and Archaeology, University of Nottingham, University Park, Nottingham) - Mercuri, Anna Maria (Laboratory of Palynology and Palaeobotany. Department of Life Sciences. Università deli Studi di Modena e Reggio Emilia) - Nadal, Jordi (Dept. History and Archaeology. Section Prehistory and Archaeology. University of Barcelona)
Format: Regular session

Urban archaeology of the historical periods traditionally deals with standing buildings and artefacts to tackle questions of economy, town development and urbanization, whereas it is more rarely that the focus turns primarily on organic material. Within the framework of the so-called environmental archaeology during the last decade or so, zooarchaeologists, archaeobotanists and other bioarchaeologists, taking advantage of the fact that urban environments are prime contexts for the preservation of these lines of evidence, have turned attention towards the urban environment and its reconstruction, as well as aspects of everyday life, such as diet and social status. Yet the vast majority of such studies are site specific within urban centers and less work has focused on larger scale analyses of networks of trade, distribution and consumption of organic (by-)products on an intra- or inter-city level. With the on-going development of modern towns an increasing amount of bioarchaeological work is being conducted furnishing new data, and thus, we are now in an excellent position to allow the critical synthesis of this information to better understand the development of commerce and markets within towns, local and long distance trade, food consumption patterns and urban and peri-urban foodscapes. In addition, urban constructed landscapes as gardens and horticulture gardens have recently been studied starting from bioarchaeologoical data.

This session aims to provide a forum where these developments, alongside new perspectives and approaches to urban trade and consumption patterns will be discussed, focusing on the Roman and medieval world.

ABSTRACTS

01 BIRDS IN THE CITY. ARCHAEORNITHOLOGY OF MEDIEVAL AND POSTMEDIEVAL LEVELS OF CASA CORRALES (RIBERA QUARTER, BARCELONA)

Author(s): Nadal, Jordi - Lloveras, Lluís - Navarro, Laura (Universitat de Barcelona) - Garcia-Petit, Lluís (UMR-5140. Université Paul Valéry) - Fernández, Antoni (El Born. CCM. Ajuntament de Barcelona) - Miró, Carme (Servei d'Arqueologia de Barcelona. Institut de Cultura de Barcelona. Ajuntament de Barcelona) - Riera, Santiago (Universitat de Barcelona)
Presentation Format: Oral

In urban medieval and post medieval bioarchaeological studies birds are of particular interest, especially as food resources. First, birds are animals that can be raised in small spaces indoor the cities, in opposition to large livestock species that must be bred, imported and processed from the surrounding areas. On the other hand, birds were considered as a luxury food and their consumption were related to people with some social status or restricted to several special religious celebration days.

In this paper we present the results obtained in the zooarchaeological analysis of the bird remains and eggshells fragments recovered from the medieval and postmedieval levels (XV to XVII centuries) of Casa Corrales. This site is situated in el Born CCM archaeological site (Ribera quarter) in Barcelona city. The sample is totally dominated by bones of chicken (Gallus gallus domesticus) that were used for meat consumption and egg production. Other domestic bird species present, are anatids (goose) and pigeons (Columba spp), but their numbers are much more scarce. Wild species are fundamentally represented by the red legged partridge (Alectoris rufa) and thrushes (Turdus spp). A bone of cinereus vulture (Aegypius monachus) has also found. The results compared with other samples of the region show that the urban context presents a higher percentage of domestic birds in front of rural sites.

02 WILD IN THE CITY: BROWN BEARS IN ROMAN AND MEDIEVAL BRITAIN

Author(s): O'Regan, Hannah (University of Nottingham)

Presentation Format: Oral

The brown bear, Ursus arctos, is Europe's largest terrestrial carnivore and tends to be associated in the modern (urban) mind with mountains and the untamed wild. Yet the remains of bears have been found in multiple Roman and Medieval towns and cities across Europe. Why are bears present in these sites? While modern bears are occasional scavengers of dumps, it is much more likely that these remains represent live animals (or their body parts) that were moved by people. Taking Britain as an example, this paper will explore the osteological record of brown bears in towns, with a particular focus on London, from the Roman period onwards. Bear-related artefacts and historical sources, in combination with the remains themselves, will also be used to explore where the bears may have come from. The presence of these animals has implications for our understanding of consumption in towns - although their bones are rare, a single specimen may inform us about the status of the people who owned it (or the status they were attempting to project), and their links with other towns and places. Were bears high status animals, and what were they (and their remains) used for? These questions will all be explored in this paper.

03 WHAT'S NEW ON THE MENU? PLANT FOOD CONSUMPTION AND TRADE IN ROMAN LATTARA (LATTES, FRANCE)

Author(s): Rovira, Núria (ASM, Archéologie des Sociétés Méditerranéennes - UMR5140, Univ Montpellier 3, CNRS, MCC) - Tillier, Margaux (ASM, Archéologie des Sociétés Méditerranéennes - UMR5140, Univ Montpellier 3, CNRS, MCC; ISEM, Institut des Sciences de l'Evolution - UMR 5554, CNRS/UM/IRD/EPHE/INRAP) - Sanchez, Corinne - Piquès, Gaël (ASM, Archéologie des Sociétés Méditerranéennes - UMR5140, Univ Montpellier 3, CNRS, MCC)

Presentation Format: Oral

The ancient port city of Lattara (Lattes, France) was founded toward 500 BC and abandoned around the 2nd c. AD. It was established directly on the edge of the stagnum latera mentioned by Pliny the Elder (HN, IX, 8), between the two branches of a small coastal river. It is noteworthy that Iron Age Mediterranean merchants (such as Etruscan or Greek) and local authorities and people founded this trading post in order to protect and regulate exchanges between the Mediterranean maritime space and the Gallic hinterland. This role will be maintained at least during the High Empire, but is it so striking that in previous centuries? Can we answer this question through the analysis of archaebotanical data?

This communication aims to characterise the plant products consumed by the Lattara's inhabitants during the Roman period (1st c. BC-2nd c. AD) mainly based on the analyses of charred and waterlogged seeds and fruits. These plant macro-remains are the most direct evidence of plant food consumption, as well as of acquirement practices developed: local growing and/or trade. The identification of new plants or plant products (exotic?) will be carried out comparing these archaeobotanical data with those of previous periods, as well as those provided by contemporary cities such as Nemausus (Nîmes), Arelate (Arles) or Narbo Martius (Narbonne).

In order to provide comparative data about the possible foreign plants or plant products we will also analyse the origin of amphorae, the main container used to transport foodstuffs preserved in dry archaeological conditions.

Archaeobotanical and archaeological data come from different quarters of the city excavated since the early 80's and partially published. At the same time, we bring new data from the current excavations of the port basin and the channel leading to the city, as well as from the artisanal quarter that borders them.

04 WHAT'S NEW ON THE MENU? PLANT FOOD CONSUMPTION AND TRADE IN ROMAN LATTARA (LATTES, FRANCE)

Author(s): Rovira, Núria (ASM, Archéologie des Sociétés Méditerranéennes - UMR5140, Univ Montpellier 3, CNRS, MCC) - Tillier, Margaux (ASM, Archéologie des Sociétés Méditerranéennes - UMR5140, Univ Montpellier 3, CNRS, MCC; ISEM, Institut des Sciences de l'Evolution - UMR 5554, CNRS/UM/IRD/EPHE/INRAP) - Sanchez, Corinne - Piquès, Gaël (ASM, Archéologie des Sociétés Méditerranéennes - UMR5140, Univ Montpellier 3, CNRS, MCC)

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05 A PLACE IN TIME: INVESTIGATING MEAT SUPPLY TO THE CITY OF EXETER IN THE ROMAN AND MEDIEVAL PERIODS

Author(s): Müldner, Gundula - Frémondeau, Delphine (Department of Archaeology, University of Reading) - Evans, Jane (British Geological Survey, Keyworth) - Rippon, Stephen (Department of Archaeology, University of Exeter)

Presentation Format: Oral

The nature of urban economies is reflected in how they interacted with their hinterlands, at local, regional and supra-regional scales. This is especially evident in matters of food supply, as the need to feed a large population who are not (primarily) involved in agricultural production, is looming large at all times, shaping landscapes and agrarian practices with the need to react to changes in demography and standards of living. Studies of "Feeding a City" have long been the domain of historians, with archaeologists, and especially bioarchaeologists, making their mark only more recently. Nevertheless, many such investigations still focus on cities and their hinterlands in particular time periods, rather than over the longue durée. This paper will present the results of a study of meat supply to the historic city of Exeter over the course of one and a half millennia, from the 1st to the 16th century AD by means of bone chemistry (multiple isotope analysis) of cattle and sheep skeletal remains. The data allow us to trace changes in animal husbandry and food supply networks, including the shift in reliance from the lowlands to the East to the use of upland pastures, over a time during which Exeter developed from a Roman fortress to the principal urban centre of South West England, which, in the early 16th century, was ranked 6th in England in terms of its urban wealth. This is the first large-scale study of its kind in North West Europe and it seeks to showcase the important contributions that modern bioarchaeology can make towards understanding the dynamic history of urban economies.

This project is funded by the UK Arts and Humanities Research Council (Reference AH/N001931/1)

06 WOOD FOR THE PYRE: FUEL PROVISIONING AND MANAGEMENT IN THE ROMAN CITY OF BRACARA AUGUSTA, NW IBERIA

Author(s): Costa Vaz, Filipe (Research Center in Biodiversity and Genetic Resources - CIBIO, University of Porto) - Braga, Cristina (Archaeological Unit of the University of Minho, Landscape, Heritage and Territory Laboratory - Lab2PT) - Oliveira, Cláudia (Archaeological Unit of the University of Minho, Landscape, Heritage and Territory Laboratory - Lab2PT; Research Center in Biodiversity and Genetic Resources - CIBIO, University of Porto) - Pedro Tereso, João (Research Center in Biodiversity and Genetic Resources - CIBIO, University of Porto; Center for Archaeology - UNIARQ, University of Lisbon) - Fontes, Luís - Martins, Manuela (Archaeological Unit of the University of Minho, Landscape, Heritage and Territory Laboratory - Lab2PT)

Presentation Format: Oral

Between 2007 and 2009, excavations in the necropolis of Via XVII in the city center of Braga (Bracara Augusta), northern Portugal, revealed one of the largest roman funerary complexes in the Iberian Peninsula, with over 190 depositions identified (including cremation, inhumation and ustrina) and spanning from the 1st to the 7th century AD. Bracara Augusta was founded in the early 1st century AD as the capital of the conventus Bracaraugustanus. As the most important city in the roman administration of the NW Iberia, it later became the capital of the province of Gallaecia and between the 5th and 7th centuries, capital of the Suebi Kingdom.

Sediment samples for archaeobotanical analysis were recovered throughout the site in primary, secondary and tertiary deposits. A total of 46000 charcoal fragments and several hundreds of fruit and seed macroremains were analysed. Quercus deciduous stood out from the diverse set of 29 species identified, reaching nearly 50% of the total. Nevertheless, the presence of several other tree species (e.g. Castanea sativa, Fagus sylvatica, Juglans regia, Pinus sylvestris etc.), along with the occurrence of a diverse set of carpological remains (e.g. Pinus pinea cones and nuts, Juglans regia shell nuts, strobilus of Alnus sp. and galbulus fragments of Cupressus sempervirens, etc.) provided relevant insights and discussions.

Considering wood's ubiquity in the everyday life activities of pre-industrial societies, this paper will discuss several socio-economic factors regarding firewood provisioning and plant resources management in a medium sized roman city in the periphery of the Roman Empire. Data from the characterization the firewood and carpological macroremains found in the necropolis of Via XVII in Bracara Augusta will be complemented with classical sources and ethnographical and historical data. Particular emphasis will be made to

firewood catchment area, transport, storage and use.

07 NATURAL RESOURCES AND LANDSCAPE CHANGES IN A ROMAN AND MEDIEVAL SUBURBAN MARITIME QUARTER OF BARCELONA

Author(s): Riera, Santiago (Seminar of Prehistoric Studies and Researc. Section of Prehistory and Archaeology. University of Barcelona) - Livarda, Alexandra (Department of Archaeology. University of Nottingham) - Ramos, Jordi (ATICS S.L.) - Miró, Carme (Pla Barcino. Archaeological Service of Barcelona) - Picornell, Llorenç (Arqueobalear. Departament of History and Art Theory. University of the Balearic Islands) - Julià, Ramon (Seminar of Prehistoric Studies and Researc. Section of Prehistory and Archaeology. University of Barcelona) - Orengo, Hèctor (McDonald Institute for Archaeological Research, University of Cambridge.) - Nadal, Jordi (Seminar of Prehistoric Studies and Researc. Section of Prehistory and Archaeology. University of Barcelona) - Marlasca, Ricard (Posidonia) - Bros, Vicenç (Servei de Parcs Naturals. Diputació de Barcelona)

Presentation Format: Oral

Environmental and landscape archaeologies have been mainly applied to the analysis of rural spaces, but these approaches have been scarcely applied to urban and sub-urban contexts where the study of archaeological structures and materials still prevails. However, these sub-urban spaces are characterised by their dynamic and transitional nature. This is particularly evident in littoral towns, where urban development is linked to changes in the coast morphology, harbour structures and trade activities.

Barcelona was a small Roman colony founded during the last decades of the 1st century BC on a small hill in a coastal position, at the southwestern edge of the river Besòs delta.

A research programme called Pla Barcino, conducted by the Archaeological Service of the City of Barcelona, has been implemented to improve the knowledge of town history and its role as a distribution centre from Roman to Medieval period. In the context of this programme, an interdisciplinary study of sub-urban space close to the harbour was carried out during the archaeological works at Sotstinent Navarro Street, where a Roman moat was dug. The study included different bioarchaeological analyses such as pollen, non pollen-palynomorphs, charcoal, seeds, micro- and macro-faunal bones, fish remains, shells and gastropods, as well as palaeoenvironmental and sedimentological studies.

Several changes in the sub-urban landscape associated to the urbanisation of this space have been recorded. In addition, changes in terrestrial and maritime resource exploitation occurred between Roman and Medieval periods. These changes have been explained as the result of the geomorphological evolution of the shoreline, the landscape change, the process of urbanisation and the cultural change.

08 MEDIEVAL BERGEN: CONSUMPTION BASED ON LOCAL RESOURCES AND FOREIGN TRADE

Author(s): Hjelle, Kari (University of Bergen)

Presentation Format: Oral

The medieval town Bergen is situated at the coast of Norway with a hinterland rich in marine and terrestrial resources. The town developed into Norway's main trading center and capital during the 12th century and it became the northernmost trading station of the Hanseatic League. A large fire in the medieval part of the town in 1955, made the starting point for larger archaeological excavations in the town and at excavations from the 1970ies onwards, archaeobotanists/palynologists have been involved in botanical sampling and analysis. These investigations have shown the importance of fruits (berries) and nuts in the diet, revealing interactions and trade between the hinterland and the town. According to written sources, cereals were imported in high quantities. This is supported through presence of arable weeds not growing in Norway. Other exotics commonly found in the medieval layers are figs (Ficus carica), grape (Vitis vinifera) and walnut (Juglans regia). Our investigations have shown that pollen analysis add important information to analysis of plant macrofossils from medieval town contexts and document activities which are not visible in the archaebotanical record, such as regular presence of horsebean (Vicia faba). Also parasites of whipworm, Trichuris trichiura, are found and together with latrines filled up by mosses these give a picture of health and daily life in the medieval town. Development and use of plant material within the town will be discussed in relation to international contacts and the simultaneous landscape development in the hinterland of the town.

09 ARTEFACT GEOGRAPHIES OF THE VIKING AGE: MATERIAL EXCHANGE NETWORKS TAKING SHAPE

Author(s): Munoz-Rodriguez, Mariana (University of York; Stockholm University)

Presentation Format: Oral

This paper will present ongoing developments in the molecular species identification of Viking-Age antler hair combs undertaken as part of the EU-funded ArchSci2020 programme. Highly-worked bone and antler artefacts can be challenging to accurately narrow down to species. Zooarchaeology by Mass Spectrometry (ZooMS) is a rapid, minimally-destructive proteomic technique which allows for the accurate species identification of raw material. As portable everyday objects, antler hair combs have the potential to act as proxies for trade, migration, and the sourcing of raw material. The antler utilised for early medieval comb-making in northern Europe was sourced from biogeographically discreet deer species, such as red deer, reindeer, and elk. For this reason, accurate species identification is an integral step in the investigation of raw material provenance, population movement, and the evolution of trade networks in the Viking Age. Recent results from a selection of Viking-Age settlements, such as Hedeby, have demonstrated

the prominence of antler importation and the spread of Scandinavian comb types. This study consists of the first multi-site synthesis which encompasses both biomolecular and typochronological analyses of antler hair combs from a variety of Viking-Age settlements across northern Europe. This wide geographical scope will allow for cross-site comparison of both timing and scale of long-distance trade and communication in the Viking Age.

a. THE ARCHAEOZOOLOGY OF MEDIEVAL PRAGUE

Author(s): Trojánková, Olga (Laboratory of Archaeobotany and Palaeoecology, University of South Bohemia in České Budějovice; Institute of Archaeology of the Czech Academy of Sciences, Prague) - Kovačiková, Lenka (Laboratory of Archaeobotany and Palaeoecology, University of South Bohemia in České Budějovice) - Frolík, Jan (Institute of Archaeology of the Czech Academy of Sciences, Prague) - Čiháková, Jarmila (National Heritage Institute, Prague) - Starec, Petr (Prague City Museum)

Presentation Format: Poster

Prague, the capital of the Czech Republic, has a thousand year old historical tradition of being centrally located, a rarity on the European scale. Almost continuous archaeological research in different parts of the current modern city is a source of archaeological data including osteological animal material. The aim of our project is to investigate the relationship between people and animals in medieval Prague from the perspective of archaeozoology. Our research focuses on catching the development of animal husbandry in the settlement agglomeration of the Early Middle Ages and in the town of High Middle Ages as well as the reflection of the social stratification of inhabitants in Prague in relation to their diet. The main sources of information are the archaeozoological analysis and published data from older investigations. In all investigated osteological assemblages, domestic animals dominated over hunted fauna. The most important were cattle (Bos taurus), pig (Sus domesticus) and sheep/goat (Ovis/Capra). Domestic birds were represented mainly by domestic chicken (Gallus domesticus). We analysed trends, which related to the higher social status of inhabitants of Prague Castle. The main characteristics are the noticeably higher presence of domestic pigs, hunting fauna and domestic chicken in the Early Middle Ages period. When we analysed representation of domestic animals, we have realized the importance of medieval urban markets, however we will never be able to determine the exact scale of animal production and distribution. Finding new born piglets in the forecastle of Prague Castle could serve as an indicator of these animals rearing in the locality in the Early Middle Ages period.

b. ANIMAL REMAINS FOUND IN MUNICIPAL RUBBISH PITS IN THE HIGH MIDDLE AGES IN BOHEMIA

Author(s): Kovačiková, Lenka (Laboratory of Archaeobotany and Palaeoecology, University of South Bohemia in České Budějovice) - Meduna, Petr (Laboratory of Archaeobotany and Palaeoecology, University of South Bohemia in České Budějovice; Center for Theoretical Studies, Charles University, Prague) - Starec, Petr (Prague City Museum) - Miklová, Vendula (Institute of Archaeology, Faculty of Philosophy, University of South Bohemia in České Budějovice) - Trojánková, Olga (Laboratory of Archaeobotany and Palaeoecology, University of South Bohemia in České Budějovice; Institute of Archaeology of the Czech Academy of Sciences, Prague)

Presentation Format: Poster

Medieval cess/rubbish pits, which served as municipal waste disposal, belong to a partially good archeologically investigated features. Animal bone remains, which are often found in their fillings, can also serve as a good source of detailed information about dietary preferences of man, the hygienic conditions or waste management practices in towns in the High Middle Ages (13th-15th cent.). A quality and level of explanatory power of osteological findings excavated in urban areas are still controversial. We tried to sum up the archaeozoological data gathered in recent years from various towns in Bohemia, extended by some older investigations. Our conclusions indicate that the cess/rubbish pits including non-functional wells in the High Middle Ages were used for the disposal of bones of domestic animals – cattle, pigs, sheep and goats and to a lesser extend for poultry. It concerned all animals, which were usually found in the markets. There is limited evidence of horse and game meat consumption. The second and major group of findings in pit fills is formed by bones and parts of skeletons of cats, dogs or commensals. To a lesser extent we can see features containing mainly dead animals. During the evaluation of results, we focus on the taxonomic and anatomical distribution and also on the estimated age or taphonomic changes (e.g. proportion of butchery marks). When evaluating we aim for the interconnection of results from the archaeozoological, archaeological and historical sources in the wider context of the urban organism.

c. POLLEN, NPPS, SEEDS/FRUITS, CHARCOALS FOR RECONSTRUCTING ENVIRONMENTAL AND CULTURAL CHANGES BETWEEN 3RD BC AND 6TH AD IN MUTINA (MODENA)

Author(s): Riso, Federica - Bosi, Giovanna - Torri, Paola - Mercuri, Anna Maria - Rinaldi, Rossella - Montecchi, Maria Chiara (Modena University) - Benatti, Alessandra (Limoges University) - Florenzano, Assunta - Mazzanti, Marta (Modena University)

Presentation Format: Poster

Modena, situated on the via Emilia, was described as firmissima et splendidissima by Cicero. In 2017, on the anniversary of 2200 years from its founding, many events tried to highlight the strong imprint left by the Roman world in the history of the city to the present day. On this celebratory occasion the LPP contributed with a synthesis of the data obtained from the numerous archaeobotanical analyses performed over the last 20 years on urban and peri-urban sites of the city.

Archaeobotanical researches (pollen, non-pollen palynomorphs, seeds/fruits and charcoals) carried out on the sites of Modena provided many information useful to reconstruct the environment, farming practices, diet and ritual uses associated to plants in Roman period. The research is a key example of integrated archaeobotanical analyses based on archeological sites studied for pal-

aeoenvironmental reconstruction. In the reconstruction of the landscape, special consideration has been dedicated to markers of grassland-pasture and wetlands, two elements that look as a special feature of the environmental-cultural history of the area of Modena. Since early phases of the Roman Age, there have been wetlands, pasture meadows and thinly scattered mixed oakwoods that, together with crops fields and gardens, characterised the landscape of the area. From the 3rd century AD the archaeobotany studies highlighted the effects of the floods on the city of Modena and its surroundings showing that subsequent episodes of floods favoured the expansion or spreading of wetlands with the development of hygrophilous woods in the later phases.

d. EXOTIC PLANTS FROM MEDIEVAL AND POST-MEDIEVAL SITES IN BELGIUM

Author(s): Preiss, Sidonie - Speleers, Lien (Royal Belgian Institute of Natural sciences; D.O. Earth and History of Life)
Presentation Format: Poster

The first archaebotanical studies on medieval and early modern sites in Belgium were published in the eighties of the last century. Since that time hundreds of samples from rescue excavations have been analysed and the increasing amount of data permitted a first review, presented at the conference of the International Working Group for Palaeoethnobotany in 2016. Throughout the medieval and modern period many new species, used as spices, condiments, vegetables, fruit, cereals, medicinal and/or ornamental plants appeared: from black pepper in the 12th/13th century to tomatoes in the 17th century. In this presentation the focus will be on macrobotanical remains of exotic plants, that are not native to North-West Europe and seem to be imported to the present territory of Belgium during the medieval and modern period. The dataset comprises published data from Flanders (the northern part of Belgium) and published and unpublished data from the Brussels-Capital region and the Walloon region (the southern part of Belgium) collected in recent years by the archaeobotanical team of the Royal Belgian Institute of Natural Sciences.

The majority of the recorded exotic plants comes from cesspit fills on urban sites. According to written sources, during the High Middle Ages, most exotics were very rare and expensive with a strong socio-cultural significance, accessible only to a social elite. Little by little, some species lost their status of luxury goods and became more common. In this poster macrobotanical evidence will be confronted with archaeological and bioarchaeological information and historical sources in order to understand the changing status of some species and developing trade networks.

e. NERVIAN SMALL TOWNS FROM THE ROMAN EMPIRE TILL 320 AD : THE COUNTRYSIDE IN TOWN?

Author(s): derreumaux, marie (CRAVO) - Preiss, Sidonie (IRSNB) - Clotuche, Raphael (INRAP)
Presentation Format: Poster

Based on the archaeobotanical studies of a rural settlement, four villae and two small towns from the civitas nerviorum, dated from the High Empire (first century/early Roman period?) to 320 A.D., compared to similar rural data from the nearby menapian territory, the cereal supply of nervian small towns has been understood.

The find of many first threshing crop residues in both of the studied small towns reveals the incorporation of agricultural activities and agricultural buildings within the town itself, showing a self-sustenance of their cereal supply, or at least a part of it. If hulled wheats are the main productions of the nervian city, bread-making wheats - bread wheat and spelt- are more present in urban centers and villae. The geographic distribution (north/south) of these two taxa matches with soils' agricultural potentials. The bread wheat, a demanding species regarding soil quality, is cultivated on the best farming lands while spelt is cultivated on the more sandy ones.

The archaeozoological study of one of the nervian towns -Famars-, combined with the botanical analysis of what appeared to be herbivore dejections, allowed a focus on local meat supply. The meat consumption is based on standardized pieces bought from the market, while presence of cattle breeding has not been put into evidence/has not been demonstrated/proved. The herbivore faeces, with no bedding evidence, probably come from fenced instead of stabled animals, leading to a hypothesis of a meat supply based on cattle imported into town.

583 NON-INVASIVE APPLICATIONS IN RESEARCH AND HERITAGE MANAGEMENT STRATEGIES IN CENTRAL AND EASTERN EUROPEAN ARCHAEOLOGY

Theme: Archaeology and the European Year of Cultural Heritage
Organisers: Mackiewicz, Maksym (Archeolodzy.org Foundation) - Wroniecki, Piotr (Independent researcher) - Tencer, Tomáš (Department of Archaeology and Museology, Masaryk University, Brno)
Format: Regular session

Non-invasive prospection is an indispensable element of archaeological research and is also an important component of cultural resource management strategies. In many countries various approaches have been developed to record, monitor and evaluate archaeological resources using a wide palette of prospection techniques: field-walking, aerial photography, ALS and geophysics.

Despite numerous successful applications in European research projects and heritage schemes seem to undervalue their potential. This problem is particularly evident in Central and Eastern European countries where due to different rhythm of political, historical and economic factors the application of non-invasive methods still raises questions and concerns about availability, cost or effectiveness. Their implementation

into a standard practice is at best sluggish.

The aim of this session is to discuss the role of non-invasive methods in recognizing and documenting archaeological sites in a Central and Eastern European background. The goal is not to present survey results but rather to be the backbone for a broader discussion on their implications and implementations. From speakers we would expect thoughts on the current status of non-invasive archeology in particular in light of heritage protection systems, analysis of the most frequently encountered problems and solutions.

The geographical focus is due to different progression of non-invasive research implementation and appreciation in the former Iron Curtain divide. This session´s intention is however to be a prelude to a broad international discussion and an opportunity to exchange experiences, trends and milestones in search for support of permanent and fully recognized procedures in archaeology.

ABSTRACTS

01 TWO GERMAN WAYS: GEOPHYSICAL PROSPECTION IN ARCHAEOLOGY AT THE IRON CURTAIN

Author(s): Meyer, Cornelius (Eastern Atlas GmbH & Co. KG)
Presentation Format: Oral

November of 1989 changed Europe and its impact was also registered in the domains of archaeological research. While archaeo-geophysical prospection had already become a field of interest in the western part, it remained rare and exotic east of the iron curtain. Archaeological geophysics in the west was a subject of research at universities like the universities of Munich and Kiel. But, in the 1980s these methods were also established at the federal archaeological authorities. These developments were backed by the heritage legislation and by the western federal structure. In the GDR the preservation of sites of historic interest was centralised and the heritage legislation still based on laws of the 1920s with the difference that the definition of monuments depended on their value for the state's ideology. Another reason for the eastern backlog was the economical situation. Geoscientific institutes had to follow state's guidelines, focusing on the location of mineral resources, in order to make the socialist economy less dependent on expensive imports. Only a few researchers were able to dedicate their time and resources to investigate the potential of geophysical prospection methods in archaeological research. The situation changed when the new heritage authorities were built up in the east in the 1990s. At the same time, methods and devices were refined, so that the application of the geophysical prospection was ready to become a standard in archaeological daily routine. However, progress is never linear. New forces entered the scene: Market rules, the lack of quality control mechanisms and the strive for presentable spectacular results strongly influenced the further development. Today, the position of the actors within the field of archaeo-geophysical prospection is better defined thanks to the establishment of rules and regulations and to the existence of institutional special interest groups, like ISAP, the International Society of Archaeological Prospection.

02 LIDAR DATA AND ITS IMPORTANCE FOR ARCHAEOLOGY IN SLOVENIA

Author(s): Hobic, Jošt (Independent researcher)
Presentation Format: Oral

In 2015 the Slovenian environment agency released LiDAR data that covers 100% of Slovenian territory, 20.273 km². Before that release there had been just small research LiDAR projects done mostly in alluvial plains of major Slovenian rivers. As Slovenia is a heavily forested country, (around 60% of it is covered with forests) LiDAR is also the most valuable remote sensing method for an archaeological research on a small or large scale.

With this huge amount of new data archaeologists involved in the heritage management are facing new challenges - what to do with the information about the new sites, and the whole "frozen in time" landscapes that are still preserved as one layer in today's landscape. In this paper, I will first present the quality of LiDAR data for archaeological research and main challenges of how archaeology is dealing with this vast amount of data in Slovenia. LiDAR data is certainly a welcome addition to topographical and archaeological surveys that are providing most of the information that are important for the listing of new sites and the quality maintenance of entries for already listed archaeological sites in National Slovenia heritage register.

I will also tackle question what archaeologists do with LiDAR data and present some overview of published articles that used LiDAR data as one of the main sources for research. Is the LiDAR data used only to search for new sites or does it lead to something else? How is the new data challenging or rather changing our perception of archaeology in landscape?

03 FROM A RENTED OVERHAUSER TO SQUARE KILOMETRES - IMPLEMENTING LARGE-SCALE GEOPHYSICAL PROSPECTION FOR CULTURAL RESOURCE MANAGEMENT IN HUNGARY

Author(s): Mesterházy, Gábor - Stibrányi, Máté - Klembala, Zsombor - Pethe, Mihály - Buránszki, Nóra - Nagy, László - Kecskés, Bence - Somogyi, Ferenc (Budavári Ingatlanfejleszto és Üzemelteto Nonprofit Kft.)
Presentation Format: Oral

In the recent decade we could see the question 'Should we implement geophysical prospection?' slowly turning into 'How and what extent should we use geophysical methods?' overall Europe. These questions are the same in Hungary as well, and we have been lucky enough to dedicate our work over the past 4-5 years at our company. CRM is under a constant pressure from stakeholders and

entrepreneurs for faster and more reliable predictions for archaeological involvement and this is changing our 'standard excavation-based' process. Geophysical prospection has indeed an opportunity as a research tool to play a key role in this, although it has to be turned from scientific curiosity into a standard element of the CRM process.

Our state-owned company gives archaeological assessments before large-scale investments (e. g.: motorways, factories) through a so-called Preliminary Archaeological Documentation. The goal is to define the actual area to be excavated, as well as the cost and duration of the archaeological mitigation process. Currently we are implementing geophysical prospection after an initial field survey, measuring archaeological sites with their buffer zone and those areas where field survey couldn't be executed. The following trial trenching (sondage) is mainly based on the results of geophysical prospection. In short, due to geophysics only a proportion of trial trenches should be used for "scanning" the area, meanwhile others can be directly opened on archaeological features (or even avoid them).

The measurements and the interpretations are the urgent part of our work for further assessment, excavation based validation is also as important to improve the quality of filtering and interpretation. Therefore excavation data are comparable with geophysical datasets. This process and the field experience combined made it possible to define the probability of a successful and valid measurement.

04 THE STATE OF NON-INVASIVE PROSPECTION IN ROMANIA. THE CASE OF THE ARHEOINVEST INTERDISCIPLINARY RESEARCH PLATFORM

Author(s): Asandulesei, Andrei (Interdisciplinary Research Department - Field Science, "Alexandru Ioan Cuza" University from Iasi)
Presentation Format: Oral

Modern archaeological research, based on the integration of some of the most successful non-invasive prospection methods, has started to increasingly consolidate in Romania, as borne out by the initiatives and results, particularly for case studies belonging to prehistory or the Roman period.

This apparently reassuring state of affairs, with several noteworthy initiatives coming into the limelight, is unfortunately put into question by the reality that the implementation of standardized research procedures relying on non-invasive methods continues to be unmet.

Overlooking the issue of underfinanced research, in general, and the branches involved in the protection and valorisation of the immovable heritage, in particular, we prefer to highlight a number of positive aspects enjoyed by Romanian archaeology when there is openness on part of those with vested interests.

As such, without a direct support for non-invasive research on part of the authorities, it was nevertheless possible to institutionally accommodate this component into universities and museums, by establishing interdisciplinary archaeological research platforms or institutes (in Sibiu, Iasi, Timisoara, Bucharest, Cluj). Such is the case of the Arheoinvest Platform from within the Department of Interdisciplinary Research – Field Science from the University of Iasi, Romania, composed of five large state-of-the-art laboratories.

On the basis of an experience of almost ten years acquired by our team, in this paper we draw attention to a series of aspects with which we have been confronted during the last decade, detail the state of non-invasive archaeological research in Romania (in terms of archaeological research itself, preventive archaeology, monitoring of the archaeological heritage, feasibility studies for infrastructure works, etc.), and put forward future prospects, more or less discernible.

05 THE INTEGRATION OF ARCHAEOGEOPHYSICAL PROSPECTION IN THE RESCUE ARCHAEOLOGY IN CZECH REPUBLIC

Author(s): Tencer, Tomáš - Milo, Peter (Department of Archaeology and Museology, Masaryk University, Brno)
Presentation Format: Oral

Despite numerous successful archaeogeophysical surveys and well-known benefits, an integration of geophysics in to the Czech rescue archaeology is still unusual. In the communist times, development of non-destructive archaeological methods wasn't the priority, rescue excavation almost didn't exist and geophysical methods were focus on tasks related to mineral exploration. Nevertheless there were few pioneers, who started to implement geophysical survey in the archaeological sites. In the 90s, the lack of financial resources and overall changes in the society keep the archaeology of the progress. Expensive instrumentation and lack of trained experts didn't allow to follow-up the trend of application of new technologies. Only the growing economic strength in the region together with gradual generation change in the archaeological community have started to change the situation. New, modern and available instrumentation at archaeological institutions and universities lead to new ideas and expectations in archaeology. First surveys gain more and more trust to the prospection methods and field archaeologists together with investors discovered the benefits of geophysical prospection. Only recently, culture heritage management bodies and archaeological authorities start to recognize availability and full potential of archaeogeophysical prospection; however the lack of standards or guidelines and outdated legislation maintains the long-standing status quo.

06 NON-DESTRUCTIVE METHODS IN THE MANAGEMENT AND PROTECTION OF ARCHAEOLOGICAL HERITAGE IN SLOVAKIA

Author(s): Bistak, Peter - Baxa, Peter - Feníková, Andrea (The Monuments Board of the Slovak Republic, Bratislava) - Furman, Martin (The Regional Monuments Board - Regional centre Žilina) - Halvoň, Ľuboš (National Forest Centre, Zvolen) - Katkin, Slavomír (The Monuments Board of the Slovak Republic, Bratislava) - Maczek, Dušan (The Monuments Board of the Slovak Republic, Bratislava; Department of Archaeology and Museology, Masaryk University Brno) - Nádaskay, Rudolf (The Monuments Board of the Slovak Republic, Bratislava) - Smreková, Miriam (National Forest Centre, Zvolen) - Šusteková, Barbora (The Regional Monuments Board - Regional centre Bratislava)
Presentation Format: Oral

A fundamental change in the strategy for the protection of archaeological heritage in Slovakia took place in 2002 with the adoption of new legislation in which the Monuments Institute was transformed into The Monuments Board of the Slovak Republic and its eight regional departments. The Monuments Board of the Slovak Republic maintains a list of archaeological sites declared as National Cultural Monuments. Other archaeological sites are registered and protected as parts of architectural monuments, and within the historical towns as parts of heritage reservations and heritage areas. Archaeologists from regional heritage departments decide where and how it is necessary to carry out archaeological excavations, which is fully funded by the construction investors (exceptions are excavations related to restoration and renovation of national cultural heritage where the owner can obtain state contribution). Over more than 16 years of operation of this system, more and more emphasis is placed on the use of non-destructive methods. Initially, when indicating the archaeological potential of a site with no prior construction history, publicly available othophotomaps and historical maps were used. These maps in combination with the methods of field prospection and survey, should have provided substantial argument for carrying out the next, destructive phase of archaeological research. Geophysical methods were initially used mainly in research of cultural monuments, and are now increasingly used in large-scale industrial or infrastructural constructions. Over the past few months, the Monuments Board of SR has gained access to lidar data, created primarily for documentation of forest vegetation. Digital relief models with a density of 1 point/m2 are satisfactory enough to locate new and update data on known archaeological sites.

07 EYES ON THE SKIES, PROBES ON THE GROUND: A (LIMITED) EXPERIENCE FROM HERITAGE MANAGEMENT IN SERBIA

Author(s): Pendic, Jugoslav (Biosense Institute) - Le Quesne, Charles (Environmental Resource Management - ERM - Inc.)
Presentation Format: Oral

For an archaeologist coming from a country in development, cost – effectiveness is a permanently raised issue in any archaeology driven project, notably a salvage one. Main concern of "how much will it cost?" is frequently followed hand-in-hand by another question, "who can provide it?". The lack of developed framework for acquiring, ingesting and storing remotely sensed and non – invasive data for archaeological purposes is visible on all levels: from current legislative practice, to practical field application. It is important to state though, that Serbia has a good tracking record in acquiring spatial data of the country: for purposes of systematic survey of the land, aerial imagery has been collected by the private contractors and the army every decade from as early as 1954. The latest survey equipment is available to major contractors and state operated entities - recent in-country catastrophic environmental events have pushed forward this trend. However, the data still trickles down to archaeologists very slowly, if at all, and the general awareness on benefits of systematic applications of remote and non-invasive sensing is relatively low. We highlight some of the major obstacles to non-invasive documentation in archaeological practice in Serbia, while also referring to a successful case study from the field of salvage archaeology, one derived from a collaboration of UK and local experts in the use of aerial imagery, LiDAR and geophysical surveying for prediction and localization of archaeological features in endangered areas.

08 NON-INVASIVE APPLICATIONS IN RESEARCH AND HERITAGE MANAGEMENT IN LITHUANIA

Author(s): Jarockis, Romas (Vilnius Academy of Arts)
Presentation Format: Oral

With good reason Vladas Nagevičius (1881-1954), a general in the Lithuanian Army during the interwar period, is seen by many as the pioneer of non-invasive applications in Lithuanian archaeology. He first employed aerial photography as a new method in the archaeological field survey in 1931-1934 while excavating the Iron Age hill-forts northwestern Lithuania.

After World War II there was no aerial photography of archaeological sites in soviet Lithuania, nor in any other part of Eastern Europe, because of restrictions on other than military flying.

Aerial photography of archaeological sites commenced again in Lithuania in 1990's, after a break of nearly sixty years. In addition to aerial photography data derived from ground-level geophysical survey was stated to implement into archeological reseach.

Non-invasing techniques are also an excellent tool for documenting cultural landscapes. In a rapidly-changing world it is important to document the most valuable monuments in their spatial and cultural contexts. It allow decisions to be taken concerning the protection not only of individual sites, but also whole complexes of monuments.

Information gathered through aerial photography, geophysics and LIDAR have a widening scope of application in modern-day archaeology. Current status of non-invasive archeology, analysis of the most frequent problems and solutions, usage of non-invasive methods in heritage protection system, and prospects for using non-invasive methods in current Lithuanian archaeology for the

coming years will be presented in this contribution.

09 NON-INVASIVE SURVEYS IN ROMANIAN ARCHAEOLOGY: BETWEEN NECESSITY, POSSIBILITIES AND LIMITS

Author(s): Preoteasa, Constantin (Neamt County Museum Complex - Cucuteni Culture International Research Centre)
Presentation Format: Oral

In recent years, several non-invasive interdisciplinary researches have been carried out in Romania, covering archaeological sites (settlements, necropolises, barrows, citadels, salt spring sites) from different ages and areas. Most of them focused on settlements established by sedentary human communities, which left behind consistent remains, which are best suited to such investigations (geophysics surveys, aerial photos taken by drones, GPR, LiDAR).

Due to the limited human (qualified personnel), material (technological equipment) and financial resources, the specialists from the Romanian public institutions with legal attributions regarding the protection, research, valorisation and promotion of the material and immaterial, mobile and immobile cultural heritage (museums, faculties within the universities, academic research institutes) have often resorted to the support of reputed specialists in the field, from several prestigious European institutions with similar attributions.

These investigations have provided valuable information on the location of sites, their shape, dimensions and boundaries, the current state of conservation of the remains within them, the intensity of habitation, the types of features, or the way space is organized by the human communities belonging to different civilizations.

In some cases, the location of archaeological excavations previously carried out in those sites could also be observed. The preliminary results thus obtained – which may or may not be confirmed by future archaeological excavations – allow the institutions in charge, as well as the local and central authorities from Romania, to provide more effective protection, invasive research, valorisation and promotion of the national cultural heritage – which is also European and universal cultural heritage –, as well as the completion or correction of scientific information existing in the National Archaeological Repertoire of Romania and in the List of Historical Monuments in Romania.

10 ONCE UPON A SITE? WAYS OF THINKING AND NON-SCIENTIFIC FACTORS INFLUENCING THE IMPLEMENTATION OF NON-INVASIVE METHODS IN POLAND

Author(s): Wroniecki, Piotr (Institute of Archaeology, University of Wrocław) - Mackiewicz, Maksym (Archeolodzy.org Foundation) - Furmanek, Mirosław (Institute of Archaeology, University of Wrocław)
Presentation Format: Oral

Why are non-invasive methods so rarely used in mainstream Polish archaeology? The main arguments that have been used over the past years are of course economic - "non-invasive surveys are expensive" and substantive issues - "non-invasive methods do not work in Poland ". At present these arguments are quite easy to refute. Most of the experiences collected over the past 10-15 years clearly indicate that the use of non-invasive methods not only works (sometimes spectacularly) but it is also relatively inexpensive and at the same time effective. It seems, therefore, that the problem of implementation is more complex. So what is blocking us?

Perceiving excavations as the main or even the only source of learning about the past, jokingly though aptly may be called "the law of the shovel". This way of thinking is extremely incompatible (or rather contradictory) with modern heritage protection doctrines. From the point of view of the protection of archaeological sites this approach is particularly harmful due to three aspects: 1) excavations are expensive 2) excavations are time-consuming and 3) excavations, especially used as a prospecting method are ineffective and destructive! There are too many endangered monuments in the world and too few archaeologists and funds to be able to excavate even the places we currently consider the most important.

This paper intends to show on empirical examples how much the practical implementation (not only of non-invasive) archaeological research is influenced by our way of thinking, the paradigm in which we operate. We will not conceal that we postulate a change based on experience, which can only be the result of a serious discussion based on well documented case studies.

The presented research was financed by the National Science Centre grants 2014/15/N/HS3/01719 and DEC-2013/10/E/HS3/00141.

a. EXAMPLES OF PRACTICAL EXPERIENCE IN RESEARCH WITH THE USE OF GEOPHYSICAL SURVEYS IN SLOVAKIA

Author(s): Šusteková, Barbora (The Regional Monuments Board - Regional centre Bratislava) - Bisták, Peter (The Monuments Board of the Slovak Republic) - Grznár, Peter (The Regional Monuments Board - Regional centre Trnava) - Nipčová, Daniela (The Regional Monuments Board - Regional centre Trenčín) - Paterka, Pavel (The Regional Monuments Board - Regional centre Nitra, Office Komárno) - Kopták, Tomáš (The Regional Monuments Board - Regional centre Žilina) - Miňo, Martin (The Regional Monuments Board - Regional

centre Banská Bystrica) - Uličný, Marián (The Regional Monuments Board - Regional centre) - Pristáš, Martin (The Regional Monuments Board - Regional centre Košice) - Tirpák, Ján (The Monuments Board of the Slovak Republic)
Presentation Format: Poster

Geophysical methods as part of the non-destructive prospection of archaeological and historical-architectural sites in Slovakia were used to define the monument potential and its extent. Among the most frequently used methods in Slovakia are gravimetry, georadar, magnetometry and resistance method.

The most advantageous use of geophysical methods is the effectiveness and definition of the extent of destructive interventions selected examples confirm the benefits of these methods but also their limitations. Examples of practical experience in archeological research with the use of geophysical surveys in Slovakia is presented from each region (Bratislava, Trnava, Nitra, Trenčín, Banská Bystrica, Žilina, Prešov, Košice). Geophysical surveys were conducted by specialized entities such as private companies, universities and other scientific institutions. Methods used on archeologically potential sites like magnetometry were made on large area ranges where destructive prospecting in the form of a strip trenches would not recognized unique and solitary movable and immovable findings. Methods used on architectural sites were smaller in size. methods such as gravimetry, georadar, and resistance method. Advantages are identifying hidden structures without breaking the object itself. Limitations on the use of geophysical methods or their results are the different physical properties or conditions found in the examined indoor and outdoor environment.

b. REVEALING ARCHAEOLOGICAL AND HISTORICAL PATRIMONIAL HERITAGE IN ROMANIA

Author(s): Magureanu, Despina - Magureanu, Andrei (Institute of Archaeology) - Penes, Marinela - Anton, Alin - Ciuperca, Bogdan (Prahova County Museum of History and Archaeology)
Presentation Format: Poster

There have been more than 100 years since the Romanian Minister of Culture stated its intentions to elaborate a complete registry (map of the archaeological and historical monuments. This cadastre continues to represent a goal for our cultural management eversince.

First, we created the legislation, then we made fields-surveys, followed by changes of the laws as we went through different political systems, and recently we imported the way of approaching this matter from the west, trying to implement new methods of studying the landscape; but we are still in the process of "doing" it, far away from a complete archaeological cadastre.

We intend to focus on our personal experience in using non - invasive methods of investigations in order to outline a better understanding of the monuments and their surroundings, starting from the idea that a monument, either archaeological, or historical, has less contextual meaning without a landscape that can explain it and put it into value.

Use of aerial investigations, such as photography, LIDAR or infrared photos, provide views from above the ground and reveal a different size of the archaeological sites and historical monuments. Using non-intrusive investigations such as geomagnetism and electric resistivity allows us to know more.

This will help us to record better, and, by this, conceive a better strategy for the protection of sites and monuments. And this strategy must be closely related to the involvement of the local communities.

584 MAPPING HISTORICAL NARRATIVES: THE POWER OF ALTERNATIVE GEOVISUALISATION AND METHODS IN ARTEFACT SURVEY

Theme: Theories and methods in archaeological sciences
Organisers: García Sánchez, Jesús (Leiden University) - Taelman, Devi (Ghent University)
Format: Regular session

Archaeological surveys have the power to generate important information about the human past. On the one hand, extensive surveys are the main source of information to gain insights in large-scale phenomena such as settlement dynamics and to generate regional historical narratives. Intensive, intra-site surveys, on the other hand, can develop knowledge on internal organisation and structuring of individual sites. Intra-site surveys can fine-tune observed larger scale, regional phenomena obtained from regional surveys.

With this session, we aim to explore how archaeological work evolves from actual field work, in particular survey, to knowledge production, and eventually the construction of historical narratives, following the chaine-operatoire system proposed by Gardin. We will overpass the stadium of data collection, which has been explored elsewhere (García Sánchez 2017). This is an occasion to study the passage from data to knowledge in the many theoretical approaches present nowadays in archaeology. Here the concept of space is relevant, since any human action has a spatial dimension. Nevertheless, as Hacıgûzeller (2012) has pointed recently, current archaeological GIS tools are uncritically bonded to positivism. We wish to focus on how visual narratives (i.e. mapping approaches and geovisualisations) can generate archaeological knowledge and historical narratives, in particular related to archaeological survey. The session will explore how theoretical decisions assumed or latent within cartographical representations and how does these representations of knowledge influence historical narratives.

The session looks for papers on:

- Theoretical insights on representationalism of spatio-temporal phenomena in survey archaeology;
- New ideas, methods, techniques to publish survey spatio-temporal knowledge.

ABSTRACTS

01 DISCUSSING GEOSPATIAL PHENOMENA AND THE CREATION OF HISTORICAL NARRATIVES

Author(s): García Sánchez, Jesús (Leiden University) - Taelman, Devi (Ghent University)
Presentation Format: Oral

The session "Mapping Historical Narratives" aims to put forward an important part of the archaeological research. That is, how to jump from datasets to the proposition of historic narratives following what Gardin has described as a reseach chaine operatoire. We acknowledge that visualization of spatial data is one of the most powerful instruments to transmit survey results and interpretation of geospatial phenomena, regardless its scale. This paper is intended as an introduction to those elements of discussion which deserve special attention by both speakers, public and session Organisers. We will focus on two particular topics for discussion. A theoretical characterization of Gardin's chaine-operatoire, and a practical approach which will lead us to the proposition of news ways of presenting narratives embedded with research survey datasets.

The theoretical approach may discuss past and present traditions about transmitting spatial phenomena and its impact in how both researchers and public understand history. This is particularly important to challenge historic-cultural narratives charged with underlaying political agenda.

Our second aim is to present and discuss the capabilities of current tools and methods to break the gap among pure data presentation and the understanding of spatial phenomena from a historical point of view. In this case we want to discuss the current GIS criticism, the modelization of spatial datasets using advance statistical and mapping techniques, and strategies to transmit this information to both specialized and lay public, using printed, digital or interactive means.

02 AORISTIC MAPPING: TOWARDS NEW SOLUTIONS FOR VISUALIZING PROBABILISTIC CHRONOLOGICAL MODELS

Author(s): Waagen, Jitte (University of Amsterdam)
Presentation Format: Oral

Probabilistic modelling in archaeological distribution maps has long existed. For example, the weighting of artefact densities collected during pedestrian survey by ground visibility factors is a common practice. Clearly, if applied properly, producing maps with various models of the surface distributions can help in engaging with potential patterning of human activity in the past. Although it still is difficult to visualize the whole range of possible density models in a single map, looking at various maps side-by-side can already help in interpretation. However, how to deal with more complex scenarios? Abundance of archaeological material per surface area is just one of many possible dimensions in which archaeological information can vary, and present uncertainties. The arrival of aoristic modelling techniques in archaeology is one of the developments pushing this issue to the surface: how can we visualize chronological probability in archaeological distribution maps? GIS provides some powerful tools of working with symbols and charts, but using those can quickly create completely convoluted maps, which are impossible to understand for an outsider, even if very experienced with the probabilistic techniques. This paper aims to explore some avenues of dealing with the problem of visualizing chronological probabilistic models and the various traditional and innovative solutions for doing so.

03 MAPPING INDIGENOUS TASKSCAPES IN THE CARIBBEAN: UNDERSTANDING AND VISUALIZING TENDENCIES OF HUMAN ACTION THROUGH NON-SYSTEMATIC SURVEY DATA

Author(s): Herrera-Malatesta, Eduardo (Universiteit Leiden)
Presentation Format: Oral

While systematic total survey strategies has been applied in Caribbean archaeology, their application is not achievable for every case study or region. Issues such as topography, weather, and surface visibility can greatly affect the feasibility of this methodology. In order to overcome these limitations, while keeping a systematic material culture registry, an alternative methodology was applied during recent research in the northwestern coast of Dominican Republic. By combining the basic ideas of regional survey, off-site methods, and landscape archaeology, field research was carried out to register archaeological evidence for subsequent GIS-based analysis. This methodology allowed the registration of material culture distributions within a difficult topography and the subsequent use of a 'bottom-up' spatial classification to define sites back in the laboratory. This permitted the consideration of sites as heuristic tools to define place and to understand tendencies of human action and their possible tasks. These tendencies of material culture and sites were then compared with environmental variables in order define indigenous taskscapes at different spatial scales and finally reconstruct the past indigenous landscape.

In this presentation, the field research first will be presented to contextualize the process of theoretically and pragmatically understanding the indigenous taskscapes in the research area. Secondly, the idea of landscape will be revisited with respect to the wider discussion of taskscapes. And finally, new strategies for visualizing this data for both academic and general audiences will be

presented and contextualized within previous and new research objectives.

04 RE-SURVEYING AND RE-TELLING – MAPPING PREHISTORY AND HISTORY OF GEBELEIN (EGYPT)

Author(s): Chyla, Julia - Ejsmond, Wojciech (Antiquity of Southeastern Europe Research Centre University of Warsaw)
Presentation Format: Oral

Complex project of surveys of Gebelein, an archaeological micro-region located in southern Egypt, was initiated in 2013 and so far resulted in detail mapping of various sites, dated from Upper Paleolithic up to medieval times.

An analysis of archival maps and satellite images showed that archaeological sites located in the Gebelein region are highly threatened by progressive encroachment of agricultural fields and contemporary settlements. Most of these sites were severely damaged in past years and looted. This area has been researched by many scholars in the past, but they did not published the results of their works in sufficient extend. Therefore, Gebelein is a white spot on the archaeological map of Egypt and is re-surveyed by the members of the Gebelein Archaeological Project from the University of Warsaw.

Scarcity of artefacts in their original context and wealth of archival data lead to the development of the approach called "comprehensive archaeological survey", which incorporates different kinds of data, e.g .archaeological and geophysical surveys, contemporary and archival satellite images, old maps, recently invented for this research anthropological survey allows to collect new data in the field and store them into mobile GIS.All of the acquired data can be visually presented as maps showing chronological and/or functional distribution of artefacts as well as human remains in the researched area.

Surveys conducted in the Gebelein region not only led to acquisition of the surface information. Combination of geophysical prospection and surface data collection enabled to date underground structures. This help to understand intra-site complexity of the researched areas and in effect is helping to create a narrative on the history of the sites and the micro region as well.

05 RE-EVALUATING EARLIER INVESTIGATIONS. INTRA-SITE SPATIAL ANALYSIS OF NIDA SETTLEMENT, LITHUANIA

Author(s): Pilkauskas, Mindaugas (Lithuanian Institute of History)
Presentation Format: Oral

In 1974-1978 there were big excavations in Nida site. A total of 4000 square meters had been uncovered and a huge collection of finds had been retrieved. Pottery constituted the biggest part of finds, there were more than 100 000 sherds. Most of the sherds were attributed to Bay-coast or Rzucewo style. It is important that almost all material is considered from relatively short period, which allows us to analyze and to understand the inner structure of the settlement.

Of course, during the earlier investigations which were led by archaeologist R. Rimantienė, there were spatial analysis of Nida settlement, but scientists were limited by the technology available at the time. Nowadays we can try to get a better view at the settlement using modern calculation and visualization methods. Also that is possible because of precise measurement of the locations of the finds during R. Rimantienė excavations. There is a drawback, because the locations were recorded without depths, so we have a 2D view. However, that may not be that big of a problem, since the material is very homogenous and probably does not differ much in time.

In this presentation I will try to show that new look at investigations carried out before, might not only create better picture, but also formalize new ideas and conclusions. Also combining new research with earlier it is possible to get to more accurate interpretations and reconstructions. Finally, by digitalizing old material we are contributing to preservation of investigation records and creating an opportunity for future research.

06 BEYOND THE SNAPSHOTS : MODELING LANDSCAPE DYNAMICS FROM SPATIAL STATISTICS TO GEOVISUALIZATION TECHNIQUES. A CASE STUDY FROM SOUTH-WEST FRANCE.

Author(s): Poirier, Nicolas (CNRS - UMR 5608 TRACES; University of Toulouse) - Hautefeuille, Florent (University of Toulouse; CNRS - UMR 5608 TRACES)
Presentation Format: Oral

Ground survey data are an important source of information about the diachronic dynamics of landscape and settlement. Their ability to detect settlements and areas cultivated by ancient societies make them an essential starting point for any land use study. Yet, they rarely alone can document all the facets of land appropriation and development (landownership, political & administrative divisions, etc.). They must be combined with other sources of information (written, planimetric, environmental). The varying spatial and chronological scales of these different sources complicate the multi-disciplinary integration process and the restitution of a unified historical narrative. From a cartographic point of view, the presentation of this information often results to the creation of maps by chronological phases, which leads to frozen representations and do not clearly express the dynamics. However, spatial analysis and statistics tools allow the representation of dynamics itself (grid analyses, mean centers, etc.). To go further, techniques of geovisualization or graphical modelling such as chrono-chorematics can be used to summarize the trajectory of space enhancement over the long term. By representing on the same diagram the major physical constraints of a space (relief, watercourses) and the elements of appropriation by ancient societies (central places, cultivated spaces, territories), it is possible to graphically express the main spatial dynamics observed (polarization, dispersion, migration, etc.). We propose to apply these different techniques (spa-

tial statistics, graphical modelling) to a study area in south-western France, which is the subject of a multidisciplinary approach integrating ground surveys, aerial surveys by drone, geophysics, and analysis of medieval and modern written sources in order to reconstruct the dynamics of land use that have affected this space and the evolution of the relations between ancient societies and their environment.

591 FROM SEDIMENTS TO BEHAVIOUR AND PALAEOENVIRONMENTS: INTERDISCIPLINARY APPROACHES TO HUNTER-GATHERER CONTEXTS DURING THE LATE GLACIAL-EARLY HOLOCENE

Theme: Theories and methods in archaeological sciences

Organisers: Polo-Diaz, Ana (IPHES, Institut Català de Paleoecologia Humana i Evolució Socia) - Aldeias, Vera (ICArEHB, Interdisciplinary Center for Archaeology and the Evolution of Human Behaviour, Universidade do Algarve; Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology, Leipzig) - Égüez, Natàlia (Archaeological Micromorphology and Biomarkers -AMBI Lab, Instituto Universitario de Bio-Orgánica Antonio González. Universidad de La Laguna)

Format: Regular session

The Late Glacial-Early Holocene witnessed not only relevant climatic fluctuations but also cultural innovations that marked a turning point in human behaviour and subsistence strategies throughout the European continent.

Much of what is currently known about this period in Europe (considered here roughly c. 15 – 8 kyr), relies mainly on investigations of lithic and bone archaeological assemblages. Such studies have provided insights into how techno-typological diversity reflects human adaptations to changing climate and ecosystems. However, key aspects concerning settlement patterns, natural resource exploitation and how climatic shifts may have shaped the behaviour of the last prehistoric hunter-gatherers remain unexplained. Investigation of sediments is crucial to unravel these questions since it can provide direct evidence of hominid use of space, the distribution of activity areas at an intra-site level and palaeoenvironments at local and regional scales.

The objective of this session is to bring together multiscalar interdisciplinary research that focuses on archaeological sediments from Late Glacial-Early Holocene deposits. Our goal is to shed light on the sedimentary evidence of human behaviour (e.g. combustion residues; occupation surfaces; midden deposits) and related palaeoenvironments (e.g. 14-12,9 kyr Interstadial; 12,9-11,6 kyr Younger Dryas; 8,2 kyr cold event, Late Glacial and Early Holocene sedimentary and soil dynamics).

We welcome contributions on Late Palaeolithic and Mesolithic sites from Europe and elsewhere using geoarchaeology, palaeoecology, organic chemistry and any other relevant interdisciplinary method as well as ethnography and experimentation to address the sedimentary signatures of climatic shifts and coeval human activities.

ABSTRACTS

01 EARLY HOLOCENE CLIMATE OSCILLATIONS IN CENTRAL EUROPE: ANNUALLY LAMINATED LAKE SEDIMENTS FROM POGGENSEE (NORTHERN GERMANY)

Author(s): Dreibrodt, Stefan (University of Kiel, CRC 1266/ Institute for Ecosystem Research) - Dörfler, Walter - Feeser, Ingo - Zanon, Marco (University of Kiel, CRC 1266/ Institute for Pre- and Protohistoric Archaeology) - Groß, Daniel - Lübke, Harald (Stiftung Schleswig-Holsteinische Landesmuseen Schloss Gottorf)

Presentation Format: Oral

Rapid environmental change is reflected by, and might be deduced from the microscopic composition of annually laminated sediments (varves).

In this paper, we present high-resolution paleo-limnological data of the 11.1 ka, 10.3 ka, 9.3/ 9.5 ka and 8.2 ka before today climate oscillations as reflected by abrupt changes in the annually laminated sediments of Poggensee (northern Germany). Micro-facies analyses (thin sections) are accompanied by geochemical data (xrf, TOC/TN, TIC, BiSi) delivering additional clues for a better understanding of Early Holocene lake and landscape processes.

The chronology is based on a model integrating 14C-dates from leafs and varve-counts. The preservation of Early Holocene sedimentological anomalies in the varved sequence allows a precise dating of the anomalies in a continental geo-archive close to archaeological sites. This is important for considerations about human-environmental interaction during the Early Holocene. Additionally, a comparison of the detected climate oscillation phases (e.g. intensity, duration, character) in the same sequence is made possible.

The results are discussed against the background of the Early Holocene paleo-environmental and archaeological record from central Europe (in particular the important Mesolithic site Duvensee, located 40 km east of the Poggensee). The detected pronounced climate variability might have resulted in changing availability of natural resources in central Europe. For example, the decrease in lacustrine productivity could have led to shortages of aquatic resources like fish. Nevertheless, new opportunities might have resulted as well since landscape openness increased for short periods.

02 THE HIGH-RESOLUTION SEDIMENTARY SEQUENCE FROM POGGENSEE (N-GERMANY): AN INSIGHT INTO EARLY HOLOCENE LANDSCAPE TRANSFORMATIONS FROM ANNUALLY LAMINATED LAKE SEDIMENTS

Author(s): Zanon, Marco - Feeser, Ingo (Institut für Ur- und Fruehgeschichte, CAU Kiel) - Dreibrodt, Stefan (Institut für Ökosystemforschung, CAU Kiel) - Groß, Daniel - Lübke, Harald (Zentrum für Baltische und Skandinavische Archäologie, SSHLM Schloss Gottorf) - Dörfler, Walter (Institut für Ur- und Fruehgeschichte, CAU Kiel)

Presentation Format: Oral

The broad development of northern Central-European vegetation history between ca. 12000 and 8000 cal. years BP is known through a network of pollen diagrams distributed along the shores of the Baltic and North seas, pointing to a coherent transition from Younger Dryas steppe/park tundra to Mid-Holocene mixed-deciduous woodlands. Yet high resolution records from well-dated and annually laminated sedimentary sequences are still rare. As a consequence, little is known concerning the fine timing of land-cover changes at a local and regional scale, and a precise comparison between vegetation development and large scale climatic fluctuations is still hardly achievable.

Here we present the first results from ongoing multi-disciplinary analysis at the site of Poggensee, located in Northern Germany, focusing on the Early Holocene section of the sedimentary record. The age-depth model is built upon a combination of varve counts and radiocarbon datings, with error estimates lying in the range of ca. ±12-27 cal. years (1σ). Preliminary pollen data are presented at an average resolution of ca. 30 years per sample.

This solid chronological support allows us to track species migration and expansion at a multi-decadal resolution. It provides a much needed environmental framework to aid the interpretation of local archaeological data and to evaluate the effects of known climatic shifts on vegetation cover. Furthermore, we test to which extent the Poggensee chronology can be transferred to local pollen diagrams sharing comparable vegetation dynamics but lacking accurate chronologies. This experiment is meant to improve the dating quality of "legacy" pollen data -especially those collected in connection with Mesolithic sites- in order to include them in modern region-wide vegetational syntheses and man/environment interaction models.

03 LATE MESOLITHIC LANDSCAPE DEVELOPMENT IN THE LOWER SADO VALLEY BASED ON HIGH-RESOLUTION MULTIPROXY SEDIMENT ANALYSES

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Presentation Format: Oral

During the Middle Holocene (c.8400-7000 cal BP) sea-level was rising due to the deglaciation, and previously incised valleys were progressively flooded, extending estuarine environments upriver and allowing for inland migration of tidal areas.

At that time, Tagus and Sado estuaries were intensely occupied by Late Mesolithic hunter-gatherer communities. Mesolithic shell-middens in Tagus valley were found on three tributaries of the left margin, c.65km upstream the present-day mouth. Previous palaeoenvironmental characterization of this area during Late Mesolithic occupation show that shell-middens were placed in the proximity of saltmarshes and near the upstream limit of tidal influence. Published data on palaeodiets inferred from human remains recovered in those shell-middens, point to mixed marine and terrestrial food consumption.

In the Sado valley, Mesolithic shell-middens are located c.25km from the estuarine outlet and extend over 15km upstream. The midden sites border the Sado channel and tributaries, and are mainly located at the top of valley steep slopes. Palaeodiet studies allowed separating Sado mesolithic communities into two groups: one, located downstream, where marine consumption prevailed; other, located farther upstream, with a diet mostly based on terrestrial resources. Those groups are contemporaneous so this difference in diets should be explained.

Having no prior information published concerning the landscape of the Sado valley during the Late Mesolithic occupation, several cores were collected from the Sado alluvial plain near shell-middens. Sediments are being analysed for environmental proxies together with 14C dating.

Preliminary results provide evidence that, as in the Tagus estuary, in the westernmost locations of the Sado occupied area, there were estuarine conditions at the end of the Early Holocene (c.8400 cal BP). These conditions were favourable for the collection of marine/estuarine species at that time, and remained as such until the Late Holocene (c.3300 cal BP). Upstream areas of the Sado valley are still being investigated.

04 FORMATION PROCESSES OF EARLY HOLOCENE ANTHROPOGENIC DEPOSITS AT LA FRAGUA CAVE (CANTABRIA, SPAIN): INTERDISCIPLINARY MICRO-CONTEXTUAL APPROACH

Author(s): Duarte, Carlos (University of Cantabria; Interdisciplinary Center for Archaeology and Evolution of Human Behaviour - ICArEHB, University of Algarve) - Nuñez de La Fuente, Sara (University of Cantabria) - Suárez Revilla, Roberto - Gutiérrez Zugasti, Igor - González Morales, Manuel - Arias, Pablo (Instituto Internacional de Investigaciones Prehistóricas de Cantabria - IIIPC, University of Cantabria)

Presentation Format: Oral

La Fragua is a small cave on a vertical cliff at 130 m directly above the Cantabrian Sea, in northern Spain, with Upper Paleolithic and Mesolithic occupations, separated by stratigraphic layer 3, radiocarbon dated to 10 000 cal BP. Layer 3 is a distinct and exogenous deposit of algal carbonate mud rich in marine organisms, an outstanding presence of phragmites pollen and non-edible small crustaceans and gastropods, all closely packed with abundant phosphatic bird guano. The deposit, which upper contact is rubified, contains micromorphological signatures of structural compaction and is located at the base of a Mesolithic succession of lenses corresponding to combustion features, where lenses of fibrous charred organic matter, resembling grassy material, is recognizable along with algal sedimentary materials. The presence of the carbonate-phosphatic mud is tentatively explained as result of an intense occupation of the cave by birds using tidal mudflat sediments for nest building. In turn, the hypothesis of the grassy material being linked with the wetland grass pollen identified is addressed combining geoarchaeological, microbotanical and malacological data. This interdisciplinary, micro-contextual reconstruction of formation processes allowed the distinction of activities like site maintenance, reuse of hearths and middening. The dynamic uses of this cave reflect coastal adaptations of the early Holocene hunter-gatherers, besides the shellfish exploitation widely documented for the Cantabrian Mesolithic, in a moment of sea level rise, when the coastal wetlands were starting to develop in the surroundings of La Fragua cave.

05 INVESTIGATING SEDIMENTS FROM EARLY NATUFIAN FIREPLACES AT SHUBAYQA 1 (NORTHEASTERN JORDAN): A MICROARCHAEOLOGICAL APPROACH

Author(s): Polo-Diaz, Ana (IPHES, Institut Català de Paleoecologia Humana i Evolució Social) - Arranz-Otaegui, Amaia - Richter, Tobias (Department of Cross-Cultural studies and Regional studies, University of Copenhagen)

Presentation Format: Oral

Hearth structures are one of the most relevant source of evidence for the understanding of human behaviour and environments in archaeological contexts.

Microarchaeology, and particularly methodological protocols involving geoarchaeology and experimental work, have proven their appropriateness for the characterisation of burnt features and the formation processes of sediments in fireplaces from a variety of Late Pleistocene and Holocene sites in continental Europe. However, the use of such analytical approach for the investigation of combustion structures preserved in late hunter-gatherer sites of southwestern Asia is still lacking.

In this work we present the first results of the investigations at high-resolution scale conducted on burnt features from two diachronic Early Natufian fireplaces at the open air site of Shubayqa 1 (northeastern Jordan).

During the excavations and ulterior laboratory processing of sediment samples, charred plant remains together with a variety of other combusted features, including dung, were documented. A programme of microscopic analyses involving the study of thin sections from archaeological and modern reference material was designed to provide detailed characterisation and fully clarify the origin of the latter.

Our results confirm the presence of dung in the sediments from the two fireplaces recorded at the site. Furthermore, the micro-morphology of the dung material indicates it could derive from ovicaprids, or alternatively, gazelle.

Our data also provide direct evidence of the burning of the dung remains, which allows us to raise the hypothesis of the use of dung as fuel during the Natufian occupation of the site, as early as 14.4-14.2 ka cal. BP.

In addition, the prelimary characterisation of a range of features made of a mixture of clay, dung and grasses indicates the production and use of plaster as building material during the occupation of the site.

06 APPLYING GEOPHYSICAL TO ARCHAEOLOGICAL ROCKSHELTERS IN THE WESTERN CAPE, SOUTH AFRICA

Author(s): Moffat, Ian (Flinders University) - Mackay, Alex (Univeristy of Wollongong)

Presentation Format: Oral

Geophysical methods are now routinely applied to many archaeological investigations however their use on Pleistocene aged sites remains unusual. We present results from Electrical Resistivity Tomography (ERT) and Ground Penetrating Radar (GPR) investigations of the Mertenhof and Klipfonteinrand rockshelters in the Western Cape of South Africa. These sites contain abundant Middle and Lower Stone Age archaeological material which represents one of the most complete Pleistocene cultural sequences in Southern Africa. Geophysical survey was used within these sites to map the geomorphology of the bedrock surface and to help define the stratigraphic packages with reference to adjacent excavation units. The geophysical investigations validated that the excavations had been undertaken in the deepest part of the rockshelter in both cases and provided important additional information about the mechanism for sediment accumulation in these sites. Additional sediment analysis including grain size, loss on ignition, magnetic susceptibility, visible and infrared spectroscopy and strontium isotope analysis is being conducted in order to assist with constrain-

ing the physical properties of the subsurface and to assist understanding the depositional history of these locations. Overall, the results from these studies demonstrate that the geophysical techniques can make an important contribution to archaeological investigations of rockshelter sites, particularly in terms of defining the best location for excavation, and should probably be used more commonly.

a. THE FORMATION OF RIVER MOTALA STRÖM AND THE PEOPLE WHO WATCHED IT HAPPEN

Author(s): Bergman, Jonas - Hagberg, Linus - Molin, Fredrik (National Historical Museums; The Archaeologists)
Presentation Format: Poster

Archaeological investigations during the last two decades at Motala, east-central Sweden, have unearthed a series of settlement and funerary sites from the Mesolithic. This extensive site-complex is situated by the current outlet of the second largest lake in Sweden, Lake Vättern, which is drained by river Motala Ström into the Baltic Sea. At the onset of the Holocene, Motala was at the very margin of the Fennoscandian ice sheet. As the ice rapidly retreated north, postglacial clays were deposited during the Yoldia Sea stage. Around 9000 cal BC, the isostatic uplift isolated the Vättern basin from the last stage of the Yoldia Sea, and its connection to the sea in the north was closed. After the isolation, Motala was on the eastern shore of the paleolake Ancient Lake Vättern, which likely had a short-lived drainage to the north. Due to the uneven isostatic uplift, the basin tilted toward the south, and the northern outlet closed. The waters in Ancient Lake Vättern thus rose in the Motala area, and small kettlehole basins, such as Lake Strandvägen, were inundated around 8000 cal BC. As the local transgression continued, the threshold at 92,5 m a.s.l. was reached around 7200 cal BC, and river Motala Ström was formed, eroding its way through glaciofluvial deposits into Lake Boren in the east. The water level in Lake Vättern thus initially dropped around 1,5 m, and around 5800 cal BC, the river had cut down to boulder-rich till at modern day level of 88,5 m a.s.l. At this time, the settlement and cemetery at Strandvägen was established. We present geological and palaeoecological data from the water-deposited sediments with refuse material, and the formation of river Motala Ström is highlighted by data from sediment cores retrieved from Lake Boren, downstream of Motala.

592 PATHWAYS TO THE NEOLITHIC IN EUROPE: TRACING THE RHYTHM AND SPREAD OF NEOLITHISATION

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Cubas, Miriam (Sociedad de Ciencias Aranzadi – University of York) - Terradas, Xavier (CSIC – IMF, Archaeology of Social Dynamics, Barcelona) - Carvalho, Antonio F. (Universidade do Algarve, Faro) - Manen, Claire (CNRS - UMR 5608, Toulouse) - Ibáñez, Juan J. (CSIC – IMF, Barcelona)
Format: Regular session

Traditionally, the debate concerning the Neolithisation process has been focused on the study of both technical and cultural aspects, the origin and exploitation of domestic plants and animals as well as their chronological context. Although these aspects have still an important role within this debate, new topics and the application of brand-new techniques are contributing with relevant data in the last years. Among them, genetic and isotopic analyses, chronological and simulation models are some of the most relevant. These studies are reinforcing some hypothesis linked to the spread model, territorial patterns of these farming communities and the rhythm and chronology of the phenomena.

This session aims to encourage debate be a meeting among researchers who focus their research on new studies and proposals related to the spread of the Neolithic, the tempo of the phenomena and the role of the hunter-gatherers communities in this process. Although this session is focused on the European region, it welcomes aims to include others proposals from the origin and spread areas, such as the Near East or North of Africa.

ABSTRACTS

01 THE FIRST INHABITANTS OF SOUTHERN NORWAY AND THE TRANSITION TO AGRARIAN SOCIETY

Author(s): Sayej, Ghattas (Vest-Agder County Council, Norway)
Presentation Format: Oral

The earliest evidence of the presence of humans in southern Norway dates to the end of the last Ice Age in the form of pioneer settlements along the then coastal areas, approximately 12800 Cal BP. Wild animals and game found new grazing areas in the newly ice-free territories, and many hunter-gatherers followed. These societies functioned for millennia, and people survived by fishing, hunting and gathering without having a major pressure on natural resources. Why did they adapt new methods and become agrarians, which demanded more work and responsibilities? How did such transition occur? Are these the same people changing methods according to influences from others, or are they a new wave of immigrants moving to southern Norway with their new methods?

There are several similarities in the material culture between southern Norway and northern Denmark, indicating that farming might have reached southern Norway directly from mainland Europe via Jutland and across Skagerrak. The earliest pollen evidence of grain

cultivation in the Lista-region indicates that this happened only a short period after agriculture had reached Denmark itself. Perhaps as much as a millennium before farming appeared along the western coast of Norway.

This paper will discuss the early inhabitants of southern Norway and will look at the causes for leaving behind well-functioning hunter-gathering societies and transitioning into more complex agrarian societies.

02 STUDIES ON THE OLDEST LINEAR POTTERY CULTURE PHASE IN SOUTHEASTERN POLAND - GWOŹDZIEC PROJECT

Author(s): Czekaj-Zastawny, Agnieszka - Rauba-Bukowska, Anna (Institute of Archaeology and Ethnology Polish Academy of Sciences) - Kukułka, Agnieszka (Regional Museum Tarnów)

Presentation Format: Oral

Neolithisation process is one of the most intensely debated issues in studies of the Stone Age. This applies particularly to areas of Central Europe, where there has been the emergence of the LBK. The oldest stage of cultural development is poorly known. Beginnings of the Linear Pottery culture settlement in the Southeastern Poland are identical to neolithisation of this area. This was a very important turning point, not only for the prehistory of that region, but for the whole of Central Europe. Areas of the Upper Vistula River basin played very important role, because there were within the first stage of LBK expansion.

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

03 THE BALKAN NEOLITHIC: ECOLOGICAL NICHE MODELING AND EXPLORING THE ROLE OF INTERMEDIARY CLIMATE ZONES AS STIMULATORS OF ADAPTATION AND TRANSMISSION

Author(s): Whitford, Brent (SUNY Buffalo)

Presentation Format: Oral

The Struma River Valley—located in Southwest Bulgaria and Northern Greece—has long been recognized as one of the primary communication arteries through which early agricultural practices spread from the Aegean to the Balkan Peninsula at-large. Extending 415 km north-south, the Struma River Valley transects both the Mediterranean and Temperate climate zones. It therefore offers an intermediary space to view how early agricultural practices adapted to more temperate environmental conditions. Such adaptations, it has been argued, preceded the expansion of early agricultural practices further into continental type climates. Recently, I characterized the changing ecological niche of Neolithic settlement in the Struma Valley based on species distribution modeling (SDM). In this paper, I elaborate on the SDM approach and examine the ecological characteristics of the Balkan Peninsula as a whole in order to identify regions with similar ecological properties to those of the Struma River Valley. All regions having similar characteristics with the Neolithic niche of the Struma Valley are then interpreted as suitable locations from which to exploit related adaptations and thereafter evaluated against the cultural evidence on the Neolithisation process of the Balkans more generally. Ultimately, the analysis supports the argument that the Struma River Valley served as an intermediary zone of ecological adaptation and transmission during the Balkan Neolithic.

04 THE SPREAD OF THE NEOLITHIC IN EUROPE: SIMULATIONS VERSUS ARCHAEOLOGICAL AND GENETIC DATA

Author(s): Fort, Joaquim (Universitat de Girona; ICREA)

Presentation Format: Oral

It is well-known that the Neolithic spread across Europe at an average rate of about 1 km/yr. Recently local variations in the spread rate have been quantified. It was slower (below 0.7 km/yr) in the Alps and Northern Europe, but extremely faster (above 8 km/yr) in the Western Mediterranean. According to mathematical demic-cultural wave-of-advance models, the relative importance of demic diffusion (i.e., the dispersal of farmers) and cultural diffusion (i.e., the incorporation of hunter-gatherers into the farming populations) can be estimated from the spread rate and, alternatively, from ancient genetic clines. At the continental level, the spread rate estimated from archaeological data indicates that demic diffusion (i.e., the dispersal of farmers) was more important than cultural diffusion. A more precise estimation comes from genetic data. We have used the mtDNA information of all Early and Middle Neolithic individuals reported in the literature (513 individuals) to quantify the space-time variation of the frequency of haplogroup K, a well-known Neolithic marker. In agreement with the simulations, the data show that the percentage of haplogroup K (%K) decreases with increasing distance from Syria and that, in each region, the %K tends to decrease with increasing time after the arrival of farming. Also in agreement with the simulations, the data display a local minimum of the genetic cline, and for the same Neolithic regional culture (Sweden). Comparing the observed ancient cline of haplogroup K to simulated clines reveals that about 98% of farmers were not involved in interbreeding neither acculturation (cultural diffusion). Therefore, cultural diffusion involved only a tiny fraction

(about 2%) of farmers. This confirms the conclusion, obtained independently from archaeological data, that the most relevant process in the spread of the Neolithic in Europe was demic diffusion, as opposed to cultural diffusion.

05 ASSESSING THE IMPACT OF BIAS OF RADIOCARBON DATES SAMPLES FOR THE NEOLITHIC TRANSITION IN THE WESTERN MEDITERRANEAN BASIN

Author(s): Oms Arias, F. Xavier (SERP, Universitat de Barcelona) - Rubio-Campillo, Xavier (University of Edinburg, School of History, Classics and Archaeology)

Presentation Format: Oral

Recent years have seen an increase on the number of works studying the dynamics of demic diffusion during Neolithic along coastal and continental fronts. The popularity of these studies is explained by the publication of several new sets of evidence including DNA, material culture, paleoenvironmental studies and specially new radiocarbon dates.

Radiocarbon dates are particularly useful for identifying the so-called front of advance. By comparing computer simulation models with C14 dates it is possible to test a range of hypothesis including the origin and number of fronts, the speed or the direction of the front wave. The plausibility of the hypothesis is typically assessed by quantifying the difference between the empirical arrival dates and the simulated arrival dates.

The evidence used to perform this assessment is often composed by all available radiocarbon dates assuming that the Law of Large Numbers will correct any errors. However, the probabilistic distribution of any C14 date can be affected by a range of taphonomic and archaeological processes which are not homogeneous over space and time. As a result, the dataset of empirical arrival dates can be heavily biased. In this context, it is not certain if the use of large sample size can overcome the challenges posed by the error of some of its observations.

This work will present an assessment of the impact of C14 dates on formal hypothesis testing. Multiple datasets have been created taking into account a diversity of information including cultural traits, archaeological context and taphonomic processes. A computer simulation of diffusion has been fitted to the different sets of evidence using Approximate Bayesian Computation as a means to assess how sample selection can impact the testing of working hypotheses.

06 THE NEOLITHIC TRANSITION IN THE WESTERN MEDITERRANEAN: A COMPLEX AND NON-LINEAR DIFFUSION PROCESS. THE RADIOCARBON RECORD REVISITED

Author(s): MANEN, Claire (CNRS) - Procome Project (http://www.anrprocome.com), Member of the (CNRS)

Presentation Format: Oral

Radiocarbon data play a major role in research focusing on the Eurasian agricultural transition. In this framework, high-precision chronologies are essential for modelling the speed of expansion and the spatio-temporal development of new techno-economic traits. This contribution proposes to discuss the emergence dynamics of the Neolithic in the Western Mediterranean, based on a renewed corpus of dates taken as part of the "PROCOME project" (www.procome.com). Three main points will be highlighted:

- The fast speed of diffusion of the Neolithic economy from the core area in South Italy, linked with the maritime movements of pioneering groups, at the very beginning of the 6th millennium BCE.

- The non-correlation between time and space in this dynamic, which reflects dispersal mechanisms that we need to investigate.

- An early "continental" pathway and a very variable rhythm of diffusion within the Western Mediterranean zone probably linked with the variety of social and environmental contexts involved in this process.

These new data highlight a complex and far less unidirectional dissemination process than that envisaged so far. In conclusion, we would also like to discuss the fact that the radiocarbon dates cannot be studied solely for their intrinsic value, without detailed contextualization (in particular the economic and technical system). Thus, if we superimpose data from the characterization of technical systems with audited and contextualized radiocarbon data, it becomes possible to bring to light complex and multi-facetted processes of the emergence and development of the Neolithic economy and to deliver a much more informative historical narrative.

07 WHO ARE YOU? EVIDENCES OF PHYLOGENETIC SIGNAL IN THE NEOLITHIC IMPRESSO-CARDIAL COMPLEX

Author(s): Pardo-Gordó, Salvador (Departament de Prehistòria. Universitat Autònoma de Barcelona) - García Rivero, Daniel (Departamento de Prehistoria y Arqueología. Universidad de Sevilla) - Bernabeu Aubán, Joan (Departament de Prehistòria, Arqueologia i Història Antiga, Universitat de València)

Presentation Format: Oral

The spread of agriculture has generally been analyzed and modelled in terms of demic diffusion. In this context, research into the Neolithic dispersal and subsequent development of agricultural groups in the Western Mediterranean shows some complex cultural patterns. Hence is the dispersal of the Neolithic is based on people movement phenomenon, it should expect that during the spread there was a parallel development of the culture and its consequence was a certain degree of diversity in several items of the Neolithic package, including the pottery productions. However, this signal in the archaeological artefacts has been interpreted but rarely evaluated using evolutionary methods.

This talk focuses on the dispersal of the Neolithic in the West Mediterranean (c. 6000-5400 cal. BC) applying phylogenetic methods and statistical methods like delta-score and similarity index in order to identify and measure traces of branching (vertical transmission) and/or blending (fission groups, horizontal transmission, borrowing…) in the first pottery productions assuming that pottery decoration is a good proxy to access cultural transmission processes.

Results suggest that both processes are present during the dispersal of the first agriculturalist societies in the Western Mediterranean although other variables (connectivity among sites) and sample size could be effects in these results.

08 THE SPREAD OF CROP HARVESTING TECHNOLOGIES IN THE MEDITERRANEAN: A VIEW FROM THE SOUTHERN BALKANS

Author(s): Mazzucco, Niccolo' (UMR 7055, CNRS / Université Paris Nanterre) - Gibaja, Juan Francisco (Archaeology of Social Dynamics group - ASD, Milá i Fontanals Institution - IMF-CSIC) - Conolly, James (Trent University, Department of Anthropology) - Naumov, Goce (Center for Prehistoric Research / Goce Delčev University) - Fidanoski, Ljubo (Museum of the City of Skopje)

Presentation Format: Oral

The Balkans are a key area for understanding the diffusion of the Neolithic into the Central and Western Mediterranean. Farmers rapidly spread, within a few centuries, over a large geographical area, from the Peloponnese to the Vardar and Struma valleys. Into these new territories, Neolithic people brought a complex package of ideas, knowledge and technologies, comprising domesticated plants and agricultural practices. In this presentation, we will approach the diffusion of farming through the analysis of the harvesting tools used by the first Neolithic communities. Harvesting tools are an important source of information on agricultural systems, and can provide data on the social, economic and technological organization of the migrating groups. The use-wear analysis of the so-called 'glossy blades' allow us to reconstruct the harvesting techniques adopted by the Neolithic farmers that moved into the southern Balkans. Data obtained from the study of a number of flaked stone assemblages from relevant archaeological sites suggest the existence of strong affinities in the way people harvested the cereals over a large area, from Thessaly to Eastern Macedonia. Our results are discussed in the light of the results obtained from previous research on the harvesting technologies of the first farmers of the Central and Western Mediterranean.

09 ADOPTION OF DOMESTIC SPECIES IN WESTERN EUROPE: COMPARING SHEEP AND CATTLE PATHWAYS IN IBERIAN PENINSULA

Author(s): Sierra, Alejandro (Grupo de investigación Primeros Pobladores del Valle del Ebro - PPVE, Universidad de Zaragoza) - Saña, María - Alcántara, Roger - Ferratges, Eloísa (Laboratori d'Arqueozoologia, Universitat Autònoma de Barcelona)

Presentation Format: Oral

The process of integration of domestic species into economic strategies has been developed through different pathways during the Neolithisation of Western Europe. In that regard, sheep and cattle, as the two most important species of the first domestic herds, show important differences in their management strategies during the early Neolithic. The diverse physiological requirements of each species and social dynamics may have been related to these trajectories. While sheep is an exogenous species, which means that it had to be introduced by the first farming societies, aurochs were already present in the Iberian Peninsula before the Neolithic.

This communication submits a synthesis of the existing data on the adoption of these two species. The trajectories and the integration rhythms of sheep and cattle are analysed and compared. In addition, the importance of both species in the Neolithic diet between different site types and regions of the Iberian Peninsula is compared. The exploitation patterns of both species and their production target (meat, milk, traction, etc.) are also evaluated. Finally, the dynamics registered for both species are correlated with their different physiological needs aiming to detect the conditioning factors (ecological, climatic, social, etc.) for their adoption. The results evidence that data on animal domestication and initial husbandry practises are a key factor in understanding Neolithisation pathways.

10 TRACING IDENTITIES AT THE IBERIAN EARLY NEOLITHIC: A FUNERARY AND MOLECULAR APPROACH

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Presentation Format: Oral

The arrival of the Neolithic to the Iberian Peninsula involved important cultural, economic and genetic changes. The Cardial expansion seems to reach the Iberian Peninsula first by the maritime colonization route. However, the inland Neolithisation of Iberia seems to occur later, being the presence of Cardial ware unusual. In that sense, the inland site of Cueva de Chaves, with an abundant Cardial assemblage, may provide valuable insights to understanding the interactions between the culturally differentiated inland and coast-

al Iberian Neolithic groups.

Despite Iberia being an important crossroad for understanding the Neolithisation process in southwestern Europe, there are only a few genetic studies available from this area with a majority focusing on the mitochondrial DNA. Likewise, stable isotope analyses have predominantly focused on carbon and nitrogen isotopes on bone collagen. Here we present a genome-wide profile from ancient individuals from Cueva de Chaves (5300-5000 cal BC.), as well as strontium isotope analysis on teeth enamel, in order to track population and individual movements at the onset of farming in Iberia. We use the published genomic data from the Iberian Early Neolithic (Cova de Els Trocs and Cova Bonica) with the objective to infer differences/similitudes among Early Neolithic peoples from this territory. Moreover, we show an updated review of funerary practices from this site. Our study shows that combining bioarchaeological analysis, including ancient DNA and isotopes, with classical archaeological inferences provides a more complete understanding of the cultural and biological interactions of the first Iberian farmers.

11 AND THE NEOLITHIC ALSO OCCURRED IN HIGH MOUNTAINS. THE CASE STUDY OF SOUTHERN CENTRAL PYREENES

Author(s): Clemente-Conte, Ignacio (CSIC-IMF) - Gassiot Ballbè, Ermengol - Rodríguez Antón, David - Obea Gómez, Laura - Díaz Bonilla, Sara - Quesada Carrasco, Manuel (Universitat Autònoma de Barcelona. Departamento de Prehistoria) - Sanchez Bonastre, Xavier (Universitat Autònoma de Barcelona) - Mazzucco, Niccolò (UMR 7055 "Prehistoire et Technologie", CNRS – Université Paris Ouest Nanterre) - Salvador Baiges, Guillem (Universitat Autònoma de Barcelona. Departamento de Prehistoria) - Rey Lanaspa, Javier (Diputación General Aragón)

Presentation Format: Oral

During the last fifteen years, the identification of new sites and the excavation of some of them has challenged the previous image on the prehistory in mountain and high mountain areas at the southern Pyrenees. Recent data show evidences of the human presence in high areas of the Axial Pyrenees as early as the Mesolithic. However, it was during the Neolithic when human settlements became more numerous and continuous in time. Current evidences document the presence of some settlements located at the slopes of the mountains, at about 1500-1800 m. asl., with a fully developed agriculture and pastoralism, at least after 5300 calBC. That means no more than two or three centuries after the first indications of agriculture are observed in lowland areas at the northeast of the Iberian Peninsula. After this chronology, it is possible to follow the expansion of pastoralism (and possibly also of agricultural practices) to higher altitudes during the end of Fourth Millennium calBC. This is confirmed by contemporaneous paleoecological data showing fire signals accompanying the first clear evidences of human impact on vegetal landscapes. This paper presents data recovered at two rock shelter with early Neolithic occupations in the Axial Pyrenees and discusses how their different locations and environments correlate with the characteristics of their occupations.

a. IMPORTS OR IMITATIONS? SOME REMARKS ON THE FINDINGS OF THE EASTERN-LINEAR CIRCLE CERAMICS IN THE UPPER VISTULA BASIN

Author(s): Szeliga, Marcin (Institute of Archaeology Maria Curie-Sklodowska University in Lublin) - Rauba-Bukowska, Anna (Institute of Archaeology and Ethnology Polish Academy of Sciences) - Gawryjolek-Szeliga, Katarzyna (Lublin)

Presentation Format: Poster

In the Upper Vistula basin currently a several dozen LPC sites are known, on which the presence of ceramic materials, ornamented in a manner typical for the eastern-linear circle style were recorded. These findings, along with quite frequent products made of the Carpathian obsidian, indicate the existence of intense contacts between the local LPC communities of the music-note and Želiezovce phases and the eastern-linear cultural groups from the Carpathian Basin.

One of the most numerous series of this category of findings originate from the LPC site in Tominy (south-central Poland) and is represented by over 50 various fragments of vessels. The diversity of decorative motifs and production techniques reveal the closest reference to the ornamentation style typical for the Kapušany-Tiszadob group and the Bükk culture from eastern Slovakia and north-eastern Hungary. Macroscopic technological analysis of the mentioned fragments of vessels does not reveal any distinct differences in relation to the remaining collection of LPC ceramics discovered in the site. Some of the ornaments, however, clearly diverge in terms of quality and workmanship from their Carpathian prototypes. Additionally on some fragments a coexistence of ornamental motifs typical for LPC and eastern-linear groups was recorded. This seems to speak for a clear quantitative advantage of local imitations of the east-linear decorative style over the fragments of imported vessels. It may indicate the presence of women from the NE part of the Carpathian Basin, as a result of undetermined social processes (migration and/or marriage exchange), initiated and successively subjected to intensification from the note phase of the LPC development. New, quite significant data in this respect are also provided by the results of mineralogical and chemical analyzes.

The study was supported by National Science Centre in Poland (grant number: 2015/19/B/HS3/01720).

b. NEW ASPECTS OF NEOLITHIZATION IN THE STEPPE ZONE OF INNER EURASIA

Author(s): Merz, Viktor (S.Toraighyrov Pavlodar State University)

Presentation Format: Poster

The process of neolithization in the steppe zone of Inner Eurasia took place under the influence of the cultures of southwest Asia.

It is demonstrated in material and spiritual culture of the ancient population of North-Eastern Kazakhstan from the Mesolithic. It reveals multi-layered Mesolithic Site Shiderty 3 having similarities with the industries of the South-Eastern Caspian. Samples of pebble and flint sculptures of this site Shiderty 3 reflect anthropomorphic and zoomorphic images which are typical for the cultures of southwest Asia. Probably their origin is connected with migration of some part of the pastoral population in the steppe zone. Gradually settling, it reached the territory of Northern Kazakhstan and the middle reaches of the Irtysh river.

The second stage of neolithization of this region was associated with the domestication of the horse and the settlement of the ancient breeders from the Volga in the Northern part of the steppe zone. This happened at the turn of VI – V Millennium BC and based by evidence of studing Borly settlement. Here are found numerous clusters of bones of domestic horses and cattle. Their Neolithic age is confirmed by C14 dates 5630±80 BP SPb-2229 and 5340±70 BP SPb-2228. This complex is associated with plate industry and ceramics Boborykino type (Middle Trans Ural).

This process was culminated by formation of Eneolithic cultures and large cattle-breeding settlements such as Borly 4 at the beginning of IV Millennium BC in this region. They represent the culture Botay-Tersek type having its own specific features.

c. THE EARLY NEOLITHIC OF THE UPPER DON

Author(s): Smolyaninov, Roman (Lipetsk State Pedagogical P. Semenov-Tyan-ShansUniversity)
Presentation Format: Poster

Territory of the Upped Don nowadays is located in the Tula, Lipetsk and Voronezh districts of Russia. River Don strikes from the North to the South. This is forest-steppe zone. Neolithic sites are located in the similar topography: settlements are located on the shore walls, in the end of the first floodplain terrace and occasionally on the root banks of rivers. Neolithic sites placed in groups ("nests") in the middle and lower part of the Don river. The surface of many of them during the spring high water is hidden under water.

The main indicator for the determining the Early Neolithic settlements in the region until today is the presence of ceramic vessels. In most cases, flint implements are similar with Mesolithic period.

First ceramic materials appeared in the forest-steppe and forest zones of the East Europe in the end of VII – VI mil. BC. These materials existed here until the first half of the V mil. BC. They have similar patterns: not ornamented or poorly ornamented pock or comb vessels, which made from the silt or silty clays. Exactly these specific patterns are used as the basis for local different Early Neolithic cultures in the Upper Don.

There are four Early Neolithic cultures here nowadays: Middle-Don culture (72 sites), Karamyschevo culture (26 sites), Upper Volga culture (4 sites) and Elshansky culture (4 sites). Earliest data, which were obtain on the ceramic materials, cover VI mil. BC (calBC). There are no data on flint implements of the Elshansky and Upper Volga cultures in the Upper Don. Flint complex is poorly presented on the researched settlements of the Middle-Don and Karamyschevo cultures. In this assemblage dominates the technology which produced tool on the flakes but not on blades. There are two examples of the house-building in the Karamyschevo culture.

595 ON SITE, BETWEEN SITES: MULTI-SCALAR NETWORKS AND ASSEMBLAGES FROM SOCIAL THEORY TO FORMAL ANALYSIS

Theme: Theories and methods in archaeological sciences
Organisers: Fulminante, Francesca (University Roma Tre; Durham University; Cambridge Univeristy) - Witcher, Rob (Durham University)
Format: Regular session

Scale is a long-standing problem in archaeology. Conventionally, it is approached as two or more distinct levels (micro vs. macro, or a series of nested scales). However, the ontological turn and the introduction of the concept of assemblages (De Landa) suggests that, at each scale, the property of the whole emerges from interactions between the constituent parts. Moreover, while the simplest entities can be conceived of as assemblages of some sort, conversely, assemblages can be considered entities in their own right.

Building on these concepts, Marston et al. (2005 'Human Geography without Scale') suggest a redefinition of the concept of 'site' as an "emergent property of its interacting human and non-human inhabitants". They argue that sites are entities that do not precede the connectivity that brings them into reality, either internally (intra-site) or across networks (inter-site). This. in turn, is consistent with recent conceptualizations of networks as self-organising systems.

Yet the methodological, theoretical and practical issues of applying multi-scalar and multi-temporal networks to archaeological data have rarely been discussed. With this session we aim to bring together scholars working on diverse periods and regions to explore applications of these concepts and to discuss their problems and potential.

01 WIRING THE PAST: A NETWORK SCIENCE PERSPECTIVE ON THE CHALLENGE OF ARCHEOLOGICAL SIMILARITY NETWORKS

Author(s): Prignano, Luce - Morer, Ignacio (Universitat de Barcelona) - Díaz-Guilera, Albert (Universitat de Barcelona; Institut of Complex Systems - UBICS)

Presentation Format: Oral

Nowadays, it is a common knowledge that scholars from different disciplines, regardless of the specificities of their research domains, can find in network science a valuable ally when tackling complexity. However, there are many difficulties that may arise, starting from the process of mapping a system onto a network which is not by any means a trivial step. This paper deals with those issues inherent to the specific challenge of building a network from archeological data, focusing in particular on networks of archeological contexts. More specifically, we address technical difficulties faced when constructing networks of contexts or sites where past interactions are inferred based on some kind of similarity between the corresponding assemblages (Archeological Similarity Networks or ASN). We propose a basic characterization in formal terms of ASN as a well-defined class of networks with its own specific features. We devote special attention to the problem of quantifying the similarity between sites, especially in relation with the ubiquitous issues of data incompleteness and the reliability of the inferred ties. We argue that, generally speaking, human past studies are quite disconnected from the rest of interdisciplinary applications of network science and that this prevent this field from fully exploiting the potential of such methods. Our goal is to give hints about what are the interesting questions that archeological applications put on the table of network scientists. We suggest that such questions need to be translated into formal terms in order to be properly addressed within the framework of multi-disciplinary collaborations. At this aim, computational experiments are devised as illustrative examples of how simple models can help the cause.

02 ASSEMBLAGE DISCONTINUITIES A CRITIQUE OF "FLAT-ONTOLOGY" FROM THE ARCHAEOLOGY OF THE CONTEMPORARY PAST

Author(s): Millan-Pascual, Rafael (CSIC - Spanish National Research Council, Institute of Heritage Sciences)

Presentation Format: Oral

Since the "ontological turn" has gained major influence in Archaeology, many old-concepts and methodologies have been replaced. "The Scale problem" shows these changes in its current assumption of the "Assemblage Theory". Assemblage-oriented-research is applied to all levels of the archaeological analysis, instead of typology, landscape archaeology or "longue durée" temporal analysis; for many, as the epistemological and ontological integration of all these partial methodologies. In my opinion, this well extended application of the theory is the main consequence of its a-historical premises, based on the "flat-ontology" DeLanda's premise. The equal consideration of all entities excludes the historical experience registered by the archaeology of contemporary past, one constituted by anthropological ruptures and disruptions where even ontology seems to change. Nothing "flat" is revealed by our recent past.

This contribution will examine this through two related problems: At first, how to investigate the ruination processes from contemporary abandonments respecting their fragmentation and integrity, and second, how to respond archaeologically to our contemporary social processes of destruction and transformation. Case studies from the Spanish contemporary past (migration processes, Civil War sites) will be used to rethink these problems, offering a critical approach to "Assemblage Theory" and its application on historical sites and territories.

03 SCALE AND RESOLUTION IN ARCHAEOLOGICAL SURVEY DATASETS: OR, WHY DO WE ONLY TALK ABOUT SQUARE-KILOMETRES NOW?

Author(s): Johnson, Paul (University of Sheffield)

Presentation Format: Oral

Archaeological survey has long been central to discussions about the tension between scale and resolution within archaeological datasets. While such discussions can remain largely philosophical in nature, there is a clear practical implication for a technologically-driven tendency towards hyper-empiricism, and the collection of more data in the belief that enlarged datasets will inevitably lead to the revelation of answers to all of our questions.

Geophysical survey is situated within these debates as a key area where what has been termed a "data deluge" is occurring through both the survey of increasingly large areas, and/or with greater spatial resolution. Geomagnetic surveys conducted with vehicle-towed multi-sensor arrays regularly cover areas measured in multiple square-kilometres, where even as recently as the last decade a survey of c. 200 hectares would have been considered to be a "big" project requiring person-years of effort to accomplish. Conversely, Ground-Penetrating Radar surveys are being undertaken with aggregated sample densities of 0.125m x 0.06m, capable of imaging sub-surface anomalies in detail far exceeding the practical capabilities of the single-channel systems which dominated the market until recently.

The last c. 10 years have seen concerns over the way that data are collected, handled, and interpreted come into sharper focus. As ever greater quantities of data are recorded and made available for study, little progress has been made in answering questions

about why. This paper will argue that only through a thorough and self-reflexive reappraisal of our research questions can we avoid hyper-empiricism. Reconceptualisation of our research framework is essential if we are to control and direct technological innovations and developments to the benefit of understanding past societies, rather than allowing the direction of research to be dictated by the latest sexy methodology or technique by hitching the wagon of archaeological knowledge to the runaway horse of technological advancement.

04 THE KLEISTHENIAN DEMES AS AN ADAPTIVE CO-EVOLUTIONARY NETWORK OF LANDSCAPES. MAPPING ANCIENT DEMOCRACY THROUGH GIS

Author(s): Arvanitis, Nikolaos (Université de Paris 1 Pantheon La Sorbonne)
Presentation Format: Oral

The kleisthenian political reform of ancient Attica, Greece, was founded on each of the circa 140 demes as the minimal unity of the territorial and human communities of the region. The prehistory and exact settlement setting of these entities are still much disputed in current scholarship, in as much as the region is not a self-evident unity but an ever-changing social construct. In absence of a shared view on what a "site" means or how should be studied, most of the maps of the Athenian settlements are still displayed as 'dots on a map', surrounded by a lifeless vacuum. But people don't settle on a dot. We approach the problem using a GIS based study and applying a critical assessment of the archaeological and textual evidence available, reviewed as 'topo-poetic' entities structured in an adaptive and co-evolutionary network. By topo-poetic entities we intend markers that convey meaning with locational attributes, literally makers of places (for example: a boundary stone, or a foundational myth), in a heterarchical and flexible matrix of possible interwoven perspectives. As such, they can be studied only in a multi-layered (i.e. subjective) definition of 'site', which should include cognition and intentionality's of who is reviewing the landscape (being he an ancient or modern). Within this analytical framework we suggest some of the possible cognitive schemata underpinning the reasons of the ancient reformer, in his choices and attempts to impose the isonomic instance.

05 THE IMPACT OF SOCIAL NETWORKS ON LOCAL IDENTITIES. A CASE STUDY OF HELLENISTIC NORTHERN ETRURIA

Author(s): Da Vela, Raffaella (Independent researcher; alumna der Rheinischen Friedrich-Wilhelms-Universität Bonn)
Presentation Format: Oral

This paper aims to analyse changes in the perception of local cultural identities between 350 BCE and 80 BCE in Northern Etruria. During the so-called process of Romanization, the region of my case study presents a complexity of patterns, as result of the interaction of local needs and backgrounds with the global process of institutional and economic unification of the Mediterranean. My principal research question is the following: how did the evolution of the economic and politic relationships between local communities affect the perception and the expression of the local identities within them? The Social Network Analysis (SNA) has been chosen as methodology to approach this complexity. Nodes of the network are the northern-Etruscan local communities. At first I will analyse the evolution of three multiscalar intelockd social networks built on the relational ties of connectivity, intermarriages and trade-flow. Then I will consider the evolution of some parameters assumed as identity markers within the local communities (node properties). The evolution of the identitiy-markers will be analysed in these communities, whose role (measurements) is affected by major changes during the diachronic evolution of the network. Some observations will be related to the interdependence of the three different relational ties and to their different impact on local identities. Finally I will try to detect patterns of behaviour or dependence between the evolution of the role of local communities in the network and the transformation of local identities within them.

06 SOCIO-MATERIAL ARCHAEOLOGICAL NETWORKS AT ÇATALHÖYÜK: CHALLENGES AND OPPORTUNITIES

Author(s): Mazzucato, Camilla (Stanford University; Koç University)
Presentation Format: Oral

The aim of this paper is to evaluate the ways in which formal socio-material archaeological network methods can be used as to elucidate mechanisms of social integration and differentiation at an early stage in the development of sedentary living. Specifically, I will present on the challenges, limits and opportunities that Archaeological Similarity Networks present for uncovering patterns of social relations and processes of group identity formation and negotiation at an intra-site level using the late Neolithic site of Çatalhöyük in Turkey as a case study. A designated UNESCO World Heritage site since 2012, Çatalhöyük represents a unique occurrence within the Neolithic of Anatolia: an undisturbed, continuous layering of dense, overlapping mudbrick buildings forming a vast tell (13 ha) that was occupied for more than 1,100 years. Çatalhöyük represents an ideal setting in which to explore the potentials and limitations of both theoretical and formal network approaches as a means of answering targeted research questions. While very large in size and population density, the site offers very little indication of hierarchical social segmentation; rather, the material and spatial evidence suggests a mosaic social fabric formed by horizontal flexible networks arranged along heterarchical lines. For the purpose of this study networks are constructed using houses as node entities as they represent at Çatalhöyük the main and enduring principle of social organization. Links between entities are then created using co-occurrence of specific material culture elements that have been carefully selected from the full range of archaeological data sets recorded at Çatalhöyük between 1993 and 2017.

07 REDEFINING CULT SITES THROUGH NETWORK ANALYSIS

Author(s): Mazzilli, Francesca (University of Cambridge)
Presentation Format: Oral

The paper aims to emphasise cult sites as the product of movements of people and ideas. This will be achieved by undertaking, for the first time, network analysis based on 29 attributes gained from multiple aspects of 60 cult sites in the Hauran (the southern Syria). It will also assess, for the first time, how and to what extent network analysis can offer a better understanding of this new re-definition of cult sites. The 29 attributes are organised into the following categories: the script of inscriptions (e.g. Greek, Aramaic), major deities based on inscriptions and statues (e.g. Zeus, Tyche), dedicators (e.g. dedicators belonging to an ethnic group, Roman soldiers), main temple's plans (e.g. Graeco-Roman cella, adyton) and decorations (e.g. Corinthian capitals). I will divide the attributes into three phases: pre-provincial period (end of second-first century BC to mid-first century AD), transition period (second half of the first century AD) and provincial period (second to third century AD). The use of this comprehensive dataset is essential in order to counterbalance the fragmentary nature of the data and to have a more complete picture of cult sites. I would follow an application of bimodal network successfully used by Raffaela da Vela's work on cultural transmissions in funerary context through a set of selected pottery types in the northern Etruria. It will visualise the evolution of cultural transmissions in religious public contexts through each category mentioned above, by identifying clusters of sites having homogenous elements from one category in three phases. This is based on the relational link between the group of cult sites and the group of different elements of a category.

08 SIZE MATTERS: USING SCALE TO UNLOCK VARIATION IN SETTLEMENTS OF THE ROMAN EMPIRE

Author(s): Hanson, John (John Hanson)
Presentation Format: Oral

As classical archaeologists and ancient historians, we are accustomed to thinking in terms of categories of sites and artefacts, such as settlements, structures, and small finds. This approach, however, often makes it difficult to understand the links between variation in the sizes of sites and variation in the amount of material generated by them, since it encourages us to think about different classes of sites and artefacts in discrete, rather than continuous, terms. This, in turn, discourages us from appreciating the extent to which these co-variances are the consequence of the emergent, non-linear, behaviour that is the hallmark of complex systems. In this talk, I will draw on new evidence for the settlements in the Roman world in the imperial period, which not only allows us to derive independent estimates for their numbers of residents but also to describe various attributes of their urban form in a controlled fashion for the first time. This opens up a new field of inquiry that allows us to approach relationships between the scales of settlements and the activities that occurred in them, represented by the material record, with greater sensitivity and nuanced than the simple nested categories of sites and artefacts that we have been reliant on.

09 SETTLEMENT SCALING THEORY AND THE ROMAN WORLD: APPLICABILITY, POTENTIAL, AND PIT-FALLS

Author(s): Mandich, Matthew (ISAR)
Presentation Format: Oral

To better interpret and model the social, political, and economic structures of past societies archaeologists have recently employed innovative approaches from the study of complex systems. Such systems are made up of many interacting parts forming a whole or outcome that cannot be (easily) predicted by examining the parts individually. While such systems are characterized by their unpredictable, adaptive, and/or non-linear nature, they are self-organising and governed by observable rules that can be analysed via various methods. As such, researchers investigating contemporary urban systems have found that certain relationships exist between a settlement's population, socio-economic outputs, and infrastructural (network) efficiency. The discovery of these correlations, identified across continents and cultures, led to the emergence of a framework known as 'settlement scaling theory', which allows for a number of quantifiable aspects of urban life to be analyzed as a function of settlement population size. For example, as population increases a settlement will become denser since its infrastructural networks become more efficient, exhibiting economies of scale (or sub-linear scaling). However, a larger population also leads to higher socio-economic outputs that exhibit increasing returns to scale (super-linear scaling) when plotted against population. Evidence for these same patterns has been found in settlement data from several pre-modern contexts, indicating that the processes behind these scaling relationships are the result of more general phenomena unbound by the parameters of the modern world. The results of such research can contribute substantially to current debates surrounding urbanization and economic development in the ancient world; yet, as we move forward we must be aware of the potential and the pit-falls this new approach. This paper will then examine the applicability of this emerging framework for the study of settlement data from the Roman world and discuss the pros and cons of its use at multiple scales.

10 EXAMINING SOCIAL, PHYSICAL AND TEMPORAL SCALE IN IRON AGE AND ROMAN BRITAIN: CONVEYING COMPLEXITY AMID INCREASING CATEGORISATION

Author(s): Garland, Nicky (Newcastle University)
Presentation Format: Oral

A multi-scalar and multi-temporal examination of archaeological landscapes allows us to understand complexity in past societies,

but also how these social groups changed over time. However, such an approach requires an increasing number of categories to fully define and understand specific social scales before we can explore them together as a single multi-scalar social network. This categorisation provides several difficulties. Classifying different groups may lead to the distinction of individual components within a single network, creating an uneven and disjointed perception between different social, temporal and physical scales. It is also possible that differing archaeological traditions may lead to these categories being presupposed. Temporal categories, for example, each have specific methodological and theoretical approaches that may make integration challenging, particularly between prehistoric and historic disciplines.

This paper stems from the approach developed during my doctoral research (Garland 2016, 2017). Through the combination of several theoretical frameworks, this research aimed to understand different social scales across the Iron Age-Roman transition period in Britain. Although successful in understanding complexity in ancient societies and how they changed over time, several methodological pit falls had to be overcome along the way. This paper will discuss the methodology for this multi-scalar and cross-temporal analysis and discuss some of the difficulties in undertaking such an enquiry across a vast archaeological landscape. I will address how this approach can lead to increasing categorisation in conventional accounts, which restricts our ability to describe complex social structures. This paper also addresses how different writing styles (descriptive, persuasive, narrative) may allow a greater conveyance of this archaeological complexity.

11 ALBERESE: A ROMAN VICUS? A MULTI-SCALAR APPROACH TO THE ROMAN LANDSCAPE IN THE AGER RUSELLANUS

Author(s): Chirico, Elena (Università di Siena) - Colombini, Matteo (Università di Firenze)
Presentation Format: Oral

Our study focuses on Alberese, Italy, shows how a multi-scalar approach can better explain the dynamics of the Roman rural settlement. The analysis is based on archaeological, textual and and epigraphical data together with the geo-archaeological study of the landscape and coastline. Alberese, in the southern part of the ager Rusellanus, was a probable Roman vicus comprising a sanctuary, the mansio of Hasta, the positio of Umbro flumen, a Roman villa and a manufacturing quarter. Connectivity of the territory with the wider region was facilitated by the river Ombrone, the Tyrrhenian Sea and the via Aurelia vetus. Material culture and epigraphical data demonstrate that this network was well established by the end of the first century A.D. At the same time, nearby Roselle experienced a boom in construction and economy and the ager Cosanus became res Caesaris (imperial property), as evidenced by stamped brick from urban figlinae, the euergetism of the emperors and inscriptions of the familia Caesaris. The imperial property modified the settlement patterns and economical organization of the Alberese territory, as illustrated by the villa at Settefinestre. During the early second century, Trajan promoted maritime connectivity along the Tyrrhenian coast as part of the annona (food supply for Rome) and built the imperial villas of portus Cosanus and Telamonis, and the cabotage ports of Torre Saline and Umbro flumen. This system eventually collapsed at the end of fifth century, probably as a result of changes within the imperial system following the Vandal conquest of North Africa and the collapse of the western Roman Empire.

12 MULTI-SCALAR TRANSPORTATION NETWORKS IN PRE-ROMAN AND ROMAN CENTRAL ITALY

Author(s): Fulminante, Francesca (University Roma Tre) - Witcher, Rob (Durham University)
Presentation Format: Oral

Settlements are the product of interactions among their inhabitants both within a site and among sites. Terrestrial routes can be considered as the result of the interplay of multiple factors: they are essential for permitting inter-settlement cooperative processes (information exchange, trade, defense), and at the same time, they need some level of cooperation to be established. However, since their creation and maintenance require a not negligible amount of resources, transportation routes are affected by competing interests. We can think of each connection between a pair of places as the result of a negotiation that involves the two actors but that can also be influenced, to some extent, by "third parties" as, for instance, a political authority acting on a higher level.

In this paper we focus on terrestrial transportation communication networks in Pre-Roman and Roman central Italy as a case study and we compare information about Roman age roads to modelled routes based on least-cost path connections among pre-Roman and Roman settlements in central Italy both at the regional (inter-cities) and local level (urban-rural). Our aim is to understand the complex cause relationship between settlements and communication transportation routes. Where routes established to connect previously existing settlement or were new settlements founded along pre-existing established long distance connections?

Some preliminary analyses seem to suggest that most of the important Roman roads running along relevant long-distance natural routes along the peninsula (river valleys, ridges etc.) were significant connections well before the Roman time both as long-distant stretches but also for small-scale local communications.

13 ANIMATE AND RELATIONAL PLACES

Author(s): Prijatelj, Agni (Durham University)
Presentation Format: Oral

Archaeological records from caves and rockshelters have traditionally been studied on different scales, ranging from intra-site studies of activity areas and artefact depositions (e.g. Angelucci et al. 2009; Bailey & Galanidou 2009) to inter-site networks of

(chiefly) prehistoric gatherings (e.g. Gamble 1999). Regardless of the scale chosen, such approaches have frequently shared an anthropocentric perspective by portraying underground places as a blank stage upon which the social was enacted.

This paper, however, takes an alternative approach. By employing relational ontology (e.g. Bennett 2010; Cruikshank 2005) and the concept of assemblages (DeLanda 2016), I propose that places in general, and caves and rockshelters in particular, be seen as animate, hybrid, participant and continuously-changing. To explore their vibrancy, I present a selection of case studies from the Kras region (SW Slovenia), and demonstrate a meshwork of multiple dynamic and fluid connections between matter, people, animals, plants and things, acting on an intra-site scale.

In addition to discussing them as fluid assemblages, I also examine caves and rockshelters as distinct entities in their own right: I present them as nodes within regional networks on the Kras plateau which, through their particular place-power, have actively participated in the creation of various social memories, meanings, communal anchors, power-geometries and ultimately, wider lifeways in the region.

By using both assemblage and network approaches, I thus aim to demonstrate that places are complex systems which can, depending on the scale of observation, be seen as fluid or solid, open or bounded, but always animate and relational.

596 EXPLORING THE POTENTIAL OF DENTAL CALCULUS FOR RECONSTRUCTING THE PAST

Theme: Theories and methods in archaeological sciences
Organisers: Kolp-Godoy, Maria (University of Zurich, Department of Prehistoric Archaeology) - Samplonius Angobaldo, Anton (Odontological Office Torres de San Isidro Golf; Universidad Nacional Mayor de San Marcos) - Power, Robert C. (Ludwig-Maximilians-Universität München, Institut für Vor- und Frühgeschichtliche Archäologie und Provinzialrömische Archäologie; Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology)
Format: Regular session

Teeth are amazing! Their excellent degree of preservation and 'survival rate' in archaeological and forensic contexts is widely recognized. However, their consideration as a primary source of information in the reconstruction of ancient lifestyles has been somewhat ungrateful. The latest development of forensic, biochemical and genetic studies, in which teeth are one of the main objects of research, has proven the potential of dental anthropology in exploring our past. From this approach, this session seeks to integrate a variety of investigations focused on the reconstruction of diets, lifestyles and health status of past societies through the analysis of teeth as primary source of information, by integrating different dental methodological approaches on bioarchaeological studies, such as dental biodistance, morphological variability, microdental and biochemical technics of dental analysis. As well as, it seeks to provide a venue of discussion about the potential of new dental anthropological techniques and methodologies in the archaeological interpretation.

ABSTRACTS

01 DIET AND HEALTH STATUS DURING THE LATE PREHISTORY IN EASTERN EUROPE: CASE STUDIES OF IRON AGE COMMUNITIES IN TRANSYLVANIA

Author(s): Gál, Szilárd (Romanian Academy. Institute of Archaeology and History of Art of Cluj-Napoca)
Presentation Format: Oral

Our investigation focuses on the anthropological analysis of Iron Age communities (Scythian and Celtic populations) from Easter Europe, especially Transylvania (Romania), territory where these two communities succeeded each other in the period between 7th and early 2nd centuries BCE. Our study is based on osteological samples collected from the most important cemeteries of the period (inhumtation and cremation graves): Pişcolt, Fântânele 1 and 2, Sâncrai, Sălcuța. Beside morpho-taxonomical analysis, our investigations implied two further different methods in collaboration with the University of Medicine and Pharmacy of Tîrgu 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 pathological cases on the skeleton and dental diseases. Near biochemical analysis we intend to identify stress markers on postcranial skeletons and teeth to find out the life style of late prehistory populations.

The present paper – conducted in the frames of a grant supported by the Ministry of Research and Innovation, CNCS-UEFISCDI project number PN-III-P4-IDPCE-2016-0353, within PNCDI III – aims to present micro-regional health status and dietary continuity and transformations of the eastern Scythian and Western European Celtic communities during late prehistory.

02 THE RELATIONSHIP OF SOCIAL STATUS AND DIET DURING THE MIGRATION PERIOD AND THE EARLY MEDIEVAL PERIOD IN PRESENT-DAY CZECH REPUBLIC

Author(s): Ibrova, Alexandra (Department of Anthropology and Human Genetics, Faculty of Science, Charles University) - Kaupova, Sylva (National Museum, Department of Anthropology) - Stepanovsky, Michal (Department of Computer Systems, Faculty of Information

Technology, Czech Technical University in Prague) - Bayle, Priscilla (PACEA - de la Prehistoire a l'Actuel, Cultures, Environnement, Anthropologie, Universite de Bordeaux - Centre National de la Recherche Scientique, Batiment B8) - Novotna, Adela (Department of Anthropology and Human Genetics, Faculty of Science, Charles University) - Veleminsky, Petr (National Museum, Department of Anthropology) - Polacek, Lumir (Institute of Archaeology of the Academy of Sciences of the Czech Republic) - Smerda, Jaromir (Masaryk Museum in Hodonin) - Veleminska, Jana (Department of Anthropology and Human Genetics, Faculty of Science, Charles University)
Presentation Format: Oral

The main aim was to study relationship of social status and diet during the Migration period (Lombard settlement, 5th/6th ct) and the early Medieval period (Great Moravia, 9th/10thct) in the Czech Republic using dental internal structure (DIS) analysis and stable isotope analysis (SIA). Previously reported differences in various bioarchaeological markers among the Great Moravian sample suggest dietary differences between socioeconomic classes. A population of Lombards was chosen as comparative sample. Dietary changes might be demonstrated in changes of thickness and distribution of enamel. SIA of carbon and nitrogen enables us to assess the dietary proportion of animal products and the relative importance of C3 vs C4 plants in diet and the use of aquatic resources.

Sample consisted of upper M2 of 50 individuals: elite graves (n=20; fortified centre Mikulčice, Great Moravia), agricultural hinterland (n=15; Prušánky and Josefov, Great Moravia) and Lombard graves (n=15; Kyjov). Each M2 was scanned using SkyScan 1172. Micro-CT scans were semi-automatically segmented and 3D surface models with topographic enamel maps were generated using Avizo 6.0. SIA was performed on two samples from each individual. Compact bone of rib was sampled to reconstruct adult dietary behaviour and the upper part of the M2 root was sampled to reconstruct the diet at the age of 8 to 10.

The preliminary results of DIS analysis suggested differences in enamel distribution between elite individuals and agricultural hinterland. The results of SIA suggested dietary differences with Lombard diet being predominantly C3 based, while for Great Moravians, substantial input of C4 plants was typical. Diet of the hinterland sample contained less animal products that in both the other samples. These results were confronted with the results of DIS analysis at the individual level. The unique combination of these two techniques allows us to perform individual bioarchaeological analysis on microscopic level.

03 DIET IN CHILDHOOD AND ADULTHOOD IN EARLY MEDIEVAL POPULATION FROM CENTRAL EUROPE (MIKULČICE, 9TH-10TH CENTURY, CZECH REPUBLIC)

Author(s): Jílková, Michaela (Charles University) - Kaupová, Sylva (National Museum) - Brůžek, Jaroslav (Charles University) - Poláček, Lumír (Institute of Archaeology of the Czech Academy of Science, Brno) - Velemínský, Petr (National Museum)
Presentation Format: Oral

A stable isotope analysis of carbon and nitrogen in tooth and bone collagen is a valuable tool for dietary reconstruction. It allows us to judge the contribution of animal products, the proportion of C3 vs. C4 plants in an individual diet and also the usage of aquatic sources. We used this method to study the diet of Great Moravian population in childhood (8 - 10 years) vs. in adulthood to get more information about timing of the formation of social roles. Previous studies focused on Great Moravian population found dietary differences between socio-economic classes, so our aim was to find out whether these differences formed already in childhood or emerged in the latter phase of the life.

We used a sample of 46 adult individuals of the 6th church's cemetery in the Mikulčice settlement agglomeration. Two samples from each individual were taken – one from cortical bone (rib) to assess adult diet and one from upper part of root of M2 to obtain information about the diet in childhood.

Our results indicate a bigger contribution of millet (a typical Slavic crop) in the diet of children than of adults. Children also consumed less animal products then adult part of population. Further, it seems that dietary differences in access to animal products based on socio-economic status were already present in childhood and remained stable during the live.

This study was supported by Grant Agency of the Charles University in Prague (Grant number: 526216) and by the Grant Agency of the Czech Republic (Grant number: 17-01878S).

04 LAST SUPPER! IDENTIFICATION OF VEGETABLE MICRO-RESTS IN SEDIMENT FROM DENTAL CAVITIES AND CALCULUS IN PERUVIAN PRE-CERAMIC PERIODS (BC. 2500)

Author(s): Samplonius Angobaldo, Anton (UNMSM) - Kolp-Godoy Allende, Maria (University of Zurich, Department of Prehistoric Archaeology) - Carbonel, Dayanna - Narvaez, Joaquín (Ministerio de Cultura, Peru)
Presentation Format: Oral

Findings of plant micro-rests in dental calculus to assess paleodiets is widely documented (Gonzáles et al. 2015; Piperno and Dillehay 2008). However, fewer studies report the evidence of micro-rests in sediment from dental cavities or carious lesions. Some studies have analyzed the content of specific intra-cavitary dental treatments (Andrew 2012; Bernardi 2012; Gibson 1971). On the other hand, data from dental calculus analysis seems to be quite broad. It contains basically fossilized, petrified, and preserved information about different micro-residues usually associated with people's diet. Also, each fragment of dental calculus provides information about the accumulation of plaque-residues over a period of time in people's life. Dental cavities, by its inherent characteristics, is a process of bacterial acid corrosion of food particles ingested by the host. This process rapidly destroys both, food (carbohydrate and protein) and the surrounding dental structure of a lesion. Therefore, all micro-rests stored in dental cavities reflect what was eaten antemortem and perimortem. In other words, the Last Supper of an individual's life. Dental cavities are even a kind of

time capsules containing residues of medicines chewed and ingested during the last days of an individual's life, shedding light on his/her cause of death. This study highlights the novelty, innovation, and usefulness of this new approach in providing paleopathological and paleodietary information.

05 THE USE OF TEETH FOR IDENTIFYING KINSHIP: AN ANALYSIS OF BIOLOGICAL SIMILARITY FROM EARLY MEDIEVAL SKELETAL ASSEMBLAGES

Author(s): Stewart, Allison (The University of Central Lancashire)
Presentation Format: Oral

Human teeth are storytellers, in that, through analysis of their size and shape osteoarchaeologists are able to 'talk' to the dead and translate biological data into social meaning. This concept has been explored in parts of the world through investigations of biodistance and kinship, but few have focused in depth on early medieval populations from South East England. This paper sets out to investigate two main aims: are teeth able to provide researchers with enough information to identify biological distance between individuals in skeletal assemblages and, if so, what can those findings be used for in order to help interpret social and cultural aspects of these populations?

Results will be presented from an investigation of metric and geometric shape data from the dentition of skeletal remains from Anglo-Saxon populations in Kent and Cambridgeshire, England. These will aim to highlight the usefulness of teeth in discovering shared biological traits within these populations and, in combination with contextual and historical evidence, form a stronger discussion around the ideas of kinship, family identity in death and cemetery structure during this era.

An argument will also be put forward in regards to the limitations of the use of biological data, as it alone is not enough evidence to completely understand and portray social concepts at the cultural level. Rather, this type of data is more useful as a building block which helps to bridge the gap between social constructs and the dead in order to substantiate interpretations about past populations in more significant ways.

06 DENTAL MORPHOLOGY ANALYSIS EVIDENCES HUNTER-GATHERER BIOLOGICAL PROFILE'S RETENTION IN FARMER POPULATIONS FROM THE IBERIAN PENINSULA

Author(s): López Onaindia, Diego - Coca, Mireia (Grup de Recerca Aplicada al Patrimoni Cultural - GRAPAC. Unitat d'Antropologia Biològica; Departament de Biologia Animal, Biologia Vegetal i Ecologia; Universitat Autònoma de Barcelona) - Schmitt, Aurore (Aurore Schmitt CNRS-UMR 7268 ADES Faculté de Médecine) - Gibaja, Juan F. (Institució Milà i Fontanals - CSIC-IMF, Consejo Superior de Investigaciones Científicas Departament d'Arqueologia i Antropologia) - Subirà, M. Eulàlia (Grup de Recerca Aplicada al Patrimoni Cultural - GRAPAC. Unitat d'Antropologia Biològica; Departament de Biologia Animal, Biologia Vegetal i Ecologia; Universitat Autònoma de Barcelona)
Presentation Format: Oral

Dental morphology studies have largely been used in order to assess biological affinities between different human populations in various contexts. Moreover, recent studies have shown that the results obtained with this method match with those obtained with DNA, but usually, it allows studying larger samples. The present work focuses on the transition from the Mesolithic to the Neolithic in the Northeast of the Iberian Peninsula, and the biological implications of this change in the human populations of the area.The latest studies show that this transition was a rather heterogeneous process.

We present the analysis of biological affinities based on dental morphology of at least 1,391 individuals representing Pre-Neolithic Hunter-Gatherers, different Neolithic groups and Bronze Age groups from the Northeast of the Iberian Peninsula and Southern France, the study with a larger sample size regarding this subject in the area to date.

The results show overall similar patterns as those reported by recent aDNA studies and show that the transition did not occur by the same mechanisms in all the regions, while in some areas an influx of population is observed, in other areas populations descendent from previous Mesolithic groups persisted. Our results also suggest that at the first moment of the spread of agricultural groups, these came from two different routes into the Iberian Peninsula: one from the east, from the Mediterranean area; and the other through the Pyrenees from the North. Finally, after the Middle-Neolithic, the farmer populations present a biological profile that was more affine to the Hunter-Gatherer one that to the one of the incoming groups.

07 A NEW ETIOLOGY OF DENTAL CHIPPING DUE TO BOTTLE CAPS. A PERUVIAN CLINICAL CASE

Author(s): Samplonius Angobaldo, Anton (UNMSM; Office Tower Golf of San Isidro) - Kolp-Godoy Allende, Maria (University of Zurich)
Presentation Format: Oral

For several decades most of popular beverage bottles, especially beer bottles, have been sealed with a typical bottle crown cap. As a sign of courage and masculinity, the opening of them by using teeth is still today a frequent habit in modern societies. Clinical observations have identified a dental lesion, specifically a new dental chipping, associated with this modern behavior in a particular social segment. This presentation shows this new etiology of dental chipping and its different degrees of severity. Similarly, from a clinical and anthropological approach, this case highlights how important medical anamnesis is in reconstructing the etiology of a dental lesion, which can easily be misinterpreted in the absence of a sociocultural reconstruction of the case. That means, we must compile all information regarding the sociocultural and physiological environment of the analyzed individuals (patients), their eating habits, oral hygiene habits, possible signs such as diseases, respiratory problems, medications, that may affect their health. It will

allow us to reconstruct clinically patient's history, determine a diagnosis and establish a treatment, while anthropologically to reconstruct food and non-food habits suggesting specific sociocultural behaviors. In addition, this case also show us a new guideline to assess the archaeological context of studied populations in dental anthropological research.

08 DENTAL MODIFICATION IN EUROPE DURING THE VIKING AGE

Author(s): Ahlstrom Arcini, Caroline (National Historical Museums)
Presentation Format: Oral

As the social being that humans are, they need to show belonging; no one wants to be alone or left out. Those who do not feel that they belong in the crowd, in various ways and for different reasons, still want someone to have a sense of community with. Everyone at some time in life has noticed a sign of recognition in another person. Our social identity is created in childhood when we look at people and related to some and distance ourselves from others. Interaction between humans often takes place with the aid of different symbols. To signal our belonging with regards to sex, age, group, ethnicity, ideology, or lifestyle, we use things like clothes and body decorations in different forms. Some of these decorations are chosen to stay forever. Dental enamel is the hardest substance in the body and is preserved even after the skeleton has decomposed and disappeared. Ever since the end of the nineteenth century scholars have noticed and documented different forms of dental modification all over the world. Studying dental modification is thus a way to obtain knowledge about human behaviour and how it can be linked to different cultures, and the possible underlying causes. In most cultures throughout the world dental modification is seen in both men and women. At the end of the 1980s, discoveries were made showing that people in Europe also changed the appearance, through filing horizontal furrows of their teeth. However, it has only been found in men. It has been found in 25 places, and in 132 individuals within Sweden's present-day borders, but also a few cases in Denmark, one case in England and one in Egypt. So, what is the signal of modified teeth?

597 TEETH ARE AMAZING! THE CONTRIBUTION OF DENTAL ANTHROPOLOGY IN RECONSTRUCTING LIFESTYLES, SOCIAL BEHAVIORS, HEALTH AND DIET IN THE PAST

Theme: Theories and methods in archaeological sciences
Organisers: Power, Robert (Department of Archaeology, Max Planck Institute for the Science of Human History; Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology) - Gur Arieh, Shira (Faculty of Archaeology, Leiden University) - Spiteri, Cynthianne (Eberhard Karls Universität Tübingen, Institut für Ur- und Frühgeschichte und Archäologie des Mittelalters) - Salazar Garcia, Domingo Carlos (Grupo de Investigación en Prehistoria IT-622-13 - UPV-EHU/IKERBASQUE-Basque Foundation for Science; Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology; Department of Geological Sciences, University of Cape Town; Department of Archaeogenetics, Max-Planck Institute for the Science of Human History)
Format: Regular session

In recent years there has been increasing attention on ancient human dental calculus as a reservoir of information on diet, health and metagenomes. Researchers first appreciated the potential of dental calculus as a source of information on life history with the advent of plant micro-remain studies in dental calculus in the 1970s. Although dental calculus was largely overlooked in archaeological research until the 1990s, since then the study into ancient biomolecules trapped within its structure has grown exponentially as researchers increasingly tapped the potential of this near ubiquitous material. A myriad of studies over the last few years have targeted dietary lipids, proteins and aDNA, and metagenomes to explore questions related to diet and microbiology, opening new avenues of research into the life of ancient peoples. In this session, we would like to invite papers presenting new research that uses different scientific techniques to study dental calculus and shed light on past populations. We also invite papers that examine the analytical methodologies applied, and studies on method development and validation. Multidisciplinary approaches to research that incorporate other techniques from archaeological sciences are particularly encouraged.

ABSTRACTS

01 ANCIENT BIOGRAPHIES. WHAT CAN DENTAL CALCULUS REALLY TELL US ABOUT THE PALAEOLITHIC

Author(s): Hardy, Karen (ICREA; Universitat Autonoma de Barcelona)
Presentation Format: Oral

Dental calculus is a depositional environment into which material can enter from a range of different sources. In this respect, it represents an archaeological deposit that can comprise environmental and cultural as well as dietary material which can reach the mouth and become embedded through different pathways. A wide range of features including breathing, food preparation methods, food stickiness, salivary clearance and oral hygiene methods all impact on which materials become embedded in dental calculus. Likewise, the type of archaeological data obtained depends largely on the methods used to recover it. The recovery of biomolecular markers and genetic material is providing new data on ingested dietary and medicinal items and human microbial communities, yet even here, survival rates for biomolecular markers is variable and can only be considered a sample of certain items that may at some point in life have been ingested, potentially for non-dietary as well as dietary purposes, such as for their medicinal properties. But

use of microfossil materials to infer diet is problematic due to the tiny amounts of unquantifiable remains, as is the inference that cooking can be identified from these. In order for meaningful information on diet to be obtained, a much greater understanding of the way dental calculus builds up and how and why some materials become embedded is needed in order to obtain useful data that can lead to a better understanding of features of past lives.

02 NEW INSIGHTS INTO SUBSISTENCE PRACTICES AT THE MESOLITHIC-NEOLITHIC TRANSITION IN THE CENTRAL BALKANS: DATA FROM DENTAL CALCULUS ANALYSIS

Author(s): Jovanovic, Jelena (The Bioarchaeology Group, BioSense Institute, University of Novi Sad) - Power, Robert (Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology, Leipzig) - Stefanovic, Sofija (The Bioarchaeology Group, BioSense Institute, University of Novi Sad; Laboratory for Bioarchaeology, Department of Archaeology, Faculty of Philosophy, University of Belgrade)

Presentation Format: Oral

One of the major debates in European prehistory concerns the nature of the Neolithic Transition. The Neolithic way of life, where a sedentary farming spreading from the Near East to the Central Europe replaced forager lifestyles, changed human biology, dietary choices and subsistence strategies. The Balkans represents one of the key areas for studying the process of Neolithisation, as it is located at the crossroad between the Near East and Central Europe. Results of previous dietary studies in the Central Balkan area, based on stable isotope data (C, N, S) indicate that many Neolithic humans remained reliant on aquatic resources. The speed of the Neolithisation process and the extent that the rich resources of some of the river environments within Central Balkans delayed uptake of domestic cultigens is unclear. The identification of microbotanical remains in human dental calculus is a powerful tool to access direct evidence of ancient diets. Dietary reconstructions based on plant microfossils, such as starch grains and phytoliths entrapped in calculus, have been useful in increasing our knowledge of plant consumption in ancient populations. The rich skeletal collection record from sites in the Central Balkans with its long Mesolithic-Neolithic sequence (9500-5200 cal. BC), provides the opportunity to reconstruct plant use and local subsistence practices by using dental calculus analysis. The resulting data sheds light on the nature of the Mesolithic-Neolithic transformation and provide better understanding of the dynamics of the Neolithisation process across the continent.

03 LIFE STORIES HIDDEN IN DENTAL PLAQUE: DIETARY AND NON-DIETARY USE OF TEETH IN THE MESOLITHIC CENTRAL BALKANS

Author(s): Cristiani, Emanuela (Sapienza University of Rome) - Radini, Anita (University of York) - Caricola, Isabella (Sapienza University of Rome) - Boric, Dusan (Columbia University)

Presentation Format: Oral

Recent methodological developments in analysing micro-fossils found trapped in human dental calculus have enabled new ways of assessing neglected aspects of hunter-gatherer-fisher subsistence along with non-dietary information on human interaction with varied environments. The potential of this method has mainly been recognised for reconstructing the relative proportion of plant foods in human diets. In addition, the recovery in dental calculus of micro-particles of material deliberately or accidentally ingested during the performance of various activities has also proven the potential of the study of dental calculus in providing insights into aspects of individual life histories other than nutrition.

Among different forager populations of Mesolithic Europe, isotope studies have indicated that forager diets were largely based on terrestrial, marine or riverine protein-rich resources while scanty and fragmentary is the evidence for the consumption of plant foods. In the Mesolithic of the central Balkans, the dearth of information on the role of plant foods is due to recovery hindrances (e.g. absence of extensive flotation during excavation) as well as methodological biases related to the predominance of approaches sensitive to the animal protein contribution to diet (e.g. isotope and zooarchaeological studies).

With the aim of understanding nuances of Mesolithic dietary regimes in the central Balkans, we present the results of the analysis of micro-fossils entrapped in dental calculus on 46 individuals from four different sites in the Danube Gorges area in Serbia: Vlasac, Haudučka Vodenica, Padina and Lepenski Vir. The data obtained from dental calculus are discussed against the results of stable isotope study as well as functional evidence obtained through the use-wear and residue analysis of material culture, in particular macro-lithic tools. These different lines of evidence allow us to understand the role of plants and plant-related activities in the region.

04 HIGH RESOLUTION APPROACHES TO DENTAL CALCULUS RECONSTRUCTION OF DIET IN CHALCOLITHIC IBERIA

Author(s): Power, Robert (Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology) - Haber, María - Avilés Fernández, Azucena - Lomba-Maurand, Joaquín (Departamento de Prehistoria, Arqueología, Historia Antigua Historia Medieval y CC y TT Historiográficas, Universidad de Murcia) - Salazar-García, Domingo C. (Grupo de Investigación en Prehistoria IT-622-13 - UPV-EHU/IKERBASQUE-Basque Foundation for Science)

Presentation Format: Oral

Human dental calculus is an increasingly common material to reconstruct diet in the human past. Most applications of dental calculus dietary research have used microscopic food remains, mostly starch and phytoliths, to qualitatively infer plant food use. Although

dental calculus-based studies have made considerable strides in understanding dietary change at crucial points in human history, only a relatively few experimental studies with well-understood diets have been conducted. Most archaeological studies have relied upon a small number of individuals and sometimes relatively low numbers of microremains. As it becomes increasingly clear that dental calculus typically exhibits a highly stochastic dietary signal, there is a need to better explain variability. However, deciphering this variable dietary signal has been limited by the few approaches that work with large sample sizes within a single population. To better understand the dental calculus signal, we analysed dental calculus from a sample of a single Chalcolithic southeastern Iberian population at Camino del Molino (Caravaca de la Cruz, Murcia). The Camino del Molino sample represents a population span of 300-400 years who lived during the first half of the third millennium B.C. We compared the dietary variability present in the dental calculus record with other lines of evidence of diet. Preliminary results indicate that starch and phytoliths may be a relatively small proportion of dental calculus assemblages and that other types of microremains can offer information about human behaviour. The data also highlight the importance of local conditions in influencing microremain preservation.

05 PALAEOGENOMIC INVESTIGATION OF 50,000 YEARS OF THE HUMAN ORAL MICROBIOME IN THE IBERIAN MEDITERRANEAN

Author(s): Fellows Yates, James (Max Planck Institute for the Science of Human History) - Salazar-García, Domingo (Max Planck Institute for the Science of Human History; Grupo de Investigación en Prehistoria IT-622-13 - UPV-EHU/IKERBASQUE-Basque Foundation for Science) - Hofman, Courtney (University of Oklahoma) - Aron, Franziska (Max Planck Institute for the Science of Human History) - Power, Robert (Max Planck Institute for Evolutionary Anthropology) - Benítez de Lugo Enrich, Luis (Universidad Autónoma de Madrid) - Haber, María (Universidad de Murcia) - García Atiénzar, Gabriel (Universidad de Alicante) - Oms, Xavier (Universitat de Barcelona) - Benito, María (Universidad Complutense de Madrid) - Avilés Fernández, Azucena - Sanz, Montserrat - Barciela González, Virginia - Valero Tévar, Miguel Ángel - Gallego Valle, David - Zarzalejos Prieto, Mar - Giner Iranzo, Daniel - Hevia Gómez, Patricia - Peña Ruiz, Cristina - Esteban Borrajo, Germán - Molero García, Jesús - Fez Calvo, Carmelo - Díez, J. Carlos - Daura, Joan - Lomba-Maurandi, Joaquín - Menéndez, Mario - Hernández Pérez, Mauro - Villaverde Bonilla, Valentín - Krause, Johannes - Herbig, Alexander - Warinner, Christina

Presentation Format: Oral

The bacterial communities that live on the human body play an important role in health and disease during the lifetime of an individual. Furthermore, research on these 'microbiota' in modern populations have shown that cultural behaviour influences the composition of these communities, with subsequent effects on the host. Recent findings of well preserved endogenous microbial DNA in archaeological dental calculus has provided insights into the biology and cultural behaviour of past individuals.

Previously, it has been argued that agricultural and industrial dietary transitions may have had a major impact on the makeup of microbiome communities in European human populations. However, these findings were based on a small number of geographically dispersed samples and focused on PCR amplification of a single bacterial marker gene. To control for geographic and inter-individual variation of the oral microbiota, as well as potential amplification biases, we have generated shotgun metagenomic DNA sequence data from over 100 dental calculus samples focusing on populations from a single region, the Iberian Mediterranean and its inland area of influence, which chronologically spans from the Palaeolithic to the present day. We present results on the genetic preservation of dental calculus over this interval and test for associations between patterns in the oral microbial communities and human cultural periods.

598 ARCHAEOLOGY AND INTERDISCIPLINARITY & INTERDISCIPLINARITY IN ARCHAEOLOGY: STORIES OF A LONG AND DIVERSIFIED JOURNEY (19TH-21ST CENTURIES)

Theme: Theories and methods in archaeological sciences

Organisers: Martins, Ana Cristina (Fundação para a Ciência e a Tecnologia / Instituto de História Contemporânea-CEHFCi-UÉ-FCSH-Universidade NOVA de Lisboa; UNIARQ-Centro de Arqueologia da Universidade de Lisboa; InterArq Project) - Ordieres Díez, Isabel (Escuela de Arquitectura-Universidad de Alcalá; InterArq Project)

Format: Regular session

Rooted in scientific areas as diverse as architecture and geology, archaeology was affirmed in the 19th century through collaboration with other disciplines such as philology and anthropology. On the other hand, archaeology played a fundamental role in the establishment of the fields of conservation and restoration. Meanwhile, it was contemplated in heritage policy and legislation, contributed to the production of knowledge divulged in different supports and ways, as well as to the development of the tourism.

Bringing together interests, purposes and procedures defined by different actors, individual and collective, public and private, local, regional, national and transnational, archaeology has been evolving theoretically and methodologically due to new ways of looking at the past. New ways that have been and are being generated by (and together to) other human and social sciences, as well as enhanced and / or urged by exact and natural sciences.

This session invites papers and posters dealing with topics such as:

- archaeology and other sciences;

- interdisciplinarity, reanalysis and reuses of the past;
- archaeology, heritage preservation and museums;
- teaching archaeology;
- archaeology, journalism, mass communication, digital platforms and new social nets;
- archaeology, cultural tourism and sustainable development.

Following the previous seminar organized within the research project 'InterArq-Archaeology and Interdisciplinarity' (Barcelona, 2017) this session aims to obtain a broader (geographical, chronological and thematic) picture of this issue.

ABSTRACTS

01 INTRODUCTION

Author(s): Ordieres Díez, Isabel (Escuela de Arquitectura-Universidad de Alcalá; InterArq Project) - Martins, Ana Cristina (Fundação para a Ciência e a Tecnologia / Instituto de História Contemporânea-CEHFCi-UÉ-FCSH-Universidade NOVA de Lisboa; UNIARQ-Centro de Arqueologia da Universidade de Lisboa; InterArq Project)

Presentation Format: Oral

The question of interdisciplinarity occurs historically at the moment when Positivism and the methodological advances of the sciences and disciplines lead to an ever greater specialization. What on the one hand has been a great advantage to advance quickly in knowledge has also had another side: that of disconnecting more and more other knowledge and epistemological tools that were closer to the pioneers of the world of archaeology.

Interdisciplinarity has come to fill those gaps that high specialization has been causing in the second half of the 20th century.

One of the issues that we raised in this session is to see if this has been true. That is, how this double phenomenon has been produced throughout the nineteenth and twentieth centuries, first of a progressive selection of methodological tools, to focus the effort in a certain direction, and, in the second round, of an attempt to recover that "lost" through unsuspected connections and exchanges of experiences with other professionals.

One thing is clear, from this increasingly interdisciplinary changes are emerging not only quantitative but also qualitative, the most interesting thing to analyze.

Being the time to present and discuss the diversity of this interdisciplinaruty, debating the achievements and problems associated with it, the session tries to underline its relevance in the development and improvement of archaeological science. We would also like this historical reflection on the evolution of the discipline of archaeology to help understand the possible mechanisms and future trends that other disciplines are opening dramatically to archaeological activity. Particularities that we intend to expose in the introduction, while at the same time we will try to delineate a model of approach of the topic that can be adopted in the session itself and in future similar scientific meetings.

02 TEACHING ARCHAEOLOGY AND ART HISTORY IN THE 19TH CENTURY: THE CASE OF PIERRE PARIS IN BORDEAUX (1885-1913)

Author(s): Reimond, Grégory (University of Toulouse; Casa de Velázquez)

Presentation Format: Oral

Pierre Paris was a famous scholar, known for his work on Iberian Culture (in 1897, he bought the bust of the Dama de Elche for the Louvre) and for the organisation of French investigation in Spain through the creation of the École des Hautes Études Hispaniques (1909) and the Casa de Velázquez (1920). But between 1885 and 1913, he was also a Professor of Archaeology and Art History; this is a forgotten point of his work. Paris received training in archaeology in the French School at Athens between 1882 and 1885. When he came back to France, the support of the French School director, Paul Foucart, allowed him to obtain a post in the University of Bordeaux. Archaeology was then a young academic discipline. The first chair in France was created in Paris in 1876 for Georges Perrot. Between 1876 and 1883, Maxime Collignon taught Greek archaeology in Bordeaux. But his departure to the Sorbonne University prevented him from perpetuating this teaching. For the young Pierre Paris, everything was still to be done. He was the one who actually organized this teaching in Bordeaux by adapting the German university model with the creation of seminars, the foundation of a museum that collected together plaster-cast copies of Greek and Roman statues and architectural sculptures, the redaction of the museum's catalogue with his students, etc. Using unpublished archives, our contribution aims to study his action as a teacher in Bordeaux in a key moment, when the French University was being reformed under the 3rd Republic.

03 INTERNATIONAL RELATIONS, MUSEUMS AND HERITAGE MANAGEMENT IN 19TH CENTURY SPAIN: A GLANCE AT THE CORRESPONDENCE OF JUAN FACUNDO RIAÑO

Author(s): Garcia-Ventura, Agnes (IPOA, Universitat de Barcelona) - Vidal, Jordi (Universitat Autònoma de Barcelona)

Presentation Format: Oral

In the second half of the 19th century networking among scholars from several countries influenced and shaped the way some

archaeological collections and museums were then newly created and managed. In this communication we aim to show that the Spanish academia was no exception to this trend and we will do it through two case studies which have as common link the figure of the historian Juan Facundo Riaño (1829-1901).

More specifically, we will take as starting point two letters Riaño sent to scholars linked then to the field of ancient Near Eastern studies. First, we will concentrate on a letter, preserved at the British Library (London), sent by Riaño to Austen Henry Layard (1817-1894). Second, we will discuss another letter, preserved at the Bodleian Libraries (Oxford), the Spanish scholar sent to Archibald Henry Sayce (1845-1933). These letters will allow us to see that the relationships among these scholars had an influence in the way the collections of two Spanish museums were managed, namely the Museo de Reproducciones Artísticas (at that time in Madrid, now in Valladolid) and the collection of the Real Academia de la Historia (Madrid). Indeed, we defend that approaching these two letters and the case studies of these two museums will allow us to see how cooperation about scholars was a basic tool then, as it is now, to enrich cultural management.

04 NINETEENTH-CENTURY CHRISTIAN ARCHAEOLOGY AND THE PARADOXICAL GOAL OF MIXING RELIGION WITH SCIENCE

Author(s): Effros, Bonnie (University of Liverpool)
Presentation Format: Oral

The late nineteenth century saw a growing chasm between the faith-based work of clerical scholars and professional archaeological circles. Whereas earlier the work of clerical archaeologists had been well integrated with that of lay scholars in the context of learned societies, their research now steadily moved to parallel but distinct organizations and publications focused on Christian history and archaeology. The career of the Belgian Jesuit Camille de la Croix is a good example of such a phenomenon: in 1879, the archaeologist, who was based for over forty years in Poitiers, France, claimed to have discovered 72 previously unknown martyrs at the Hypogée des Dunes. His subsequent privately financed publication of the site ignited an international debate as to whether priests could be objective scientists. Some contemporaries argued that a faith-based approach precluded full and meaningful participation in professional research. Père de la Croix, who received unwavering support from clerical colleagues in the face of withering critique of his archaeological claims, was but one of a number of intrepid clerics and their allies who bridged the growing gap between religious circles and lay learned circles. Using recently documented inscriptional and monumental remains, like-minded historians, epigraphers, and archaeologists presented their work as objective and historical, yet sought to highlight the exemplary faith and achievements of early Christians. Their main objective was to draw attention to material evidence for the early flourishing of Christianity in the territories of the ancient Roman world. In this proposed paper, I will discuss the significance of the emergence of an influential support network of scholars that stretched from Rome to French North Africa and from Belgium to Poland in the late nineteenth and early twentieth century, who laid the foundation for the study of Christian archaeological, art historical, and epigraphical remains of the late Roman West.

05 HUMANISM AND NUMISMATICS IN 19TH CENTURY PREHISTORIC ARCHAEOLOGY

Author(s): Schlanger, Nathan (Ecole nationale des chartes, Paris; UMR Trajectoires, Nanterre)
Presentation Format: Oral

Conventional historiography would have us believe that the transition from (old-fashioned) antiquarianism to (modern) archaeology, over the 19th century, took place through the positive impetus of the natural sciences. While this scenario is not entirely without its foundation (and reflects also some presentist or strategic self-interest in terms of discplinary positioning and funding), it leads us to overlook the deeply enmeshed interdisciplinary dialogues spanning from prehistoric archaeology to ancient history and classical learning. Indeed one of the most decisive and yet little acknowledged contributions to the establishment of high human antiquity, with long-lasting repercussions on Palaeolithic archaeology ever since, has been that of numismatics, especially in the hands of English polymath John Evans (1823 -1908). Drawing on new research and already published assessments, I argue in this paper that the interdisciplinarity of modern archaeology – in the 19th century as well as today, in theorisations and in museum practices – owes much more than we admit to the so-called disciplines of humanistic erudition. Drawing on new research and already published assessments, I argue in this paper that the interdisciplinarity of modern archaeology – in the 19th century as well as today, in theorisations and in museum practices – owes much more than we admit to the so-called disciplines of humanistic erudition.

06 INTERDISCIPLINARITY AND PREHISTORIC ARCHAEOLOGY IN ROMANIA

Author(s): Coltofean, Laura (Brukenthal National Museum, Sibiu, Romania)
Presentation Format: Oral

Interdisciplinarity seems to be an inseparable part of archaeological research in present-day Romania. However, a glimpse into some of the representative Romanian publications of the past, especially monographs, reveals the fact that, for a long time, there was confusion in both archaeological theory and practice. More specifically, interdisciplinarity was confounded with multidisciplinarity. For example, if archaeozoological, paleoanthropological and palynological studies were also conducted on the finds from a certain site, the results remained within the boundaries of each field, failing to be integrated into a clear and coherent whole. Interdisciplinarity, in its real sense, is a recent innovation in Romanian archaeology. In addition to this, not much is known about the beginnings of the incorporation of other disciplines into the archaeological practice in this country, about their later evolution or about the institutions

and specialists behind them.

How and in what cultural and political context did the process of integrating other fields into prehistoric archaeology start in Romania? How did this process evolve before and during the Communist regime, as well as after its collapse in 1989? What was and is its impact on the development of archaeology? This paper aims to trace the history of interdisciplinarity in Romanian prehistoric archaeology and its role in shaping archaeological research from the twentieth century until today.

07 WHAT MEANS «PRE-HISTORY»? THE ANTHROPOLOGICAL SOCIETY OF TOKYO AND THE BEGINNINGS OF PREHISTORIC ARCHAEOLOGY IN JAPAN

Author(s): Abad de los Santos, Rafael (University of Seville)
Presentation Format: Oral

In this paper we examine the introduction of archaeology in Japan from West during the 19th century, paying attention to its academic definition, theoretical and methodological development and relationship with other disciplines such as anthropology. Shortly after the Meiji Restoration (1868), some Western researchers carried out the first archaeological excavations in Japan. Among them, the American Edward S. Morse and the German Heinrich von Siebold played a key role. Strictly speaking, none of them had received professional training as an archaeologist, but they had important connections with the world of western archeology. For example, Morse had collaborated with Jeffries Wyman, one of the pioneers in the study of shell middens in the United States of America. The introduction of modern archeology in Japan meant not only the arrival of a new scientific discipline to study the material remains of the past, but also the diffusion of a different way of conceptualizing the past. The Japanese were very receptive towards this new "method" of study, but the initial response of local scholars to Western archaeological concepts ranged from rejection to attempts to adapt them to Japanese history. During the 1880s, a group of young students, already educated in modern institutions, established the Tokyo Anthropological Society and conducted excavations throughout the territory, collecting a large number of artifacts. Further, their activity extended in the theoretical level. They defined archeology as a subdiscipline of anthropology, and accepted the application of concepts such as "stone age" and "prehistory". As will be discussed, this process reached its culmination with the publication of Nihon Kokogaku [Archaeology of Japan] (1898-1899), the first compendium of prehistoric archaeology published in Japan.

08 THE GERMAN INTERDISCIPLINARY TEAM THAT ACCOMPANIED ADOLF SCHULTEN IN SPAIN OF THE FIRST THIRD OF THE 20TH CENTURY

Author(s): Garcés Estallo, Ignasi (University of Barcelona) - Gómez Gonzalo, Paz (Independent research)
Presentation Format: Oral

In 1905, the German hispanist Adolf Schulten began his historical and archaeological research in Numancia, which, subsequently, extended to various places in the peninsular geography for the next thirty years. Despite his philological training and despite the personal prominence shown in his work, from the beginning he was clear that he needed to have a team of experts in various disciplines. Although written about Schulten's collaborators, in the present communication, new information is collected and its list is completed. These formed a varied and specialized list: the realization of topographic plans, stratigraphic drawings, drawings of objects, photographs, perspectives of landscapes and geological or numismatic studies. It is interesting to observe their models, which leads us to discuss the state of German archaeology at the end of the 19th century. It is also useful to compare this approach with the archaeological practice that his contemporaries developed in the Iberian Peninsula, whether Spanish or foreign. Another aspect few studied up to now: the attitude of Schulten to offer his collaborators for specific tasks for other peninsular projects and, even, his offers to train specialists in Germany. The issue that most attention has generated in recent times is the possibility that spies slipped into the team of collaborators.

09 INTERDISCIPLINARITY AND THE EMERGENCE OF AN ENVIRONMENTAL PERSPECTIVE IN ARCHAEOLOGY. AN ITALIAN CASE-STUDY (1904-1930)

Author(s): Tarantini, Massimo (Soprintendenza ABAP Firenze)
Presentation Format: Oral

This paper presents a case-study of the way in which interdisciplinary relationships can determine the development of archaeology, on both the theoretical and the methodological level, in close association with (to use the words of the call for papers) "new ways of looking at the past."

The proposed case-study describes the contemporary affirmation of an environmental perspective in prehistoric archaeology and Etruscology in Italy in the first decades of the 20th century. This perspective was the product of a series of both direct and indirect interdisciplinary relationships among glaciology, paleontology, geomorphology, botany, and archaeology. Our paper centers on a reconstruction of some of these interdisciplinary relationships.

The main setting of the case-study is Florence, where the period in question saw the foundation of the Italian Institute of Human Paleontology (1913 and 1927) and the Italian Institute of Etruscan Studies (1928). The protagonists are naturalists and archaeologists whose meeting and collaboration in these institutions was stimulated by precise historical questions.

The case-study demonstrates clearly that interdisciplinary collaboration originates in a convergence of interests, because each

scholar is motivated primarily by his own discipline. The naturalists described in our paper did not have to redirect their research in order to collaborate in a program of archaeological research. But it is important to emphasize a certain reciprocity: even for the naturalists collaboration in archaeological research served as a decisive stimulus, in terms of perfecting new methods and formulating new research programs.

The essential background of the interdisciplinary relationships reconstructed here is the emergence of a new way of looking at the past which explicitly feels the need to relate the history of mankind to the environmental context by studying animal remains, plants, the physical environment, and site formation processes.

10 ARCHITECTURAL RESEARCH FROM ARCHEOLOGY TO INTERDISCIPLINARITY: THE SPREAD OF METHODS AND THEORIES IN LITHUANIA TERRITORY DURING 19TH – 20TH CENTURIES

Author(s): Povilaityte-Leliugiene, Edita (Vilnius Academy of Arts)
Presentation Format: Oral

Current Lithuania territory during diverse history in 19th – 20th centuries experienced few occupations of Imperial Russian, Polish, Germany, and Soviet Russian. The first cases of the archeology or architectural research were sporadical; however, gradually the investigation of heritage acquired more precise practices and methods. While there has been considerable research on the methods of archeology and the earliest separate cases, the architectural study as part of archeology and the cause of the establishment of heritage preservation and management practices and theories has so far been neglected. Therefore the primary aim of this presentation will be to discuss what methods and approaches were spread and how different architectural research, as well as archeology and other sciences influences from east and west practices, were adapted to the investigations of Lithuanian architectural heritage. Moreover, one of the aims will be to distinguish the interdisciplinary methods used in archeology, architectural and urbanistic researchers during the interwar period in 20th century. For instance, due to evaluate the interwar architectural research as an evident movement to interdisciplinary studies in this presentation as a case study will be presented the art historian Marian Morełowski methodology and interpretations of data from different sciences during his architectural research of Vilnius Upper Castle and the reconstruction of Vilnius urbanistic development. I argue that the presentation based on various archival documents and (un)published publications would enrich the understanding of the earliest interdisciplinary practices, methods, and theories during the architectural research as well as archeology itself.

11 A LONG WAY TO INTERDISCIPLINARITY IN ARCHAEOLOGY: PORTUGAL DURING THE 50S AND THE 70S OF THE 20TH CENTURY

Author(s): Martins, Ana Cristina (Fundação para a Ciência e a Tecnologia / Instituto de História Contemporânea-CEHFCi-UÉ-FCSH-Universidade NOVA de Lisboa; UNIARQ-Centro de Arqueologia da Universidade de Lisboa; InterArq Project)
Presentation Format: Oral

In 1958 took place the 1st National Archaeological Congress in Portugal. Reading its proceedings we find some papers dealing with the relevance of interdisciplinarity in archaeology. Nonetheless, it was by the end of the 60s that a new generation of young archaeologists began to seek for other references, updating bibliography and attending conferences and congresses on this special issue. A new generation supported by eldest archaeologists perfectly aware of the relevance of interdisciplinarity in archaeology, as it was for all sciences. Together, these two groups fought for the establishment of interdisciplinary practices in the country. Teaching and publishing was most certainly some of the ways to fulfill this purpose. But presenting oral papers at congresses and temporary exhibitions within them were also other preferred ways to reach that same point.

We will therefore analyze the contents of the congresses which took place in Portugal between the 50s and the 60, in order to identify actors (individual and institutional), places and projects aiming to embrace interdisciplinarity in archaeology. Moreover, we intend to understand the real impact and immediate consequences of these initiatives in the development of this science in the country, as well as the role played in this same scope by foreigner archaeologists in Portugal and by Portuguese archaeologists studying abroad.

12 FRONTIERS OF ROMANIA: NATIONALISM AND THE USE OF THE ROMAN PAST

Author(s): Hanscam, Emily (Durham University)
Presentation Format: Oral

Modern Romania is a nation-state containing territory which has long been considered marginal – first as part of the Roman Empire and now within the European Union. During Antiquity the region was the focus of Roman colonization, followed by a sustained period of migration which lasted throughout late Antiquity and the early medieval period, culminating in Ottoman domination. Archaeology developed in Romania during the 19th century as a means of proving that the region belonged with the European west rather than the Ottoman east, focusing on the common European Roman past and/or the unique Romanian Iron Age Dacian identity. Narratives about antiquity which were constructed by academics from archaeology, classics, and history were all meant to promote a unique Romanian identity, a practice which has continued into the 21st century. As such, the archaeological tradition of Roman studies is heavily entangled with Romanian nationalism and identity. This paper examines this relationship, and considers the ways in which this same past may be reinterpreted to support trans or postnational narratives for Romania. Multidisciplinary studies will be key to developing new ways of looking at the past, in addition to an emphasis on the continued evolution of archaeology as reflexive and

engaged with social/political contexts.

13 THE LATIN EPIGRAPHY OF THE PORTUGUESE ETHNOGRAPHIC MUSEUM IN THE EPISTOLARY BETWEEN EMIL HÜBNER AND JOSÉ LEITE DE VASCONCELOS

Author(s): Marques, Pedro (UNIARQ - Centro de Arqueologia da Universidade de Lisboa; DGE; IPAEHI)
Presentation Format: Oral

On December 20th, 1893, the Portuguese Ethnographic Museum was founded, currently National Museum of Archeology, being its founder and first director José Leite de Vasconcelos. The desire of Leite de Vasconcelos was that the objects of the Museum's collections represented the material part of the life of the Portuguese people and constituted a practical course of national Archeology and Ethnography. These objects thus had a space where they could be stored, preserved and exposed, and the director particularly endeavored to acquire inscriptions. Many inscriptions thus entered the museum's collections, writing Leite de Vasconcelos in the year 1897, that the Museum held a unique epigraphic collection in the national museological panorama.

The process of acquiring Latin inscriptions inevitably marked the epistolary between Emil Hübner, the illustrious German epigraphist and author of the Corpus Inscriptionum Latinarum dedicated to Hispania, and Leite de Vasconcelos. The travels that the Portuguese researcher carried out throughout Portugal were very important in the discovery and obtaining of the epigraphic monuments, as well as in the expansion of their knowledge. Some of the illustrative examples of this activity and the scale of the results obtained are precisely referred to in this epistolary.

In the paper that we propose, we intend to analyze the references about the acquisition of Latin inscriptions in the epistolary between Hübner and Leite de Vasconcelos, as well as the various issues raised by these monuments, namely in terms of epigraphic readings.

14 INTERDISCIPLINARITY WITHIN ARCHAEOLOGY DEPARTMENTS. SPAIN AS A CASE STUDY

Author(s): Díaz-Andreu, Margarita (ICREA; Universitat de Barcelona)
Presentation Format: Oral

In the last decades there has been a change in the composition of archaeology departments in Spain: whereas to start with all archaeologists based in universities had a period-based specialisation, nowadays departments usually combine these with some staff members who focus on archaeological science. In this paper an analysis of how the transition from one system to the other took place from the last decades of the twentieth century to today will be undertaken looking at the conditions that made this shift possible. The research has been based on different methodologies. The first of them has been oral history made with archaeologists either still active or, in some cases, already retired. Secondly, a search for material associated to the activities related to interdisciplinarity has been employed, including photographs and conference programmes. Thirdly, some documentation coming from archive has also been useful. Finally, an analysis of written literature has been valuable in the search for connections. Issues to be discussed will include when and how the transference of knowledge that encouraged this change took place; the role of international contacts and international research stays in this transformation; whether there were distinct patterns in different fields of knowledge and the reasons behind the alternative trajectories observed in different institutions.

15 PUBLIC ARCHAEOLOGY AND HERITAGE PARTICIPATION IN CHINA: THREE CASE STUDIES IN SHAANXI PROVINCE

Author(s): Iva, Stojevic (Northwest University Xi'an)
Presentation Format: Oral

Archaeology in China has, along with the entire country, gone through great changes in the past few decades. Recently, concepts like public archaeology and community archeology have been given more attention by Chinese scholars, but at this point in time, public archeology in China still lacks a consistent strategy. On the other hand, heritage projects like ecomuseums and traditional villages in China have a strong base in public participation and community involvement, and lessons learned on those projects can be used to lead Chinese archeology to a more opened path.

This paper focuses on changes and development of rural communities that occupy areas around three major archeological sites in Shaanxi province. The three sites selected for this research are: the famed Emperor Qinshihuang's Mausoleum Site Museum; Qianling, a site that, among others, hides the tomb of China's first and only empress, Wu Zetian, and finally Zhaoling, China's largest imperial mausoleum with the greatest number of subordinate tombs. This paper considers how archaeology transforms Chinese rural communities, and what influence archaeology has on economy, education and social life in those communities, as well as attitudes of local people, local government and heritage experts towards these phenomena.

This research aims to determine past and current relationships between archaeology and community in China, propose strategies for future development of public archeology, and build bridges between the scientific community and the public. It intends to do so by using data obtained through qualitative and quantitative methods, but also by taking into account what public archeology can learn from successful heritage participation projects in China.

16 WAS THE UNESCO INTERNATIONAL CAMPAIGN OF NUBIA A MULTIDISCIPLINARY OR INTERDISCIPLINARY WORK? JOURNALISTS AND ANTHROPOLOGISTS IN THE SPANISH TEAMS

Author(s): Zurinaga Fernández-Toribio, Salomé (Museo Arqueológico Nacional)

Presentation Format: Oral

Among the innovations introduced during the UNESCO International Campaign to Save the Monuments of Nubia from YEAR to YEAR, a series of new technological resources were used such as photogrammetry and aerial photography. The teams were organized by nations and each was usually composed by many specialists coming from diverse fields such as prehistory, classical archaeology, epigraphy, Egyptology anthropology, geology, archaeological and monumental conservation and engineering. All specialists jointly collaborated join in the making of inventories and registration for archaeological documentation, in the excavation of archaeological sites, and in the protection and removal of a large number of monuments such as temples, churches, frescoes, and rock art heritage. This paper would like to examine whether we can see the teams formed for the UNESCO International Campaign in Nubia as truly interdisciplinary. Taking the teams sent by Spain as a case study we will analyse whether looking at them as interdisciplinary actually responds to the way specialists acted in the field. In particular we will focus our analysis in the work of physical anthropologists and journalists, looking at the work of Emiliano Aguirre Enríquez and Jesús Altuna Etxabe among the physical anthropologists and Pedro Lozano Bartolozzi among the journalists, and their interactions with the archaeologists in the team: Rafael Blanco Caro, Manuel Pellicer, and Eduardo Ripoll Perelló.

17 PLURALIZED ARCHAEOLOGIES - RECLAIMING ARTS AND TECHNOLOGY

Author(s): Tevdovski, Ljuben (University Goce Delcev -Shtip, Macedonia) - Sokoloska, Angela (Institute of Cultural Heritage and Archaeology)

Presentation Format: Oral

Archaeology, from its roots in renaissance antiquarianism to its most recent developments, has been associated to the paradigms of positivism and empirical evidence. The general focus on the research of material remains that corrected the historical narratives in the earlier centuries was upgraded dramatically in the last decades by the integration of natural sciences and the unprecedented influence of high-technology in archaeological research.

However, all the dependency and relying on technology, has not helped us solve the equilibrium of the nature of archaeology. While it certainly steered the debate, it seems hard to win convincing majority or unity in moving archaeology from its humanistic and social aspects towards the direction of natural science.

In the last fifty years, the scientific and technological developments made major influence in archaeological practice and archaeological methods, providing archaeologists with great resources to describe, classify or catalogue material remains. Yet, in the same period, the archaeological theory has grown dramatically, becoming, to a degree, independent from the archaeological practice. In its newest postprocessual dimension it shifted dramatically the basic task of archaeology from describing material remains to interpreting the past.

The professional growth of archaeology in the last decades can be perceived as rapid and multifaceted development, but also as drastic theoretical pluralism that lacks unity of a scientific field. In this context, the nature of archaeology as a discipline should be defined in intradisciplinary debate of the pluralized archaeologies and the interdisciplinary relations in which archaeology is increasingly building symmetrical relations with both natural and social sciences.

a. AN EXAMPLE OF TRANSFERRED MODELS: LUIS SIRET AND THE ANALYSIS' BOOK

Author(s): Maicas, Ruth (Museo Arqueológico Nacional, Madrid)

Presentation Format: Poster

Among the last third of the 19th and the first years of the 20th century, archaeology was settled in Spain. Luis Siret was a leading figure of this period. He was a pioneer who helped to establish the scientific bases of our discipline. Archaeology could be judged today as a representative science in the interdisciplinary studies and Siret in this subject is an excellent example of the transfers of knowledge from other areas more developed in the international scientific scene.

Siret's professional training both in natural sciences and social matters was equally important. These two lines of studies were used by him in order to assist in the development of a characteristic archaeological methodology. This new method was based on a scientific structure which helped expanding in a conservative scenario governed by erudition. Despite his broad knowledge, Siret was aware he needed the partnership of other scholars and analytical tools. Consequently he turned to experts in different matters in the local area and in other countries, who developed technical reports about the remains recovered in the sites excavated by him, as early as the end of 19th century.

In this paper, the contributions of this author to the progress of different fields such as: experimental archaeology, conservation, stratigraphy or ethnoarchaeology have been studied. To this end, we start from the study of documentation preserved in the Archive of Museo Arqueológico Nacional, highlighting the unpublished manuscript: The Analysis' book. This folder contains several documents focused on metal studies, but it also includes other kinds of documents which tell us about the amplitude of Siret's inquisitiveness.

b. "CHILDREN OF A LESSER GOD". FROM PHYSICS TO BIOLOGY AS MODELS FOR ARCHAEOLOGY

Author(s): Maicas, Ruth (Museo Arqueológico Nacional, Madrid) - González, Amador M. (Física Aplicada, ETSIST, Universidad Politécnica de Madrid)

Presentation Format: Poster

The development of experimental sciences during the 19th century set the tone of what we consider today as the scientific paradigm. In essence, this model was based on the linear and deterministic behavior of the physical systems. Even for the Physics this model failed in the first third of the 20th century.

The unsuitable adaptation of those models to archaeology, makes archaeologists consider themselves in a position of disadvantage in comparison with other more settled disciplines. The vulnerability imposed by its political use, the image of adventure and romance publicized by the media, as well as the youth of our theoretical basis, make a case for us to regard other scientists as 'big brothers'. Therefore we try to imitate their way of working to acquire knowledge.

Archaeology takes both formal and theoretical features from other disciplines and in this way, it adapts not only methodologies from other sciences but new points of view about the study of new hypothesis in which to substantiate its theories.

It is our purpose for this paper to show how the work and mentality of Spanish archaeologists has undergone a transformation during this period of change which has also affected every other science as well.

599 INTERDISCIPLINARY APPROACHES TO EARLY MEDIEVAL TRANSITIONS

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Leggett, Samantha (Department of Archaeology, University of Cambridge) - Brownlee, Emma (Department of Archaeology, University of Cambridge) - Sebo, Erin (Department of English, Flinders University)

Format: Regular session

The Early Medieval period in Europe and its significant political, social and economic changes, present an interesting set of challenges for researchers. These challenges are multi-scalar and go beyond the remit of any one discipline. Questions surrounding the catalysts and progress of such changes are complex, and the integration of scientific techniques alongside, historical, linguistic and archaeological methods may elucidate these developments.

Areas such as the British Isles, the Frankish Empire, Iberia, the Baltic and Scandinavia all see major shifts in material culture during the second half of the first millennium, much of which is strikingly similar despite major environmental and cultural differences. What is it about this period that makes it so universally dynamic across Europe? And how can or should we approach these questions of transition in a broader sense?

This session addresses the methodological and theoretical challenges and in studying transitions in the Early Medieval period. From the Late Antiquity through to the turn of the first millennium AD there are rapid socio-political and economic changes throughout Europe. Language, religion, trade, burial practice and urbanism are all in flux. This raises questions about the spread and rate of Christianisation, the changes in urban and rural life during the period, mobility across and between regions, access to resources and trade routes, and much more. We wish to bring to the fore different approaches to these questions of social versus material change and the archaeological record, particularly in terms of interdisciplinary and trans-national methodologies.

ABSTRACTS

01 ANIMAL SYMBOLISM ON SEVENTH CENTURY IRON BELT FITTINGS AND THE CHRISTIANISATION OF MEROVINGIAN GAUL

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

Presentation Format: Oral

Merovingian Gaul experienced a profound and long-term transition due to the ongoing process of Christianisation after the Roman state organisation faded away. Who were where and to which degree affected by this process is still a matter of debate. The interpretative models dealing with the rich burial record of the Merovingian period, however, do not contribute to this debate in a substantial way, though the traditional interpretations of furnished burials being Pagan and unfurnished being Christian have now been left behind. Straightforward Christian iconography is basically absent on the wide variety of burial objects, which seems to make it difficult to connect the Merovingian burial record to Christianity.

In this paper iron animal style belt fittings of the seventh century are discussed as objects with specific qualities that enabled people to deal with the changes they experienced in a Christianising world; these fittings may be seen as 'symbols of transition'. It will be argued, underlined with examples of Christian art and architecture, that their presence in graves could have reflected encounters with Christianity without necessarily expressing a profound commitment to it.

An analysis of the 'materiality' of three specific belt fittings from the Dutch province of Limburg will demonstrate that a meticulous

examination of their material characteristics can contribute to a better understanding of the interplay between production, wide spread object appropriation and the societal context in which this took place. The materiality of the fittings is not only related to the actual materials used, but also involves assessments of their 'quality and 'value', which enabled them to function in a transitional phase.

This discussion of Merovingian burial objects as 'symbols of transition' aims at answering the question on whether interpretative models dealing with Merovingian death and burial can contribute to the understanding of early medieval Christianisation.

02 FROM CLOVIS TO THE COUNTS OF FLANDERS: TRANSFORMATIONS IN RURAL SETTLEMENT IN WESTERN FLANDERS (CA. AD 450-AD 1000)

Author(s): Deschepper, Ewoud - de Clercq, Wim (Universiteit Gent)
Presentation Format: Oral

The Counts of Flanders were among the most powerful and respected medieval sovereigns in Western Europe, despite the rather humble size of the territory they controlled. A large population, a highly-productive agriculture and abundant cities with international trade connections are mostly cited as the reasons behind their economic, political and military success. However, how this triangulation came into being is still poorly understood.

The roots of the count's economic might lay in the Early Middle Ages, a period when certain transformations gradually shaped a structure which would determine rural Flanders for centuries to come. The Merovingian period is both culturally and economically defined by its relatively regional scope, smaller scale and inter-site variation. Furthermore, the eight century can be seen as a period of transition, giving way to a more homogenous system in the Carolingian period, characterized by a shared material culture and a more focused approach to rural settlement and agriculture. The emergence of a new house type able to stock large harvests and the increasing structuring of the farmstead and the landscape are but some of the archaeological markers of this new socio-economic system with surplus-extraction at its core.

This transition is not unique for Flanders, as 'the long eight century' is being recognized in different parts of Western Europe. The swift taking over of Carolingian power by the first Counts of Flanders during the later 9th and 10th century should thus not only be explained by royal weakness, but also by the fact that these first counts could depend upon a robust economic structure for which the seeds were sown some hundred to two hundred years earlier. Easier than elsewhere, they could step into the void left by the Carolingian kings, and reap the fruits of labour.

03 EUROPE IN TRANSITION: MAPPING CHANGING FUNERARY RITES IN THE SIXTH-EIGHTH CENTURIES

Author(s): Brownlee, Emma (University of Cambridge)
Presentation Format: Oral

The abandonment of furnished burial practices in the late seventh and early eighth centuries AD is something which has been the subject of much past research. However, this research tends to be constrained by modern national boundaries; this ignores one of the most interesting aspects of the change, that it spreads over much of western Europe in a very short space of time. In addition, study of the transition is made more difficult by the differing nature of evidence on either side; furnished burial has traditionally been the study of much more research than unfurnished burial, and so there is much more data available for pre-eighth century burials.

This paper will examine the transition in burial practices at a continent-wide level, focusing specifically on burial practices in Anglo-Saxon England, Merovingian Gaul, and Alamannian and Bavarian regions. While it is impossible to completely eliminate regional and chronological biases in excavation and study, this paper will attempt to minimise their impact using GIS and statistical analysis. This will allow us to investigate how the concept of unfurnished burial spread over such a large geographical area, and how its adoption was influenced by local traditions. From there, this paper will then examine what this transition in practices can tell us about 'European' culture more broadly.

04 UNDERSTANDING ANGLO SAXON BURIAL PRACTICE PATTERNS THROUGH RADIOCARBON DATING: A CASE STUDY FROM SOUTHERN ENGLAND

Author(s): Miller, Katherine (University of Bristol) - Knowles, Timothy (University of Bristol Radiocarbon Accelerator Mass Spectrometry Facility)
Presentation Format: Oral

With the influx of European migrants from 500 to 800 AD, southern England endured major political and religious conflict. From warring kingdoms to missionary coercion, the south of England was in a constant state of change. This can be recognized through the adoption of burial practices. With cultural and religious practices often linked with burial tradition, funerary rites may give an insight into when and how these practices changed over time.

This paper will present preliminary data of from a multifaceted approach to dating three Anglo-Saxon cemeteries in southern England, with mixed burial practices to reveal chronological patterns. Through reading contemporary accounts, utilizing artefactual evidence, and radiocarbon dating, we can hypothesize when certain burials practices, such as mixed alignments and the proportions of grave goods, were popularized. The sites analyzed are Apple Down (Compton, Sussex), Droxford (Droxford, Hampshire), and Pilgrim's Way (Wrotham, Kent). Each of these sites presents a mixture of burial styles including furnished and bare; south to north orientation

and east to west. The importance of the first two sites mentioned, Apple Down and Droxford to this study, is demonstrated through their location in region previously belonging to the kingdom of Wessex whose history is largely absent from the written record. Radiocarbon dating on smaller, mixed practice cemeteries, this will help provide this missing information. Additionally, by including a site from the kingdom of Kent, Pilgrim's Way, allow for comparisons between these two kingdoms to be made. With new data alongside previous research, the hopes for this project will be to question how the constant fluctuation in political powers and religious beliefs could have influenced cultural ideals concerning death and burial rites.

05 MISSING THE ANTIQUE? RECONSTRUCTING THE ROMAN - MEDIEVAL TRANSITION IN RURAL SETTLEMENTS IN ENGLAND

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

Presentation Format: Oral

Since 2005, a programme of excavation of more than 2,000 1m square archaeological 'test pits' has been carried out in more 60 rural settlements in eastern England. The aim of this project was to reconstruct the long-term development of currently occupied rural settlements (CORS), that is settlements of likely medieval date which did not end up as permanently deserted medieval villages (DMVs). This paper will present the results from some of these excavations to show how they have enabled changes in settlement size, form and location to be reconstructed from the Roman period to the high medieval. It will highlight one particular phenomenon observed in the recovered data, which is that unexpectedly little material of Roman date has been found under these medieval settlements. In considering what this might imply about the degree of discontinuity between the Roman and medieval periods in England, the presentation will invite delegates to consider the possible explanations offered.

References:

Lewis, C. 2010. 'Exploring black holes: Recent investigations in currently occupied rural settlements in Eastern England' in N. Higham and M Ryan (eds) The Landscape Archaeology of Anglo-Saxon England (Manchester Centre for Anglo-Saxon Studies Series) (Boydell and Brewer), 83-105.

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

06 FOOD AND FAITH IN ANGLO-SAXON ENGLAND, THE CHALLENGES OF MULTI-DISCIPLINARY RESEARCH

Author(s): Leggett, Samantha (University of Cambridge)

Presentation Format: Oral

The sixth to eighth centuries in Europe and the significant political, social and economic changes during this period, present an interesting set of challenges for scholars. These challenges are multi-scalar and go beyond the remit of any one discipline. Questions surrounding the catalysts and progress of such changes are complex, and scientific techniques such as stable isotope analysis and ancient DNA may offer new avenues for approaching them.

This paper uses the case study of the Christianisation of Anglo-Saxon England to explore how biomolecular archaeology when used in conjunction with funerary archaeology and history can help elucidate some of these processes in the long seventh century and beyond.

This paper will present stable isotope data in conjunction with funerary evidence to see how and if changes in diet and mobility align with the conversion and Christianisation of Anglo-Saxon England. It will also explore the unique challenges and advantages of this kind of multi and interdisciplinary research, reflecting on best practice for collaborations with other disciplines and creating a multi-scalar and multi-proxy research project of this nature.

Changes in burial practice and diet through time and space will be explored, looking at multi-proxy tooth and bone collagen samples to also investigate individual change over life course. This will demonstrate how the Early Medieval 'Fish Event Horizon' was not purely a c.1000 AD phenomenon but actually had its beginnings in the seventh century, and possibly earlier, beginning with fresh water fish consumption and moving towards increased marine resources. This alongside other kinds of data will be used to argue for a very dynamic long seventh century with Christianity playing a small role in a larger pan-European transition towards a different socio-economic model.

07 IN SEARCH OF A COMPLEX PAST – LOMBARDS IN ITALY: A POPULATION ON THE MOVE IN LATE ANTIQUITY

Author(s): Micarelli, Ileana - Francisci, Guendalina - Trosini, Mariasole - Di Giannantonio, Stefania - Di Matteo, Martina (Sapienza, Università di Roma) - Giostra, Caterina (Università Cattolica del Sacro Cuore, Milano) - Manzi, Giorgio - Tafuri, Maryanne (Sapienza, Università di Roma)

Presentation Format: Oral

In facing the investigation of a migrant population as the Lombards, it is never simple nor intuitive to collect all available sources. The Lombards started their departure from Scoringa, a small island close to the coast of Germany. European burial contexts testify their path across the North of Europe to Hungary, the ancient Roman region of Pannonia. As reported in Historia Langobardorum by Paul

the Deacon, in 568 AD this population crossed the Italian boundary to occupy its territories. From this moment, the interaction with the inhabitants and land-use began. Our analysis focuses on two Lombard necropolises: Povegliano Veronese and La Selvicciola, respectively from northeastern and central Italy and dated to a crucial period of post-classical era, namely between the 6th and the 8th AD. The contextualization of these two funerary areas is supported by an interdisciplinary approach. On the one side we consider the comparison between the archaeology of production and material culture with the anthropological data. On the other we define each skeletal sample as a biological archive that registers the biological and cultural biography of an individual and a population. In this perspective, the bioarchaeological investigation could examine levels of considerable complexity within our understanding of past societies. The isotopic analysis of human and animal samples investigates migration in relation to a population on the move from borders beyond Italy and along the peninsula. Non-metric traits of the skull provide useful information on possible family relations intra- and inter-necropolises. Finally, dental pathologies can help in interpreting the biocultural implications of dietary changes in a population facing complex cultural transformations.

08 CHALLENGES AND THEORIES SURROUNDING SETTLEMENT-INTERNAL BURIAL SITES IN SOUTHERN GERMANY

Author(s): Müller, Kathrin (University of Freiburg)
Presentation Format: Oral

The late seventh century faced a change in the late Merovingian burial behaviour. The row-grave cemeteries, which were the characteristic cemeteries in middle and western Europe ever since the fifth century, were increasingly abandoned while other types of cemeteries emerged which were used simultaneously and thus broke with former traditions. One of those new types is the settlement-internal burial site. Especially this type of burial shows a shift in the way people thought, as it included death as such in everyday life. Some questions then arise as to who is buried in settlement-internal burial sites and why the bereaved chose that form of burial. Furthermore, whether this form of burial was driven by the religion of the buried person or their bereaved, their status or their claim on land. And most importantly, which archaeological evidence can be found for the different theories? The compilation and comparison of settlement-internal burial sites in southern Germany (Baden-Wuerttemberg and Bavaria) provide a foundation for both the analysis and discussion of the issue.

One of the obstacles that are encountered while dealing with settlement-internal burial sites is the fact that those are difficult to date. An increased lack of grave goods led to a misdating of the graves without objects, which were simply compared to graves including goods. This leads us to circular reasoning which makes us believe that the newly emerged cemeteries were used only for two or three generations. However, new perspectives of looking at these small grave groups have arisen. With the help of radiocarbon dating, recent research has found that those graves date at least until the ninth century – a fact that can help find new questions on the analyses of other cemetery forms, revealing the dynamics not only of the Merovingian but also the Carolingian period.

09 EXAMINING AN EARLY MEDIEVAL CRANNOG'S RESPONSE TO ENVIRONMENTAL, SOCIO-POLITICAL AND ECONOMIC CHANGES AT AN ANNUAL RESOLUTION.

Author(s): Barrett, Marie-Therese - Plunkett, Gill - Brown, David - Donnelly, Colm (Queen's University Belfast)
Presentation Format: Oral

The Early Medieval period in Ireland (like much of Europe) was a time of significant social, economic and political change. Chronology is key to understanding these changes and transitions in a meaningful way. A disproportionate importance has been placed on the establishment and abandonment of settlement in Ireland, with little focus on the intervening period of occupation. This has been detrimental to a deeper understanding of how sites developed in response to social-political and economic change during their occupation. Through the period, crannogs came to be a common settlement type, though debate continues about their function and status. Reconciling their occupation with early textual evidence is, however, hindered by the differences in the dating precision available, which at best includes precise dendrochronological dates for some of the construction phases. Tree-ring analysis of short-lived timbers used in crannog construction offers a means to overcome this limitation. Drumclay crannóg, a site in the north of Ireland, comprised 7 m of waterlogged archaeological deposits dating from the 9–17th centuries AD.

Here we show that it is possible to scrutinise life in Early Medieval and Medieval Ireland at an annual resolution using a combination of tree-ring analysis of alder timbers, radiocarbon dating and wiggle matching, with close analysis of the archaeological record. The results reveal the pace at which the site developed and provide an unrivalled view of crannog evolution in time and space. New archaeological interpretations will therefore be based not just within a confined time period, but on a year by year basis. This multidisciplinary approach allows us to consider life on the crannóg at a timescale relevant to human history in relation to major environmental, socio-political and economic changes. We anticipate that this approach will provide new theoretical perspectives with which to understand Early Medieval and Medieval settlement in Ireland.

10 SHIPS AS SYMBOLS OF IDENTITY THROUGHOUT A PERIOD OF TRANSITION

Author(s): Cartwright, Rachel (University of Minnesota)
Presentation Format: Oral

Movements from the Scandinavian homelands during the Viking Diaspora, inherently led to shifts in community and national identi-

ties. However, throughout this period of migration there was still an underlying sense of Norse community showing a continuation of culture even as many other aspects of identity were in transition. This sense of "Norseness" can be seen historically with the law codes of the Norse groups and archaeologically through the persistent use of ships/boats in iconography, burial, and ritual deposits. From the ritual deposition of entire boats in the Iron Age to ship burials found throughout Scandinavia and abroad, in places like the Ardnamurchan Peninsula of Scotland, the use of ships can be seen throughout much of Scandinavian prehistory and early history forming an integral part of Norse identity. Although ship burials were also performed by other peoples, they are not very common outside of the Scandinavian tradition. The prevalence of association with ships and the dead indicates that ships and boats during the Viking Age were very important in Scandinavian culture, not just as a means of transport, but also as a cultural symbol. This paper will examine the archaeological evidence for a core Norse identity throughout periods of conflict and transition.

11 THE VALUE OF LITERARY SOURCES IN INTERPRETING ARCHAEOLOGY: SWORDS, BURIALS AND THE CASE OF BJ 581

Author(s): Sebo, Erin (FInders University)
Presentation Format: Oral

This paper will survey the evidence of literary depictions of burials and swords, and analyse the cultural attitudes displayed towards them, in literary texts from across Scandinavia and England; in particular, the sagas and Old English heroic poetry, since these are the clearest representations of the warrior ethos in these cultures. Although these texts come from across the Germanic world and date from around the 8th to the 15th century, it is at least worth considering what cultural attitudes they betray. It is suggested that there are certain consistencies across the corpus which indicate strong and prevailing cultural attitudes which is, perhaps, not as surprising as it might seem at first: diaspora and migration cultures are typically culturally conservative. Although these texts are fictional and often include fantastic events, they are underpinned by cultural values which are recognizable to their audience or they fail to function as literature. Since various kinds of cultural evidence must be in agreement because they necessarily reflect the culture that produced them and that, in those cases where they appear to be in contradiction, it is because we have failed to understand some aspect of that culture. In this case, we believe the literary evidence does shed light on the role of swords in Scandinavian and Anglo-Saxon burial practice—though not necessarily in the way we might expect. This paper outlines these conclusions and considers strategies for reading fictional texts for evidence of everyday life and death.

12 SEX SEGREGATION ON CHRISTIAN CHURCHYARDS IN SCANDINAVIA – GENDERED SOCIAL IDENTITIES IN THE EARLY MEDIEVAL NORTH?

Author(s): Bütje, Clara Henrike (University of Freiburg)
Presentation Format: Oral

Scandinavia in the 11th and 12th centuries AD underwent huge societal changes. This is not only visible in the material culture but also in the dealing with the body after death. Burial practices changed; this change is mainly to be connected with the conversion to the Christian faith. People started to bury their deceased on delimited churchyards and no longer on the typical Viking Age burial grounds. What impacts had these profound transformations in the society? In some regions in Scandinavia, e.g. Sweden, Denmark, Iceland and Greenland, there seems to be a specific manner of burying the decedents on the earliest churchyards. What is unknown in the rest of Christianised Europe is the sex segregation on the churchyards. Men are buried in the south of the church and women in the northern part. This funerary sex segregation is neither ever completely executed nor to be found on every early Christian churchyard in Scandinavia, also there are no parallels that connect these cases to earlier non-Christian northern societies. This phenomenon does not only raise questions about the understanding of the Christian faith, but also about the perception of Christianity in terms of building new societal forms and finding new (social) identities, that emerge in the interaction between "the New" and "the Old". What does sex segregation mean? In which context can we, as archaeologists, put the sex segregation, also regarding anthropology and historical sources? Trying to leave aside binary concepts of interactions, it will be shown that this phenomenon challenges archaeology and anthropology to shed light on new perspectives.

a. DIETARY HABITS AND MOBILITY DURING THE EARLY MEDIEVAL PERIOD IN EUROPE BY MEANS OF ISOTOPIC ANALYSES: OVERVIEW AND CRITICAL APPROACH

Author(s): Depaermentier, Margaux (University Freiburg)
Presentation Format: Poster

As a young discipline, research in medieval archaeology has long been influenced by historical approaches. That is probably why archaeologists still try to read archaeological remains in the light of great political events usually supposed in the European Early Medieval Period. And because archaeological data are inherently restricted, natural sciences such as isotope analyses have become a common alternative to provide 'more precise' data. Lots of papers exhibit for example strontium isotope data to convey grand migration narratives, while retracing dietary habits by means of stable carbon and nitrogen isotopes is often used to suggest social status differences.

However, the interpretation of isotope data remains ambiguous and mainly subjective. Environmental factors, individual behaviour and methodological parameters instead of migration or social status differences are further options to explain isotope ratio fluctuations. But if research is influenced by historical and political background, it may focus on data correlating with the expected nar-

ratives. This paper provides an overview of isotope analyses realised in archaeological context in Early Medieval Europe. This study proposes potential alternatives to interpret isotope analyses dealing with dietary habits (δ13C and δ15N) and mobility (87Sr/86Sr) by comparing their results with contextual information such as archaeological, archaeozoological and environmental data.

b. BIOLOGICAL AFFINITY AND SOCIAL IDENTITY: ANCIENT DNA ANALYSIS OF ANGLO-SAXONS AT BARRINGTON A (EDIX HILL), CAMBRIDGESHIRE.

Author(s): Bates, Jessica - Scheib, Christiana - Inskip, Sarah - Dittmar, Jenna - O'Connell, Tamsin - Stock, Jay - Robb, John - Kivisild, Toomas (University of Cambridge)

Presentation Format: Poster

Barrington A (Edix Hill) is an important Anglo-Saxon site in Cambridgeshire with 115 burials (149 individuals) spanning from 500 – 700AD, a period of significant transition within Anglo-Saxon England. The site is believed to have been used by a rural community of around 50-65 people with a complete burial record of all ages and both sexes, with material culture suggesting a mixture of cultural identities (both Anglian and Saxon). However, until this point a genetic analysis has not been possible. Here we present ancient whole genomes of a group of individuals from Barrington A, analysed in context of nearby, contemporary Anglo-Saxon populations. We use published and newly determined reference genomes from other sites in Cambridgeshire and modern genomes from Britain and Europe to examine the context of genetic ancestry of Barrington A individuals and the extent of genetic continuity over time in the region. We address ideas of relatedness, cultural identity and the movement of people by exploring correlations between genetic information and burial markers (burial goods, orientation, location, etc.). Our preliminary scans of generated sequence data show that most individual remains have retained sufficient quantities of sex chromosome mapping reads for accurate genetic sexing and mtDNA reads for determining strictly maternal relatedness among individuals. A subset of genomes with >10% endogenous DNA presents us the unique opportunity to explore at genome scale if genetic relatedness is expressed in burial. Brooches have been previously identified as unique markers of ethnicity in Anglo-Saxon burials. However, through the implementation of both scientific and material based approaches, this study has readdressed these past assumptions of expressions of ethnicity and identity to provide a more in depth understanding of the people living in this time of transition.

600 ADVANCING ARCHAEOLOGICAL SYNTHESIS: USING THE PAST TO BENEFIT THE FUTURE

Theme: Theories and methods in archaeological sciences
Organisers: Altschul, Jeff (SRI Foundation; Statistical Research, Inc.) - Luth, Friedrich (German Archaeological Institute)
Format: Regular session

Over the past 50 years, public support, effected through laws and regulations, has allowed archaeologists to document the archaeological record to an extent and intensity that was heretofore unimaginable. For many areas of the world, our knowledge of cultural sequences and trajectories—the who, what, when, and where of the past—is astounding. Yet for all the data we have amassed, we find it no easier to ascertain how cultures evolved, why societies chose the paths they followed, or how the patterns we discern in the past can inform decisions we make today. To move beyond documenting the archaeological record, archaeologists must shift their focus from interpreting project-by-project results to synthesizing multiple sources of data to produce emergent knowledge.

Synthesis, although not new to archaeology, has been difficult to institutionalize. Regulations require archaeological resources to be documented, but generally do not fund the integration of data beyond the project boundaries. Academics have been slow to recognize the value of cultural heritage data, and even when the importance of these data is recognized, academic research is inadequately funded to exploit its potential.

Recognizing these constraints, international efforts, such as the Coalition for Archaeological Synthesis (CfAS), have emerged. CfAS has adopted a form of collaborative synthetic research developed in the ecological sciences in which important scientific questions with clear public policy implications are framed in ways that can be solved within a few years (see http://archsynth.org). Collaborative synthesis, along the lines followed by CfAS and others, is the subject of this session.

ABSTRACTS

01 SYNTHESIS AND THE CONTEMPORARY RELEVANCE OF ARCHAEOLOGY

Author(s): Ortman, Scott (University of Colorado Boulder; Santa Fe Institute) - Hanson, John (University of Colorado Boulder)

Presentation Format: Oral

One of the goals of archaeological synthesis is to increase the practical relevance of archaeological data and findings. To accomplish this goal, archaeologists will need to convince other social scientists to jettison several widely-held beliefs: 1) that archaeological data are hopelessly partial and haphazard; 2) that modern societies are fundamentally different from those of the past; and 3) that human behavior is too contingent on context to be predictable. In this paper we present evidence that at the scale of settlement

systems (and above) a different set of beliefs is justified: the archaeological record is a surprisingly good data source; differences between past and present are more a matter of degree than kind; and emergent patterns in human behavior are actually quite predictable. We illustrate these points using a database of information for cities of the Roman Empire, through which we show that it is easier to measure the areal extent of ancient cities than contemporary cities; that past and present urban systems exhibit the same allometric scaling patterns; and that one can predict statistical patterns in aggregate behavior using mathematical models that frame human settlements as social networks embedded in physical space. This example suggests that, with appropriate theoretical development, archaeological synthesis could contribute to new ways of viewing and analyzing social dynamics throughout the social sciences.

02 OPEN COLLABORATIVE MODELS FOR ADVANCING ARCHAEOLOGICAL SYNTHESIS: LINKING RESEARCH, RESOURCE MANAGEMENT, AND PUBLIC EDUCATION APPROACHES

Author(s): Anderson, David (Department of Anthropology, University of Tennessee) - Kansa, Eric - Kansa, Sarah (Open Context/The Alexandria Archive Institute) - Wells, Joshua (Indiana University South Bend) - Yerka, Stephen (Eastern Band Cherokee Indians, Tribal Historic Preservation Office)

Presentation Format: Oral

Archaeology in the 21st century must of necessity develop open, multi-institutional and multidisciplinary collaborative efforts at national and international scales. Critical to research, resource management, and public education will be capacity building, the development of publically accessible informatics tools and flexible practitioners, capable of creating, linking, and working with distributed networks of heritage and environmental data at broad scales. The DINAA (Digital Index of North American Archaeology) project is one example of the kind of tools that will be needed, a publicly accessible index of existing archaeological site file, collection, research, and report data distributed across multiple regional, state, and local repositories, linked with modern and paleoenvironmental data sets. Such tools will be needed, not only to help us better to understand and interpret the past, but to making well informed forecasts and policy decisions about how to respond to threats posed by rapid climate change, extreme weather events, displaced populations, and changes in infrastructure, factors that will shape our civilization profoundly in the years to come. Cultural resources are a critical factor to consider when planning for such changes. They are essential to our sense of self and well-being, and a continuing source of inspiration. Construction of large linked data sets of what will be impacted and what will be lost is essential to developing procedures for sampling, triage, and mitigation efforts. They will also allow researchers, land managers, and interested members of the public to examine human responses and solutions to the dramatic fluctuations in temperature, biota, and sea level that have occurred in the past, and help guide the implementation of possible human responses as we move forward in a changing world.

03 ARCHAEOLOGICAL SYNTHESIS FOR LONG-TERM INTERDISCIPLINARY RESEARCH ON SOCIAL CHANGE

Author(s): Mills, Barbara - Ram, Sudha (University of Arizona) - Clark, Jeffery (Archaeology Southwest) - Ortman, Scott (University of Colorado, Boulder) - Peeples, Matthew (Arizona State University)

Presentation Format: Oral

Archaeological synthesis is not new to archaeology but how it is being done, and the kinds of questions being asked and answered, have been significantly transformed over the past decade. Central to this transformation is ensuring that the results are of broad interest to archaeologists in different parts of the world, researchers in other disciplines, as well as to the general public. Granting agencies are similarly interested in results that can be translated across disciplines. A unique feature of archaeological data of interest to many other disciplines is the ability to investigate social changes at different temporal scales—decadal, centennial, and millennial. We describe efforts in the Southwest U.S. to synthesize archaeological data for interdisciplinary research on a number of topics addressing human demography, social inequality, migration, and the spread of social movements. Several of these projects are currently being combined to form cyberSW, including data integration from projects over a large region, new data collection, and the creation of an online cyberinfrastructure for knowledge discovery and dissemination. This paper discusses the evolution of the project and some of the challenges faced in the synthesis process. These include the creation of flexible yet explicit entity relationship models and working across disciplinary boundaries to address research questions relevant to contemporary society.

04 THE CHALLENGES AND PROSPECTS OF DEVELOPING RADIOCARBON 'BIG DATA' FOR THE STUDY OF PREHISTORIC DEMOGRAPHY

Author(s): Kelly, Robert - Robinson, Erick (University of Wyoming)

Presentation Format: Oral

The use of large radiocarbon datasets has the potential to transform archaeology and its place in the social and natural sciences in the coming decades. Radiocarbon 'big data' enhances the unique contribution of archaeology to reconstruct human demography over vast spans of time. This move towards big data is confronted by some central challenges in archaeological method and theory, such as the use of legacy data of disparate quality and working over broad spatial and temporal scales. It likewise entails issues of taphonomy, researcher bias, date quality, and effects of scale and mobility. It also requires solutions to the effect of calibration (plateaus and cliffs) on summed probability distributions, and appropriate methods of analyzing not very well-behaved probability distributions. For some, these challenges pose insurmountable barriers to the use of radiocarbon big data. We disagree: radiocarbon

big data help answer appropriate kinds of questions, ones that concern processes working at broad temporal and spatial scales, especially if used in conjunction with site-specific Bayesian analyses. This presentation discusses our ongoing work to develop a radiocarbon database for the US, focusing on the problems of data collection and potential for using these data to ask questions regarding long-term human demographic change, human-environment interactions, and cultural dynamics.

05 ARCHAEOLOGICAL SYNTHESIS: THE ROLE OF DIGITAL REPOSITORIES AND THE FAIR PRINCIPLES

Author(s): Richards, Julian (Archaeology Data Service; University of York)
Presentation Format: Oral

It is increasingly difficult for academic research to keep up with the deluge of data that has been generated by new archaeological investigations, particularly in those countries where these are often undertaken by commercial contractors. In many cases it can even be difficult to find out what has been discovered, or where the results can be found, and grey literature reports and data may not be available in a form that can be properly referenced. In short, new interpretations may rely on very weak foundations, and archaeological textbooks and synthetic research can be decades out of date. This paper will discuss the role of digital repositories, such as ADS in the UK, and tDAR in the United States, in providing online access to Open Access fieldwork reports and primary data. This role is crucial in ensuring that archaeological data and reports conform to the FAIR principles, i.e. are Findable, Accessible, Interoperable, and Reusable (https://www.force11.org/group/fairgroup/fairprinciples). I will discuss some recent projects, such as the Rural Settlement of Roman Britain (https://doi.org/10.5284/1030449) which have made extensive use of grey literature to generate new works of synthesis, and the role of ADS in providing research resources and presenting and preserving the new information. I will argue that such institutions are central to the future of the discipline as we deal with the tsunami of archaeological and related information that continues to grow daily.

06 COMPUTATIONAL TOOLS SUPPORTING SYNTHETIC RESEARCH: DATA INTEGRATION USING TDAR AND DELIVERING PALEOENVIRONMENTAL RECONSTRUCTIONS WITH SKOPE

Author(s): Kintigh, Keith (Arizona State University; Coalition for Archaeological Synthesis) - Kohler, Timothy (Washington State University) - Ludäscher, Bertram (University of Illinois) - Spielmann, Katherine (Arizona State University) - Bocinsky, R. Kyle (Crow Canyon Archaeological Center; University of Montana; Desert Research Institute)
Presentation Format: Oral

Addressing archaeology's most compelling substantive challenges requires synthetic research that exploits the expanding corpus of systematically collected archaeological data along with data from allied disciplines. While synthetic research is always data- and labor-intensive, computational tools can facilitate key components. We introduce two tools designed to support synthetic research: one for data integration and one for acquiring and analyzing paleoenvironmental data.

Synthetic research typically requires combining datasets recorded using different systematics, while at the same time preserving the semantics of the data. To that end, we have developed a general procedure that we call query-driven, on-the-fly data integration that is deployed within the tDAR (the Digital Archaeological Record; http://tdar.org) digital repository. The integration procedure employs ontologies mapped to the original data sets. Integration of the ontology-based dataset representations is done at the time the query is executed, based on the specific query content. In this way, the original data are preserved and data are aggregated only to the extent needed to obtain semantic comparability. Our presentation draws examples from an effort by a research community of Southwest US faunal analysts. Using 24 ontologies, we integrate faunal data from 33 sites including 300,000 individually recorded faunal specimens.

Knowledge of past environments is generally needed to place archaeological datasets in their environmental contexts and to evaluate cultural transformations in light of changing environments. Unfortunately, relevant paleoenvironmental data is often difficult to discover, acquire, visualize, and effectively analyze —especially for less technically-focused scientists. To that end we have developed SKOPE (Synthesizing Knowledge of Past Environments; http://openskope.org), a Web tool that provides easy access to paleoenvironmental data and that allows users to rerun paleoenvironmental models with different parameters. Although the current implementation is focused on North America, it provides a data discovery and exploration software framework that can readily incorporate models and data worldwide.

07 DATA POST-RECOVERY

Author(s): Herr, Sarah (Desert Archaeology)
Presentation Format: Oral

Although the laws that enable archaeological investigations in the United States laud the value of research for scientific and educational purposes, in daily practice it is the policies that allow archaeological investigations for management purposes that are prioritized. The framework and funding of the ensuing cultural resource management work is thus, necessarily, focused on the completion of individual projects. The United States cultural resource management industry has evolved to efficiently meet these management needs while variously interpreting the more idealized and less present goals that obligate archaeological work for a public good. In this paper, I consider cultural resource management's readiness for scientific synthesis by considering internal data collection and management practices and the technical and peer reviewed publication record of a sample of medium and large pri-

vate-sector companies. I also ask what "synthesis" looks like from the vantage point of companies, and what goals for industry-collected data might be.

The goal of the Coalition for Archaeological Synthesis is to create collaborations that will, ideally, catalyze new understandings of the past using existing data that has largely been collected by cultural resource management firms. This paper is intended to assess the industry's role and readiness to participate in these partnerships.

08 THE NEED AND POTENTIAL FOR ARCHAEOLOGICAL SYNTHESIS IN US HERITAGE RESOURCE MANAGEMENT

Author(s): Heilen, Michael (Statistical Research, Inc.)
Presentation Format: Oral

In the United States, the National Historic Preservation Act (NHPA) of 1966 has required government agencies to identify important resources under their jurisdiction, evaluate their significance and integrity, and resolve effects to those resources that will be impacted. In the 52 years since passage NHPA, over 56 million hectares of land have been surveyed and nearly one million heritage resources have been identified and recorded. These efforts have produced hundreds of thousands of project reports, vast collections of data, and a wealth of descriptive information about the past. The accumulated data and information have many scientific and management implications and can be used to generate important new knowledge about the past, but remain largely untapped. This paper argues that proactive and informed management and research decisions cannot be productively made in heritage resource management (HRM) without comprehensive synthesis of existing archaeological data. Synthesis is needed to identify which resources to preserve and/or study and how best to do so with limited time and funding. Following current approaches, many resources will damaged or lost long before effective strategies for studying or preserving them can be developed. As such, the lack of synthesis in HRM comes with a large and irretrievable opportunity cost. Using recent archaeological modeling projects as examples, this paper explores the potential for compiling and synthesizing large HRM and environmental datasets within a GIS environment to model the nature and distribution of heritage resources. It is argued that dedicated synthesis of HRM data will allow for more effective and proactive research and management strategies to be developed and implemented and will allow HRM investigations to provide lasting benefit to diverse scientific and traditional communities and the public that they serve.

09 21ST-CENTURY CHALLENGES FOR ARCHAEOLOGY: SYNTHESIS OF INFORMATION FROM DEVELOPER-FUNDED INVESTIGATION TO FORM NEW HISTORICAL NARRATIVES

Author(s): Wills, Jan (CIfA)
Presentation Format: Oral

More than 90% of archaeological investigation in England is now initiated by the planning process and, depending on the state of the economy, more than 5000 archaeological investigations – from small field evaluations to extensive excavations - can be carried out annually in advance of development. Academic research in over 30 active university departments, and increasing numbers of community-led investigations add to this number. In the last 25 years, since the introduction of planning policies requiring assessment of the impact of proposed development and mitigation of the impact of that development, perhaps 80,000 investigations have occurred.

In 2017 a collaborative project between the Chartered Institute for Archaeologists and Historic England considered six current challenges for the archaeological profession in England through online discussion and workshops. Workshop 5, Synthesis of information from developer-funded investigation to create new historical narratives, brought together academics, local and national government representatives and the commercial sector to review how successful we have been in drawing together the results from the many thousands of individual investigations to form broader narratives. Recent successes in England have included projects that have provided new perspectives on the Roman period and the English landscape from the past 25+ years of developer-funded investigation, but we still lack the mechanisms to capitalize fully on the amount of data being delivered by our generally successful planning process. This paper will present some of the thinking from the workshop, the concerns about data recording and accessibility, the issues of funding and the aspirations for the future.

10 PROMISE AND PERIL: ARCHAEOLOGICAL COLLECTIONS AND SYNTHESIS-BUILDING

Author(s): Majewski, Teresita (Statistical Research, Inc.)
Presentation Format: Oral

Preexisting and yet-to-be-created archaeological collections (artifacts and associated records as well as digital collections) are a key component of synthesis-building. Unfortunately, the reality is that future use of collections is not the driving force behind generating them in the first place. Recent research using collections to advance archaeological synthesis illustrates many of the inherent challenges, including accessibility, data-quality issues, and funding. Many of the perceived or real barriers to collections-based research relate directly to decisions made during the life cycle of an archaeological project regarding data management, field and laboratory methods, and curation, all of which can affect the long-term integrity of collections and impact their future uses. Realizing the full potential of using collections for advancing synthetic knowledge in archaeology requires a refocusing of our collections management and curation "ethos" and refinement and development of the skills and methods we traditionally use for material culture

analysis and other components of the archaeological process. Using collections for the important work of synthesis-building is tied to our ethical responsibilities as archaeologists to share and disseminate the results of our work. A restructuring of our attitudes and approaches to the use of collections for research, and ultimately synthesis, must become part of the conversation about how we teach and practice archaeology.

11 THE COALITION FOR ARCHAEOLOGICAL SYNTHESIS: FOSTERING COLLABORATIVE RESEARCH IN PURSUIT OF PUBLIC GOOD

Author(s): Altschul, Jeff (SRI Foundation)
Presentation Format: Oral

Archaeology offers the means of evaluating claims about the past in ways that can support a variety of public goals. Archaeology can give voice to the voiceless as a means of rectifying politically motivated histories. It can provide a means of cultural expression that ties disenfranchised social groups to the land and its resources. It is the only social science that examines long-term behavioral trends at multiple temporal and spatial scales.

The longer the temporal scales and the larger the spatial area encompassed, the more data are required to address research goals. Thanks to laws and regulations requiring the identification and treatment of archaeological resources affected by development, we now have huge, ever-increasing, amounts of data. However, these same laws generally do not provide for more than project-specific interpretation. As a discipline, we find ourselves in the position of having more than enough data to address questions of public interest, but lacking the funding and institutional support to pursue them.

The Coalition for Archaeological Synthesis (CfAS) was established to meet this need. CfAS is a "bottom-up" approach composed of organizational Partners and individuals Affiliate members that promotes and funds innovative, collaborative synthetic research that rapidly advances our understanding of the past in ways that contribute to solutions to contemporary problems, for the benefit of society in all its diversity. CfAS is open to all. In this presentation, I will provide background on CfAS, what types of collaborative research projects the organization has funded, and how you can become part of the Coalition.

12 ARCHAEOLOGICAL SYNTHESIS: A JOINT STATEMENT BY SAA AND EAA

Author(s): Criado-Boado, Felipe (Incipit, CSIC; EAA President) - Chandler, Susan M. (SAA President)
Presentation Format: Oral

The Society for American Archaeology and the European Association of Archaeologists are membership-based international associations dedicated to research, interpretation, and protection of archaeological heritage. Together they gather about 10,000 members from virtually almost every country in the world. Within their own spheres of Europe and of the Americas, both associations promote the development of collaborative and interdisciplinary research, the management and interpretation of archaeological heritage, and the exchange of archaeological information through their annual conferences, publications, and advocacy work. EAA and SAA are committed to sharing and using archaeological data to advance science and to benefit contemporary society. The current SAA-EAA Presidents share a common goal of integrating data from development-led Archaeology, cultural resource management projects and research conducted by academic institutions. From these activities, the amount of archaeological information has grown in huge proportions throughout the last 25 years. Making use of this documentation in critical knowledge about the past and the present must be of the maximum concern for archaeologists of any field of specialization and activity. Such synthesis could benefit of present developments in big data, data mining, lower costs of computing facilities, digital technologies, advances in AI, and new trends in scientific applications in Archaeology, among others. We believe that this new synthetic effort of archaeological data must move forward from a regional scale to a global scale, reconcile methodic informed approaches with a strong interpretive agenda, and combine quantitative with qualitative research. The best Archaeology has ever been based in the coalescence of our humanistic and scientific traditions. Therefore, we believe necessary to provide a forum for archaeologists from Europe and the Americas to collaborate. EAA and SAA are now exploring topics of interest to archaeologists and the public that can be studied across multiple cultures and at multiple spatial and temporal scales.

602 FOR FUTURE REFERENCE: UNDERSTANDING THE CITY, (RE)PRESENTATIONS OF THE URBAN LANDSCAPE AND THE PAST-AS-PRESENT

Theme: Archaeology and the future of cities and urban landscapes
Organisers: Hadji, Athena (Hellenic Open University) - Saura, Magdalena (Polytechnic University of Catalonia)
Format: Regular session

The session examines the politics of the past-as-present with reference to the urban landscape as a field of inscription. The term ecumenopolis was coined by architect Constantinos Doxiadis in the 1960s to denote the world-city of the future. Current urban sprawls and projections for the future include numbers of people unheard of until recently residing in a single city of the aforementioned kind. The environment of crisis, a global phenomenon with varied local and/ or regional impacts, raises the question of how we can understand, interpret and protect the city

and its heritage under rapidly changing circumstances.

We welcome contributions from distinct disciplines with a common axis of studying the urban condition in a coherent way, among others: how (re)presentations of the past are constructed and communicated in the urban setting and how this entangles itself with the practice of archaeology as socially evolving and involving audiences; alternative archaeologies, such as graffiti and street art and urban comics; urban space – in particular heritage sites - and how it is transformed in relation to tourism and because of its consequences (i.e. gentrification, prioritizing of certain sites over others, site (in)visibility); mechanisms of the social memory of space and the kinds of knowledge that emerge as a result of the use and abuse of architecture, especially iconic urban architecture; the "building-as-image" attitude toward urban heritage promoting a visual approach as opposed to a multisensory somatic experience.

ABSTRACTS

01 INTRODUCTION: LEARNING (?) FROM ATHENS: FOOD FOR THOUGHT

Author(s): Hadji, Athena (Hellenic Open University)
Presentation Format: Oral

The introduction to the present session follows a somewhat peculiar trajectory: instead of providing a general framework for the contributions that follow, it focuses on the way urban heritage has been (mis)treated, perceived, received, preserved, highlighted, degraded or abandoned in Athens during the past decade or so. The literal and metaphorical Athenian landscape of crisis has been transformed into a dystopic destination reminiscent of Banksy's Walled Off Hotel. What started as an 'Athenian Spring' for street art has in the past couple of years deteriorated into a series of degrading events culminating into a new kind of flaneur/ -se: following the footsteps of Lord Byron inscribing his name onto the pillar of Poseidon's classical temple in Sounion near Athens, intrepid travelers mostly of the backpacker genre flock Athens to add to its tags and graffiti bombings and pursue their fleeting moment of fame.

In a few words, the present session delves into the world of urban heritage as prescribed by UNESCO's 2011 Recommendation for the Urban Historical Environment, with selected case studies from various and variable contexts in the global urban world. A common denominator already emerges: an urgent need for a reinterpretation and recalibration of what urban heritage has come to denote in the 21st century.

02 TIME AS ARCHEOLOGY OF MEMORY IN ITS MATERIAL AND IMMATERIAL MANIFESTATION

Author(s): Gómez, Nathan - Molarinho, Sara (UPC)
Presentation Format: Oral

The temporal dimension in architecture considered as archeological memory, with its material and immaterial manifestation, is perceived through a phenomenological experience. The experience is contingent, determined by a location in space and time of the architectural objects, referring us to its singularity. The architectural experience, according to his physical stimuli, makes the temporal experience relative, managing, either to activate or deactivate cultural existing memories, or generating new ones.

The concept of time refers us to memory, the materialization of collective memory is done through architecture and the physical structures of the city that are socially built over time. As Pallasmaa points out, architecture is an extension and externalization of memory. This means that a building or a public space can guarantee the identity of a society, configuring the culture of the place that favors the spatial appropriation of a community.

The link we have with architecture is directed to the human beings where their sensory perceptions such as colors, light and its shadow, the passage of time, textures, smells and sounds among others, are given immediately, these characteristics awaken our senses and are part of the architecture itself. However apart from those physical phenomena that architecture has, it is equally important to know the intentions that results from the combination of those phenomena, and from the uses of their spaces in relation to the purpose with which they were created and to perceive, also in addition to the particular content, the content of contents that makes up architecture.

This theory will be applied to works by Juha Leiviskä and Peter Zumthor.

03 LOOKING FOR HUMAN PURPOSE AND HUMAN WILLFULNESS THAT DRIVES AND HAD DRIVEN THE MAKING OF A CITY

Author(s): Beltran Borràs, Júlia (Universitat Politècnica de Catalunya)
Presentation Format: Oral

This contribution has to do with how and why the cities took the shape they did. The intention is to find some relationships between the process of thinking the architectural design and the history of the profession, taking into account different voices and points of view: territory, infrastructures, rolled and pedestrian circulation hierarchy, social interaction in open spaces, public and private buildings, connectivity and accessibility of urban form, architects, and inhabitants considered as users.

This study focuses on how all this complexity of factors and/or parameters of interdisciplinary nature, have conditioned and condition the configuration of the city. I am not engaged with form in the abstract, but with form as a receptacle of meaning. The configu-

rative knowledge is embedded into building and urban forms in a "generative way". The purpose is to understand the meaning of the architectural design related to the problems behind, not only to the quality of architecture.

The main case study is the historic core of Morella, in Spain, that is composed by an urban sequence of open spaces and pedestrian circulation layouts. The method of this study is based on two different perspectives, the first based on the Italian school of urban morphology and typology, the second on space syntax, developed particularly in University College London by Bill Hillier. Both approaches are being further developed in a wide international context, as theories as well as methods. Space syntax analysis will be used to analyze the urban fabric in relation to its connectivity and integration, while urban morphology studies will examine how the settlement has grown and been adapted to continue suiting the living. Then, direct observation and interviews with local residents provide insight into their daily lives and will also address how they have appropriated space to suit their needs.

04 WINE SANT CUGAT: A 19TH CENTURY RURAL VILLAGE IN A 21ST CENTURY CITY

Author(s): Rodríguez, Alba (Museus de Sant Cugat)
Presentation Format: Oral

The city of Sant Cugat (Barcelona, Spain) has an historical centre and local heritage around the municipality related with the world of wine. In the 18th and 19th centuries the small rural village that once was Sant Cugat specialized in the cultivation of vineyard and the elaboration of wine and changed its image. New streets were open and a new model of urban housing was developed to lodge families of rabassaires (peasants specialised in vine cultivation). Also the farms scattered around the village were adapted to this new economy. The local museum has the challenge to preserve heritage related to this fact, both integrating it in urban landscape and including it in the story of the construction of the current city. The lines of action developed are the following. On the one hand, we aim to recover the original types of rabassaire housing. These types have been established by means of historic and archaeological research: volume, façade composition and interior configuration, where the cellar with its underground vat is the main wine infrastructure. Alterations through time have hidden some of the most representative elements we try to recover now: simple composition in façade with wide doorways which are relevant for city landscape, interior vats when possible. On the other side, we are carrying on an interpretation scheme based on the most representative assets of this past (ie. Cooperative Winery, Cal Quitèria, and other minor elements scattered around the municipality).

05 REPRESENTING INVISIBLE TOWNS WITHIN THE MODERN URBAN DEVELOPMENT OF THE CITY OF OSIJEK (CROATIA)

Author(s): Lelekovic, Tino (The Croatian Academy of Sciences and Arts)
Presentation Format: Oral

This paper aims to present current results and future developments of the project «Archaeological heritage of Osijek» executed by the Croatian Academy in the Croatian town of Osijek. The history of This town came to its turning point in the begging of the 18th century. After Habsburg Reconquista of the eastern part of the Danube basin from the Ottoman empire, Austrian government decided to build a fortress, accompanied by two towns, on the place of the existing Ottoman city. During these developments remains of all existing structures were eradicated and covered with the sprawl of the modern Osijek. Even more, remains of old structures were used as a building material for new parts of town. Due to this not a single structure or a monument remained to witness the existence of settlements that preceded modern Osijek: the Roman colony Mursa, medieval and Ottoman Osijek. In 2012 the Ministry of Culture of Croatia and the Croatian Academy of Sciences and Arts established a project whose aim is to excavate, scientifically evaluate and present archaeological remains of these past towns. The final objective of the project is to create a plethora of public spaces through which (re)presentation of the remains of currently invisible cities will be incorporated within modern urbanity.

The paper aims to present current acknowledgments, explain the problems in the execution of the project, as well as communicating the aims of the project to the general public and local authority. The paper will also present guidelines and plans for future development of this project.

06 RELUCTANT REFUGE: TAKING AN ARCHAEOLOGICAL APPROACH TO SITES OF TEMPORARY REFUGEE SHELTER IN ATHENS, GREECE

Author(s): Kiddey, Rachael (University of Oxford)
Presentation Format: Oral

1 in every 113 people on the planet is now a displaced person (UNHCR 2016). A key concern for those forced to flee their homes is where to find shelter, a safe place to sleep, eat, rest and socialise. Media images focus on large camps but in truth migrants journey through (and get 'stuck' in) cities - making shelter, taking shelter in squats and abandoned buildings, sleeping rough on unfamiliar streets - transforming them.

This paper draws on recent archaeological fieldwork undertaken in the city of Athens (Greece) for 'Architectures of Displacement', a joint research project between the Pitt-Rivers Museum and the Refugee Studies Centre at the University of Oxford. Taking the concept of 'shelter' to encompass a range of qualities and approaching the 'problem' of the current refugee crisis using archaeological and cultural heritage methodologies, I document the city of Athens as a landscape of 'reluctant refuge'. What emerges is a palimpsest of complex and, at times, conflicting social memory, where the city is transformed through multi-temporal notions of

'past-as-present' and 'time-as-crisis'. I show how, through imaginatively re/using and adapting the limited materials and technologies available to them, forced and undocumented migrants (and others working in solidarity) create diverse spaces that offer some of the intangible features of 'home' (such as privacy, autonomy, community and relative safety), too often lacking from conventional forms of emergency shelter. I position this paper against the polarising discourses of humanitarianism and securitisation, familiar within Refugee Studies, to produce 'new', 'authentic', more nuanced understandings of experiences of temporary shelter. Through this activist archaeological work, it is hoped that problematic configurations of 'the refugee' as dependent victim may be countered. Rather, by looking at the city as a socially evolving urban setting, we highlight the new skills and knowledge that migrants bring.

07 ATHENS CALLING: THE COMMODIFICATION OF A LANDSCAPE IN CRISIS

Author(s): Giannetopoulou, Efi (University van Amsterdam - UVA) - Dermati, Thomais (Newcastle University)

Presentation Format: Oral

Athens is a constantly transforming landscape where representations of the past are embedded, intensively, in the realm of the city. Greece has been using archaeology both for the building of a national identity and as a tool for the economic development of the country. Acropolis, as the symbolic landmark of the city of Athens, has been widely exploited by the tourism industry, promoted as a symbol of a glorious past. While archaeology is an evident layer in the urban area of Athens, the economic crisis and urban growth have managed to foster the rise of new forms of archaeologies in the city, the namely ''alternative archaeologies'' such as graffiti and street art. Crisis along with global political strategies have altered the urban Athenian landscape through gentrification and have promoted low-cost mass tourism that transformed neighbourhoods, such as Koukaki, into Airbnb shelters. As a result, prices increased, people got displaced and areas turned into touristic ghettos. What we will designate is that the focus of tourism is being moved from the Classical archaeological remains to an alternative form of tourism by fostering, to some extent, the city branding of a poor yet lively city. Tourism is exploiting every aspect of the Athenian landscape by trying to sell the representation of the ''ugly'' past as present of an abused reality in Athens. Archaeology is becoming, slowly, additional and not dominant, an exotic background in the selfies of the travellers, while the present conditions of the city are evolving into a touristic attraction.

08 THE PIT OF SHAME: (UN)COVERING THE PAST IN BASMANE, IZMIR

Author(s): Baydar, Gülsüm - Güngör, Selin (Yaşar University)

Presentation Format: Oral

In 2016 the Chair of Folkart, a leading construction company in Turkey, proudly announced their plans for a monumental mixed-use project in a building plot in Basmane, a central location in İzmir. He stated that the plot, which had been left inert for the past 17 years and which caused shame for the city would finally be the cause for pride.

The site has been known as "the pit of shame" since being deserted due to legal and administrative issues, after foundations were laid for a World Trade Center project in 1998. In the following decades the area was filled with water and inhabited by wild vegetation and living organisms including mosquitoes, seagulls and ducks. The term, the pit of shame, was readily adopted by the media which widely publicized the current situation of the plot.

To cover up shame, Folkart invited five reknowned architectural firms to develop design proposals. The winning design was to be decided by the public. The submitted projects, each consisting of a soaring tower of eye-catching architectural features, were embarrasingly similar in their visual and programmatic approach. The choice of the public to cover shame hardly involved a choice that would effect their lives.

Focusing on the plot in Basmane, our paper addresses the notion of shame from a psychoanalytical viewpoint. We unearth the history of the site from its little known past as an Armenian hospital in the 19th century; the great İzmir fire of 1922; an inter-city bus terminal; and various failed projects in the ensuing years. By means of the scopic drive that results in incessant representations of the "pit of shame" in various media, we explore how the exorbitant pleasure of the drive arouses the feeling of shame and tread the tenuous line between shame and guilt regarding the projected towers.

09 "TURKEY HAS THE MEMORY OF A GOLDFISH": NEO-OTTOMANISM, GENTRIFICATION, AND THE THREAT TO TANGIBLE AND INTANGIBLE HERITAGE IN CONTEMPORARY ISTANBUL

Author(s): Geraets, Joel (University of Bristol)

Presentation Format: Oral

In 1950, the population of Istanbul was a mere million; now, half a century later, it is the most populous metropolis in Europe, with a population in excess of fifteen million. This rapid growth in one of the most historically important cities globally has not been without impact, not for the older historic populations, nor for the material fabric of the city.

Within recent years the AKP government has begun a systematic process of "Kentsel Dönüşüm" (Urban Regeneration), which has seen vast swathes of the historic inner city bulldozed to make way for luxury developments and malls, ironically often built in a Neo-Ottoman style (Türkün 2011; Uysal 2012). Simultaneously, the complex and destructive nature of Turkish politics poses a grave threat not only to the tangible heritage, but also the intangible; the lived experience and practices of the communities that exist within the city.

Placing itself on the streets of the city, on the back of two years of fieldwork, this paper explores the Turkish governmental narrative

and action toward cultural heritage from the perspective of the city's landscape and material culture, and those that dwell alongside.

Analysing relationships with the material fabric of the city, including through political action such as protests or the production of graffiti, this paper draws out multiple entanglements with the heritage. Through understanding these relationships to the material landscape, this paper highlights their impact upon the future of both tangible and intangible heritage in the city and wider nation.

In an extremely nationalist nation, the relationship with the past and landscape is the foundation upon which personal and national identity is built. Within Turkey, a country with some of the most globally significant archaeology, the past is very rarely straight backwards and always changing, for "Turkey has the memory of a goldfish" (Temelkuran 2016).

10 ARCHAEOLOGICAL HERITAGE AND TOWNSCAPES OF CHANGE: HISTORIC URBAN CORE OF MODERN ANKARA

Author(s): Serin, Ufuk (Middle East Technical University, Dept. of Architecture)
Presentation Format: Oral

This paper intends to discuss the transformation of the historic urban core of Ankara, comprising archaeological sites and monuments from the Roman, Late Roman and Byzantine periods, with particular emphasis on the site of the acropolis of ancient Ankara; a holy place for Pagans, Christians and Muslims alike throughout the centuries. This area is distinguished by the presence of the temple dedicated to the cult of the emperor Augustus and the goddesss Roma, also known as the Monumentum Ancyranum. The monumentalization of the acropolis had begun long before the erection of the temple of Augustus and was concluded in the fifteenth century (C.E.) with the construction of the mosque of Hacı Bayram-ı Veli, immediately adjacent to the vestiges of the temple of Augustus.

The major urban transformation of this area, which started in the 1980s (when the area was registered as a 'First Degree Urban Site' to be protected), has gained momentum especially in the last decade with massive interventions at both urban and architectural scale. These recent interventions have created a number of different physical and visual focal points in this historic site, without, however, taking into consideration the historical and archaeological values of the area, thus changing not only the scale and urban landscape of this historic hill, but also influencing the perception of the temple and the mosque complex as a whole in this newly-created vast urban square. In this context, this paper will also attempt to interpret the past and the present of this significant historic urban site, subject to intensive land speculation and physical and social transformation, in terms of current policies involving the 're-presentation' of specific (selected or excluded) areas of the past.

11 UNDERSTANDING ET-TELL AS HERITAGE IN A PAST AND PRESENT URBAN LANDSCAPE

Author(s): Anfinset, Nils (University of Bergen) - Salem, Hamed (Birzeit University)
Presentation Format: Oral

In the Early Bronze Age the urban centre Tell et-Tell was one of several urban centres in the southern Levant as part of the rapid urban development in the Near East in general. Three millennia later the first excavations took place at Tell et-Tell from 1928-until the present through different aims, perspectives and methodologies. We will start to draw some lines from the earliest excavations and interpretations of the site, and look at how earlier researchers have placed the site within the urban landscape, both in the past and in its present excavation context. Thereafter we try to situate ourself within the present contex of an extreme rapid urbanisation, and to a large degree an overurbanisation which is out of hand where the overall heritage often is neglected and destroyed. This paper builds on recent fieldwork and studies of et-Tell as an urban site and its present adjacent village. But how are we to understand this city, as part of an ever increasing urban landscape of Palestine? How is the urban landscape connected to the changing political landscape? How is the past of this specific urban centre presented over the last 100 years, and how is this communicated and part of the social memory of people.

12 CONSERVATION IN THE NEOLIBERAL CITY: COMMEMORATION OF HISTORY OR REJECTION OF HISTORY? THE CASE STUDY OF JAFFA, ISRAEL

Author(s): Shiff, Menachem (Tel Aviv University)
Presentation Format: Oral

This paper will examine the dialectic role conservation plays in urban planning in the neoliberal age of privatization and globalization through the case study of Jaffa, Israel. While neoliberal processes have assumedly transformed conservation into a tool enabling the rejection of any specific historic perception of the past in the urban space, I will attempt to demonstrate how its' use underlines the historic narratives that shaped the dichotomous relations between Jews and Palestinians in Israeli society.

Studies that examine conservation in the neoliberal age assume that processes of privatization and globalization allow the deconstruction of its political and ideological aspects, focusing only on the economic advantages it may convey to the urban space. According to these studies, conservation is thus transformed into a tool that is used in urban planning that transcends beyond competing perceptions of the past that fueled the dichotomous relations between Jews and Palestinians in Israel.

However, through the case study of Jaffa, I will claim that this very aspiration to "reject history" serves to strengthen dichotomous power relations between hegemonic groups and minority groups in society.

In Israeli society Jaffa Symbolizes the contradicting historical narratives of Jews and Palestinians. Ostensibly, any ideologically neutral conservation process that is to take place in this space should take these competing narratives into consideration. However, it is my contention that the examination of recent discussions regarding the most appropriate conservation practices that should be utilized in recently implemented urban regeneration plans demonstrates how the attempt to reject history only accentuates its importance in ethnically mixed urban spaces such as Jaffa in which not only do Jews and Palestinians live side by side, but their contested memories and perceptions of the past continue to resonate as well

13 EMERGENCE OF RESIDENTIAL ARCHITECTURE IN IRAN "FROM THE EARLIEST TIME TO THE DAWN OF URBANISM"

Author(s): Ameli Najafabadi, Rasoul (PhD student) - Muntañola, Josep (Professor)
Presentation Format: Oral

Iranian architectural fundaments and also residential architecture is not limited to political boundaries considering its extent, hence roots of this expansion should be found in broader areas like Great Plateau of Iran and surrounding lands. Great Iranian plateau is a relatively broad and high land which expanded to the Punjab and Sind rivers from East, to the Tigris and Euphrates Rivers (the plains of Mesopotamia) from west, Caspian Sea and its adjacent prairie (Transoxiana ,Cora) from North, and Persian Gulf and Oman Sea from south.

Perhaps the history of architecture from Paleolithic to the Neolithic can be referred to the first attempt of Human in putting up some rocks together and separate space in the Shenidar cave (around 10,000 BC). The first traces of residential architecture in Iran are related to the temporary and nomadic period. at the same time circular architectures (Pit dwelling; KOOMEH) were being built using stone in west of Iran (around 8,000 BC), and In some areas that nature allowed, buildings have been made from wood and straw. Concurrent with sedentism and the formation of the villages, Circular architecture to the orthogonal architecture and houses are made of adobe and clay wall (around 5,000-4,000 BC).

14 PINHEIROS 2: PERSPECTIVES ON URBANITY IN SÃO PAULO OF THE 16TH AND 17TH CENTURIES

Author(s): Manfrini, Marcelo (University of São Paulo; Museum of Archaeology and Ethnology)
Presentation Format: Oral

The Pinheiros 2 site was excavated during the years of 2011-2013 in a context of preventive archaeology. From this site 40.553 ceramic fragments were unearthed, besides 10 clay burning structures, similar to pit kilns (mostly dated into the 16th century and first half of the 17th century). After fully excavated, this site became the first pottery works found within the urban region of São Paulo up to date.

Based on the information gathered within the archaeological record, aside from historiographical sources, we believe it's possible to identify urban characteristics in a São Paulo that wasn't officially considered a city (the official date is 1711). Yet, under an archaeological viewpoint, the city may receive a new perception. To achieve this venture, we base most of work in studies by Michael E. Smith, and several other archaeologists that focus on archaeological urbanism.

Therefore, we consider being feasible to backpedal the date in which São Paulo has been considered a city through an archaeological perspective by, at least, half a century. With this study, we aim to retrieve part of São Paulo's lost heritage that lies beneath asphalt, and bring to light that the city wasn't simply an isolated establishment of the colony during most of its history.

603 ALIBI ARCHAEOLOGIES: EXCAVATING IN ARCHIVES, MUSEUMS AND STOREROOMS

Theme: Theories and methods in archaeological sciences
Organisers: Berg, Ria (University of Tampere) - Coralini, Antonella (University of Bologna) - Calandra, Elena (Italian Ministry of Cultural Heritage and Activities and Tourism - MIBACT, Istituto Centrale di Archeologia) - Toniolo, Luana (Italian Ministry of Cultural Heritage and Activities and Tourism - MIBACT, Parco Archeologico di Pompei)
Format: Regular session

This session focuses on archaeological excavations alibi, i.e. not on site, and, in particular, on the study of artefacts and documents deposited in the repositories of archaeological sites and museums and archives, often unpublished and inaccessible long after their original discovery and production:

an increasingly rich data source, to be analysed with stratigraphic and philological method, in order to enhance their information potential. In fact, all too often "archaeology" equals "excavation on site", leaving the long-term study of the materials out of the spotlight of funding and research.

Many European excavation sites have long and intriguing histories of excavation, archiving, storage and inventorying the finds. Finds and documents – in various stages of processing, study and publication – may have been accumulated for many decades, even for centuries. The main intent of this session is to confront current methodologies of working on such accumulated archives of archaeological materials, in order to

find common nominators and solutions to their similar problems and challenges.

The session, all in all, has the intention to call attention and to assign more value to these important resources in the archaeological process, including the problem of ever growing archaeological archives and storage.

ABSTRACTS

01 RE-DIGGING POMPEII: THE VESUVIANA PROGRAM AND THE INSULA IX 8

Author(s): Antonella, Coralini (University of Bologna)
Presentation Format: Oral

In the recent history of the researches and studies in and about the archaeological urban site, like Pompeii, the strategy "by insula", or per insulas" is the most successful one.

The Pompeian Project of the Vesuviana Program (1997-) of the Università of Bologna, started in 1998, selected from its beginnings an insula as case-study, namely the insula IX 8, so-called "del Centenario".

Since 1998, in the Pompeii Project of the Alma Mater Studiorum a very important role has been played by the alibi excavations, i.e. By the excavations not in situ, but in archives, museums and archaeological reserves.

Between the main action lines of the Pompeii project of the Universituy of Bologna, the more interesting was is the new rediscovery, in the National Archaeological Museum at Naples, of the finds of the XIX century excavations ("Vecchi Scavi"): more than 500 objects, mostly instrumentum domesticum, in fifty percent of cases recovered also materially.

The study "in se" f these finds, as artifacts, and the contextual analysis of their assemblages offered the tools both to better understanding the production and consumption systems in ancient Pompeii and to rewriting a chapter a chapte of its second life.

02 EXCAVATING THE ARCHIVES AND RECONSTRUCTING THE PRAEDIA IULIAE FELICIS IN POMPEII

Author(s): Parslow, Christopher (Wesleyan University)
Presentation Format: Oral

The Praedia (Properties) of Julia Felix, a complex of baths, shops and richly decorated garden dining rooms, hold the distinction of being the first site fully explored in Pompeii in the 1750s, then reburied and only fully re-excavated and restored in the 1950s. The unique and rich cache of archival material generated over this 200-year period includes excavation diaries and field notes, correspondence, inventories of the finds, preliminary and finished plans, and photographs, plus the finds themselves, scattered between Pompeii and Naples, with some even having found their way to London and Los Angeles. Ironically, the archaeological data from the 1750s is more thorough and accurate than that from the 1950s, but combined they can reveal remarkably nuanced details about the Praedia's design and form in antiquity, and their appearance at the time of their initial discovery and their re-excavation. Having suffered the indignity of being stripped of their artistic program and degraded by their long exposure to the elements, the standing architectural remains are today mere vestiges of their former elegance. This paper will highlight the ways in which the archival material alone helps restore several of the Praedia's lost features, including the famous painted political posters from the façade and the sculptures from the central viridarium. In so doing it will illustrate the relative merits of each type of archival document.

03 GLI SCAVI DELL'AREA DELLE TERME SUBURBANE DI POMPEI DA DOCUMENTI DI ARCHIVIO DEGLI ANNI 1959/60

Author(s): Jacobelli, Luciana (CNR)
Presentation Format: Oral

The Suburban Baths (Terme Suburbane) are located in the southwest area of Pompeii, just outside the Porta Marina gate, close to the city walls. During the first two centuries of the excavations of Pompeii, large amounts of soil removed to bring to the light the ancient town were accumulated to the area of the baths. In the 1950's the systematic removal of these heaps of terrain from Bourbon age excavations began. Such work was possible thanks to the support of the Cassa del Mezzogiorno and the Societa' delle Autostrade, engaged in developing a large street embankment in the Pompeii-Scafati portion of the Napoli-Salerno Highway. Of course, such huge earthwork was unfit to a proper archaeological investigation and the removal of earth from the area was not accompanied by a careful and accurate report of the excavation, which still remains substantially unpublished. At the Pompeii excavation office of the Archaeological Superintendency of the site, the 'Systematic Journal of the excavation works of the Porta Marina Regio VII Ins. from June 1st 1959 to June 23rd 1960' is preserved. Unfortunately, such documentation lacks a detailed record of the work carried out; it mentions inexisting maps, it lacks any topographic and orientation reference, and so even the mere recognition of the environments described and the materials found is quite difficult.

The systematic excavation of the Baths, begun between 1985-1987, imposed the revision of such documents and their interpretation. Around the 1990's the photographic plates of the 1959-1960's excavation were luckily found. The confrontation between diaries and photos has allowed to correctly locate some paintings with generic origin kept in storage, as well as to reconstruct portions of the pictorial decoration of the Baths, today completely lost. Such work, unpublished until now, is hereby presented for the

first time.

04 THE ARCHIVE IN THE ARCHIVE: THE VANDER POEL CAMPANIAN COLLECTION AND TOPOGRAPHICUM CORPUS POMPEIANORUM

Author(s): Zanella, Sandra (University of Montpellier)
Presentation Format: Oral

The project of the Corpus Topographicum Pompeianorum (CTP) conceived and carried out by Halsted B. Vander Poel between the years 1950-1997, was intended as a worldwide archive of the archives of Pompeii. Every photo, excavation report, and publication on a building created during the nearly two and a half centuries of research and excavation in Pompeii that was dispersed in archives all over the world had to be systematically reproduced and indexed in topographical order to build up a corpus of all activities relating to every single monument in the city.

The time was the 1980s, and the "container" for all this material had to be a series of thematic publications organized topographically. This monumental project, requested and financed by the American magnate Halsted B. Vander Poel, will never more than partially see the light of day, but it still exists among the papers kept at the Getty Institute where the Halsted B. Vander Poel Campanian Collection archive is kept. The analysis of the largest collection of documentation on Pompeii in existence abroad permits us to analyze, almost 40 years later, the methods and objectives of a wide-ranging project, a forerunner of the current Geographic Information System.

By following this veritable sequence of 'Russian dolls,' that is to say, the 'archives in the archive,' with an understanding of the original goals set out by Vander Poel, this collection will allow us to take an intersectional look over practical archeology, recording systems and long-term publishing adventures. The introspective analysis that is possible through the papers of Vander Poel will allow us to finally isolate errors and, looking for better solutions, build a Russian doll for our time.

05 ARCHIVAL CONTEXTS AND CONTEXT THROUGH ARCHIVES: THE CASE OF THE LATE BRONZE AGE – EARLY IRON AGE TRANSITION IN GREECE

Author(s): Duray, Anne (Stanford University)
Presentation Format: Oral

In recent years, the importation of theoretical and methodological principles from the field of science studies (Latour 1999) into archaeological discourse has provided an additional vocabulary and means of interrogating archives with respect to archaeological practices and knowledge production (Schlanger 2004; Witmore 2009). Excavation archives, however, are not necessarily direct reflections of archaeological practice, and so present difficulties in reconstructing and interpreting practices, especially in the case of older archives. It is therefore advantageous to also consider correspondence and other biographical archival materials, given that constructed divisions between the lives and scholarship of individuals are artificial (Shapin 1998).

This paper aims to develop both a theoretical framework and practical methodology for integrating these diverse types of archaeological archives—excavation notes and personal correspondence—in order to address questions of archaeological knowledge production. Following Lucas (2001), I contend it is necessary to frame the history of archaeological practice in terms of the development of conceptualizations of "the archaeological record," not merely how methods and techniques changed. In order to assess such constructions of the archaeological record, I propose it is useful to think in terms of context-formation—both how the archive came to be, and how the construction of archaeological contexts may be assessed through archival materials. Drawing from the case studies of the personal archive of Vincent Desborough and excavation archive of Nichoria, I trace some examples of the creation of contexts of archaeological knowledge production—that is, the formation of research agendas, resultant fieldwork, and choices in recording—surrounding the study of the Late Bronze Age – Early Iron Age transition in Greece during the mid-20th century. While this approach highlights gaps that inevitably arise in working with archival materials, it also deepens our understanding of how archaeological practices are shaped by lasting connections between practitioners, longevity of certain methods, and institutional factors.

06 ONE HUNDRED YEARS OF OBLIVION. RECOVERING THE 19TH CENTURY RESEARCH OF THE DACIAN SITE OF SARMIZEGETUSA REGIA

Author(s): Petan, Aurora (Study Centre of Dacica Foundation)
Presentation Format: Oral

The archaeological site of Sarmizegetusa Regia, the capital of pre-Roman Dacia (nowadays Grădiștea de Munte, Romania), has a research history spanning more than two centuries. But whilst the archaeological research of the last century is well known, capitalizing the 19th century contributions has just begun. A number of political and cultural circumstances plus some hazard made almost all the rich documentation related to the pre-scientific investigations of this site remain unknown. The first digging reports were drawn up by the Austrian tax authorities in connection with the first known diggings undertaken on the site in 1803-1804, but unfortunately they were not published after the diggings came to an end. It was only in 1966 that a paleography expert recovered the valuable documents from Romanian, Austrian and Hungarian archives, but their turning into account would have to wait for several decades. The Austrian extensive campaigns were followed by some short expeditions of Hungarian and Saxon scholars resulting in dozens of documents with descriptions, measurements, sketches, plans, but almost all of this information has remained untapped

so far. In this paper I will present the methods I have used in order to recover the information and the main results of this approach.

07 THE ALIBI ARCHAEOLOGY OF A HABSBURG FUNERARY CHAPEL IN MADRID: RECONSTRUCTING THE VANISHED BURIAL OF IMPERIAL AMBASSADOR HANS KHEVENHÜLLER

Author(s): Elbl, Martin Malcolm (The Portuguese Studies Review / Baywolf Press / Trent University)
Presentation Format: Oral

The paper combines archival written and iconographic data (c. 1600 to the 1980s) with a detailed revisiting of the construction-permit rescue archaeology record (2001-2002) for the East cloister (claustro grande) of San Jerónimo el Real in Madrid, a sixteenth- to seventeenth century monastic site now entirely overlaid (no possibility of controlled re-excavation) by the Moneo addition to the National Museum of Prado in Madrid (the "Moneo Cube"). Neither the rescue excavation nor the process of preserving the façade of the cloister's arcade and re-erecting it inside the Moneo Cube addressed satisfactorily the issue of the funerary chapel of Hans Khevenhüller, Austrian ambassador to Madrid, installed somewhere in the San Jerónimo el Real cloisters in 1612-1616. The study documents a digital "virtual re-excavation" of the cloister site, using combined 2001-2002 and historical data, including unpublished documents. The project's goal was to propose a new and convincing location for the chapel -- the former Chapter Hall of San Jerónimo el Real, purchased by the ambassador's executors in 1612 -- and to proceed with a tentative reconstruction. The project forms part of a study of several urban and country estate sites connected with Hans Khevenhüller, the results of which are partly scheduled to appear in the winter of 2018 in a collective work edited by Annemarie Jordan-Gschwend. The conference presentation focuses in particular on questions of methodology and on approaches to reconstruction in a challenging urban context marked by multiple destruction episodes -- later seventeenth-century rebuilding, dissolution of monasteries, Napoleonic wars, nineteenth-century neglect and street-grid adjustments, nineteenth-century projects for a Viollet-le-Duc-style site restoration, and subsequent serially failed twentieth-century maintenance -- culminating in a total obliteration of the site as such.

08 NEW LIGHT ON THE VIA SALARIA NECROPOLIS THROUGH ARCHIVE DOCUMENTS

Author(s): Casaramona, Alba (Sapienza University)
Presentation Format: Oral

The aim of this paper is to describe how different data sources have brought new informations about the Via Salaria Necropolis. North of the Horti Sallustiani there was one of the most intensely exploited graveyards in Rome. Starting from 1886, during the urbanization of the district, considerable remains of burials came to light, which G. Gatti identified as being part of a unitary complex that he called "Sepolcreto Salario". Ancient structures and burial chambers were documented and often destroyed. The data selection - through the cross-analysis of various archival funds - has led to the identification of funerary monuments previously little or not at all known. It often happened that accounts of the finds were separated from graphic and photographic documentation. "Digging" into archives and matching different sources has made possible to reassemble scattered documents.

In the Photographic Archive of the Soprintendenza Speciale ABAP di Roma, photos of funerary monuments - previously unknown or represented only in plan - have been found, so we could identify the building typology and in one case the dedicatory inscription. The unpublished plans of the 19th and 20th century excavations, stored in the ASSAR Archive, have been of great help for the correct positioning of archaeological evidences. A deeper level of knowledge of the distribution of burials was reached by approaching photos and plans.

During rescue excavations carried out in the last years other funerary evidences were unearthed in this area. The examination of the reports preserved in territorial record office of the Soprintendenza has shed new light on elements that enrich the knowledge of the necropolis.

The results of this research have been archived into the SITAR project, a webAIS database that allows to integrate the alphanumeric with the geographical data, to make available the access in an open-source format.

09 PIERRE GUSMAN'S ARCHIVES: PHOTOGRAPHY, HISTORY OF ARCHAEOLOGY AND CONSERVATION STATUS IN POMPEII AT THE TURN OF THE 20TH CENTURY

Author(s): Acolat, Delphine (Université de Bretagne Occidentale; Laboratoire Centre François Viète)
Presentation Format: Oral

The history of the excavations in Pompeii and in the other Vesuvian sites can be documented by many sources and not only by the Special Superintendency for the Archaeological Heritage of Naples and Pompeii's archives. Before he published Pompéi. La ville, les mœurs, les arts in 1899 and Une ville antique sous les cendres – Pompéi in 1906, Pierre Gusman, a French painter and engraver, visited the sites in 1894, 1896, 1898, and 1902, and used drawing and photography to build up his own archives, now conserved at the Institut de France and the Institut National d'Histoire de l'Art. Gusman, by following the progress of the excavations, shows a real archaeological consciousness of the site. Today, his archives are new resources which help document ongoing excavations at the site at the turn of the 20th century, with their conservation status, but also illustrate Gusman's own original method on the ground before the publication of his very rich work, as he made 600 drawings in order to publish what he photographed and 32 watercolors. Using photography as a tool which he describes as reliable and "without fanciful interpretation," and an essential medium for his archaeological interpretation, he conducted a rigorous thematic investigation of architecture, colors of frescoes, material culture,

museology. Thanks to his work, we have today an original archive showing the heritage of Pompeii before its alteration or its reburial (for example the villa of Pisinella and the villa of Fannius Synistor in Boscoreale or the House of the Silver Wedding).

10 RESEARCH, INTERRUPTED: RE-DEPLOYING THE NUMISMATIC ARCHIVE OF KONRAD KRAFT

Author(s): Watson, George (Goethe University)
Presentation Format: Oral

In 1970, the German numismatist and ancient historian Konrad Kraft died at the age of just 50. He was midway through a project that was to revolutionise the study of the Roman provincial coinage, exploring the sharing of obverse dies by multiple cities. Although a posthumous monograph was able to be brought to publication by his assistant (Das System der kaiserzeitlichen Münzprägung in Kleinasien. Berlin, 1972), it is clear that much of what Kraft intended to write went with him to the grave. The material on which he based his study – plaster casts of coins numbering into the thousands, a card index, and other documentation – has lain largely untouched at the Goethe University in Frankfurt since his death. This paper reports on a new project to systematise, digitise and investigate Kraft's archive, which it is hoped will lead not only to new insights into the provincial coinage itself, but also to new opportunities to use the archive in teaching and research. Particular emphasis is laid on the necessity of understanding the working practices of researchers in the past in order to fully understand the material they have left to us, as well as how it can be best re-deployed and re-studied in a modern research context.

11 RECOMPOSING THE EXCAVATIONS AND LIFE OF ENRICO CALDERARI THROUGH THE DOCUMENTS HELD IN THE STATE ARCHIVES OF ROME

Author(s): Grazian, Andrea (Sapienza)
Presentation Format: Oral

The object of this study is the analysis of a series of documents kept at the State Archives of Rome concerning the activity of Enrico Calderari, architect and draftsman of antiquities, active in the first half of the nineteenth century.

Calderari illustrated the findings that were being discovered in Rome on behalf of the "Commissione Antichità e Belle Arti" established by the Pacca edict in 1802. Our knowledge of Calderari and the excavations he followed and documented is mainly due to archival material: a careful analysis of this material, which has been dispersed and divided as a result of complex archival events, has allowed a recontextualization and a more in-depth knowledge of numerous excavation interventions. As a matter of fact, due to diverse conservation logics, it often happened that the descriptive part of the reports on discoveries was separated from the graphic one, thus losing reciprocal correspondence over time.

Here we will present three cases in which, in different ways and times, the relationship between the two parts of the documentation has been "recomposed" as it was originally produced.

The link is given by the carrying out by Enrico Calderari of the illustrations of the discoveries. Specifically, during excavations on the Caelius, on the Aventine and in the church of St Rocco, mosaics were found, faithfully depicted by the architect. The representations illustrate the artist's ability to reproduce antiquities, as well as being the testimony of these findings.

In the same archives, moreover, a series of files are kept on the activities of Calderari as an inspector of the Ancient Monuments: they represent a primary source for reconstructing Calderari's history and personality, and his role in the service of antiquities.

Finally, we will focus on the possible developments of research: Enrico Calderari's activity is indeed traced in other Roman archives.

12 THE BEGINNING OF NEW STORIES: REDISCOVERY AND ENHANCEMENT OF ARTEFACTS AND DOCUMENTS FROM A MUSEUM'S STORAGE

Author(s): Menegazzi, Alessandra (Museum of Archaeological Sciences and Art, University of Padua) - Zanovello, Paola - Salvadori, Monica (University of Padua; Department of Cultural Heritage)
Presentation Format: Oral

Between 1999 and 2008 the new reassessment of the Museum of Archaeological Sciences and Art, (University of Padova, Italy) was an extraordinary opportunity to investigate archaeological collections and excavation archives that were almost unknown and were lying in storage.

For this purpose the Museum encouraged the establishment of research groups that included scholars from different university departments. Thanks to the projects that have been carried over the years and still continue today, we have been able to test some multidisciplinary research methodologies and to propose the results both to the scientific community and to the museum public.

The paper takes into account some of the most important research and related methodologies of working we adopted. A first research group (head prof. Paola Zanovello) worked on the artefacts and excavations archives from Egypt. The original excavation was carried out in the 1930s under the direction of prof. Carlo Anti. The studies also started several collaborations in and outside our university (universities, museums, cultural institutes in Italy and abroad) and they are still ongoing. In recent times they had also included multimedia technologies and virtual reconstructions.

A second research group is starting now and will cover the study of Greek pottery both from old excavation and private collections. The research group, named AMA (Archaeological Materials Authentication, head prof. Monica Salvadori) aims to have a multidiscipli-

nary approach to the study and enhancement of Greek pottery also in terms of social and collecting history.

13 A MUSEUM IN (RE)CONSTRUCTION - AN ARCHAEOLOGICAL EXCAVATION IN THE STOREROOMS OF THE SALINAS MUSEUM IN PALERMO

Author(s): Spatafora, Francesca (Polo Archeologico di Palermo)
Presentation Format: Oral

The restoration of the seventeenth-century monumental complex that houses the Archaeological Museum in Palermo since 1866, as well as the realization of the new exhibition based on different museological criteria from those that guided the previous exposure, gave the opportunity to discover parts of the building and documents that were previously unknown and to return the original contexts of provenance to works and artefacts previously ordered according to a strictly typological criterion. This was possible thanks to a thorough review of the materials deposited in the storerooms but also through the reading of some documents preserved in the Historical Archive of the museum.

Finally, a critical re-reading of some works was possible thanks to extensive cleaning operations and to some important restorations carried out before the partial reopening of the museum.

Il restauro monumentale del complesso architettonico seicentesco che ospita dal 1866 il Museo Archeologico Antonino Salinas di Palermo, nonché la realizzazione del nuovo percorso espositivo fondato su criteri museologici diversi da quelli che avevano guidato la precedente esposizione, sono stati l'occasione per portare alla luce parti di edificio e documenti finora sconosciuti e per reinserire negli originari contesti di provenienza opere e reperti prima ordinati secondo un criterio strettamente tipologico. Ciò è stato reso possibile grazie a un'approfondita revisione dei materiali depositati nei magazzini ma anche attraverso la lettura di alcuni documenti conservati nell'Archivio storico dello stesso museo.

Infine una rilettura critica di alcune opere è stata resa possibile grazie ad approfondite operazioni di pulitura e ad alcuni puntuali restauri effettuati prima della parziale riapertura del museo.

14 FROM THE STOREROOMS OF THE CATANIA CIVIC MUSEUM: NEW INSIGHTS INTO BRONZE STATUARY OF THE ROMAN PERIOD

Author(s): Pafumi, Stefania (National Research Council of Italy - CNR, Institute for the Studies on Mediterranean Societies - ISSM)
Presentation Format: Oral

Archival research and forays into the stores of the Civic Museum of Catania have led to the rediscovery of fragments of bronze statuary deriving from the two most important local collections of the eighteenth century: that of the Prince of Biscari and that of the Benedictine monksAlthough these are only disiecta membra, the fragments in Catania contribute significantly to the understanding of bronze statuary of the Roman period. The examination of them has led to a more complete study of both technical, typological and chronological aspects. In particular, archaeometric examinations carried out with non-destructive methods not only provided precise details of the composition of the alloy, but also added new elements to our understanding of the techniques of decoration.

This is the case in regard to the bronze fragment presented here from the collection of antiquities of the Benedictines. From archival research it has been possible to establish that it was found in 1746, and that its archaeological provenance was probably the port of Anzio. The fragment belongs to a statue of considerable size, and consists of the edge of a cloak with an inlaid decoration, used to convey the impression of a textile enhanced by embroidered figures.

The archaeometric examination of the inlay has demonstrated the use of an alloy that has been deliberately manipulated in its composition in order to obtain a very dark, almost black coloration with pronounced iridescence. These characteristics remember those of a specific alloy used in Roman times and known throughout the Mediterranean as Corinthium aes.

The examples known to us, and recognised as such, are too few for a full evaluation of this metallurgical tradition and of a production which was clearly of "high status". The fragment in Catania therefore represents an exceptional piece, since it adds new elements to our understanding and enables us to appreciate the application of this technique to Roman statuary of notable significance in terms of both quality and size.

15 "PAPER POTTERY": DIGGING IN THE UNPUBLISHED ARTEFACTS AND DOCUMENTS FROM THE PUNIC-ROMAN ARCHAEOLOGICAL SITE OF CARTEIA (CÁDIZ, SPAIN)

Author(s): Sánchez Moral, Carmen María (Universidad Autónoma de Madrid)
Presentation Format: Oral

Archaeological projects are usually understood as new physical excavations and the study of the artefacts discovered in their context. This perception is even more frequently applied to ceramology, which is barely conceived as the study of ceramics…. without ceramic. Put in other words, the research on ancient pottery based on the examination of documentary legacies and unpublished artefacts.

Illustrating what has been previously mentioned, the main purpose of this contribution is to address the study of hundreds of unpublished ceramic artefacts and documents which have demonstrated to be fundamental pieces to reconstruct both the historiography and history of the Bay of Gibraltar.

In the 1970s and 1980s, a research group led by Prof. Francisco Presedo, a lecturer at Universidad de Sevilla, conducted a project at the archaeological site of Carteia (San Roque, Cádiz, Spain), an ancient Punic-Roman city located in the Bay of Gibraltar. The results of the earlier campaigns, those held in the early 70s, were compiled and released as a book in 1981. Nevertheless, the campaigns accomplished in the second half of the seventies and the eighties remained unpublished until today, including thousands of potsherds.

Furthermore, those excavations originated a vast variety of unpublished documents -pictures, roll films, manuscripts, letters, hand drawings, sketches, field journals, descriptions of potsherds…- recently deposited in the Centro Documental de Arqueología y Patrimonio (CeDAP- Archaeological and Heritage Documentary Centre) in Universidad Autónoma de Madrid (UAM) by Prof. Presedo's descendants, constituting a precious Documentary Legacy.

To examine such a huge amount of information, a substantial part of my PhD research work, a suitable well-planned methodology has been devised. The results thus achieved from this "paper pottery" dug out from documents and storerooms, have contributed to shed light on the daily life at Carteia, an ancient city between two bays, two seas and two continents.

16 FROM FRAGMENT TO MEANING: RECONSTRUCTING DYNAMICS OF INTERACTION USING THE CERAMICS FROM 1980-1981 EXCAVATIONS AT THE FORUM OF POMPEII

Author(s): Cottica, Daniela (University Ca' Foscari Venice) - Arthur, Paul (Dipartimento di Beni Culturali, Università del Salento)
Presentation Format: Oral

The paper illustrates research issues, priorities and strategies of a project of "alibi archaeology", based on the retrieval and analysis of "old data" from stratigraphic excavations conducted between 1980 and 1981 by Paul Arthur at Pompeii in and around the forum (Arthur 1986). The project, which begun in 2008 (Cottica / Curti 2008) and is now in the final stage of publication, focuses on the retrieval and study of a large corpus of material, mainly ceramics, brought to light by the first major stratigraphic excavations ever undertaken at Pompeii, but then left in the local storerooms for decades due to lack of research funding. Because of the dual - material and cultural- nature of the artifacts, the study and analysis of this remarkable quantity of ceramic fragments offered an extraordinary opportunity to explore key aspects of the socio-economic history of Pompeii.

The research team includes numerous specialists, inspired by an interdisciplinary approach to archaeological ceramics and by a fruitful cooperation between the various institutions involved. This strategy eventually allowed us to draw a complex picture of production and exchange at Pompeii, from the Archaic period to the Plinian eruption, proving to be a valuable tool in order to explore issues of cultural interaction and transfer of technological know-how among communities living around the Bay of Naples.

17 WORKING WITH OBJECTS THAT DO NOT EXIST. FINDS FROM THE 1847 EXCAVATION OF THE HOUSE OF M. LUCRETIUS (POMPEII)

Author(s): Berg, Ria (University of Tampere)
Presentation Format: Oral

This paper presents a case study of research on the materials found in the mid-nineteenth century excavation of a Pompeian elite house, the House of M. Lucretius (IX 3, 5). Of these finds, originally ca 500 in number, only under 50 have been materially conserved and traceable at present. The fate of the finds is, as always, closely tied with the exact period of their excavation. Many factors, such as the priorities given to certain categories of materials, the quality of their original documentation, the inventory methods and even material factors such as the types of labels used to sign the objects, have affected the final conservation of the finds in the museum deposits. The central question of the paper is, what to do with the finds that do not materially exist any more? What kinds of publication strategies can be adopted for objects of which only inventory records, descriptions, drawings and photos remain? How can such information be combined with the finds that have been conserved?

In general, the paper also briefly outlines the practices of conservation, cataloguing and storage systems of finds from the excavations of the Vesuvian area before the innovations of Giuseppe Fiorelli, that marked important changes in such practices.

a. DOCUMENTING COLLECTIONS OF THE PAST, CREATING HERITAGE FOR THE FUTURE: THE CASE OF SINDA, CYPRUS

Author(s): Tsoumari, Vasiliki - Ahola, Juuli - Alyasin, Ghaza - Gierow, Kristine (Uppasla University)
Presentation Format: Poster

Documenting collections is a part of a museum's objective. A modern approach to documentation is to digitize and publish collections online; a way for preserving the collections and making them accessible to researchers and the public. Several Swedish institutions, including Gustavianum Uppsala University Museum, contribute to this process by publishing collections on their national database Alvin.

Among the collections digitized by Gustavianum is the archaeological material from Sinda, a Cypriot Bronze Age town excavated in 1947 – 1948 by Professor Arne Furumark. Sinda had long been overlooked due to the lack of a final report until 2003. However, as the site is for now inaccessible for excavation, by digitizing the existing material Sinda could be brought back to the attention of the archaeological community for critical re-evaluation.

This poster illustrates that archaeological work and documentation does not end in the field, but should instead extend to museum

archives. Digitization can function as a means to encourage collaboration between the two. Furthermore, the process of digitizing a museum collection and adjusting analogue documentation to fit modern databases are also topics discussed in this poster. With Sinda as an example, this case study exemplifies how old collections can be given new meaning through digitization.

604 DWELLING ON THE SHORE: WATER-LEVEL CHANGES IN WETLAND ENVIRONMENTS

Theme: Mediterranean seascapes
Organisers: Steiner, Bigna (LabEx ARCHIMEDE, Université Paul-Valéry Montpellier 3) - Antolín, Ferran (Integrative Prehistory and Archaeological Science - IPAS, University of Basel) - Ebersbach, Renate (Fachbereich Feuchtbodenarchäologie, Landesamt für Denkmalpflege im Regierungspräsidium Stuttgart)
Format: Regular session

Wetlands have always attracted people due to a wide range of valuable services, eg. resources like food and water, high fertility, diversity of habitats, safety, transportation on the water, buffering of extreme weather conditions, scenic beauty etc. Since prehistory, human activity focused on the edges of water, and wetland settlements can be found throughout all archaeological periods. However, dwelling on the shore also held its risks. These highly dynamic environments could lead to flooding or be a potential source of diseases and could severely test the resilience of its inhabitants. Rising water levels are also one of the ways in which climate change most evidently manifests itself and are often argued as one of the reasons for settlement abandonment.

The changing water levels would leave traces in the archaeological sediments, which can be used to assess human responses to the changing environment. In this session, we are trying to interpret and disentangle these traces using multiple proxies like micromorphology, botanical macro- and microremains, zoological remains etc. from on-site archaeological analyses, ideally in interdisciplinary combinations. In this way, we hope to tackle the following research questions: Can we detect flooding episodes before water-level changes take place? How did people react to these episodes in the past? How do water-level changes affect the site preservation and formation processes? Can we define combinations of indicators for flooding events?

ABSTRACTS

01 PILE DWELLINGS IN SEMI-AQUATIC ENVIRONMENTS: A PRE-ALPINE PERSPECTIVE ON QUESTIONS OF WATER LEVELS AND ARCHITECTURAL RESPONSES

Author(s): Ebersbach, Renate (Landesamt für Denkmalpflege Baden-Württemberg)
Presentation Format: Oral

Since the detection and first description of pile dwellings at the shores of lake Zurich in 1854, the question of water levels and the relationship of settlements and houses towards them are one of the main issues of research, sometimes even THE main issue, as the "Pfahlbaustreit" in the german speaking research of the 1950ies and 1960ies illustrates. New methods and increasing numbers of excavated sites with good preservation of floors, timbers and settlement layouts have resulted in an enormous amount of data about con-struction details preventing pile-dwellers from having wet feet, but still – even with the newest methods and approaches – the relationship between houses, living surfaces, water levels and their seasonal or annual or perennial changes is open to debate.

The presentation will give a short overview of research history and recent ideas concerning settlement locations and construction details in lake-shore sites with an emphasis on neo-lithic pre-alpine sites. The possible connection of construction elements, orientation of houses and settlement layouts with lake levels will be discussed against the background of comparing intra-site and inter-site variability in space and time. It will tackle the session topic of how people reacted to changing water levels and reflect today´s research questionaire from the perspective of a settlement archaeologist.

02 LAKESIDE SETTLEMENTS AND LAKE LEVEL CHANGES – SUPPOSED THERE WERE ANY

Author(s): Bleicher, Niels (Underwaterarchaeology / DendroLab City Of Zürich)
Presentation Format: Oral

As early as the 19th century, the first authors postulated lake level changes in order to explain the unusual position of lakeside settlements in the shallow water. Since then, a great number of authors have based their work on this hypothesis, often in combination with ideas of climate change. The latter was thought to have brought about the supposed lake level changes. Other authors felt that houses with raised floors were the easier explanation and were less convinced of the supposed changes in water level. Consequently, climatic changes played a minor role in their interpretations of settlement dynamics and cultural behaviour.

Since the consequences are obvious, we need to reflect on our sources of information and the appropriate methodology to reconstruct water level variability and possible relations to climate and culture.

In this talk, Lake Zurich is taken as a case study to discuss a range of aspects that need to be taken into account: Different kinds of lake level changes, strengths and weaknesses of historical, sedimentological, hydrological and climatological lines of argument

are discussed, as well as the role of archaeology in this debate – both in terms of methodology and heuristic approach. Lastly, a new dataset on lake level changes of Lake Zurich is presented, based on geotechnics, organic geochemistry and archaeology.

03 WATER-LEVEL CHANGES AND FORMATION PROCESSES AT THE WATERLOGGED NEOLITHIC SITE OF LA DRAGA (NE IBERIA). A MICROMORPHOLOGICAL APPROACH

Author(s): Andreaki, Vasiliki (Universitat Autònoma de Barcelona; Department of Prehistory)
Presentation Format: Oral

La Draga is a lakeshore settlement, where various sectors have been excavated. Water level changes have affected their sedimentation and subsequent formation processes. These indicators are gradually present at the preservation of archaeological material retrieved, as we proceed from the more distant to the sector closer to the lake. Sector A is situated at a higher elevation topographic location and greater distance than the rest from the current shoreline and as a result, the retrieved archaeological material indicates a minor grade of preservation. Sector B is nearer to the shoreline, thus, the material has been preserved under anaerobic conditions, while the third sector C is completely inundated, currently underwater. Although, the current preservation conditions of the three sectors are these, we don't know yet if that was the case during the Neolithic occupation of the settlement and why that was eventually abandoned. Thin sections from each sector are prepared for micromorphological study within the frame of a wider sedimentological approach, aiming to decipher the formation processes of the settlement and the reasons why its inhabitants have abandoned it. The micromorphological study is considered an important proxy in the identification of erosion, transportation and sedimentation events in prehistoric archaeology. The lake as a sedimentary environment can present temporal water-level changes connected to climate change or the vegetation cover, and as result reflects a dynamic background for sedimentary changes. The thin sections presented here come from sectors A and B - retrieved from the stratigraphic sections – and deal with the events associated with water presence before, during and after the human occupation. Palynological and bioarchaeological studies have been already realized and alongside with the stratigraphic analysis at the waterlogged site of La Draga, help to create a more complete picture and contribute to the interpretation of the wetland formation processes.

04 TRANSDISCIPLINARY EVALUATION OF THE NEOLITHIC LAKESHORE SITE ZUG-RIEDMATT (SWITZERLAND)

Author(s): Steiner, Bigna (University Paul Valéry Montpellier 3) - Ismail-Meyer, Kristin - Heitz, Annekäthi - Schäfer, Marguerita (IPAS, University of Basel) - Sebag, David (University of Rouen) - Gross, Eda - Schaeren, Gishan (Amt für Denkmalpflege und Archäologie, Kanton Zug) - Jacomet, Stefanie - Antolín, 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, transdiciplinary 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 marshy conditions 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.

05 FORMATIVE LANDSCAPE ENGAGEMENT ON THE SHORES OF LAKE TITICACA, BOLIVIA THROUGH MULTI-PROXY DATA

Author(s): Hastorf, Christine (University of California Berkeley) - Bruno, Maria (Dickinson College) - Weide, Marie (Kansas State University) - Capriles Flores, Jose (Pennsylvania State University)
Presentation Format: Oral

The Andean high plain is a cool steppe location of early domestication and residence. There both important plants, such as the potato and quinoa were domesticated as well as the camelids llama and alpaca. Once the glaciers retreated plants, animals and people moved in to reside in the diverse lake shore zone. Some of the most prominent early high plain Andean political and ceremonial centers were located on the lake shore. These were not isolated architectural complexes but places made potent by being situated within meaningful and managed socio-natural landscapes. Topographic, archaeological and ecological investigation at the early monumental center of Chiripa, Bolivia by the Taraco Archaeological Project sheds new light onto a complex palimpsest of long-term management and interaction with the surrounding area, especially the lake. A multidecadal-scale lake-level reconstruction for the southern basin lake (Wiñaymarka) based on diatoms, will situate the sequence of interaction, that allow us to track the resident's interactions with changing wetlands, springs, lake and terrestrial resources as they settled on the landscape and became farmers,

herders and fisherfolk. Here, we present this complex landscape by examining several hydraulic features modified by generations of Chiripa residents on the lakeshore, springs, streams, and raised-fields in addition to the evidence for fishing and agriculture throughout the pre-hispanic time frame. This evidence reveals a dynamic history of lake engagement, from the first settlement up to the present-day Chiripa residents.

06 LANGUEDOC LAGOON ENVIRONMENTS AND MAN: BUILDING A MODERN ANALOGUE DATABASE FOR UNDERSTANDING SEDIMENTATION DYNAMICS AT THE PORT CITY LATTARA

Author(s): Steiner, Bigna (Archéologie des Sociétés Méditerranéennes, University Paul Valéry Montpellier 3) - Grillas, Patrick (Institut de recherche pour la conservation des zones humides méditerranéennes, Tour du Valat) - Rovira, Núria (Archéologie des Sociétés Méditerranéennes, University Paul Valéry Montpellier 3) - Alonso, Natàlia (University of Lleida)

Presentation Format: Oral

Previous experience in lakeshore environments in central Europe proved that the use of modern analogue botanical data was helpful in order to establish water level changes and detecting flooding episodes in archaeological stratigraphies (Steiner et al. 2017). For this reason, it is important to expand this type of approach to new amphibious environments, such as lagoon areas. This project aims to reconstruct water agency in the sedimentation processes of the Etrusco-Roman port city of Lattara (Lattes, France), one of the most important commercial enclaves in the area during Antiquity (5th cent. BCE - 2nd cent. CE). For this, modern analogue botanical macroremains were gathered from different wetland habitats around the Mediterranean wetland observatory and nature reserve Tour du Valat, where conditions might still be close to Lattara's environment in the past. The sampling points were chosen in order to represent different natural agents that could have influenced Lattara, which was located at the mouth of the river Lez on the edge of the lagoon "stagnum latera", almost completely surrounded by water (Jorda et al. 2008). A lagoon, a riverine forest and the delta of the Rhone were therefore sampled for modern analogue botanical data in order to find out whether they can be used for the reconstruction of formation processes in sediments of Lattara and whether water sources having influenced the site can be differentiated. Some preliminary results will be presented.

605 TRAINING ARCHAEOLOGISTS FOR TRANSNATIONAL MOBILITY (ANNUAL ROUND TABLE OF THE EAA COMMITTEE ON THE TEACHING AND TRAINING OF ARCHAEOLOGISTS)

Theme: Archaeology and the European Year of Cultural Heritage

Organisers: Karl, Raimund (Bangor University) - Kerr, Sarah (Trinity College Dublin) - Aitchison, Kenneth (Landward Research Ltd.) - Rocks-Macqueen, Doug (Landward Research Ltd.) - Pintucci, Alessandro (Confederazione Italiana Archaeologi) - Marciniak, Arek (Adam Mickiewicz University Institute of Archaeology)

Format: Round table

In a Europe without borders, archaeologists can be and increasingly are required to be transnationally mobile. International online jobs resources for archaeology provide those in search for jobs with opportunities in countries they may never have thought about when starting their archaeology degrees. Many who want a career in archaeology pick up these opportunities and apply for posts abroad; not just in the academic sector, where this has long been the case, but also in the commercial, the museum and the heritage management sectors.

Archaeology degrees, on the other hand, still mostly seem to be focused on the archaeology of the area the University teaching them is located in, or some specific area its staff are interested in. What training is provided in museology, heritage management, and even commercial skills, tends to be specific to the local labour market, too; if it considers the future career opportunities of students at all.

In this round table, we intend to discuss whether archaeological training provided is sufficiently broad and internationally applicable to qualify graduates for a transnational career in archaeology. Are we doing enough in our curricula to prepare them? What can we do better to get them ready to move where the archaeological jobs are? Do we need to develop European Standards in teaching and training at least some core skills that transnationally mobile archaeologists will need in the future?

ABSTRACTS

01 ACCREDITING DEGREE COURSES IN ARCHAEOLOGY

Author(s): Geary, Kate (Chartered Institute for Archaeologists)

Presentation Format: Oral

The Chartered Institute for Archaeologists (CIfA) is the leading professional body for archaeologists in the UK and overseas. As such, it sets standards and promotes good practice and works with partners to ensure that archaeologists are able to develop the skills and competence they need to practice in a challenging, and rapidly changing, environment.

CIfA has been working with its sector partners to develop flexible career entry routes designed to provide vocational skills as well underpinning academic knowledge. As part of this , we have been working with University Archaeology UK (UAUK: the body representing

departments of archaeology in UK universities) on a joint initiative to accredit degree programmes or pathways.

The proposed accreditation process is based on mapping learning outcomes to National Occupational Standards (national statements of competence) which CIfA has aligned with its membership grades. It focusses on the delivery of vocational skills and competence, whilst recognising the many transferable skills students will also be gaining.

As part of the work, CIfA and UAUK are also drafting a memorandum of understanding which they hope will provide a very positive opportunity to develop further strategic connections between the professional and higher education communities. This round table contribution will describe our progress is meeting those aims.

02 TALES OF THE TRANSNATIONALLY MOBILE ARCHAEOLOGIST – AN EARLY CAREER RESEARCHER'S PERSONAL EXPERIENCE

Author(s): Moeller, Katharina (Bangor University)
Presentation Format: Oral

Finding a job in archaeology can be hard. Therefore, being able to apply for work worldwide can be a huge advantage. With most jobs being advertised on the internet these days, it is fairly easy to search for work on an international level. On a European level, there is the added advantage of freedom of movement within the European Single Market area (Directive 2004/58/EC). This makes it particularly easy to relocate within the EU.

Despite these advantages and the fact that mobility seems to be more important than ever across the whole labour market, universities do not always teach the skills required for working in another country. While students could technically try to gain these skills outside of university, this is not always possible. In fact, they might not even be aware how crucial these skills could turn out to be. After all, you do not necessarily expect to be relocating to another country for your first job. So who cares if you were taught the planum method rather than stratigraphic method of excavating, right? However, when you do find yourself working as an archaeologist in another country, you might realise that you are lacking some relevant skills.

This paper takes a critical look at training provided by universities from a graduate's point of view and the advantages European Standards in teaching and training could have for those who are willing to look for employment on an international level.

609 FROM LOCAL TO GLOBAL LAND USE IN THE HOLOCENE

Theme: Theories and methods in archaeological sciences
Organisers: Madella, Marco (Universitat Pompeu Fabra) - Whitehouse, Nicola (University of Plymouth) - Morrison, Kathleen (University of Pennsylvania) - Fiorentino, Girolamo (Universitá del Salento) - Vander Linden, Marc (University of Cambridge)
Format: Regular session

Holocene changes in landcover are documented primarily by pollen and macrobotanical records. Syntheses of historical landuse are less developed than those of land cover, partly because of data heterogeneity archaeological and historical records, and the larger size and disciplinary diversity of the communities involved. Changes in landuse are inferred from multiple forms of archaeo-historical evidence. Farming types, for example, may be identifiable based on settlement sizes, distributions, duration, and from faunal remains (wild/domestic taxa, husbandry practices such as milk, traction, and manure), botanical remains (macroremains showing crops grown, commensal weeds, processing strategies, wood assemblages from fuel), landscape features, geoarchaeological evidence (soil micromorphology, buried soil profiles, evidence of erosional regimes), and isotopic evidence for human and animal diet, to name some of the ways in which categorical assessments of landuse type are made. Other forms of landuse such as foraging using of fire, metallurgy, pastoralism, and urbanization also impact landcover and carbon cycling. This session aims to bring together researchers with an interest in assessing landuse, from local to global level, during the Holocene. The session has also interest in improving our understanding of human responses to change, including climate adaptations and technological 'fixes' for overcoming limitations. Human land use strategies represent complex outcomes of multiple kinds of choices, from economic to cultural and are not necessarily simple responses to physical stimuli and this session will approach this with geographical and temporal examples.

ABSTRACTS

01 LANDCOVER6K/LANDUSE6K – AN APPROACH TO UPSCALE HOLOCENE LAND USE HISTORY FROM LOCAL TO GLOBAL SCALE

Author(s): Madella, Marco (Universitat Pompeu Fabra) - Morrison, Kathleen (University of Pennsylvania) - Whitehouse, Nicki (University of Plymouth) - Gaillard, Marie-José (Linnaeus University)
Presentation Format: Oral

Adequate incorporation of land cover in global and regional climate models is still one of the major priorities in the climate modeling community. In particular, anthropogenic land cover change (ALCC) is still not successfully implemented in these models. As a result, climate models that try to take anthropogenic land cover into account, either to retrodict the past or predict the future are seriously

hampered. The inability of climate models to cope with anthropogenic land cover is due to the fact that the dynamic vegetation models coupled to global climate models (GCMs) or regional climate models (RCMs) simulate climate-induced vegetation (potential natural vegetation) but cannot simulate anthropogenic vegetation or full-scale cultivation; additionally, human-induced vegetation need to be prescribed in these models. Further, the scenarios of past anthropogenic land cover change (ALCC) that are used in climate models to prescribe anthropogenic land use show large differences between them, possibly due to limited integration with archaeological data. The size and direction (e.g. +/- °C temperature and +/- mm precipitation) of the impact of long-term and especially pre-industrial land use on climate is still a matter of debate, and the effects of anthropogenic burning, deforestation, farming, and other land use practices on global climate via biogeochemical and biogeophysical processes in the past are not yet fully understood. Such understanding is critical, however, for land management solutions and strategies for the future. Improved descriptions of past ALCC at both regional and global scales are therefore urgently needed. In this presentation we will illustrate the work of the LandCover6k/LandUse6k initiative for achieving an initial classification and mapping of land use practices during the Holocene based on archaeological data.

02 LAND USE HISTORY IN SOUTH ASIA: ISLANDS OF DATA IN SEAS OF UNCERTAINTY

Author(s): Morrison, Kathleen (University of Pennsylvania)
Presentation Format: Oral

In many parts of the world, such as South Asia, even regional-scale syntheses of archaeological data are rare, meaning that efforts to 'scale up' understanding of past land use and settlement on a global scale must confront issues related both to areas of high data density (such as Europe and North America) and to the very large proportion of the earth with uneven archaeological coverage and variable-quality archaeological data. This talk describes how we are addressing this problem of data coverage and quality in India, a process of estimating past land use by building out from areas with better research coverage to areas less well-studied. Spatial extrapolation of land use types in different periods must necessarily be based on understandings of changing land use practices -- for example, farming in regions with established irrigation infrastructure will respond differently to rainfall constraints than in areas lacking these. This work in progress is part of the LandCover6k project sponsored by PAGES, which uses global-scale archaeological synthesis to help improve climate models. Although we must continue to advance new field research in regions such as this, even imperfect efforts at synthesis allow us to begin to link regional to global-scale patterns, however provisionally.

03 RESERVOIRS AND RADAR: MODELING AND MAPPING LONG-TERM IRRIGATION STRUCTURES ACROSS SOUTHERN INDIA

Author(s): Bauer, Andrew (Stanford University) - Morrison, Kathleen D. (University of Pennsylvania)
Presentation Format: Oral

The construction of irrigation reservoirs for agricultural purposes became a widespread practice in South India sometime after the start of the early Middle Period (ca. 500 CE). With catchment areas ranging from just several hectares to more than a thousand square kilometers, some of these features have long been abandoned while many others continue to pond water and irrigate crops. As part of the efforts of the South Asia working group of LandCover 6K, in this paper we report comparative results from several different remote sensing approaches to mapping the distribution of these archaeological and historical features across southern India. More specifically, we draw on radar data (e.g., SRTM), multispectral remote sensing products (e.g., Landsat), and the results of several intensive pedestrian survey projects. Taken together, these data allow us to evaluate the effectiveness of different methods for modeling and mapping these reservoirs, and develop procedures for estimating the size, quantity, and density of irrigation features across the southern Indian landscape. The results of this work will ultimately form an important dimension of modeling how past human land use and land cover changes contributed to biogeophysical feedbacks over the last several thousand years and how the distribution of such irrigation resources continues to do so today.

04 EUROPEAN LANDUSE AT 6000 BP: FROM ON-SITE DATA TO THE LARGE-SCALE VIEW

Author(s): Whitehouse, Nicki (School of Geography, Earth and Environment, University of Plymouth) - Antolin, Ferran (Integrative Prehistory and Archaeological Science, University of Basel) - Bishop, Rosie (UCD School of Archaeology) - Styring, Amy (Institutfür Archäologische Wissenschaften, Goethe Universität Frankfurt am Main) - Vander Linden, Marc (Department of Archaeology, University of Cambridge) - Kolar, Jan (Department of Vegetation Ecology, Institute of Botany of the Czech Academy of Sciences) - Madella, Marco (CaSEs Research Group, Department of Humanities, Universitat Pompeu Fabra; ICREA)
Presentation Format: Oral

The LandCover6K Working group is concerned with the question of whether prehistoric human impacts on land cover (i.e. anthropogenic land cover change due to land use) were sufficiently large to have had a major impact on regional climates. Climate model simulations have shown that land use data sets can have large regional impacts on climate in the recent past and may have also done so during prehistory. However, there are major differences between the current available land use models (e.g. HYDE and KK10) and reconstructions based on pollen analysis. The only way to provide a useful assessment of the potential for land use changes to affect past climate is to input land use models such as HYDE with more realistic land cover and land use changes based on palaeo-vegetation (land cover) and archaeological evidence (land use).

We present preliminary results from a recent initiative that has reconstructedland use for parts of the European continent (encom-

passing areas north of Greece, north up to Fennoscandia and Ireland, east as far as Russia) at 6000 BP,using asynthesis of land use patterns derived from the archaeological record. We examineplant and animal exploitation, farming and landscape management strategies and,where available,the intensity of these strategies for the time period. The location of settlements, field systems, and other activitiesare also discussed where available. We discuss some of the challenges of developing generalised land use categories within a European context, identify regions for which we have good datasets and identify where there are major gaps in our understanding.We also present a pilot study of first order,top-level land use maps for selected regions of Europe.

References:

HYDE: History Database for the Global Environmenthttp://themasites.pbl.nl/tridion/en/themasites/hyde/

KK10: The KK10 global scenario of anthropogenic land cover change over the Holocene. https://www.unil.ch/idyst/en/home/menuinst/research-topics/natural-and-anthropogenic-ec/atmosphere-regolith-vegetati/the-kk10-global-scenario-of.html

05 LANDCOVER AND LANDUSE IN SOUTH EASTERN ITALY: ENVIRONMENT, FARMING, SETTLEMENTS AND CLIMATE DYNAMICS IN APULIA DURING THE II MILLENNIA BP.

Author(s): Fiorentino, Girolamo (Università del Salento) - Primavera, Milena (Università del Salento) - Muntoni, Italo Maria (Soprintendenza Archeologia, Belle Arti e Paesaggio per le Province di Barletta - Andria - Trani e Foggia) - Radina, Francesca (Soprintendenza archeologia belle arti e paesaggio per la città metropolitana di Bari) - Primavera, Milena (Laboratory of Archaeobotany and Paleoecology - Università del Salento) - Muntoni, Italo M. (Soprintendenza Archeologia, Belle Arti e Paesaggio per le Province di Barletta - Andria - Trani e Foggia) - Radina, Francesca (Soprintendenza archeologia belle arti e paesaggio per la città metropolitana di Bari) - Fiorentino, Girolamo (Laboratory of Archaeobotany and Paleoecology - Università del Salento)

Presentation Format: Oral

Human influence on landcover, and its degree, is subject to change according to socio-cultural as well as climate drivers and thus depends on geographical and chronological scales of the case-studies examined. Over the last few years the Apulia region has been extensively investigated by interdisciplinary approaches, mainly focused on Archaeology, Archaeobotany, Paleobotany and Geomorphology, aiming at the a better understanding of the interaction between Bronze Age Society and their environment. These studies has highlighted major transformations of annual crop husbandry, seasonal harvesting strategies and storage technologies that appears to be alternately linked to climate forces and to socio-political "pressure". In this contribution, we intend to reassess the different lines of evidence in the light of further variables concerning settlement sizes, distributions and duration throughout the II millennium BP; these integrated data sets could reveal further insights into relationship between "socio-ecological" system components in terms of patter, processes, feedback and linkages.

06 ASSESSING ANCIENT LAND USE ON THE PELOPONNESE PENINSULA, GREECE

Author(s): Weiberg, Erika (Department of archaeology and ancient history, Uppsala University) - Hughes, Ryan (Independent scholar) - Finné, Martin (Department of archaeology and ancient history, Uppsala University) - Bonnier, Anton (Department of archaeology and ancient history, Uppsala University) - Kaplan, Jed (ARVE Research SARL, Pully; Department of Archaeology, Max Planck Institute for the Science of Human History; School of Geography and the Environment, University of Oxford)

Presentation Format: Oral

Human use of landscape includes a wide range of interconnected activities, including crop and animal production systems and the exploitation of natural resources for the production of quotidian material culture. Increasingly, it is realized that understanding the sustainability of land use systems over time, and their vulnerability or resilience to both exogenous and endogenous environmental change, requires an accounting of this diversity of land uses and the way in which these influence the environment. Here we present a synthesis of land use systems present in the Peloponnese from the Early Neolithic to the Middle Roman period (6800 BC-AD 300), developed within the Domesticated Landscapes of the Peloponnese (DoLP) project, with the explicit aim of understanding at which periods and under which systems was land use either sustainable and resilient or unsustainable and vulnerable to environmental change. This paper outlines our effort to provide quantitative land use data for a regional land use model. Following the approach of Kay & Kaplan (2015) and Hughes et al. (2018), we recognize three interlinked land use systems that represent a hierarchy of intensity and impact on the environment: field crop cultivation, livestock pasturage, and tree crops/woodlot. We demonstrate how much land for each of these would have been required to support a medium-sized settlement, given typical data available from the Peloponnese. Our results show that per capita land use increased from the Late Neolithic to the Middle Roman period in the Peloponnese, driven primarily by the diversification of economic activities and increases in societal complexity. Although our approach is highly generalizing, we argue that the synthesis is useful and indeed necessary to bring the local to bear on regional and global perspectives on ancient land use.

07 LAND COVER OF THE VALLO DI DIANO (ITALY) DURING THE BRONZE AGE: FORESTAL COVER BY ANTHRACOLOGICAL ANALYSIS AND HUMAN-ENVIRONMENTAL INTERACTION

Author(s): Breglia, Francesco (Scienze del Patrimonio Culturale, Università del Salento; C.R.S. „Enzo dei Medici") - Sellitto, Arianna (Scuola di Specializzazione in Beni Archeologici „Dinu Adamesteanu", Università del Salento) - Fiorentino, Girolamo (Laboratorio di Archeobotanica e Paleoecologia, Università del Salento)

Presentation Format: Oral

The Vallo di Diano is the largest intermountain basin within the Southern Apennines (Italy), it is located in the Southeastern part of the Campania region, near the Lucanian border.

On the basis of the available literature the valley was a large lake during the Pleistocene, progressively dried out in the Holocene, maintaining a marshy appearance up to the XVIII century AD, when the valley was finally reclaimed.During the Bronze Age the area was densely occupied. Nevertheless we just know cave sites located on the slopes of the mountains facing the valley, mainly used for pastoral and funeral reasons. The lack of open air settlements in the area may be due to the high sedimentation rate at the bottom of the valley in addition to the particular environment, which probably wasa wetland during the Bronze Age. This study represents the first try to develop a land cover reconstruction of the area during the Bronze Age through microanatomical analysis of the charcoal remains from three cave sites. We crossed these data with the present day vegetation, in a diachronical distribution pattern of the sites aiming to sketch the changes of the Vallo di Diano forestal cover in order to better understand the human-environment relationship in such a particular context.

08 LOCAL – GLOBAL – GLOCAL? LAND USE STRATEGIES IN MEROVINGIAN SOUTHERN GERMANY

Author(s): Kempf, Michael (University Freiburg)

Presentation Format: Oral

The supposed interrelations of environmental features, settlement dispersal and burial grounds in Merovingian Germany are usually cited when it comes to land use strategies and economical enhancements during the early medieval ages. Unfortunately, the physical properties of the environmental surroundings are often poorly understood - thus leading to the simple linkage of soil and usable space. But the construction and arrangement of settlement spots follow further parameters such as accessibility, flood protection or slope-steepness in terms of erosion and landslide vulnerability. Furthermore, the mental perception and construction of landscape plays another important role in ordering principles. The strong connection of dwelling and graveyard is one of the major topics in early medieval archaeology. Predictive modelling as well as spatial and environmental analysis of the large-scale Merovingian cemetery and settlement ‚Lauchheim' (Baden-Württemberg, Germany) reveals rather practical handling of social and economic conditions. Cognitive relations in the mental representation construct of the dead in the world of the living is probably less physical than presumed. Distances and topography influence the production of landscape but are possibly overestimated in ‚local' settlement micro-regions. This paper argues with the pros and cons of modelling natural features, mental concepts and human interaction by analysing the dependencies of settlement and accompanying burial ground.

09 THE MAKING OF THE KARST: PREHISTORIC LAND USE CHANGES IN THE KARST

Author(s): Mlekuz, Dimitrij (University of Ljubljana; Institute for the protection of cultural heritage of Slovenia) - Fabec, Tomaž (Institute for the protection of cultural heritage of Slovenia)

Presentation Format: Oral

We examine profound land use change in the Bronze Age Karst – a limestone plateau on the border between western Slovenia and eastern Italy – by combining landscape and geoarchaeological record. Analysis of Airborne laser scanning data revealed a very well preserved traces of prehistoric land use. It is composed of settlements, enclosures, field systems, preserved as a network of low walls and terraces, walled tracks and extensive cairinfields. These traces of landscape clearance and rearrangement can be associated with the landscape dynamics documented in sedimentary infill of doline or sinkholes. Doline infills document an impact in landscape after 2500 and especially between 2000 and 1000 BC. Within infills, anthropogenic horizons of burnt ground and charcoal suggest burning of vegetation and removal of tree stumps for forest clearance. In some cases, these are accompanied by sparse finds of prehistoric pottery. Period of intensive modification of landscape is accompanied by the fast accumulation of mainly eolian sediments, which suggest much more open and even disturbed landscape. We discuss the impact of these practices, accumulating over time. Karst has become a profoundly modified landscape. This is not only visible on patches of smooth landscape textures created through clearance, pasture, and plowing. These practices changed everything. Doline became filled with sediments, blown from recently cleared pastures. Vegetational patterns were profoundly influenced by grazing sheep and burning. The open landscape changed wind patterns. There is no natural landscape anymore, what becomes the Karst landscape is a result of the collective contribution of multifarious entities. Karst is an artifact.

10 MODELLING NEOLITHIC WESTERN SWITZERLAND: DEMOGRAPHY AND LAND USE

Author(s): Laabs, Julian (Institute of Archaeological Sciences, University of Bern; Oeschger Centre for Climate Change Research, University of Bern) - Lemmen, Carsten (C.L. Science Consult, Lüneburg; Helmholtz-Zentrum Geesthacht) - Hafner, Albert (Institute of Archaeological Sciences, University of Bern; Oeschger Centre for Climate Change Research, University of Bern)

Presentation Format: Oral

The interdisciplinary trinational project "Beyond lake villages: Studying Neolithic environmental changes and human impact at small lakes in Switzerland, Germany and Austria" combines research agendas on micro, meso- and macro-regional scales for a better understanding of human-environment relationships over time in the Northern Alpine Foreland. Next to archaeological and palynological investigations an emphasis is set on computer-based modelling studies. In this framework different kinds of approaches are chosen to investigate the reciprocity in human-environment systems especially concerned with past human spatial behaviour and land use (LU).

Our subproject focuses on the Three-Lakes-Region in Western Switzerland, which was densely settled during the Neolithic (~4300-2200 cal. BC). The richness of (bio-)archaeological data from the lake shore villages provides us with reliable information about prehistoric subsistence economy, social organization and, in many cases, with high-resolution dendrochronological dating.

In order to tackle the question of past LU patterns we employ an approach that enables us to test and explore hypotheses about the settlement dynamics, subsistence models and strategies to cope with a changing environment. We use a regional scaled down version of the "Global Land Use and technological Evolution Simulator" (GLUES) to simulate population growth/decline and combine it with the agent-based "Wetland Settlement Simulator" (WELASSIMO) to simulate the LU. We are currently working on a simulation model that is capable to estimate human impact on their environment and gain insights into Neolithic communities' resilience against changes in the natural system, triggered by external forces or the legacy of former LU activities.

11 DYNAMICS OF THE SPATIAL DEMOGRAPHY, LAND-USE, AND LANDSCAPES OF MID-VOLGA DURING THE MIGRATION PERIOD

Author(s): Vyazov, Leonid (Kazan Federal University) - Salova, Julia (Khalikov Institute of Archaeology, Tatarstan Academy of Sciences) - Blinnikov, Mikhail (St.Cloud University; Kazan Federal University) - Ershova, Ekaterina (Moscow State University; Kazan Federal University) - Gladnev, Nikita (Kazan Federal University) - Ponomarenko, Elena (University of Ottawa; Kazan Federal University)

Presentation Format: Oral

The most intensive period of migrations that changed the ethnic map of Europe and Russia in the 1 m. CE occurs in the 3rd-7th centuries CE in the Eastern European forest-steppe. In the Mid-Volga region, 700 occupation sites are dated by this period. Being attributed to the single archaeological culture for a long time, those settlements have recently been divided into several cultural and chronological groups. In addition, a number of multi-proxy analyses, including paleopedological investigations, pollen, and phytolith data recently became available. Combining archaeological and paleoenvironmental data allowed us to outline the human-nature interactions during the Migration period.

Spatial patterns of settlements were changing through time. Occupation of the floodplains and low banks of small rivers was characteristic for the settlements during 3rd-5th cc. CE, while settlements of 5th-7th cc were situated mainly on high terraces of large rivers. The change in the topography of the sites in the 5th c. CE was accompanied by the remarkable changes in the spatial structure and by innovations in the agricultural implements.

Most of the sites of 5-7th c. were located in the zone of broadleaf forests that became increasingly important when the European climate was getting wet and cold. A combination of the shifting agriculture on river slopes, livestock breeding in floodplains, fishing, and hunting became a dominant type of economy. The changes in the spatial structure of Mid-Volga habitation sites in the 5th c. appear important markers of the cultural transformation accompanied by significant changes in the landscape due to both climatic and anthropogenic factors.

12 RAINDROPS: RECONSTRUCTING PAST WATER MANAGEMENT PRACTICES FOR DROUGHT-RESISTANT CROPS

Author(s): Lancelotti, Carla - Biagetti, Stefano (CaSEs Research Group; Department of Humanities; Universitat Pompeu Fabra) - Madella, Marco (CaSEs Research Group; Department of Humanities; Universitat Pompeu Fabra; ICREA - Catalan Institution for Research and Advanced Studies)

Presentation Format: Oral

Irrigation, river floods or permanent water sources are often deemed necessary for cultivation to be practised in drylands, especially in hyper arid areas where annual rainfall might be below 100 mm. However, there are modern traditional examples that testify to the existence of successful rain-fed cultivation systems, even in hyper-arid environments. Quantification of the extent of these practices in the past has the potential to dramatically change our understanding of human adaptation and agriculture. RAINDROPS, an ERC starting grant beginning in January 2018, investigates cultivation practices that support human resilience and adaptation in drylands. The project is developing an innovative and reliable methodology based plant remains and isotopic proxies for the identification of water management practices from archaeobotanical remains. By establishing a protocol for the accurate identification of rain-fed cultivation, RAINDROPS will pave the way for the investigation of this practice in the past. Highly controlled data on phytolith

ratios and carbon, oxygen and silicon isotopes from macro- and micro-remains from experimental fields of finger millet [Eleusine coracana (L.) Gaertn.] and sorghum [Sorghum bicolor (L.) Moench] will be validated with ethnographic evidence before being applied to selected key archaeological case studies. In this paper we present some preliminary results from ethnographic modern comparative samples collected from rain-fed fields in Sudan. The study was a pilot to develop a model for identifying fields in drylands by using phytoliths. Our analysis show that phytoliths are a valuable tool to discriminate both between long and short-term use of a field, as well as plant water availability.

13 ANTHROPOGENIC FOREST ISLANDS FROM SOUTHWESTERN AMAZONIA: 10,000 YEARS OF PEOPLING AND LANDSCAPE ANTHROPIZATION

Author(s): Ruiz-Pérez, Javier - Lombardo, Umberto (CaSEs Research Group, Universitat Pompeu Fabra) - Fernández Seláez, Geraldine Paloma (Facultad de Ciencias Sociales, Universidad Mayor de San Andrés) - Ortega Barboza, Luís Miguel (Asociación Armonía) - Madella, Marco (ICREA)

Presentation Format: Oral

The Llanos de Moxos, in southwestern Amazonia, has an impressive archaeological landscape where the main manifestations are late Holocene earthworks such as monumental mounds, agricultural raised fields, canals and causeways. The region is also dotted with hundreds of the so-called "forest islands". Recent research demonstrated that some of these forest islands are prehistoric artificial mounds made by early to mid-Holocene hunter-gatherers and then re-occupied by agriculturalist populations of the late Holocene. These "islands" are mainly distributed along the margins of rivers and palaeorivers, and in some cases they are associated to raised fields and water management earthworks. However, very little is currently known about how many of them are of actual anthropic origin, their general chronology and the societies that built them. Understanding such issues is key to better comprehend the dynamics of South America peopling and to infer the degree of land use and landscape anthropization of southwestern Amazonia during several thousands of years as a result of the economic and cultural activities of several generations of people. In this paper, we illustrate the results of our project carried out in the Barba Azul Nature Rerserve (Beni, Bolivia), where we surveyed 19 forest islands and excavated one of them, and we analysed archaeological and sedimentological materials.

14 GROWING CROPS AND HARVESTING FRUIT: EVIDENCE FOR DIVERSIFIED PLANT USE IN THE LATE HOLOCENE ON THE MIDDLE SOLIMÕES RIVER, AMAZON

Author(s): Cassino, Mariana (Instituto de Desenvolvimento Sustentável Mamirauá) - Shock, Myrtle Pearl (Universidade Federal do Oeste do Pará) - Freire, Guilherme de Queiroz (Universidade do Estado do Amazonas) - Lopes, Rafael Cardoso de Almeida (Universidade Federal de Sergipe) - Lima, Anderson Márcio Amaral (Instituto de Desenvolvimento Sustentável Mamirauá) - Almeida, Fernando Ozório (Universidade Federal de Sergipe) - Tamanaha, Eduardo Kazuo (Instituto de Desenvolvimento Sustentável Mamirauá; Universidade de São Paulo)

Presentation Format: Oral

The archaeological site of São João is located on the middle Solimões River (Amazonas, Brazil). The occupational evidence, dating to between 900 and 1,450 AD, is from populations that produced ceramics associated with the Amazonian Polychrome Tradition. This cultural manifestation has been documented occurring contemporaneously along the Amazon River and several of its important tributaries. In 2016, four test pits (1x1m) were excavated and ten liters of sediment were collected from every 10cm level. The charred archaeological plant remains recovered by flotation were analyzed, quantified, and, when possible, fruit and seed fragments were identified to botanical taxa. Analysis of this archaeobotanical record points to a considerable richness of fruit trees species, that include several genera of Arecaceae, Bertholletia excelsa (Lecythidaceae), Theobroma sp. (Malvaceae), Spondias mombin (Anacardiaceae), Caryocar sp. (Caryocaraceae), Byrsonima sp. (Malpighiaceae), Annonaceae, and Solanaceae. Cultivated annual plants are represented in the numerous fragments of maize cupules and kernels. In combination, the results suggest the existence of ancient agroforestry systems since, even with the adoption of maize cultivation, past populations relied on a rich set of fruit trees, some of which were domesticated. Floristic and ethnobotanical surveys of modern vegetation on the São João site, concurrent with the excavations, indicate that many of the species identified in the archaeobotanical record are important components of the present local landscape. These species are recognized as usually forming oligarchic stands in association with amazonian dark earths, the anthropic soils that resulted from past human activities around dwellings and cultivated areas. The continuity that can be traced at this location on the middle Solimões River between the past uses (and probably the associated management practices) and the present occurrence of domesticated amazonian trees corroborates the hypothesis that the composition of Amazon vegetation was extensively shaped by human societies throughout the Holocene.

611 (NATIONAL) PERSPECTIVES ON THE SIGNIFICANCE AND EFFECTS OF THE INTERNATIONAL CULTURAL TOURISM CHARTER. FROM THEORY TO PRACTICE IN ARCHAEOLOGICAL TOURISM

Theme: Archaeology and the European Year of Cultural Heritage
Organisers: Dunning, Cynthia (ArchaeoConcept) - Mihelic, Sanjin (Archaeological Museum in Zagreb) - Willems, Annemarie (AW Heritage Consultancy) - Smith-Christensen, Cecilie (World Heritage Catalysis) - Sofaer, Joanna (University of Southhampton) - Bedin, Edoardo (University College London) - Martínez Yañez, Celia (Departamento de Historia del Arte, Universidad de Granada)
Format: Round table

For many of those concerned with the various aspects of the relationship between archaeology and tourism, the ICOMOS International Cultural Tourism Charter, Managing Tourism at Places of Heritage Significance, has been a seminal document. It approached this often lacking relationship from a novel perspective, addressing issues and introducing notions and ideas designed to promote a participative approach to management of heritage places. It appealed for respect, understanding and collaboration between different stakeholders as the best, and arguably also the only way to ensure a sustainable future for heritage places. It also sought to enfranchise host communities, while at the same time championing the rights of visitors for a worthwhile and enjoyable experience.

The Charter is currently under review and the aim of this session is to provide local or national perspectives not only on the theoretical significance, but also on the reception of the Charter and the effects it has had since its adoption. To what extent have the objectives and principles of the Charter been implemented in various parts of the world, i.e. in different countries? May the tenets of the Charter be considered a standard practice today, or are they still only a vision that will take a long time to fulfil?

Practical examples show that reality often does not match the theoretical advances stipulated by the international charters and declarations. Can the development of assessment tools contribute to the sustainable development of tourism management on heritage sites?

Session organised by the EAA Working Party on Tourism.

612 TRANSDISCIPLINARY AND PARTICIPATIVE APPROACHES TO CULTURAL LANDSCAPES

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Martin Civantos, Jose Maria (Universidad de Granada) - Chavarria Arnau, Alexandra (Università degli Studi di Padova)
Format: Regular session

Current European rural landscapes are the result of coevolutive processes between human beings and nature. Understanding landscapes means disentangling those complex historical relationships, including not only perceptions and identities, but also production, local ecological knowledge (LEK) and associated traditional practices. Different societies have created different landscapes through time. Social options and strategies have been essential despite environmental conditions. The role of local, peasant communities and power players, in making decisions or developing strategies, has also been different across different European contexts. Currently, Cultural Landscapes (CL) are facing new challenges within the Global Change framework. Relationships between local communities and external players (not always visible) have frequently changed the way local communities live, act in and perceive landscapes. This session aims to debate about CL historical formation as complex socioecosystems; why and how LEK is disappearing at the same time as ancestral practices, resulting in cultural and environmental values of CL being lost. New cultural urban models are being imposed, denying other rural cultural values that have been fundamental for the construction of European landscapes and identities. Almost no debate has taken place about the consequences of those changes, such as the loss of tangible and intangible values, transformations on environmental values, ecosystem services and balances created throughout centuries of cultural interaction. Almost nobody questions how rural communities perceive those changes or which elements communities would like to preserve in this global context. The session will try to respond to these questions by learning from the past to face current challenges

ABSTRACTS

01 FACING CHANGING TIMES: THE EUROTA VALLEY BETWEEN 15TH AND 12TH CENTURY BC

Author(s): Ruzza, Stefano - Scarsella, Elena (Sapienza, University of Rome, Scuola di Specializzazione in Beni Archeologici)
Presentation Format: Oral

The focus of this paper is to investigate the changing relationship between human societies and landscape in time of crisis and socio-economic instability. Such reflection has a timely relevance for our own society, and explores the historical circumstances in a geo-political perspective. History, economy and geography concur, all together, in shaping the choices of human communities toward the landscape and its occupation. In order to offer a retrospective view of this subject, this paper investigates a very complex period of the Mediterranean Late Bronze Age in an area that in historical times had a crucial importance: we will focus on Late Bronze Age Laconia and its changings after the great crisis of the 12th century BC, the so-called Collapse.

As emerged from a precedent study, the settlements in the Eurota's Valley from Pellana (north) to Ayios Stephanos (south) and from Lekas Panayiotis (west) to Apidhia (east) formed a contiguous polity in the shape of an inverted "T". According to such vision, this paper will deal with the geographical and archaeological analysis of the settlement pattern and its changings between the 15th and 12th century BC in the area from Apidhia to Epidauros Limera. Once the changings have been highlighted, their relationship with morphology of the area and its natural sources (mining ores, orography and approdals) will be analyzed, in order to understand the factors that determined the survival of some communities and the disappearance of others.

02 THE ALPUJARRA'S HUSUN (GRANADA, ESPAÑA): A TRANSDISCIPLINARY RESEARCH METHODOLOGY

Author(s): Rouco Collazo, Jorge (Universidad de Granada)
Presentation Format: Oral

The functionality of the husun (rural castles) in the Andalusian society has been highlighted and debated since the pioneer work of the French school in the Spanish Levante in the 70's. These fortifications, managed by the peasant communities, are vectors in territorial organization and central places in the relation between the Islamic state and these communities.

In the framework of the MEMOLA "Mediterranean Mountainous Landscapes" FP7 project, we propose a new transdisciplinary research methodology to deepen in the study of theses fortifications and their role on the longue durée, with the Alpujarra as study object. This methodology is sustained by three pillars: Building Archaeology, Landscape Archaeology and Digital Humanities. Through the Building Archaeology, using stratigraphical analysis of the walls and characterization of building techniques and mortars, we analyze the constructive sequence of each fortification and we can precise if any general constructive program exits. With the Landscape Archaeology approach, we can study the relations between husun and alquerias (hamlets) and irrigation systems, the other two central components of the Andalusian rural settlement. The last methodological pillar, Digital Humanities, is profoundly bound to the other two, contributing with digital techniques that reinforce archaeological analysis. Thereby, a fundamental basis to the Building Archaeology is the photogrammetric documentation of the fortifications through ground-base and UAV-based SfM techniques, while the GIS allows essential analysis of the Landscape Archaeology.

Thus, we aim to analyze the evolution of a core archaeological element for the comprehension of the Andalusian society with this holistic approach.

03 OLD COMMONS AND NEW COMMONS: THE PEASANT LANDSCAPE OF THE CANTABRIAN MOUNTAINS

Author(s): López, Pablo - Rodríguez, Santiago (Llabor - Laboratorio rural de historia, paisaje y patrimonio)
Presentation Format: Oral

Rural communities from the Cantabrian mountains are heirs to a millennial tradition of careful management and advantageous use of their local spaces. In this exploration, the agroforestry territories have played a multifunctional role, developing a high range of productive activities (from grass to forest products, through agricultural activity). They were linked to diferent forms of management in which the collective or semicollective organization and common property took precedence (belonging to small villages, parishes, neighborhood assemblies, manors…), which had generated a wide range of materials (enclosures and corrals, terraces, agrarian and productive buildings…). These spaces and collective uses have endowed some communities with a great capacity for resilience, which has allowed them to reach the 21st century, conforming a singular landscape and ways to understand, manage and conceptualize their living space, which sinks its roots into medieval times.

From the mid-twentieth century, these spaces have suffered a process of dislocation, leading rural communities to a post-productive position and redirecting the peasantry to become rural entrepreneurs. In this context, the understanding of the historic complexity that involves the forms of use and governance of spaces for collective use of mountainous areas is an inescapable point of departure from which to approach new overtures within the framework of current rural development policies.

For this, It would be necessary to perform an agrarian and social archeology, which from a notion of relational landscape links productive processes throughout history with present problems, giving historicity to the struggles and resilience of human groups, showing social alternatives in the past, and showing the different forms that socioeconomic inequalities take today.

04 LINKING THE ARCHAEOLOGICAL PAST AND AGRICULTURAL PRESENT: TOURISM, HERITAGE, AND OLIVE PRODUCTION IN THE ZAKROS VALLEY, CRETE

Author(s): Seifried, Rebecca (Institute for Mediterranean Studies - FORTH)
Presentation Format: Oral

Capitalism has transformed rural landscapes in Europe, revolutionizing farming technology, attracting laborers to cities, and contributing to rural depopulation. At the same time, its forces have operated on a deeper societal level to restructure the social fabric of rural communities and alter their relationship to the cultural landscapes around them. This paper seeks to explore how these forces have played out in the Zakros Valley, a rural zone located in the eastern part of the island of Crete.

Less than one century ago, the Zakros Valley was a vibrant but remote agricultural landscape with roughly one dozen inhabited villages. With the discovery of the Minoan palace of Kato Zakros in the early 20th century and the incorporation of its gorges into a cross-European hiking trail (the E4), the region became a key tourist destination and the demographic makeup of its villages began to shift. However, far from replacing the agricultural livelihood of the region, tourism has contributed to its transformation. The valley

is still an epicenter for olive oil production, with manufacturers like the Agricultural Cooperative Zakros and smaller family companies like Terra Zakros harnessing the region's archaeological past as a part of their marketing platforms. Another company, geared towards a French-speaking clientele, sells its products online through an "adopt-an-olive-tree" scheme.

This paper explores the connections between the archaeological landscape of the Zakros Valley, the ways in which its residents envision their relationship with the archaeological past, and the transformations in how agricultural work is performed and depicted in the cultural imagination. In particular, I use historical records and interviews to focus on the region's more recent archaeological heritage, including abandoned settlements, mule paths, and features associated with agricultural practices (e.g. field huts, terraces), which are the most immediate vestiges of the region's pre-capitalist "cultural landscape."

05 EXPERIMENTING PARTICIPATORY RESEARCH ON HISTORICAL LANDSCAPES IN THE EUGANEAN HILLS

Author(s): Chavarria Arnau, Alejandra (University of Padua)
Presentation Format: Oral

The Medieval Archaeology Group of the University of Padova has been researching about historic landscapes in north-east Italy for about twenty years. Recently, the MEMOLA project gave us the opportunity to work in the territory of the Euganean Hills (about15 km away from Padova). The research was carried out using innovative (LiDAR, radar) as well as traditional methods (aerial photographs, historical maps, excavations, surveys, ...). The results underlined the active role of the local communities in shaping their territory in the past and particularly in managing water and agricultural resources, facing serious environmental challenges through time. The area, still rural in the 1960s, has been rapidly urbanized from the 1970s onwards and its economy is now devoted mostly to tourism and to wine production. The work with the local communities highlighted the tensions within the community and the loss of local ecological and traditional knowledge. The team established a fruitful contact with the managing body of the area, the Euganean Hills Natural Park, only after two years of attempts and the political tensions between the Park and the local communities were evident when the community boycotted some research-related communication activities. Also, the researchers tried to gather traditional information by interviewing the local farmers, but only few people were able (and willing) to help the researchers. Some school activities verified the total loss of intangible values, local knowledge and sense of place of the teenage students, probably due to the rapid urbanisation of the Euganean Hills. In this particular environment archaeology can be an opportunity to build together with the local communities their landscape identity. The paper will analyse opportunities and challenges faced by the researchers in this environment, evaluating the research and introducing the future research perspectives.

06 BIOCULTURAL HERITAGE AND ARCHAEOLOGY. CANCELLING BORDERS BETWEEN DISCIPLINES

Author(s): Martin Civantos, Jose Maria (Universidad de Granada)
Presentation Format: Oral

Biocultural heritage or biocultural memory is a concept firstly suggested by Etnoecology in Latin American context. It refers to inextricable links between cultural, biological and agricultural diversity at global, national, regional and local scales. These multidimensional and complex relations are named 'biocultural diversity'. In some way, these links represent the (biocultural) memory of humans, because they are the present-day expression of a long historical legacy of interrelations between humans and nature. The concept is linked to knowledge and practices of indigenous people and their biological resources, from genetic diversity to landscapes. Is a complex system of interdependent parts centred on relationship between people and their natural environment. It includes biological resources, traditions, practices and knowledge. But many times historical factor is not taken into account. That includes socioeconomic structures and relationships, but also political or cultural processes. In this sense biocultural heritage should be understood as a coevolutive process, but also as an accumulative process (not always positive) with social and political implications. The concept of indigenous population cannot be applied in regions like Europe and the Mediterranean, already transformed throughout time. But nevertheless, many of the elements forming biocultural heritage have already existed or are still preserved also in these contexts. Archaeology can contribute to reconstruct biocultural heritage of past societies, mainly through an integrated and complex approach.

a. APPLICATION OF GEOINFORMATICS AND CROWDSOURCING INTO LANDSCAPE ARCHAEOLOGY.

Author(s): Paclíková, Klára - Preusz, Michal (Department of Archaelogy, Faculty of Arts, Univerzity of West Bohemia in Pilsen; Institute of Applied Informatics, Faculty of science, University of West Bohemia) - Weinfurtner, Anne (Deggendorf Institute of Technology) - Horníčková, Kateřina (Institute of Applied Informatics, Faculty of science, University of West Bohemia) - Dorner, Wolfgang (Deggendorf Institute of Technology) - Vohnoutová, Marta (Institute of Applied Informatics, Faculty of science, University of West Bohemia)
Presentation Format: Poster

Rural landscape in Czech Republic and its way of use has changed significantly during last hundred years, in "contemporary" or "recent past". Mainly due to dramatic historical events and changes in the society and communities associated with them. To name most significant: World Wars; the expulsion of Germans after The Second World War and abandonment of their villages and rural system; populating of this location with new people; collectivization of agricultural terrains caused by Communistic regime; or border closure because of construction of the Iron Curtain.

Important witnesses of these dynamic processes are historical photographs. They reflect cultural, social and economic developments, nature and climate changes. In the same time, they provide a basis for the interpretation of past events, activities and sit-

uations. Moreover, historical photographs are for the public emotional documents and visualisations of historical situations and a vehicle of memories of past cultures in general. The following poster, presenting preliminary results and concepts of the interdisciplinary and trans border project PhotoStruk, focuses on geoinformatics and crowdsourcing based approaches to speed up the process of classification and meta documentation. Together with methods of non-destructive archaeology and history, they allow investigation and reconstruction of abandoned settlements, landscapes, land use and cultural assets. In addition, describes how important historical events affects the landscape. The developed method and tools are tested on a collection of photographs from the archive of the Museum Fotoateliér Seidel in Český Krumlov, Czech Republic. It contains 140 000 photographs taken from the late 19th century until the 1950s. Its digital collection composed by 20 000 photographs is holdings with many undocumented and wrong tagged images with contains important information of destroyed or abandoned villages, landscapes and cultural heritage.

614 ENVIRONMENT, FOOD PRODUCTION AND LIFESTYLE IN BRONZE AGE EUROPE

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Filipovic, Dragana (Institute of Pre- and Protohistoric Archaeology, University of Kiel) - Kirleis, Wiebke (Institute of Pre- and Protohistoric Archaeology, University of Kiel) - Kiss, Viktória (Institute of Archaeology, Hungarian Academy of Sciences) - Kneisel, Jutta (Institute of Pre- and Protohistoric Archaeology, University of Kiel) - Kulcsár, Gabriella (Institute of Archaeology, Hungarian Academy of Sciences)
Format: Regular session

The Bronze Age in Europe was characterised by far-reaching transformations in socio-political organisation, demographic structure, technology, material culture and symbolic expression. It was also a period of some major changes in the environment, as well as in food production and diet, which may have affected the health of Bronze Age communities. The aim of this session is to bring together different lines of evidence on subsistence economy and food acquisition, health status, and natural landscapes modified through human use in the Bronze Age. The underlying idea is to examine relationships between these aspects and investigate how the changing cultural and natural environment could have affected food economy and dietary and lifestyle habits.

Papers are invited dealing with the reconstruction of Bronze Age crop and animal husbandry and their effect on the landscape; research on the opportunities (and limitations) offered by the natural and cultural environment in terms of food production; bioanthropological and other investigations of human diet, nutrition and health status; identification of movements of people, ideas and things and their effect on the subsistence and lifestyle. Case and comparative studies, overviews, uni- and multidisciplinary research papers are welcome, as well as those using indirect evidence (e.g. tools and other objects) or palaeoenvironmental models in the investigations of environmental context of food production and associated land use over this period. We are particularly interested in presentations of the results of recent research, and outcomes of methodological improvements or experimental studies.

NB: For now, ten speakers from three countries are confirmed

ABSTRACTS

01 FEEDING THE MASSES: ENVIRONMENTAL RESOURCES AND AGRICULTURAL POTENTIAL IN THE ARGIVE PLAIN, GREECE

Author(s): Timonen, Riia - Klinkenberg, Victor (Faculty of Archaeology, Leiden University)
Presentation Format: Oral

Towards the end of the Bronze Age (ca. 1600-1100 BCE) the Greek mainland witnessed large-scale socio-political changes such as the development of administrative organizations, expanding international trade and a dramatic population growth. This resulted in increased subsistence requirements which were met with agricultural intensification and other changes in land use patterns. One of the regions where these societal transformations are prominently visible is the Argive Plain in the Peloponnese. The area is renowned for the architectural and artistic achievements observed at monumental sites such as Mycenae and Tiryns. Much less is known about the land use, subsistence strategies, or the food economy of the people living in and around these major sites. To come to a better understanding of these factors of daily life, we bring together data on the resource availability and settlement patterns of this important agricultural landscape and discuss (1) the agricultural potential or carrying capacity of the Argive Plain and (2) how the landscape was used to secure basic subsistence and, possibly, surplus production. To achieve this we combine available data provided by archaeobotanical, and environmental (e.g. climatic and geographical) studies. These data are contextualized in their cultural landscape. To this end we also present a critical revaluation of available settlement data obtained from surveys and excavations. This results in an up-to-date overview of the Bronze Age subsistence economy, set in its ancient cultural landscape.

02 THE IMPACT OF BRONZE AGE SUBSISTENCE ON A DYNAMIC LANDSCAPE

Author(s): van Amerongen, Yvonne (Archol - Archaeological Research Leiden)
Presentation Format: Oral

Bronze Age farming in most of north-western Europe consisted of a mix of crop and animal husbandry. This was no different for the area of Bronze Age West Frisia, The Netherlands (ca. 40x20 km), which was used as a case study to research human impact on the landscape.

To assess the impact that a Bronze Age mixed farm could have on its environment, the natural landscape was reconstructed as well as the amount of land and resources required by one farm. The landscape reconstruction was made with the aid of physical geographical, macrobotanical, palynological and zoological data, to evaluate the potential maximum forested situation surrounding a settlement. Human impact was assessed by evaluating the average numbers of livestock of different species and plots of arable land owned by a mixed farm based on ethnographical data. For each of the identified settlements within the entire research area (consisting of ca. 3-4 contemporaneous farms), the impact (including their arable land and livestock) was subtracted from the reconstructed maximum forested situation to identify the openness of the landscape created by man. Finally, for both the Dutch Middle and Late Bronze Age (ca. 1500-1100/1100-800 BC), the carrying capacity of the landscape was calculated for humans, their livestock, as well as wild animals, and compared to the actual archaeological evidence for settlements. It was concluded that the area of West Frisia, with its fertile soils, was densely inhabited during both periods of the Dutch Bronze Age.

03 TOP-DOWN – BOTTOM-UP: BRONZE AND IRON AGE SETTLEMENT PATTERNS AND LANDSCAPE DYNAMICS IN THE NORTHERN FRANCONIAN JURA (BAVARIA, GERMANY)

Author(s): Kothieringer, Katja - Seregély, Timo (University of Bamberg) - Lambers, Karsten (Leiden University)
Presentation Format: Oral

In this paper, we present first results of an interdisciplinary, multi-year research project on Bronze and Iron Age (approx. 2100 – 30 BC) settlement patterns and landscape development in the Northern Franconian Jura, Bavaria, Germany. Despite the presence of Metal Age hillforts, ritual sites and burial mounds, this part of the German Central Uplands has been largely considered void of rural occupation mainly due to its unfavorable topography and climate, as the valleys are narrow, and the plateaus exhibit a shorter vegetation period and lower soil quality than the surrounding lowlands. However, mounting evidence from archaeological findings and geoarchives has led us to investigate human activity and its impact on the landscape during the Metal Ages both at valley and plateau sites in our study area.

Especially on the plateaus, both preservation and detection of Bronze and Iron Age archaeological findings are hampered by severe soil erosion due to medieval and modern land-use activities. Nevertheless, a combination of archaeological and geoarchaeological, on-site and off-site, field and lab as well as GIS investigations has revealed evidence of a human-induced opening of the landscape and subsequent soil erosion from the Middle Bronze Age onwards. The original vegetation mainly comprised oak-dominated mixed forests that were cleared by fire to open land for rural occupation. Whether this opening was due to long-term land-use around permanent settlements or rather to seasonal activities around temporary camp sites, still needs to be further investigated. In terms of settlement preferences, we find an increase of settlements on the plateaus as compared to the valleys from the end of the Late Bronze Age, and later on an increase of settlements in the valleys in the Early Latène period. Possible relations of these shifts to socio-economic and climatic factors will be discussed at the conference.

04 COLLAPSE OF THE EL ARGAR CULTURE IN SOUTHEASTERN SPAIN DUE TO OVER-EXPLOITATION OF A SEMI-ARID LANDSCAPE?

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

In semi-arid southeastern Spain the subsistence production and consumption underwent significant changes from Copper Age (3100/3000 - 2200 cal BC) to Bronze Age El Argar Culture (2200 – 1550 cal BC) and finally to Late Bronze Age (1550 – 1250 cal BC). For Copper Age sites diverse subsistence strategies and consumption were organized in a collective way. The focus lay on local resources, a low technical standardization and collective storage practices are visible. The social organization changed from a collective context in the Copper Age to a highly hierarchic class society with a centralized system in El Argar Culture practicing a strongly controlled redistribution of resources. The broader spectrum in plants in Copper Age were focused on an extensive barley monoculture and regionally adapted stock breeding of cattle and sheep/goat during the El Argar Culture. Highly technical standardization in food processing and tool use is noticeable. Cereal processing was organized in workshops. Large scale, fortified hilltop settlements were probably not directly involved in agricultural production but had a centralized role in processing and redistribution. Ceramic finds point to an individualized distribution and consumption of mainly boiled food. The low maintenance and over-exploitation of the agricultural surfaces were ecologically unsustainable in the long run. Ecological degradation led to a collapse of El Argar Culture. Increasing exploitation and malnutrition of large parts of the population resulted in social conflicts that brought El Argar to an end. Most of the El Argar sites were abandoned in the mid of the 2nd millennium cal BC, few were ongoing at small size during the Late Bronze Age. The subsistence strategy became more diverse again and the Mediterranean polyculture with the tree fruits olive, grapevine, and fig began to get important. In Late Bronze Age, economic and social life was organized on household level.

05 FOOD PRODUCTS: SOURCES, STORAGE, PROCESSING AND CONSUMPTION IN THE EARLY BRONZE AGE SETTLEMENT OF MINFERRI, CATALONIA, SPAIN (2100-1600 CAL. BC)

Author(s): Alonso, Natàlia - López, Joan B. - Marín, Dióscorides (University of Lleida) - Moya, Andreu (Iltirta sl) - Nieto, Ariadna (IMF-CSIC) - Prats, Georgina (University of Lleida; IPNA) - Vila, Sílvia (University of Lleida)

Presentation Format: Oral

Minferri is a settlement dating to the Bronze Age (a period regionally known as the Mature Bronze Age, 2100-1600 cal BC) located in the interior plains of the north-east of the Iberian Peninsula. The site, the object of ongoing archaeological work since 1993, offers a unique archaeological record consisting of a great number of structures and the artefacts. Minferri is, in fact, one of the major exponents of knowledge of Prehistoric societies of the north-east of the Iberian Peninsula.

The model of the settlement is that of a "dispersed village" characterised by small huts spread over a large surface. The cabins, built with perishable materials, are associated with groups of productive features and storage structures. Excavations identified more than 400 dug out features serving different functions: silos, pits, ovens, burials... The typological variety of the structures, coupled with the richness of the bioarchaeological materials and other aspects of the material culture, serve as a broad repertoire of information from which to approach the questions of food products and processing, resource management. In sum, they offer data to characterise the community's way of life.

Minferri is a sedentary settlement with an agricultural economic base. The bioarchaeological studies reveal populations that were essentially dedicated to cereal farming and the breeding of caprines, bovines and suidae. The presence of large-capacity grain silos leads to hypothesise the existence of communal structures that most likely required an organisation with mechanisms for grain management and redistribution. This study therefore presents the state of the question of the latest interdisciplinary studies (archaeobotany, archaeozoology, lithic ware, use-wear traces, silo volumetrics, fuel) and, in a particular way, plunges into the characterisation of the management and processing of food products.

06 EXPLORING FOODWAYS IN A LATE MINOAN KNOSSIAN 'NEIGHBOURHOOD' (GYPSADES, CRETE) THROUGH MICROBOTANICAL ANALYSES

Author(s): García-Granero, Juan José (University of Oxford) - Hatzaki, Eleni (University of Cincinnati) - Tsafou, Evgenia (Université Catholique de Louvain) - Cárdenas, Marc (Basque Culinary Center) - Ayala, Gianna (University of Sheffield) - Bogaard, Amy (University of Oxford)

Presentation Format: Oral

Despite more than a century of continuous archaeological research at Knossos, little is known about the domestic life of the people living in the area surrounding the palace. In particular, the role of plants in the diet of the inhabitants of Bronze Age Knossos remains poorly understood. This study provides evidence of plant consumption in Minoan Knossos through the analysis of starch grains and phytoliths from Late Minoan cooking vessels recently uncovered at the Knossian 'neighbourhood' of Gypsades. The excavations conducted in 2014 and 2015 by the members of the Knossos-Gypsades project, a synergasia between the Herakleion Ephoreia and the British School at Athens, uncovered a variety of archaeological contexts, including a storage room and two middens. The analysis and comparison of samples from these contexts allows a better understanding of the different stages of the food preparation and consumption cycle. The results of this study highlight the importance of domestic crops in the diet of the inhabitants of suburban Knossos while showing that non-agricultural staples were also part of their diet. The presence of a small number of phytoliths from date palm (Phoenix dactylifera) leaves further suggests that the inhabitants of Gypsades used imported baskets made of date palm leaves, perhaps as (crop) storage containers.

07 HUMAN NUTRITION 10 000 – 1000 BC: A BAYESIAN ERRORS-IN-VARIABLES MODEL OF NEAR EASTERN AND EUROPEAN STABLE ISOTOPE DATA

Author(s): Rosenstock, Eva - Scheibner, Alisa (Freie Universität Berlin, Institut für Prähistorische Archäologie) - Groß, Marcus (INWT Statistics, Berlin) - Fernandes, Ricardo (Max Planck Institute for the Science of Human History Jena, Department of Archaeology; University of Cambridge, McDonald Institute for Archaeological Research)

Presentation Format: Oral

The number of published δ15N and δ13C stable isotope determinations on archaeological human skeletal material has now reached numbers that allow for statistical analyses. Our study draws on data collected for a recent publication (Scheibner 2016) and additional entries, amounting to more than 4000 individuals of at least infans II age to ensure a post-weaning dietary signal. By adapting an algorithm initially developed for archaeological anthropometric data (Groß 2016; Rosenstock et al., forthcoming) to fit the isotope dataset, we created Bayesian errors-in-variables models of the spatio-temporal variation in δ13C and δ15N in the Near East and Europe ca. 10 000 – 1000 BC. By smoothing the effects caused by the patchy distribution of data in space and time, the model reveals robust trends in human nutrition. Notably, nutrition varied considerably between regions and millennia during the early Holocene, but stabilizes at values of around 10 ‰ for δ15N and -20 ‰ for δ13C in the 5th through 3rd millennia in most regions. This finding underlines that, rather than during primary and secondary Neolithization, uniform and stable agrarian economies only developed during later prehistory, i.e. in the Copper and Bronze Ages.

Groß, M. (2016) Modeling body height in prehistory using a spatio-temporal Bayesian errors-in variables model. Advances in Statis-

tical Analysis 100/3, 289-311.

Rosenstock, E., Ebert, J., Martin, R., Hicketier, A. and Groß, M. (forthcoming) Human Body Height in the Near East and Europe ca. 10 000 – 1000 BC: its spatio-temporal development in a Bayesian errors-in-variables model.

Scheibner, A. (2016) Prähistorische Ernährung in Vorderasien und Europa: Eine kulturgeschichtliche Synthese auf der Basis ausgewählter Quellen. Studien zum Lebensstandard in der Vorgeschichte, Vol. 1. Rahden: Marie Leidorf.

08 DIETARY HABITS ON THE BANKS OF SAVA RIVER DURING LATE BRONZE AGE

Author(s): Kalafatic, Hrvoje - Hulina, Mateja (Institute of Archaeology, Zagreb) - Mihaljević, Marija (Municipal museum Nova Gradiška) - Spiteri, Cynthianne (Eberhard Karls Universität Tübingen Institut für Ur- und Frühgeschichte) - Radović, Siniša (Croatian Academy of Sciences and Arts) - Rageot, Maxime (Eberhard Karls Universität Tübingen Institut für Ur- und Frühgeschichte) - Reed, Kelly (University of Warwick, School of life science) - Škreblin, Ana (University of Zagreb, Faculty of humanities and social sciences)
Presentation Format: Oral

Mačkovac-Crišnjevi is a Late Bronze Age settlement and cemetery in Northern Croatia, situated on the left bank of the Sava River, near the town of Nova Gradiška. It belongs to Late Bronze Age Barice-Gređani group, and it is dated from 14th to 12 th century B.C.

The settlement is only partially excavated, but features and interdisciplinary analysis produced evidence of animal husbandry and food production in the late Bronze age. As the part of the settlement, furnaces and hearts were found. Archaeological assemblage consist mainly of pottery sherds, animal bones and small metal objects. In this paper we are going to present the results of our analyses of organic residues from pottery, animal bones and plant remains. Plant remains show evidence of cereals (e.g. oats), pulses and wild fruits and nuts use. Faunal assemblage is dominated by domestic animals: pigs, cattle and sheep/goat, suggesting a strong herding community. The remaining fauna includes scarce remains of wild taxa such as fish, red deer and small to medium-sized carnivores, that were most likely hunted localy, or in the case of later co-existing with people in and around the settlement. We also applied residue analysis on a small sample of different vessel types. Organic residues were extracted and analysed using Gass Chromatography - Mass spectrometry (GC-MS) and Gass Chromatography - combustion - Isotope Ratio Mass Spectrometry (GC-c-IRMS). Results of this analysis are consistent with faunal data, but also show that animals were possibly used for dairy products. Subsistence economy on the site was based on farming and livestock breeding for meat and possibly dairy products.

09 ARCHAEOBOTANICAL AND ISOTOPE STUDIES TO REVEAL THE ECONOMY OF THE EARLY BRONZE AGE SETTLEMENT FIDVÁR NEAR VRÁBLE, SLOVAKIA

Author(s): Schlütz, Frank - Bittmann, Felix (Lower Saxony Institute for Historical Coastal Research, Wilhelmshaven)
Presentation Format: Oral

Fidvár near Vráble in southwest Slovakia is one of the largest Early Bronze Age settlements in the region of the Pannonian Basin. The fortified settlement is located on a riverbank of the Zitava within a landscape with fertile loess soils. The ore rich Carpathian Mountains are in sight. Extensive archaeobotanical material taken form houses near the centre as well as in the former periphery of the settlement allows detailed spatial and diachronic studies.

The archaeobotanical analyses have revealed a very strong economic dependency on cereals, especially Emmer (Triticum dicoccum) and some Einkorn (Triticum monococcum). Legumes and oil plants were most probably unimportant. The amount of threshing waste is usually very low but considerably higher in the samples taken inside the houses near the walls and is highest in the lanes between the houses. Phosphatised material in the houses is restricted to the working area around the fireplace.

While nearly all samples - independent whether being rich storage finds or poor in remains - are dominated by Emmer, their isotope signatures vary considerable. The signatures show that Emmer and Einkorn were cultivated separately as well as together as maslin and that some of the weeds were probably associated with certain wheat species.

10 MACRO-BOTANICAL PERSPECTIVE OF A HOUSEHOLD AT THE BRONZE AGE FORTIFIED SETTLEMENT KAKUCS-TURJÁN MÖGÖTT, HUNGARY

Author(s): Filatova, Sonja - Filipović, Dragana - Kirleis, Wiebke (Institut für Ur- und Frühgeschichte, Kiel)
Presentation Format: Oral

The onset of the Middle Bronze Age (MBA) in the Hungarian Carpathian Basin is marked by a transformation in the settlement pattern, including the reappearance of tells and centralised settlement structure. The fortified settlement of Kakucs-Turján mögött in central Hungary is a good example of this development and a suitable case-study for investigating how the new settlement organisation is reflected in economy and lifestyle. The excavations have so far revealed a two-phase residential structure that was occupied by a Vatya culture household during the entire MBA (2000/1900-1500/1450 BC). Preceding and succeeding phases of habitation in the same location are indicated by pits from the EBA and the final phase of the MBA. The latter phase marks the abandonment of this particular habitation area and, moreover, the abandonment of tells in the Carpathian Basin as a whole.

The macro-botanical results suggest that, during the MBA, einkorn and lentil were the main staple crops for the occupants of the excavated house, followed by barley and garden pea. A number of other crops have been identified in the samples, including several wheat and legume species, reflecting a food economy founded on a wide variety of cultivars.

The contextual and stratigraphic analysis of the deposits in the house that yielded macro-botanical remains allows the reconstruction of spatial and temporal distribution of different activities related to plant processing and food production. Further, it sheds light on the continuity/discontinuity over time of subsistence strategies within this particular household. The insights from this case study can be used to gain a better understanding of specific choices made by communities of the Vatya culture with respect to their plant-food economy, and of the role these choices played in the socio-cultural transformations in the Carpathian Basin at the onset and at the end of the Middle Bronze Age.

11 BRONZE AGE FOODWAYS IN THE MAROS REGION, SE HUNGARY: LITHIC AND CERAMIC PERSPECTIVES

Author(s): Szeverenyi, Vajk - Priskin, Anna (Deri Muzeum)
Presentation Format: Oral

The study of foodways – the diverse cultural aspects of food preparation and consumption – is still a neglected subject in Hungarian prehistoric research. It is a complex, interdisciplinary approach using results among others from archaeobotany, zooarchaeology, stable isotope studies on humans, animals and plants, study of food remains, residue analysis, environmental reconstruction, lithic studies, and last but not least, pottery analysis. The aim of our paper is to present some preliminary, but integrated results from the last two categories, the typological and functional study of macrolithic implements and ceramic vessels used in food preparation and consumption in the Maros region in southeast Hungary throughout the Bronze Age. Through simple formal analysis we investigate the sets of vessels used to store, prepare and consume foodstuffs and attempt to reconstruct basic food storage, preparation and consumption habits. Through the functional analysis of macrolithic tools and their contextual analysis throughout various settlement types, we attempt to reconstruct the organization of food production and preparation within a region and its changes through time. The paper is intended to bring us closer to a better understanding of Bronze Age foodways in Hungary and to form the starting point of more in-depth and multifaceted analyses in the future.

a. CORDED WARE MATERIALS IN THE FOREST ZONE OF NORTH-WESTERN RUSSIA

Author(s): Tkach, Evgenia (Institute for the History of Material Culture Russian Academy of Science)
Presentation Format: Poster

North-Western part of Russia (Pskov and Leningrad districts) is located in the forest zone. Corded Ware culture (CWC) materials were discovered along the border between Russia and Estonia, at the shore of Gulf of Finland. On the other hand, Corded Ware materials are also distributed on the Estonian side of the Lake Peipsi. In the Pskov region, not far from the Peipsi lake, Corded Ware materials are located on the bank of the lake Belaya Struga. In this region were also found rare materials of the local fish-gathering Neolithic (Pit-Comb) culture. CWC material includes 11 ceramic vessels. There are different wide-necked vessels with everted upper part. They are made in patching technique with grass as admixture. Some of the vessels are decorated by hollow stamps or grooves. One vessel was made in N- technique with grass and organic materials in the forming dough. In this collection, a beaker with "herringbone" as the ornamentation was distinguished. Also found here were fragments of a stone battle-axe and a copper awl. These ceramic materials could be described as vessels of the A-horizon of the CWC that were found at one of the most eastern forest site of this culture. There are rare flint tools which could be explained by long-distance trade of raw materials. It is be possible that CWC inhabitants of the site used also quartz tools. The appearance in this region of the CWC traditions could have introduced metal production and agriculture to the local fish-gathering Neolithic communities.

c. DIETARY VARIABILITY DURING THE BRONZE AGE IN THE AREA OF PRESENT-DAY CZECH REPUBLIC

Author(s): Kaupová, Sylva (National Museum) - Parma, David (Archaeological Heritage Institute Brno) - Salaš, Milan (Moravian Museum) - Unger, Jiří (Institute of Archaeology of the Czech Academy of Sciences, Prague) - Jarošová, Ivana (free-lancer)
Presentation Format: Poster

Earlier studies have referred to the Bronze Age as to the period of important dietary change. The introduction and subsequent intensification of millet production was reported from several parts of Europe. Isotopic analysis of carbon, nitrogen and sulphur in collagen allows for the direct estimation of dietary contribution of millet, as well as animal products of both terrestrial and aquatic origin.

The studied sample could be attributed to the Early (EBA, 2000-1500 BC) and the Late (LBA, 1300-800 BC) Bronze Age. The Middle Bronze Age was regrettably not represented in our sample. EBA is represented by 21 individuals from Tuřany. Due to the dominance of cremation burial rite, the LBA sample consisted from either isolated inhumations or those scattered in the settlement context of several sites: Hostice (n=3), Ivanovice (n=1), Vyskov (n=1) and Blucina (n=5). The comparative LBA dataset comes from geographically distant site Zálezlice (n=8). Faunal samples (n=24) representing all the above mentioned contexts were included in the study.

In comparison with other data from the area, faunal samples from all the Bronze Age contexts show higher nitrogen isotopic values, which may reflect specific husbandry practices. Carbon data show a range typical for terrestrial C3-plant environment. Millet was probably not used as a supplementary fodder.

Human carbon isotopic values differ significantly between EBA and LBA samples, suggesting a sharp increase in consumption of millet in the latter period. Nitrogen isotopic values suggest substantially limited access of most individuals to animal products. These results are discussed with respect to the burial characteristics (grave vs settlement pit, ritual vs non-ritual position of the body, presence of grave goods).

This study was supported by the Ministry of Culture of the Czech Republic (DKRVO 2018/17, National Museum; DKRVO, MK000094862, Moravian Museum).

d. PLANTS AND ANIMALS FROM THE BRONZE AGE IN THE MIDDLE RHONE VALLEY: THE ARCHAEOLOGICAL SITE OF NOGEIRET (BOLLÈNE, FRANCE)

Author(s): Pinaud-Querrac'h, Rachël (UMR5140 ASM LabEx Archimède) - Cenzon-Salvayre, Carine (UMR7299) - Renaud, Audrey (UMR5140 ASM) - Garcia-Dalmau, Cristina (Mosaiques Archéologie) - Rovira, Nuria (UMR5140 ASM)

Presentation Format: Poster

The archaeological site of Nogeiret (Bollène, France) is located in the Rhone plain, in an area of very fertile silt, consisting of old overflow deposits of the rivers Rhone and Lauzon. A first archaeological excavation was carried out in 2009 by INRAP, revealing an early Iron Age settlement. The work presented here concerns the new excavations made by Mosaïques Archéologie in 2016 and 2017 (C. Garcia, dir.).

These latest excavations made it possible to find some early Bronze Age structures (pits and postholes) and an open-air settlement, a farm, dated to the transition period between the late Bronze Age and the first Iron Age (8th c. BC). To date, the farm presents an absidial building made of wooden posts with a hearth inside and, in the immediate periphery, an oven and some small structures with heated stones, probably linked to a workspace, a silo, a well and four granaries.

Sampling has allowed finding many archaeobotanical (seeds and fruits, charcoal) and zooarchaeological macro-remains: 413 charcoal fragments, 3845 seed and fruit remains, and 300 bones. All plant macro-remains are charred. Soil samples have been water-sieved using meshes of 4, 2, 1 and 0.5 mm.

The aim of this work is to present the first results of these studies in order to characterize the environment close to the site, particularly vegetation, as well as human activities related to timber exploitation and fuel-wood collection, crop growing and animal husbandry. A particular attention will also be paid to plant and animal food production.

This work, even if the number of samples and remains is not yet very high, covers a chronological period poorly documented and studied on the middle Rhone Valley. It will certainly provide new evidence to better understand the agrosilvopastoral systems and the subsistence practices developed by these Bronze Age societies.

e. WILD PLANT CONSUMPTION AT BRONZE AGE SITES IN THE SOUTH CARPATHIAN BASIN

Author(s): Filipovic, Dragana (Institute for Balkan Studies, Serbian Academy of Sciences and Arts; Institute for Pre- and Protohistory, University of Kiel) - Kroll, Helmut (Kiel)

Presentation Format: Poster

The Bronze Age, particularly in its middle and late phases, was in the Carpathian Basin the time of large fortified settlements, increased trade/exchange, technological innovations and introduction of more extensive agricultural regimes. With respect to plant production and consumption, broadening/diversification of exploited resources was noted, as several new species were added to the spectrum known from the Neolithic and Copper Age. Some of these species are wild, and thus their role is not immediately clear. Here we present the evidence of collection/use of wild plants from several sites in the southern part of the Carpathian Basin (the northern Serbian province of Vojvodina). Large concentrations of charred seeds of Camelina sativa, Sisymbrium, Chenopodium polyspermum, Chenopodium album were recorded at the sites of Feudvar, Vatin, Židovar, Kalakača and Idjoš. For crucifers, producing oil-rich seeds (Camelina and Sisymbrium), the potential use seems obvious. For Chenopodium, producing starchy seeds but normally considered arable weed, the possible purpose is not as straightforward. We review some ethnographic and experimental evidence of the potential use of Chenopodium seeds. We also consider how the potential food role of these and other new plant resources may reflect changing dietary habits and lifestyle of Bronze Age communities in the region.

f. DID IT SPREAD LIKE WILDFIRE? DETERMINING THE TIME AND RATE OF SPREAD OF MILLET CULTIVATION IN BRONZE AGE EUROPE

Author(s): Filipovic, Dragana (Institute for Pre- and Protohistory, University of Kiel) - Effenberger, Henrike (Academy of Science and Literature, Mainz; Christian Albrechts University, Kiel) - Corso, Marta - Kirleis, Wiebke (Institute for Pre- and Protohistory, University of Kiel; Graduate School)

Presentation Format: Poster

There were many changes and innovations in different aspects of life in Bronze Age Europe. They were so profound and extensive, that they led to transformation of economy, sociality, communications, built space, symbolism. Agrarian novelties, such as new crops, tools, practices, may have transformed crop production and, in turn, social relations. Introduction of millet cultivation likely was one such development and it is accepted that it occurred in the Middle-Late Bronze Age. Many large deposits of millet were attributed to these phases, but only in some cases were the grains directly dated. Millet may have been present in Europe earlier, although radiocarbon dating demonstrated that the supposed Neolithic/Copper Age millet grains, at least in some cases, represent later intrusions. Assuming the Bronze Age spread of millet cultivation, further questions arise. What was the rate of this spread? Was there a time lag between different regions? Thirsk (1985, 542) states that, "A new crop could spread like wildfire among small peasants, if its social, economic and agricultural requirements suited their circumstances". What were the economic, technological

and social circumstances and consequences of the introduction of millet cultivation? Such questions about millet cultivation are addressed in the research on 'Dynamics of plant economies in ancient societies' – a project of the Collaborative Research Centre 1266 'Scales of Transformation', Institute for Pre- and Protohistory, Kiel University. Recently, a programme of 14C dating of archaeobotanical finds of broomcorn millet from a number of prehistoric sites in Europe has been initiated, in collaboration with many colleagues. The specific goal is to produce radiocarbon dates on millet grains and determine, as accurately as possible, the time and pace at which millet cultivation became established in Europe. This paper gives more details on the aims and scope of the programme and presents first results for northern Germany.

618 PROCUREMENT AND DISTRIBUTION OF SILICEOUS ROCKS IN THE LIGHT OF GEOCHEMICAL AND PETROGRAPHIC ANALYSIS IN ARCHAEOLOGY

Theme: Theories and methods in archaeological sciences
Organisers: Werra, Dagmara H. (The Institute of Archaeology and Ethnology Polish Academy of Sciences) - Sobkowiak-Tabaka, Iwona (Institute of Archaeology and Ethnology, Polish Academy of Sciences Centre for Prehistoric and Medieval Studies) - Collin, Jean-Philippe (Université de Namur / Université Paris-1) - Asheichyk, Vitali (Institute of History, The National Academy of Sciences of Belarus)
Format: Regular session

Looking across Europe we can see a strong tendency towards geochemical and petrographic characterization of raw materials. Collecting, sourcing and finding new materials unveil so far unknown rocks used by prehistoric communities. In addition to on-going investigations describing the occurrence and geological nature of raw material, determining the levels at which the raw material occurs in the deposits, as well as the stratigraphic context and geological dating of the layers, the principal goal is to identify instrumental methods for an accurate distinction of siliceous rocks and application of the results in archaeological studies. On one hand the new developed methods provide some very useful tools to discriminate various kinds of rocks but on the other hand the exchange of scientific results is fragmentary due to speech barriers and publications being printed in local series. All this affects our state of knowledge and causes stagnation in methodological development.

We would like to direct our invitation to scientists working on the problem of stone material used by the prehistoric societies. Our goal is to encourage presentation of papers on applying geochemical and petrographic methods, describing the features of raw materials. Beyond this problematic, what are the respective contributions of the different methods to the reconstitution of the prehistoric communities? How do they affect our reconstitution of the functioning of prehistoric communities, i.e. the description of extraction, processing and distribution of siliceous rocks. We hope that session could help to lift the barriers by creating a space for consultations and experience exchange.

ABSTRACTS

01 PROCUREMENT AND DISTRIBUTION OF SILICEOUS ROCKS IN THE LIGHT OF GEOCHEMICAL AND PETROGRAPHIC ANALYSIS IN ARCHAEOLOGY – AN INTRODUCTION

Author(s): Werra, Dagmara H. - Sobkowiak-Tabaka, Iwona (The Institute of Archaeology and Ethnology Polish Academy of Sciences) - Asheichyk, Vitali (Institute of History, The National Academy of Sciences of Belarus) - Collin, Jean-Philippe (Université de Namur / Université Paris-1)
Presentation Format: Oral

Siliceous rocks were most widely used raw materials during the Stone Age and in Early Bronze Age for making various types of weapons and tools. Along with dyes (used in burial rituals) and shells, lithic raw materials are among the most important items available to archaeologists to document long distance distribution, exchange networks and mobility.

This is one of the reason why archaeologist all are looking for new methods, which allow reliable differentiation between sorts of siliceous rocks. We would like to be able precisely identify lithic artefacts found at archaeological sites and link them with the outcrops of raw material used in prehistory.

Because flint, and also some other kinds of rocks, are notoriously difficult to source using macroscopic means, instrumental methods of analysis all have been explored to help attribute artefacts to their source of origin and to distinguish among and between individual varieties of siliceous rocks.

Most importantly from an archaeological perspective is detailed knowledge of the outcrops of siliceous rocks as well the identification of the mineral and the chemical composition of raw materials. Knowing the geographical sources of lithic raw materials is prerequisite to archaeological studies devoted to documenting procurement, social networks, and mobility patterns in the Stone Age.

02 LONG-DISTANCE RAW MATERIAL IN THE LATE MIDDLE PALAEOLITHIC ASSEMBLAGES IN THE CSERHÁT REGION (NORHERN HUNGARY)

Author(s): Markó, András (Hungarian National Museum - Budapest) - Kasztovszky, Zsolt (Nuclear Analysis and Radiography Department Centre for Energy Research, Hungarian Academy of Sciences)

Presentation Format: Oral

Since 2000 several surface scatters were identified in the previously not investigated Cserhát mountains (Northern Hungary). In the assemblages of clear Middle Palaeolithic character the metarhyolite, imported from a distance of 90-100 km is represented by several tools and waste material. In the excavated assemblage of Vanyarc 650 pieces were identified after macroscopic inspections as made of metarhyloite. Moreover, technological analysis proved the on-site resharpening and flake production of this rock.

Beside the "Vanyarc-type industry" characterised by the presence of leaf shaped tools, Bábonyian (local variant of the Micoquian) assemblages with elevated ratio of metarhyolite were also discovered in the same region (Legénd and Galgagyörk).

However, several radiolarite, hornstone and limnic quartzite/limnosilicite variants can be very similar to the metarhyolite. Keeping in mind the scientific value of artefacts made of extralocal raw material, a non-destructive neutron-based analytical method, Prompt Gamma Activation Analysis (PGAA) was chosen for the analysis. With PGAA, one can determine the bulk elemental composition of the rocks, including the major and some trace components.

Altogether 45 pieces of felsitic porphyry and several grey siliceous rocks both from archaeological and geological context were analysed, including fragments of the same objects, refitted artefacts, as well as repetitive measurements, to check the reliability of the method.

Besides the silica content, concentrations of alkalia (Na2O and K2O), TiO2 and also Al2O3 turned out to be discriminative factors at discriminating the metarhyolite samples from the similar grey siliceous rocks.

As a result, the chemical identity of the source collected metarhyolite samples and the archaeological artefacts from the Cserhát sites, including not modifeid flakes, chips and refitted pieces was proved.

This way, the analysis of several Late Middle Palaeolithic assemblages imply the short term occupations of highly mobile human groups with intense raw material transport across 90-100 km along the northern mid-mountains range.

03 FROM PETROGRAPHIC ANALYSIS TO BINOCULAR CHARACTERISATION: AN EXPERIMENTAL APPROACH TO IDENTIFY ARCHAEOLOGICAL QUARTZITE ARTEFACTS IN THE CANTABRIAN REGION, SPAIN

Author(s): Prieto, Alejandro - Arrizabalaga, Álvaro - Yusta, Iñaki (University of the Basque Country)

Presentation Format: Oral

Quartzite was the second most frequently used lithic raw material in Europe in the Palaeolithic. However, this rock has not been fully characterised from the geoarchaeological point of view. Nevertheless, the characterisation of quartzite from petrological perspectives has been attempted by diverse geologists in the last decades. These researches offer a solid base for the characterisation of this material that could be potentially used in archaeological contexts. Isolated studies have tried to understand quartzite from an archaeological perspective applying two different methodological approaches. The first one is based on non-destructive characterisation, aiming to understand human procurement and management of quartzite. The second one characterised the material from a petrographic perspective, in order to understand quartzites from archaeological sites or from potential catchment areas. Currently, both perspectives are unconnected, creating a methodological gap that needs to be solved to deepen into the catchment and management strategies of quartzites practised by prehistoric societies.

The aim of this communication, which will be mainly methodological, is to expose the characterisation and the quartzite type determination of seventeen quartzite samples from the lithic assemblages of El Arteu and El Habario (Cantabrian Region, Spain), using petrography and geochemical analyses. In addition, we also characterised the complete quartzite assemblage using non-destructive characterisation techniques based on textural analysis, grain size characterisation, and non-siliceous mineral detection. The high variability of quartzites in both lithic collections allows us to understand the formative conditions of quartzites and to determine seven coherent petrogenetic types (from sedimentary to pure metamorphic rocks). In addition, their recognition in the complete lithic collection using non-destructive techniques lets us to understand preferential catchment and management of specific quartzites.

04 OBSIDIAN AND INTERREGIONAL HUMAN CONTACTS. AN ATTEMPT TO DETERMINE THE COURSE OF TRANS-CARPATHIAN COMMUNICATION ROUTES IN THE EARLY NEOLITHIC PERIOD

Author(s): Raczak, Adrianna (University of Rzeszów)

Presentation Format: Oral

The presence of obsidian items and Bükk culture pottery fragments on the LBK settlements in south-eastern Poland are an archaeological confirmation of trans-Carpathian contacts between Early Neolithic people. As the natural resources of obsidian are found only in some parts of Europe, it can perform the function of one of the determinants of contacts between early Neolithic societies living in areas north and south of the Carpathians. This work is devoted to the influx of obsidian raw material, blanks and tools from

the Slovak-Hungarian deposits. It is also an attempt to identify potential trans-Carpathian communication routes. The course of potential Early Neolithic communication routes, based on distribution of obsidian finds, is surprisingly convergent with the roads presented on the map from the end of 18th century. It is the map of the Kingdom of Galicia and Lodomeria, the so-called von Mieg's map. The obsidian products found on the Early-Neolithic settlements in southern Poland and in the eastern part of the Polish Carpathians, as well as the roads marked on the Mieg's map, both clearly indicate that people have always chosen the most convenient natural tracts, also those crossing the main Carpathian ridge. The basis of the analysis will be the distribution of the LBK settlements in the Rzeszów-Przemyśl area, the presence of obsidian items on the settlement-sites, as well as single finds of obsidian artefacts from the eastern part of the Polish Carpathians compared with the modern road course documented on the Mieg's map. The time span of the work is from around 5500 to approximately 4,800 years BC, which corresponds to the period of the existence of LBK in Poland. The territorial scope covers the area of south-eastern Poland, mainly the areas of the Rzeszów-Przemyśl loess, and the high part of Polish Bieszczady Mountains.

05 GEOCHEMICAL INVESTIGATIONS OF THE RAW MATERIALS OF THE ENEOLITHIC METATUFF CHOPPING TOOLS INDUSTRY OF THE LAKE ONEGA REGION

Author(s): Tarasov, Alexey - Gogolev, Maksim (Karelian Research Centre, Russian Academy of Sciences)
Presentation Format: Oral

The paper is devoted to the results of geochemical investigation of the lithic raw materials (slightly metamorphosed tuffs) that were used for producing chopping tools of the so-called Russian Karelian type on the western shore of Lake Onega (Karelian Republic, Russian Federation) during the Eneolithic period. The implements of this type are especially noteworthy because of their role in the long-distance exchange. Petrographical studies that have been conducted so far confirm that the material of these tools, including those found at the distance of ca. 1000 km from present-day Russian Karelia, must have originated on the western shore of Lake Onega. Geochemical study with the aid of ICP-MS method was performed with the aim of more precise location of the raw material procurement area and obtaining a geochemical "passport" of the material that was used for making these tools in the workshops on the western shore of Lake Onega, where the full cycle of production was taking place, in order to compare it in the future with geochemical characteristics of the material of finds that were found outside of the production centre. The studied sampling includes samples from the entire territory of the present-day Russian Karelia and also from Estonia.

06 NEW INSIGHTS INTO SILICEOUS MARLS FROM THE CARPATHIANS. IDENTIFICATION AND INTERPRETATION

Author(s): Pelisiak, Andrzej (Institute of Archaeology, University ofof Rzeszów)
Presentation Format: Oral

Neolithic and Early Bronze Age communities which settled eastern Carpathians Forelands and Carpathian Foothills used variety of local and non-local siliceous raw materials. Silicites identified in archaeological material differ in quality and usefulness for making tools. Obsidian, Jurassic flint from Cracov-Częstochowa Upland, chocolate flint, and Świeciechów and Volhynian flints are the best quality. They were commonly used from the Early Neolithic onwards. On the other hand, some local raw materials were also in used. Among them so-called Dynów marl or siliceous marls were the most popular. Numerous items made of so-called Dynów or siliceous mars were registered in the strong archaeological context (settlements, burials) of all Neolithic and Early Bronze cultures in SE Poland or were discovered as a single finds. Most numerous are rectangular axes or wastes from production or reparation of these tools.

There HCl was used for testing raw material samples and the artefacts. The results of the analysis shows that so-called Dynów or siliceous marl consists of several different raw material varieties. More than 50% of analyzed tools previously described as made of Dynów/siliceous marl was of yellowish or grey-yellowish hornstone (chert). Both siliceous marls and the chert came probably from different sources and each one has different chemical composition and physical properties.

Proper identification of raw material type and it sources is of primary importance in the studies on economy and procurement strategies, contacts and interactions between the Neolithic as well as Early Bronze Age communities.

For this reasons results of the test suggests: (1) necessity of re-analysis of large part of known artefacts previously interpreted as made of so-called Dynów or siliceous marl to correct their raw material affiliation, (2) comprehensive characteristic of these raw material and their sources.

a. ATTEMPT TO SOURCE RAW MATERIAL OF THE EARLY HOLOCENE BLADE ASSEMBLAGES IN THE SE BALTIC REGION WITH FTIR

Author(s): Asheichyk, Vitali (Institute of History of the National Academy of Sciences of Belarus) - Žemantauskaitė, Monika (Lithuanian Institute of History)
Presentation Format: Poster

Lithic industry of the early Holocene hunter-gatherers' communities in the E and SE Baltic region is characterized with developed pressure blade technology. Such technology requires raw material of certain quality whereas different parts of the region have unequal availability of siliceous rocks. It is noticed that many of the Early Mesolithic assemblages in the area were based on non-lo-

cal 'high quality' raw material which originating, as it believed in historiography, from southern Lithuania and western Belarus. Cretaceous flint occurs there in glacial rafts of chalk as well as in moraine deposits. Even though visually it is defined but it is poorly studied from the chemical point of view.

The objective of the poster is to present the preliminary results of ongoing attempt to challenge the issue with geochemical methods. In order to find relative similarities and differences among the flint Fourier transformed infrared spectroscopy (FTIR) was used together with the grinding curve method. 34 samples from Lithuania and Belarus were analyzed. First, it was noticed that grinding curves of different types of flint do not coincide. Later they were related to the atomic disorder of the material because the most crystalline material (quartz) and less crystalline material (flint containing relatively big amount of opal) were plotted furthest away from each other. Could this be a method for relative grouping of flint in order to find any systematic pattern in the use of it in the prehistory? First task for such studies is to check if samples of one type of flint tend to cluster and are clusters separable from each other? Further in depth studies are needed in order to seek meaningful arrangements of different flint types and results and their relations among archaeological and geological samples.

b. OBSIDIAN IN THE EARLY NEOLITHIC OF THE UPPER VISTULA BASIN: ORIGIN, PROCESSING AND USE

Author(s): Szeliga, Marcin (Institute of Archaeology Maria Curie-Sklodowska University in Lublin) - Kasztovszky, Zsolt (Nuclear Analysis and Radiography Department Centre for Energy Research, Hungarian Academy of Sciences) - Osipowicz, Grzegorz (Institute of Archaeology, Nicolaus Copernicus University in Toruń)

Presentation Format: Poster

More than 100 LPC sites are currently known from Poland, where artefacts made of obsidian were recorded. It confirms the inflow of this material into the areas on the northern side of the Carpathians, starting from the classical phase of LPC development, accumulating mainly on the settlement centres located in the loess uplands in the Upper Vistula basin. Obsidian products known from particular sites reveal a diversified degree of quantitative and morphological variation. The attendance of obsidian within particular inventories rarely exceeds a few percent. It indicates its minimal economic importance in the LPC overall system of processing and tool production.

The basic reference plane for this issue is one of the most numerous (118 pieces) collections of LPC obsidian products from the Upper Vistula basin, originating from the site in Tominy (south-central Poland). The results of the non-destructive prompt gamma activation analysis (PGAA) measurements confirm the presence of Carpathian 1 variety products, allowing the identification of its origin with outcrops located in south-eastern Slovakia, between Kašov and Cejkov. Their morphological diversity, in connection with the data from other sites, allows for a comprehensive reconstruction of this raw material processing. The findings confirm its inflow in the form of concretions and pre-cores, which were subjected to an appropriate treatment on the spot, oriented primarily to obtaining a small blade-blanks. Blades, sometimes also flakes, sporadically were intentionally retouched. In the Tominy collection, which is one of the most numerous series of tools in the area of the Upper Vistula basin, they are represented by 14 pieces. The results of the micro-wear analyses provide an important data for the identification of the actual purpose and the range of its practical use by the local LPC

The study was supported by National Science Centre in Poland (grant number: 2015/19/B/HS3/01720).

619 PUBLIC SPACE IN LATER PREHISTORIC EUROPE

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Gorgues, Alexis (Université Bordeaux Montaigne; UMR 5607 Ausonius) - Črešnar, Matija (University of Ljubljana) - Armit, Ian (University of Bradford)

Format: Regular session

From an archaeological point of view, "public space" can be understood as a specific location structurally and functionally devoted to social interaction, the negotiation of identity and "institutionalized" meetings and performances. Such spaces are quite recent in human history. This session examines different perspectives on the definition, structure and function of public space in later prehistoric Europe. It includes case studies examining the ways in which how public space is organized and understood in different communities and regions, as well as papers explaining transformation of public space within individual communities over time. Particularly important in that sense are the transformations and negotiation of such spaces that occur in transitional periods when Iron Age communities are becoming part of Hellenistic or Roman world.

01 BRONZE AGE CULT PRACTICES AND TERRITORY MARKING. THE CASE OF METAL HOARDS IN THE REGION OF SALINS-LES-BAINS (JURA, FRANCE)

Author(s): Gauthier, Estelle (University of Franche-Comté; UMR CNRS 6249 Chrono-Environnement) - Piningre, Jean-François (UMR CNRS 6298 ARTeHIS)

Presentation Format: Oral

Systematic field survey campaigns conducted since the early 2000s in the area of the fortified hilltop settlement of the Camp du Château at Salins-les-Bains (Jura, France) have revealed about fifty Bronze Age metal hoards mainly from the turn of the Middle to Late Bronze Age. The accuracy of the record of their location allowed us to study the topographical choices made for these still not well understood practices, but for which we think more and more of social and cultic interpretations. Hoards were placed fairly systematically in locations that could be seen from the contemporary fortified settlement, other hilltops and other hoarding sites, thus forming a real network of visual relationships with the Camp du Château in its centre. Hoards were also deposited at places which were from afar easily recognizable: in joints, in limestone pavements or near large erratic boulders. Disposed along the edges of plateaus, along crests, they delineate the main natural lines structuring the landscape of Salins-les-Bains. We propose to interpret these topographical choices as an intentional marking of the landscape through collective, repetitive and symbolic acts that might be carried out to demonstrate the control of the boundaries of the territory belonging to the Camp du Château at this period.

02 WHAT IS AND WHAT IS NOT "PUBLIC SPACE" IN THE LATE PREHISTORIC SOUTH-EASTERN ALPINE REGION?

Author(s): Cresnar, Matija (University of Ljubljana; Institute for the Protection of Cultural Heritage of Slovenia)

Presentation Format: Oral

With the definition of a "public space" in modern terms, we do not have much trouble. We understand it as locations, structurally and functionally prepared for hosting social interactions of various kinds. We even have laws, how to move around these public spaces, how to organize public gatherings on those public spaces etc. Even, if we move backwards in time, we can often see that there is a tradition in the locations of formal public spaces. They have their roots in the past, to make them more important and more relevant.

What about if we move to prehistory, to the Late Bronze and the Early Iron Age in the south-eastern Alpine region? We know for places where people lived, where they buried their dead, where they performed rituals and we even seem to see, where they moved through the landscape(s) etc. But, these are all acts, which left physical traces. Public spaces are sometimes also equipped with signs that communicate with the by-passers and, weather they are willing or not, absorb them into that interaction. The Early Iron Age landscapes seem to be full of evident markers, which were there not only to "stand in silence", but to interact, to address and to express messages. However, on the other side, very little is known about the places of commerce, where (groups of) people meat to engage in business and trade, made decisions on political or judicial matters etc. These biased datasets maybe let us have even completely wrong ideas and make wrong conclusions…

We also have to think about the questions like, how "public" where any of these happenings? Is a ritual performance already a public act? The question is therefore also, how public is public, if it is really public?

03 TIME TO SPEAK: SPACE, TIME AND INTERACTIONS IN WESTERN EUROPE DURING THE EARLY IRON AGE

Author(s): Gorgues, Alexis (University of Bordeaux Montaigne; CNRS UMR 5607 Ausonius)

Presentation Format: Oral

This paper would consider the dynamics of decision-making and of the transmission of information in the specific context of the first half of the 1st millenium BC in Western Europe. It will emphasize the fact that the normal situation is that apparently no formal public spaces, i.e. bounded spaces specifically intended for community gathering, trade, political interaction with outsiders, ritual performance, etc., exist at this time. Yet, collective decision-making, trade, interactions with outsiders, ritual performances, took place in this early 1st millennium BC. Archaeological remains associated with such processes are plenty: ramparts, imported goods, huge hoards are evidence of it.

In this paper, we will try to shift perspective and argue that, rather than taking place, these actions took temporality. In other words, we will defend the idea that the framework structuring collective decision-making and transmission of information was a chronological one, in communities that conceived their own existence not like an institution, but rather like an experience: a community lived not because symbols of its existence were displayed everywhere and public speeches delivered, but because people were united by a sense of common interest, which however did not hindered internal competition. We will try to look in the archaeological record for understanding how one could build his/her capacity to interact with others, and show that the acquisition of the skills necessary to perform in public life rested upon the embodiment of social behaviours and the learning of the temporality of social interaction, and conclude by trying to identify the most active agents of these processes.

04 PUBLIC SPACE AND SOCIAL ACTION IN IRON AGE SOCIETIES

Author(s): Armit, Ian (University of Bradford)
Presentation Format: Oral

Recent approaches to the Iron Age in Britain have challenged traditional models that envisaged hierarchical, triangular, or traditionally 'Celtic' societies. In their place, a variety of social models have been suggested that can variously be described as segmentary, heterarchical or anarchic. In such communities, corporate decision-making is necessarily collaborative rather than coercive – as it might be, for instance, in a chiefdom or similarly-constituted hierarchical structure – implying the existence of periodic gatherings of potentially large numbers of people. In certain parts of Iron Age Britain it may be possible to identify the public spaces where these communities came together. In particular, a group of large hilltop enclosures in various parts of Scotland, such as the Brown Caterthun and Traprain Law, seem to have existed during the Iron Age as enclosed (yet empty) spaces, with a distinctive, non-defensive architecture. This paper argues that we might see these places as centres for communal debate and decision-making within societies that lacked hierarchical structures. As such, they may also have taken on other functions associated with social co-operation, such as ritual performances and the exchange of goods. With the appearance of overtly hierarchical structures at the end of the Scottish Iron Age, certain of these locations (notably Traprain Law), appear to be co-opted as centres of chiefly power, and take on a wholly different character.

05 PUBLIC SPACES IN IRON AGE EUROPE: PERSPECTIVES FROM GAUL AND IBERIA

Author(s): Fernández-Götz, Manuel (School of History, Classics and Archaeology)
Presentation Format: Oral

Public spaces were key arenas of social negotiation, and could serve as locations for a variety of often interconnected events such as political assemblies, religious celebrations and fairs. Popular assemblies in particular were important mechanisms of collective governance, similar to those existing in societies all around the globe. They represented early arenas for political debate, conflict resolution, alliances, and the display of power, and were therefore important tools for the functioning of communities. Although these political institutions were to a certain extent instrumentalised by members of the Late Iron Age elite through their clientage networks, they also limited the agency of the upper classes and redistributed social power. This paper will address the role of public spaces in the construction of collective identities in Late Iron Age Western Europe, using selected case-studies to exemplify the diversity but also commonality of these 'plazas'. Recent research has uncovered evidence of public spaces for political gatherings and ritual performances in numerous oppida, both in Gaul and in other regions such as the north-western Iberian Peninsula. In some cases, the use of certain locations as public spaces preceded the development of large agglomerations on the sites, a phenomenon that has important implications for our understanding of early urbanisation processes.

06 PUBLIC SPACES IN LATE IRON AGE OPPIDA: A CASE STUDY

Author(s): Poux, Matthieu (Université de Lyon)
Presentation Format: Oral

Public spaces has become an important topic in archaeological research on late Iron Age Gaul. Open-area excavations carried out on Pre-Roman oppida since the early 21th century provide a new vision of celtic urbanization on a wider scale, which altered our knowledge in terms of social, political and civic organization. Recent field works on the volcanic plateau of Corent in the basin of Clermont-Ferrand (Auvergne, France) have uncovered a large gaulish settlement of over 50 hectares, the centre of which is occupied by a wide empty open space of more than 5000 meters square. The public place is demarcated by a row of spaced vertical posts and surrounded by community water supply points (watersheds, wells), as well as various structures related to institutional and economic life of the city. Several buildings have been found on its periphery, including a monumental sanctuary within a fifty meters side length gallery, a crafts and commercial area similar to ancient macella, and a semi-circular assembly hall with a wooden stand, which is later converted to a small Roman masonry theatre. The very large amount of related finds – dozens of tons of italic wine amphorae sherds, thousands of bronze, silver and gold coins, prestige goods such as gold and silver jewellery, imported bronze and glass vessels, weaponry, chariot fittings, writing and surgical instruments – attest the high social rank of the resident population and close relations with the Mediterranean world. This findings are not only been considered internally, but are already drawing comparisons with similar discoveries on the oppida of Bibracte (France) and Titelberg (Luxembourg), which gives us a glimpse of the general public spaces planning mode in Pre-Roman Gaul.

623 BEYOND RAMPARTS, WALLS AND DITCHES: NEW PERSPECTIVES ON THE EUROPEAN HILLFORTS

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Linde, Lennart (Goethe University Frankfurt) - Blitte, Hélène (Goethe University Frankfurt) - Risch, Robert (Universitat Autònoma de Barcelona) - Ashkenazi, Hai (Tel Aviv University)
Format: Regular session

The engagement with Hilllforts and fortified settlements from the Bronze and early Iron Age is a long standing topic in European archaeology. Nevertheless most studies focus on the fortification itself and their function within war and conflict. As archaeologists further engage with this topic the manifold relations between the Hillforts and their surroundings become more clear. Our approach has to take the social dimension of these sites into account, beyond their defensive function. Hillforts most likely have fulfilled a plenty of functions within the social and economic spheres they originated from. They furthermore serve as actors in networks that incorporate other fortified sites and might have been a structuring element in the political landscape of their times.

In this session we want to shed light on the many reasons that might have lead to the erection of a hillfort and the various functions and incarnations that they take on during their existence. We aim at papers that discuss hillforts and fortified settlements in terms of interactions between and within communities, whether they emphasize on a hierarchical network or a scale free approach. We are interested in the broader relations between the hillforts themselves as well as their connections to their individual hinterlands. Further we welcome papers that try to place them in models of social and economic activities and processes. The chronological focus of this session is on the Bronze and early Iron Age sites. However papers from different periods that fit or complement our subject are welcome too.

ABSTRACTS

01 INTRODUCTION: ARE HILLFORTS MEANT TO BE JUST DEFENSIVE PLACES? SOME REFLEXIONS ABOUT THE FUNCTION OF HILLFORTS

Author(s): Blitte, Helene - Linde, Lennart (Goethe University Frankfurt)
Presentation Format: Oral

In this presentation, we would like to introduce the participants to the topic of our session by sharing some reflexions from our current LOEWE project on prehistoric conflicts and Bronze Age Hillforts across Europe.

In the past Hillforts where often reduced to their defensive function, and wrongfully perceived as nothing but focal places of armed conflicts. But except for the group of vitrified forts which reveal evidence of fire that could be interpreted as a consequence of a defeat within a fight. In contrast most hillforts did not deliver any traces of violent conflicts. Thus in mind, how could we interpret these fortifications? What was their purpose behind defence?

The importance of a hillfort might rely more on its social and/or economical functions than its defensive features. But the debate is divers: Some scholars want to interpret these sites as political centres, others as sacral or religious areas. Another group of scholars is generalising excavation results that reveal the existence of a developed craftsmanship that is often connected to a production chain for elaborated metal objects.

Another topic to be evaluated to interpret hillforts is their topographical position. As they can bring some revelations to understand their interplay within their surrounding landscape, in particular in terms of control over paths and rivers as well as they can be considered trade routes for various raw materials and finished goods.

02 INTERPRETING BRONZE- AND IRON AGE FORTIFICATIONS

Author(s): Nakoinz, Oliver (Johanna-Mestorf Academy) - Kneisel, Jutta (Graduate School 'Human Development in Landscapes', Kiel University) - Beilke-Voigt, Ines (Humboldt-Universität zu Berlin)
Presentation Format: Oral

Since centuries fortifications of the Bronze- and Iron Age are subject to rather intense research. Usually, fortifications are still interpreted as indicators of violent threads, centres of power and social hierarchies. Current research demands a broader range of less dogmatic interpretations. We attempt to sketch these requirements.

The first step is not to confuse the definition of an archaeological phenomenon with a functional interpretation. The interpretation should be based on descriptive features only. A fortification is a structure which enforces or delimits a certain area or region using rather permanent means such as ditches, walls, palisades, hedges and pit-zones. We assume rather complex and poly-functional interpretations than simple mono-functional ones. The interpretation should stress more on hitherto neglected aspects. The relationship, interdependence and connectivity of different fortifications between fortifications ('multiple fortifications') as well as in a settlement chamber play an essential role for the interpretation of fortifications.

Conditions such as the required economic and social capacities for building and maintaining the fortifications, the decisions made during planning and designing the fortification and side effects on nature, society, culture, and economy should also be taken into

account. It is required to consider the role fortifications play in contexts of conflicts. Fortifications do not work as means of force the own interests only but also are means to reduce the conflict potential and avoid conflict escalation and violence. Furthermore, fortifications play an active role in economic and ritual processes. According to these considerations, fortifications have to be seen as sensitive indicators of social, economic and historical processes.

03 FORTIFIED SETTLEMENTS AS COLLECTORS OF PEOPLE AND RESOURCES: A QUANTITATIVE ANALYSIS

Author(s): Vicenzutto, David (Università degli Studi di Padova, Dipartimento dei Beni Culturali: Archeologia, Storia dell'Arte, del Cinema e della Musica)

Presentation Format: Oral

This paper focuses on the fortified settlements of the Northern Po plain during the Bronze Age. These settlements are traditionally considered the poles of the Middle and Late Bronze Age plain landscape, and probably they ruled the social and economic dynamics of their surrounding territories. However, these considerations about the historical role of the fortified settlements are mostly based on qualitative analysis, so this kind of research suffers of a lack in the explanation of how these enclosed villages managed people and resources. This paper try to answer to this question using a quantitative approach, looking at the demography, at the manpower needed to realize ditches, ramparts and hydraulic infrastructures, and estimating how much food resources was necessary to sustain people involved in a fortified settlement life cycle.

For first, the research focuses on how many people lived inside the settlements, using a method based on the ratio between housing and free spaces. Then, an estimate of the number of labourers needed to realize defensive and canalization structures has been obtained referring to the nineteenth century literature about the earthworks and to the texts of soviet archaeologists about manpower. This analysis shows that, in many cases, the manpower needed to build the perimeter infrastructures was higher than the average number of people who lived in the fortified settlement. Finally, it has been calculated how much food was needed to sustain people in everyday life and during the realization of infrastructures: this evaluation shows that a surplus of food resources was necessary to sustain manpower during infrastructures works.

Through this quantitative analysis, it is possible to explain how the adjacent communities were involved in the fortified villages dynamics, and how the enclosed settlements managed food and water resources.

04 THINK SOCIAL! – HILLFORTS BEYOND CENTRALITY AND ELITES

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

Presentation Format: Oral

The Bronze Age is widely perceived as a time of economic change. With the transition from stone tools to their metal counterparts comes a wave of changes within the social sphere. But apart from theorizing on the emergence of an "elite" archaeological engagement with the structure of society itself is mostly conducted in piecemeal fashion. Most studies that tackle the subject focusing on graves and limit themselves therefore to a simple distinction between object ensembles that we perceive today as "rich" or "poor". The inner structure of these societies remain nebulous. This paper argues that we can use Hillforts as a proxy to gain a glance at the extend of social organization in Bronze Age Europe. Hillforts are a monumental expression of the societies that created them. Their study beyond their military function and the attribution of centrality can yield imprints of the social structures that were in place during their construction. The presentation is based on research from a joint LOEWE project that connects sociology and archaeology. It will try to utilize Hillforts as a focal point to apply theory and methods that decent from socio geography. Alongside it will address topics like (proto)-urbanization, flows of goods, planning, resilience and identity.

05 FUNCTION OF FORTIFIED HILLTOP SETTLEMENTS – A MEASURE OF THE INTANGIBLE?

Author(s): Girotto, Chiara (Goethe University Frankfurt)

Presentation Format: Oral

Following Simmel's idea, that social structures and power relations are projected to space, fortified hilltop settlements have played a major role in the interpretation of Bronze Age settlement patterns. Often they are associated with military power and functions associated with central place theory. In pre- and protohistory these functionalities are usually estimated on the basis of a theoretical framework. It connects a set of ideas how economic and political power as well as cultic centres might be reflected within the archaeological and environmental record. However, without written sources there are no direct tracers, easy access interpretations, or a priori selective variables. This makes the estimation of an intangible variable, like function, complex. Nonetheless it can be investigated, as anything in existence reflects on the system. These consequences can be measured by selecting matterful variables.

While treating measurement as a state of uncertainty reduction this paper aims to investigate functional differences in the material record of Urnfield culture fortified hill-top settlements and low land settlements in the Central Swabian Alb by comparing them among themselves and to other features, such as graves or hoards. Reflecting on similarities and differences in spatial location, categorical functional groups, as well as the chaîne opératoire of pottery as interaction indicator will open up new pathways to the interpretation of fortified hill-top settlements and their function. Aided by statistical analysis, differences in the material record are apparent, however their functional association is not accessible for us. Embracing our own lack of understanding of the observed pattern, we gain further insight into the structures of Urnfield culture, even if we might not be able to deduce clear and objective

indicators of functionality or the position of fortified hill-top settlements within their respective settlement pattern.

06 HILLFORTS IN PREHISTORIC IRELAND: NEW PERSPECTIVES AT THE EDGE OF EUROPE

Author(s): O'Driscoll, James (University of Aberdeen)
Presentation Format: Oral

Modern investigations of prehistoric hillforts are often prefaced by a common caveat, that these sites are multifunctional and a single explanation cannot adequately encompass the complex character of an individual site. This is usually followed by arguments which promote a singular or dominant function, such as the defensive aspects of hillfort design, or the ritual nature of these site. Few have tried to amalgamate the different strands of evidence into a single coherent argument. The same is true in Ireland, where there is a diverse, seemingly disparate range of evidence that could be used to promote different functional elements relating to ritual, warfare or status. A recent programme of archaeological research has re-enforced this viewpoint, while also highlighting that Irish hillforts had a condensed construction horizon spanning the end of the Middle Bronze Age and Late Bronze Age, c. 1400–800 BC. In fact, Irish sites have much in common with those from mainland Europe, such as chronology, morphology, landscape setting etc. This paper aims to outline and discuss the new evidence from Ireland in relation to these arguments, while proposing a social and economic model that synthesises this data into a single cohesive narrative applicable to other regions of mainland Europe.

07 THE DECLINE OF TRANSHUMANCE AND THE RISE OF HILLFORTS IN CENTRAL SOUTHERN ENGLAND

Author(s): Valdez-Tullett, Andrew (HE - Historic England)
Presentation Format: Oral

This study looks at the creation of hillforts in Central southern England, namely in the northern parts of Wiltshire and Hampshire, Berkshire and southern Oxfordshire.

The paper analyses the shifting landscapes of the Earliest Iron Age (800-600BC) to Early Iron Age (600-400BC) to assess the trajectories of the dominant social and economic practices. It highlights the prevalence of features associated with pastoral activities in the earlier period, particularly linear earthworks and early hilltop enclosures, and their relationship with hillforts created in the latter. Combined with an increase in permanent settlements with grain storage facilities, it underlines the creation of the network of hillforts at a time when the fluid social relations and land rights inherent in transhumant systems were being challenged by more immobile structures associated with increasingly arable systems.

I posit that the creation of hillforts resulted from the need of communities to manage the conflicting demands of mobile transhumant and static arable organizations. Growing out of the tradition of early hilltop enclosures, hillforts continued to support the movement of large numbers of animals through a landscape where land was being increasingly turned over to arable production and movement was becoming increasingly restricted. At the same time these structures were statements of ownership by the more settled elements of society in areas that continued to be accessed by pastoral elements from outside of the immediate community.

08 LINKS BETWEEN THE FORTIFIED PENINSULA OF "KERMORVAN", LE CONQUET (BRITTANY, FRANCE) AND ITS COASTAL ENVIRONMENT

Author(s): Duval, Hervé (CReAAH, University of Rennes 1)
Presentation Format: Oral

Located at the extreme end of Brittany and surrounded by the Ocean on most of his sides, this remote peninsula offers an area of 60 acres. Only connected to the rest of the continent by a narrow isthmus, this site has been occupied and fortified at multiples periods, mainly due to his strategical position in the landscape. However, despite the presence of massive fortifications focused on a single spot, not much can be said about the dating of the structure's remains for the protohistorical period. Unlike many others hillforts or fortified sites nearby, this particular peninsula seems to stay beyond the scope of any archaeological study focused on typomorphological criters.

Therefore, it is a necessity to take into account the complex archaeological and geographical environment, in order to get the reasons that led to the erection of the defensives structures, supposed as protohistoric. The key-position of this coastal site in relation to the Chenal du Four, a maritime crossing point, seems to be one of the main reasons of his occupation, as well as his connection with the hinterland. A quick review of the available data tends to illustrate the picture of a site deeply dependent from the surrounding landscape. The exercise wants to lead the study through the defensives structures to a better understanding of this important peninsula of the Iroise Sea, which has been already mastered in such protohistoric times, both for political and economic reasons. Thus, a discussion to replace the site in interaction with other fortified sites is proposed to conclude this communication.

09 FORTIFIED HILL SITES IN CENTRAL-BELGIUM DURING THE 5TH CENTURY BC

Author(s): De Mulder, Guy - Dalle, Sarah (GhentU niversity)
Presentation Format: Oral

Central Belgium is crossed from West to East by a mountainous range of low hills. In the same area a series of rivers are flowing from the South to the North. In each area divided by the rivers a hill site has been occupied during the final phase of the Early Iron Age,

although on two sites there are indications of an earlier Late Bronze Age occupation.

These sites have certain common characteristics. They are located on a less accessible height in the area and surrounded by a system of ditches, ramparts and/or palisades. The Kemmelberg in western Belgium shows the most complicated use of defensible structures. The Kemmel is also the most important residence among this hill sites, proven by the important of central-European and Mediterranean luxury goods. Although not proven by he find of a kiln, the Kemmelberg seems to be the production site of so-called red painted Kemmel ware, which has also been found on the other hill sites. This pottery is limited to elite associated sites.

A viewshed analysis f these sites pointed to some interesting ascertainment. Two sites were explicitly oriented toward the control of the neighbouring river. The Kemmelberg controlled not only visually the coastal area but also the neighbouring site of Kooigem fell within the visual range of the Kemmelberg.

Finally, the present preventive archaeology has shown that around the hill sites from the 5th century BC numerous rural settlements were active at this period.

10 ON THE MARGINS: HILLFORTS OF WESTPHALIA, GERMANY

Author(s): Davis, Oliver - Dennis, Ian (Cardiff University)
Presentation Format: Oral

Germany possesses a dense concentration of hillforts particularly in the southern regions of Baden-Württemberg and Bavaria. The Iron Age in lowland northern Germany is distinctively different and characterised by an absence of hillforts, the predominance of distinctive byre houses and a reliance on cattle rearing. The region of Westphalia, in north-west Germany, is located at the interface of these two zones. Unfortunately, there has been relatively little study of the Iron Age in Westphalia which is surprising given its key location on the boundary between the Celtic and Germanic worlds. The extent to which the region was peripheral in the Iron Age, or conversely, a core zone of cultural contact and exchange is unclear. Indeed, while the hillforts of Westphalia display morphological similarity with others to the south, until recently none had seen anything beyond superficial excavation and it is not an exaggeration to say that we knew little about their construction, use and how they related to non-hillfort settlement and activity. A key question therefore is why do hillforts exist in this region? Was their formation a result of contact with communities to the south, or rather, a result of endogenous social needs or tensions? This paper will present new chronological, structural and artefactual data produced from ongoing excavation of several Eastern Westphalian hillforts. Drawing from interpretive models inspired from both German and British traditions, we will examine the extent to which hillforts in the region were centres of production and settlement, and the role they played in warfare and the construction of identities.

11 PROTECTION OF PLACE AND SPACE - CASE STUDY SULM VALLEY

Author(s): Hellmuth Kramberger, Anja - Mele, Marko (Universalmuseum Joanneum)
Presentation Format: Oral

Research has increasingly shifted from the study of single sites to the contemplation of prehistoric cultural landscapes. Legacies of human activities are assessed in their relationship to each other and in terms of space, time and environment. The EU project "Iron-Age-Danube" deals with the exploration of Iron Age cultural landscapes as part of the Interreg Danube Transnational Programme. Eleven project partners and nine associated partners from Austria, Croatia, Hungary, Slovakia and Slovenia are dedicated to research and promote nine Iron Age micro-regions.

One researched micro-region is located in the municipality of Großklein, Styria, determined by the rivers Sulm and Saggau and best known by the vast Sulm valley-necropolis below the settlement Burgstallkogel. While the numerous tumuli groups are well researched, it is unclear to what extent Burgstallkogel possessed a specific position within a settlement hierarchy or even as central settlement. Archeological landscape research is pursuing the aforementioned question in the frame of the project. Significant new insights brought the investigations on the nearby hillfort Königsberg. Although in the vicinity of Königsberg are situated isolated groups of tumuli, the situation is not comparable with Burgstallkogel and also spatially considered these groups lay in considerable distance from the settlement. This may be an indicator of the chronological assignment of the settlement, and indeed, both the ceramic material and radiocarbon dates point to an occupation in the late Urnfield period. The question arises if we are dealing with possible hierarchical changes between both settlements in the course of upheavals at the end of the Late Bronze Age and at the beginning of the Early Iron Age. Did the settlement on Königsberg have to relinquish its formerly dominant role to its competitor on Burgstallkogel, which in the following centuries became seat of an elite that presented itself with splendidly furnished graves under monumental tumuli?

12 THE EARLY BRONZE AGE ENCLOSURE IN JĘDRYCHOWICE IN THE PERSPECTIVE OF FIRST MATERIALS AND METHODS REVIEW

Author(s): Jedrysik, Joanna (Jagiellonian University)
Presentation Format: Oral

The enclosed settlement in Jędrychowice, located in the south-western Poland, is one of the points related to the Únětice culture eastern periphery. The microregion was intensively inhabited in the Early Bronze Age because of very good environmental and economical conditions and the crucial location in the Moravian Gate zone. The site was excavated on a large scale in 1978-1985

by Marek Gedl's team and introduced to the science but the whole spectrum of data (about 350 storage features and tens of thousands of artefacts) was never presented. We already know that the settlement has at least two phases - at the beginning the large open space was occupied, then the living zone was restricted to the area surrounded by two ramparts and a ditch. What we do not know is how the whole settlement and its outer zone developed in time and space, so the first aim of the paper is focused on methods which are used in a new research project to recognize the vertical and horizontal stratygraphy (with incorporation of geomagnetic survey and radiocarbon dates) and to analyze the chronology and distribution of different types of artefacts. The result of conducted studies will make possible to trace building and settlement phases or to differentiate living, production and craft zones (i.e. metallurgical space) in Jędrychowice. The second theme is the wider perspective of the Early Bronze Age local microregional organization with its few enclosures and big open settlements and a lack of cemeteries (according to present state of research). In description of this unusual situation I will look closer to other regions of Central Europe and stress on Jędrychowice as a one of the biggest enclosures among those inhabited by the societies related to the Únětice culture.

13 EARLY STONE ARCHITECTURE OUTSIDE MEDITERRANEAN – ITS FUNCTION AND DEVELOPMENT. THE MASZKOWICE HILLFORT CASE

Author(s): Jedrysik, Joanna - Przybyla, Marcin S. (Jagiellonian University)
Presentation Format: Oral

Among many prehistoric hillforts of the Western Carpathians the one located at Maszkowice village displays unique traits. The site was excavated in 1960s and 1970s, but it was not until 2015 that in the result of a new field project were revealed here remains of a massive stone fortification. The wall of the Maszkowice hillfort is dated to the Early Bronze Age (18th century BC) being one of the earliest examples of defensive stone architecture in Europe outside Mediterranean. In our paper we are going to discuss following issues:

1. Development of the defensive system of the site. As far as we are currently able to reconstruct chronological sequence of the settlement, the stone fortifications can be considered as belonging to the oldest building phase. Moreover at this stage the defensive system existed probably in its most elaborated form (with at least two gates leading into the village), whilst during the latter phases we are able to observe slow but constant deterioration of fortifications.

2. Settlement layout, both in terms of the inner organization of the village and its broader settlement context. Among others, considering the results of excavations, field surveys, geophysical prospections and palynology we are forced to assume, that in the case of Maszkowce hillfort we deal with an isolated site, located within scarcely populated area. We have not traces of stable 'satellite' settlements or other contemporary hillforts within a radius of 15-20 km around the site.

3. Reasons that led to erection of the stone constructions. We are going to discus here costs and benefits of using stone as a building material in the area where, until the Middle Age, enclosures were erected usually of clay and timber. We shall analyze also a possible source of the ideas staying behind the defensive architecture from Maszkowice.

14 ENCLOSED SETTLEMENT IN BRANDÝS NAD LABEM AND THE EARLY BRONZE AGE SETTLEMENT STRUCTURE IN THE CENTRAL BOHEMIA REGION.

Author(s): Langova, Michaela (AU - Institute of Archaeology of the Academy of Sciences of the Czech Republic)
Presentation Format: Oral

The amount of known early Bronze Age fortified settlements from the northern part of Bohemia is surprisingly very low, which is in a big contrast to the other regions of Únětice culture. From the other finds (mostly graves and hoards) it is clear that, exactly in this region, there was one of the most important cultural centres of that time.

During the years 2007-2016, the rescue excavation in Brandýs nad Labem uncovered a big settlement of Únětice culture which was enclosed by a ditch. Generally, the location of the settlement in the lowland of the river Labe (Elbe) is not very typical for fortified settlements. But it´s strategic position in the landscape cannot be denied. More over, the analysis of the finds has shown long distance contacts of this site.

The task of this contribution is to present the assumed role of this settlement as a part of the whole settlement structure. To understand these issues, it was necessary to focus on the settlement structure of the region. The careful revision of the early Bronze Age finds from this part of Central Bohemia has sketched the importance of the settlement on a long distance route and has shown the early Bronze Age fortified settlements in the northern part of Bohemia in a very different light.

15 BEHIND DITCHES. THE BRONZE AGE TELL-SETTLEMENTS OF THE CARPATHIAN BASIN

Author(s): Gogaltan, Florin (Institute of Archaeology and Art History Cluj-Napoca) - Cordoș, Cristina (Iași Institute of Archaeology)
Presentation Format: Oral

The Bronze Age tell settlements imply an intensive and dynamic long-term habitation of the same place, frequently enclosed and surrounded by open satellite settlements.

In this contribution we will present the enclosing elements of Bronze Age tells. One important trait of most tells is the presence of enclosing ditches, which were most likely built right from the beginning. In several cases, as the settlement grew in size, the initial

ditch was refilled and abandoned and a new ditch was dug.

Recently, several ideas according to which these ditches do not serve a defensive role were proposed. The hypothesis that, at least in some cases, they had a rather symbolic meaning was not excluded. Likewise, it was considered that these ditches might have had the function of delimitating the inhabited space, rather than defending it, while in some instances the idea that they might have been used as drainage channels protecting against flooding was advanced. It is obvious that these fortification elements, from simple ditches to massive earth ramparts or stone walls, define the boundary between two spaces: the inner one and the outer one. The reasoning behind this attitude is unclear. Following the entire process, starting with the decision of delimitating a certain area and going through the effort of digging an impressive ditch and constructing an earth rampart or palisade, notable changes would have had taken place within the community, where new rules of living behind walls would have emerged, influencing major aspects of their society. In fact, one of the factors which led to the creation of the tells, or multi-layered settlements in general, is none other than the presence of enclosing and defensive elements, as the community decided from the very beginning to live inside a delimitated space, following the new architectural rules imposed by such structures.

16 MONBRODO – MONVI – MONKODONJA – A SETTLEMENT SYSTEM OF BRONZE AGE HILLFORTS

Author(s): Cuka, Maja (Archaeological Museum of Istria) - Müller, Sebastian (Institute for Mediterranean Studies, Busan University of Foreign Studies) - Hellmuth Kramberger, Anja (Universalmuseum Joanneum)

Presentation Format: Oral

Since the 19th century the interest of scientists and antiquity lovers is directed to the prehistoric hillfort settlements, also known as Gradine, Castellieri or Kastelliere, on the Istrian peninsula. Several Hundred of these fortified settlements, situated on the tops of the countless hills of the Karst, are today registered. However, investigated by systematic archaeological research, are only a few of them. The Gradina of Monkodonja near the small port city of Rovinj on the western coast of Istria, excavated with modern methods, is currently the best investigated. It dates to the developed Early and beginning of thr Middle Bronze Age. Researches led to multiple new insights, as the chronology, the settlement organization and the remote contacts. But they have also raised new questions. Because of the size of the Gradina Monkodonja with an almost 1 km long outer fortification wall and it´s prominent position, it was supposed by the excavators that it was a central hillfort within a settlement system with various small satellite settlements. However, until today not much information about these smaller, presumed satellite settlements – especially regarding their chronological assignment - is known. Therefore, it is mainly unclear if they indeed lived contemporary with the supposed central settlement Monkodonja and that a hierarchical system of hillforts existed in the Bronze Age. New researches funded by the National Research Foundation of Korea and supported by the Archaeological museum of Istria in Pula and the Rovinj Heritage Museum are aimed since 2016 at the exploration of the system of hillforts around Rovinj. One step in the investigation is directed on gaining new data regarding the chronological assignment of the smaller hillforts. Significant new results stem from the Gradine Monbrodo and Monvi, which shed new light on the aforementioned questions about the settlement system around Rovinj.

17 FORTIFIED MOUNTAINS? A PRELIMINARY ANALYSIS OF PRE-ROMAN HILLFORTS IN UMBRIA (CENTRAL ITALY)

Author(s): Mattioli, Tommaso (University of Barcelona, Dept. of History and Archeology) - Di Miceli, Andrea - Fiorini, Lucio (Dipartimento di Ingegneria Civile ed Ambientale, Facoltà di Ingegneria, Università degli Studi di Perugia)

Presentation Format: Oral

The most distinctive cultural landmarks of the Central Apennines before the Romans are the hillforts dwelled by Umbrians and Sabines between the 10th and the 3rd century BC. In particular, in the mountainous region of Umbria in Central Italy they form an heterogeneous group of about 800 sites placed in the highest points of the landscape, dominating the skyline for miles around. In this area hillforts differ in shape and size, ranging from simple circular ditches and stone-walled ramparts to complex and larger areas – up to 3 hectares – with inner structures such as terracing walls, cisterns and votive deposits. Dense concentrations are particularly found in the territories of Iguvium, Plestia, Ameria, Spoletium, and Interamna Nahars, as well as the Valnerina valley and the Monti Martani ridge. Regrettably, despite their great number and variety, very little is known about their chronological span, function, whether they were inhabited regularly, irregularly or seasonally, and their possible links to monumental tumuli, burials, productive areas and trade-routes across the Apennines. In this paper an exploration of the range of fortified structures will be undertaken. Attention will also be paid to the many interpretations that they have been proposed about them. In particular, we will propose a preliminary attempt to create a large-scale comparative study of this archaeological evidence by integrating different approaches: topography, GIS analysis, geophysics, and material culture.

18 POWERFUL CENTERS OF CHANGE: CYPRIOT FORTRESSES IN THE TRANSITION TO THE LATE BRONZE AGE

Author(s): Monahan, Eilis (Cornell University)

Presentation Format: Oral

During the Middle-Late Bronze Age (MCIII-LCI) transitional period on Cyprus, over 20 fortresses were built atop hills, plateaus, and mountainsides across the northern half of the island. They were the earliest monumental architecture on the island, only built and used for a brief period of time coinciding with the transformation of Cyprus from a relatively egalitarian village-based society, to a

more urban-focused, complex society engaged in trade and diplomatic relations with the major polities of the Eastern Mediterranean. Despite the appearance of these massive structures at this important juncture, they have been the subject of little theorization, likely because the majority of the sites have been inaccessible to archaeological research since 1974. Despite significant parallels, they also have not been brought into dialog with the tradition of European hillforts.

Recent fieldwork in the Ayios Sozomenos region of central Cyprus provides a fresh opportunity to study a cluster of three fortresses and their diachronic relations with surrounding settlements and the landscape. Rather than static structures, the fortresses on the Ayios Sozomenos plateau are shown to be components of a dynamic assemblage, within which evolving architectonics and spatial relations reveal the changing functions of the sites: from settlement and refuge to economic and political center, and from communal, ad-hoc spaces to highly regimented, hierarchically informed spaces. At the same time, the fortresses form a close-knit network that dominated and disciplined the local landscape, and likely aided in the establishment of the political and economic regimes, including the vital copper trade, that came to define the Cypriot Late Bronze Age.

19 LA BASTIDA. A FORTIFIED URBAN CENTRE OF EL ARGAR IN THE CONTEXT OF THE "4.2K EVENT" IN THE WESTERN MEDITERRANEAN

Author(s): Risch, Roberto - Rihuete Herrada, Crstina - Micó, Rafael - Lull, Vicente - Celdrán, Eva - Bonora, Barbara - Velasco, esentation
Format: Oral

The time around 2200 BCE was marked in the western Mediterraean by profound social, political and ideological changes. A substantial number of 14C dates confirms that most, if not all of the Chalcolithic fortified settlements as well as the Late Neolithic–Chalcolithic monumental ditched enclosures, dominating the landscape during most of the 3rd millennium BCE, had been abandoned by that time. Precisely at that moment the first urban centre of the western Mediterranean was founded in the highly protected location on the hill of La Bastida (Murcia, SE Iberia). This early El Argar centre was carefully planed and defended by a fortification system, which deploys new notions of poliorcetics and reminds the defensive architecture of the eastern Mediterranean. The position of La Bastida in a mountainous landscape with little agricultural potential and at a certain distance from the main communication routes, suggests a markedly political motivation behind its foundation, which needs to be understood in the context of the formation of the first state or state-like organisation in western Europe. New investigations and excavations are revealing further aspects of this monumental architecture and its relevance to the political structures emerging during the first centuries of El Argar, when different forms of violence seems to have been critical.

20 RAMPARTS, DITCHES AND WALLS AS A MEANS FOR UNDERSTANDING IRON AGE SOCIETIES IN NW IBERIA

Author(s): Álvarez, Samuel (Universidade de Santiago de Compostela)
Presentation Format: Oral

Although defensive systems are a usual focal point of Protohistory studies of the NW Iberia, few researchers have exploited their potential for the understanding of the behavioural patterns of the societies that built them. From our point of view, ramparts and ditches might have been undervalued as a pathway to achieve archaeological information. The defensive systems are a manifestation of many social decisions that could had shown different social situations, and it is possible that they could keep helpful information in terms of social and political organization. In this proposal, a methodological framework and its preliminary results applied to the north-western region of A Coruña (Galicia, Spain), will be shown.

This methodology starts with the study of the defensive systems with LiDAR data, identifying and quantifying all of these defensive elements. Calculations such as the waste of energy made in the fortification of each hillfort will be implemented. The analysis of the defensive systems will be combined with other available data (total dimensions of the hillfort, possible living space, productive agricultural potential of the surroundings), in the aim of exploring a possible relationship between these elements. We will try to put forward the possibility that these data will allow to infer regional or general patterns which might be useful for understanding some points about the social organization in the Iron Age of NW Iberia.

The main objective of this communication is, on the one hand, to assess the value of this proposal as a valid pathway to obtain archaeological data related to some aspects of social organization in Iron Age. On the other hand, we will explore how this information can be interpreted, and how it can be used in order to develop new archaeological hypothesis.

625 THE BIOARCHAEOLOGY OF LANDSCAPES

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Orengo, Hector (McDonald Institute for Archaeological Research, University of Cambridge) - Livarda, Alexandra (Department of Classics and Archaeology, University of Nottingham) - Palet Martinez, Josep Maria (Catalan Institute of Classical Archaeology)
Format: Regular session

Landscape archaeology has become a well-established discipline during the last decade with the adoption of multidisciplinary approaches.

Although landscape archaeology has played an important role in the analysis of ancient food production, the incorporation of data gathered by bioarchaeological analyses (archaeobotany and zooarchaeology) is still rare in landscape discourses, which tend to rely more on palaeoenvironmental and geoarchaeological data. This is mostly due to bioarchaeological studies being conducted at site level while landscape research usually restricts the use of site data to their location, distribution, chronology and function without fully exploring other lines of site-related evidence. Nevertheless, the integration of bioarchaeological and landscape data has enormous potential to open new avenues for the study of ancient food production, storage, distribution and consumption; human impact on the environment; the consequences of environmental change in terms of adaptation, change and resilience; the cultural value of traditional food derived from specific landscape settings; the reproduction of landscape settings beyond their original environment for the production of culturally valued food (transported landscapes) and the symbolic representation of particular landscapes embodied in food.

This session aims to start bridging the gap between landscape and bioarchaeological data by showcasing: (1) studies where both types of data have been meaningfully combined; (2) integrative workflows or methodological approaches involving the use of these datasets; and (3) theoretical perspectives on their integration. Papers addressing any of the abovementioned or related topics are welcomed.

ABSTRACTS

01 THE PALAEOENVIRONMENTAL RECONSTRUCTION OF THE BRONZE AGE SETTLEMENTS OF THE PO PLAIN, N ITALY (SUCCESSO-TERRA PROJECT)

Author(s): Mercuri, Anna Maria - Florenzano, Assunta - Torri, Paola - Montecchi, Maria Chiara - Rattighieri, Eleonora - Clò, Eleonora - Bosi, Giovanna - Rinaldi, Rossella (Università di Modena e Reggio Emilia) - Zerboni, Andrea - Cremaschi, Mauro (Università degli Studi di Milano)
Presentation Format: Oral

The national-funded Italian project SUCCESSO-TERRA aimed at elucidate the reasons, dynamics and timing of the collapse of the Terramare civilization (16th–12th century BC, Middle and Late Bronze Age). The results from archaeological, geoarchaeological, archeobotanical and archeozoological studies are interpreted in a multidisciplinary perspective, and point out that exploitation of natural resources and climatic factors strengthened the crisis of the Terramare system.

The poster shows the palynological research carried out on the three archaeological sites - Noceto, Santa Rosa di Poviglio and Valestra - at the centre of the project. In this research, the environmental and land-use changes have been investigated to understand their relationships over the last millennia. The terramara Santa Rosa di Poviglio was settled during the Middle/Recent Bronze ages (1550–1170 BC). Pollen samples were collected from trenches excavated within the moat and ditch surrounding the site (from the oldest sequence: VP/VG, VP/VGII, VP/VGIII). The interdisciplinary investigation demonstrates that this site is emblematic of the land transformations of the southern-central part of the Po Plain.

The palynological research allowed to reconstruct the agricultural dynamics besides the distribution of wood and wetland plant associations. Crop fields and wood management were at the base of the agricultural economy. A dramatic decrease of woods and crop reduction were documented at the end of the Bronze age, in correspondence with the drying of the moat system. Increased aridity and intensive land-use might have been the driving factors of this sudden change in the vegetation. After the Bronze age phase, the agro-system rapidly decreased and showed significant changes towards pasturelands.

02 EXPLORING CHANGES IN MOBILITY BETWEEN THE NEOLITHIC AND THE BRONZE AGE IN BRITAIN

Author(s): Osborne, David (University of Nottingham)
Presentation Format: Oral

To study the mobility of people in the landscape is to focus on a fundamental part of human life and society. Mobility brings many social activities into view, including material exchange, trade networks, migration, cultural influence, and marital and kinship links (Sørensen, 2015). Sørensen argues that the challenge to archaeology is to recover, from 'fossilised residues that are entirely stationary and static', the traces of mobility in the past.

This paper explores whether a reduction in mobility of people and animals in Britain can be detected between the Neolithic and the Bronze Age. This is important because it would support the idea of a transition from Neolithic agriculture and pastoralism practised in the context of a mobile way of life, to a more sedentary way of life by the Middle–Late Bronze Age, suggested by the development of extensive field systems. Using Lincolnshire and the Fens in eastern England as a study area, stable isotope analysis of excavated faunal and human remains will be used as a proxy for mobility, with reference to the oxygen "isoscape" map (Pellegrini et al., 2016) and the strontium biosphere map of Britain (Evans et al., 2010). Analytical results will be combined with those from other studies, such as the Beaker People Project (Parker Pearson et al., 2016) and published data, to allow a synthesis and comparison between the study area and other areas of Britain.

03 A LONG-TERM PERSPECTIVE ON LANDSCAPE CHANGES IN THE SABOR VALLEY (NE PORTUGAL): A MULTI-SITE LOCAL-SCALE STUDY WITH WIDE-RANGING IMPLICATIONS

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Presentation Format: Oral

From 2010 to 2014, more than two hundred archaeological sites were excavated along the lower course of Sabor River valley (northeast of Portugal) within the framework of the construction of a hydroelectric dam. The archaeobotanical results obtained by this vast project provided the most extensive set of archaeological plant remains ever put together in Portugal. Site chronologies ranged from the Upper Palaeolithic to the 19th century AD but with particular emphasis to the period between the Middle Bronze Age and Roman times.

Data suggest changes in landscape that seem to be related to an increase of agricultural activities and changing patterns of human occupation. There is an expansion of flora related to (and benefiting from) regular disturbance and even soil depletion, such as Cistus ladanifer, which we tentatively relate with an expansion of agricultural fields into less favourable areas. In parallel we find direct and indirect evidence of large scale crop production, processing and storage, particularly cereals, from the Bronze Age onwards. Archaeological data, namely regarding settlement types, tally this perspective.

This presentation intends to exploit the complementarity between carpological and anthracological data in a multiple-site and local-scale approach, also taking into consideration settlement patterns and other archaeological data and framing it in the broader context of the Holocene.

04 TOWN, COUNTRY AND A LITTLE TASTE OF HOME. HOW PEOPLE SHAPE THE LANDSCAPE WITH REFERENCE TO ROMAN AND MEDIEVAL BRITAIN

Author(s): Francis, Robert (Nottingham University)

Presentation Format: Oral

To a greater or lesser extent when people move from one place to another they tend to bring with them something from their homeland. This can be intentional; a certain herb, spice or cereal, or by accident; a weed hitching a ride, or this can be a cultural custom that can be reproduced within the landscape. The results can be transient, an attempt to grow a new plant which eventually fails or the introduction of a new species which will naturalise and flourish.

This paper examines the primary analysis of two case study sites: the urban site of Early Roman Bloomberg, London and the rural site of Early to Late Anglo-Saxon Dando Close, Northamptonshire. This presentation will cover elements of diet, wild, cultivated, local and exotic food plants and will be complemented by the analysis of the wood resources exploited at the different sites. The results demonstrate the ways in which people in these two locales interacted with and shaped their landscape. It will also allow a discussion regarding the ecological attributes of different groups of wild plant remains and what they can tell us about the local environments at the two sites, providing insights into the cultural landscape of Roman and Anglo-Saxon Britain.

05 BIOARCHAEOLOGICAL HISTORY OF A 7.500 YEARS-OLD TELL AND ITS LANDSCAPE: PLATEIA MAGOULA PRODROMOS, WESTERN THESSALY, CENTRAL GREECE

Author(s): Krahtopoulou, Athanasia (Ephorate of Atniquities of Karditsa, Hellenic Ministry of Culture & Sports) - Orengo, Hector (McDonald Institute for Archaeological Research, University of Cambridge) - Riera-Mora, Santiago - Cañellas-Voltà, Núria (Department of History and Archaeology, Seminar of Prehistoric Studies and Research, Universitat de Barcelona) - Livarda, Alexandra (Department of Classics & Archaeology, University of Nottingham) - Picornell -Gelabert, Llorenç (ArqueoUIB Research Team, University of the Balearic Islands) - Halstead, Paul (Department of Archaeology, University of Sheffield) - Veropouloidou, Rena (Museum of Byzantine Culture, Hellenic Ministry of Culture and Sports)

Presentation Format: Oral

The tell site 'Plateia Magoula Prodromos', a type site for the early Neolithic in Greece, is located in the broad alluvial plain of western Thessaly, central Greece. It was rescue excavated in the early 70's. Regretfully, only short excavation reports with little contextual information are available, while the stratigraphy of a trench is the only physical evidence of the old excavation preserved today.

Given the importance of this key site for the understanding of the lifeways and landscape use of this early agro-pastoral community, the project 'Long time, no see: land reclamation and the cultural record of central-western plain of Thessaly' adopted a high-resolution, multi-proxy, palaeoenvironmental approach for the study of cultural sequence of the tell.

This approach combines palynology (pollen, non-pollen palynomorphs and micro-charcoal), carpology, anthracology and zooarchaeology. Bayesian modelling of AMS radiocarbon dating using short-lived material offered a reliable chronological frame for the different lines of evidence and a combination of dGPS and high-resolution photogrammetrical recording was able to exactly correlate samples all along the cultural sequence.

The combination of data obtained at 'Plateia Magoula Prodromos' with the information provided by landscape survey and re-

mote-sensing analysis of the study area, carried out during previous years, provide new evidence on the landscape use of these Early Neolithic Thessalian communities and important insights into the nature of occupation, origins of deposits, range of activities performed on site, environmental conditions, local vegetation, land use, environmental and/or anthropogenic disturbances and human use of fuel and timber.

This paper will present the methodological workflow developed in the project and will discuss its far-reaching preliminary results.

06 HOW THE MULTI-PROXY APPROACH HELPS TO REVEAL THE MYSTERY OF THE LATER PREHISTORIC SETTLEMENT IN THE ŠUMAVA MOUNTAINS (BÖHMERWALD), BOHEMIA

Author(s): Dreslerova, Dagmar - Kozáková, Radka (Institute of Archaeology of the CAS, Prague) - Bobek, Přemysl (Institute of Botany of the CAS) - Brychová, Veronika (University of Chemistry and technology, Prague, Dpt. of Dairy, Fat and Cosmetic) - Metlička, Milan (Museum of West Bohemia, Pilsen) - Pokorná, Adéla - Strouhalová, Barbora (Institute of Archaeology of the CAS, Prague)

Presentation Format: Oral

The highest altitude site from the La Tène period in the Czech Republic is located in the Sklarske valley, Šumava Mts. Last year it became the subject of grant research primarily focused on understanding the nature, duration and extent of human activities in the mountains, and their impact on Holocene vegetation. Due to a forestation of the lower mountains, archaeological prospection is extremely difficult, and human activities are recorded almost exclusively through anthropogenic indicators in local pollen profiles. During the excavations of the archaeological site we applied a multi-proxy approach (pollen, plant and animal macrofossils, macro- and micro-charcoal, soil phosphate analysis, organic residue analysis and mineralogical analysis of pottery fragments) to reveal the purpose of the site which could be agricultural settlement, seasonal summer farming, seasonal hunting or fishing, a base near an assumed trade route, a place for occasional ritual or social activities, or something else entirely. We will present our current ambiguous results of all analyses and their correspondence with high resolution pollen analysis from the core situated ca. 60 m from the archaeological site. Here, evidence of (non-intensive) human activity precedes dating of the site by almost one thousand years. The low intensity of human impact during prehistoric periods is especially evident in comparison with the late medieval and modern sections of the pollen profile, when the existence of a large village with glass production resulted in significant changes in vegetation.

Local results will be further combined with pollen data from the wider region which will enable us to understand the connections between the settlement in the foothills and activities at higher elevations.

a. BIOARCHAEOLOGICAL DATA AND THE DIACHRONIC RECONSTRUCTION OF SOUTH-EAST SICILY LANDSCAPES: THE CASE STUDY OF AKRAI

Author(s): Stella, Matilde (Università del Salento, Lecce, Laboratorio di Archebotanica e Paleoecologia) - Chowaniec, Roksana - Gręzak, Anna (University of Warsaw Institute of Archaeology) - Fiorentino, Girolamo (Università del Salento, Lecce, Laboratorio di Archebotanica e Paleoecologia)

Presentation Format: Poster

The aim of this work is to reconstruct the natural and cultural landscapes, dietary habits, food production and storage, during the period from Hellenistic until Late Antiquity, in the ancient town Akrai. Our holistic work (we analysed archaeozoological, archaeobotanical, archaeological and geomorphological data) is part of several ancient Sicilian landscape studies and is not often introduced in classical Mediterranean archaeology. The archaeological site, which will serve as the case study, is localised near the modern town Palazzolo Acreide and is placed at the top of the Acremonte plateau, one of the hills forming the Hyblaean Mountains, characterized by Karst topography and geomorphological condition of gentle slopes interrupted by deep valleys. Naturally, the site is characterised by Mediterranean vegetation and climate. Akrai, founded by Syracuse in 664/663 BC and developed in the shadow of metropolis, became part of first Roman province in 212 BC, as other Sicilian towns. The Roman town was inhabited up until Late Antiquity. Our preliminary results show that the investigated area was almost continuously occupied. It suggests that the landscape, the strategic location (at the top of a hill) and the environmental resources (springs, rivers and forests) played a crucial role in the growth and the development of the town.

b. RITUAL PRACTICES AND LANDSCAPE INTERPRETATION: NEW ARCHAEOBOTANICAL ANALYSIS IN THE SITE OF CASTRO (LECCE, ITALY)

Author(s): Porta, Marianna (University of Salento; Laboratory of Archaeobotany and Palaeoecology) - Fiorentino, Girolamo (University of Salento, Department of Cultural Heritage; Laboratory of Archaeobotany and Palaeoecology) - D'Aquino, Silvia (University of Salento; Laboratory of Archaeobotany and Palaeoecology)

Presentation Format: Poster

In this paper we try to integrate the archaeobotanical analysis with the archaeological data to reconstruct a sacred landscape related to a cultic place in southeastern Italy. The ancient site of Castro, occupied since the II millennium BC, is located on a slight hill along the Adriatic coast of the Salento Peninsula, 47 km south from Lecce (Italy). The research project conducted by the University of Salento started about 20 years ago and during the last years the investigations concentrated in the sacred area of "Località Capanne". The focus of this work is on the Messapic and Hellenistic evidence found in the sanctuary dedicated to the goddess Minerva, therefore the name of the Roman colony Castrum Minervae. In particular, the archeobotanical analysis relates on the study of

the soil samples from a sacred altar where votive offerings and traces of consumption of ritual meals are clearly documented. The archaeological record shows that the plant remains played a central role in the context of the religious rituals of this worship place gathering also important evidence as regards what was the surrounding ancient landscape. As a matter of fact the paleobotanical assemblage could help us both tracing the territorial distribution as well as interpreting the significance of some specimens in the cult sphere of this Hellenistic local sanctuary.

627 CROSS THE STREAMS. MULTIPROXY APPROACHES TO DEMOGRAPHY AND POPULATION DYNAMICS

Theme: Theories and methods in archaeological sciences
Organisers: Solheim, Steinar (Museum of Cultural History, University of Oslo) - Hinz, Martin (Institute for Pre- and Protohistoric Archaeology, Kiel University) - Diez Castillo, Agustín (Department of Prehistory and Archaeology, University of Valencia)
Format: Regular session

In the last two decades, approaches dealing with demographic assessments based on archaeological data have experienced enormous popularity. The reason for this is certainly that almost all aspects of past societies, which are archaeologically interesting, is related to the question of the size of these societies. A certain zoo of different methods has developed in this course. These include the number of sites per time period and relative site density, size sites, density of artefacts, 14C data, paleoanthropological or paleobotanical methods as well as oral and written history, to mention a few.

However, it is obvious that most investigations rely on only one of these methods. The linking of different proxies is the only way to check their validity and to calibrate them because of the lack of ground truth.

For this session we would like to invite contributions that examine archaeological case studies regarding demography and population dynamics using more than one method or proxy. What knowledge can be gained from combining different methods? Which approaches have proven their worth, and which ones confirm each other? Have we developed methods of correlating the individual proxies with each other that go beyond observing correlation or forming mean values? How can we correlate proxies with different temporal resolution? We welcome studies based on empirical evidence and archaeological data as well as papers dealing with these issues from a theoretical perspective.

ABSTRACTS

01 CROSS THE STREAMS: INTRODUCTION TO THE SESSION

Author(s): Solheim, Steinar (Museum of Cultural History University of Oslo) - Hinz, Martin (Institute for Pre- and Protohistoric Archaeology, Kiel University) - Diez Castillo, Agustín (Department of Prehistory and Archaeology, University of Valencia)
Presentation Format: Oral

In the last decades, approaches dealing with demographic assessments based on archaeological data have experienced enormous popularity. One reason for this is certainly that almost all aspects of past societies, which are archaeologically interesting, are related to the question of the size of these societies. A variety of different methods have developed in this course. These include the number of sites per time period and relative site density, size of sites, density of artefacts, 14C data, paleoanthropological or paleobotanical methods as well as oral and written history. While most investigations rely on only one of the methods, linking of different proxies is the only way to check their validity and to calibrate the proxies because of the lack of ground truth.

What knowledge can be gained from combining different methods? Which approaches have proven their worth, and which ones confirm each other? Have we developed methods of correlating the individual proxies with each other that go beyond observing correlation or forming mean values? How can we correlate proxies with different temporal resolution?

In this introductory paper we will give a short introduction to the session and present a brief overview of recent developments in approaches to demography and population dynamics.

02 BEHIND THE MODEL: DATA AND ASSUMPTIONS FOR ESTIMATING DEMOGRAPHY OF THE ENEOLITHIC SOCIETIES OF THE SANDOMIERZ UPLAND (SE POLAND)

Author(s): Oberc, Tomasz (Institute of Archaeology Jagiellonian University)
Presentation Format: Oral

A shortage of reliable data allowing direct calculation, the main problem for modern demography concerning today's societies is even more pronounced in case of distant past populations sizes and dynamics estimations. In case of prehistoric archaeology, with no births or deaths censuses available, we have to rely solely on remains of material culture, buried bodies and signs of land use, with each group of sources suffering seriously limitation as a proxy for that kind of studies.

In this presentation some examples of demographic estimation methods based on different types of data will be presented, with

focus on possibility of evaluation or cross-testing between them in purpose to obtain population models. For this end, there is a need for review of assumptions and data utilised in every case. The data used in the presentation derive from the Eneolithic sites located in the Sandomierz Upland, southeastern Poland, including excavated settlements, cemeteries and surveyed sites in this area.

As generated models of population can differ due to both factors, the input of information, and calculations resulting from assumed relations, the aim is not only finding the model that fits into the data, but also to render it the most consistent with recent socio-biological and bio-demographical knowledge.

03 'TACTICAL SIMULATIONS' AND ARCHAEOLOGICAL APPROACHES TO PAST DEMOGRAPHY

Author(s): Crema, Enrico (University of Cambridge)
Presentation Format: Oral

The last decade saw a renewed interest in prehistoric demography thanks to the development of new methods for inferring population change, including summed probability distribution of radiocarbon dates (SPDRD), age-profile methods based on skeletal assemblages, and coalescence models from genetic data. The use of SPRD in particularly has experienced a considerable growth due to the increased availability of large samples of 14C dates and the exceptional opportunity to carry out continental scale comparative studies, more systematic analysis of the role of climate change, and even estimate empirical growth rates. These advances are however not immune to critiques and often caused heated debate on the reliability (or the lack thereof) of SPDRD as a demographic proxy. While some of the early criticisms (e.g. the effects of idiosyncrasies in the calibration curve) have been addressed, others still need to be explored. A key factor that played a pivotal role in some of these debates has been the use of tactical simulations, a process whereby an artificial archaeological record is generated and analysed in order to assess the robustness of a particular statistical technique. This paper will: a) review the contribution tactical simulations in the methodological and theoretical development of SPDRD; and b) make use of this approach to evaluate how sampling bias and settlement change can deteriorate demographic signals in SPDRD as well as in other time-frequency based methods.

04 DEMOGRAPHIC DEVELOPMENTS IN STONE AGE WESTERN NORWAY (11.500-3800 CAL BP) BY PROXY OF RADIOCARBON DATES, SITE COUNTS AND STRAY-FINDS

Author(s): Bergsvik, Knut Andreas - Åstveit, Leif Inge - Darmark, Kim (University of Bergen) - Aksdal, Jostein (Hordaland County Administration)
Presentation Format: Oral

Large numbers of Stone Age sites have been surveyed and excavated in western Norway during the last few decades, mainly as a result of modern development and cultural heritage management. This work has also produced significant amounts of radiocarbon dates. The data is truly massive, but has, until now, not been sufficiently organized and systematized for the purpose of doing research on long-term social and economic change. The same is true for the large quantities of Stone Age stray finds, which have been delivered by local farmers to the University museum of Bergen since the museum was established in 1825. A new project, which is a collaboration between university archaeologists and archaeologists from the county administration, aims at bringing together these different datasets for comparative purposes, with a specific goal of studying demographic change. In addition to data mining and basic classification, the work consists of summing up the radiocarbon dates, performing site counts and evaluating the distribution of stray-finds. In our paper we wish to critically discuss the sometimes conflicting patterns emerging from the study and their bearing on demographic changes. Several source-critical factors are considered, such as biases of collection, site differences, and differences in settlement-patterns during the Stone Age.

05 ACCUMULATING CULTURES: EXPLORING PREHISTORIC DEMOGRAPHY COMBINING RADIOCARBON DATES AND MATERIAL CULTURE (SOUTHERN NORWAY)

Author(s): Nielsen, Svein - Solheim, Steinar - Persson, Per (Museum of Cultural History, University of Oslo)
Presentation Format: Oral

Modelling combinations of radiocarbon dates using Bayesian statistical principles is becoming an increasingly common method for research into prehistoric population dynamics. It has recently been suggested that results from such analyses should be linked with multiple proxies in order to secure a more robust validation. This paper explores population dynamics in southern Norway throughout the Neolithic period (3900-1800 BCE) by comparing two different proxies: (1) radiocarbon dates and (2) trends in material culture from occupation sites. For this study, 643 14C-dates derived from 204 Neolithic sites were analysed using SPD's (UCL-method), while trends in material culture from 180 occupation and mortuary sites were analysed using kernel density modelling. The analysis of radiocarbon dates identified three phases of intensified relative population size in the Neolithic, which correlated well with regional changes in material culture, indicating a 'rise and fall' of cultural complexes. However, the three phases in the SPD's did not follow a predictable pattern with regard to the character of the documented settlement activity, e.g. hunting, fishing and gathering compared to local food production. These findings are discussed in terms of how expected grand mediators in prehistoric societies such as migration and food production techniques are to be deciphered from results of demographic research.

06 MULTIPLE PROXIES SHOW CONSISTENT PATTERN OF LONG-TERM HUMAN POPULATION DYNAMICS IN HOLOCENE FINLAND

Author(s): Tallavaara, Miikka (Department of Geosciences and Geography, University of Helsinki)
Presentation Format: Oral

Increasing popularity of studies using archaeological population proxies has sparked severe and sometimes even dogmatic criticism against reconstructions of prehistoric population dynamics. Maybe the best way to evaluate the uncertainty related to archaeological population proxies is to use multiple and, at best, independent proxy data. Archaeological and other data from Finland offer several options for reconstructing prehistoric population history. In addition to most commonly used proxies that are based on the temporal distribution of the amount of archaeological material, such as 14C dates or archaeological sites, Finnish archaeologists have used proxies that are not dependent on the amount of archaeological material. These include number of tool types per period and indicators of resource use intensification. Availability of high-quality palaeoenvironmental and modern genetic data allows also building species distribution model simulations of population density and reconstructions of effective population size that are independent of archaeological material altogether. Here, I show that several different indicators of prehistoric human population size in Finland reveal consistent pattern through time. Some proxies even replicate smaller-scale features in the summed probability distribution of 14C dates that are often considered as random or calibration-induced variation. All this indicates that these different datasets reflect true demographic signal from the past. Thus, Finnish case study lends strong support to archaeologists' ability to detect past population trajectories.

07 LONG-TERM POPULATION AND LAND-USE TRENDS IN MIDDLE VOLGA REGION IN EARLY IRON AGE AND MIDDLE AGES

Author(s): Vyazov, Leonid - Efimov, Maxim (Kazan Federal University) - Ponomarenko, Elena (University of Ottawa; Kazan Federal University) - Ershova, Ekaterina (Moscow State University; Kazan Federal University) - Sitdikov, Ayrat (Kazan Federal University)
Presentation Format: Oral

One of the most complicated tasks in archeology is the reconstruction of the population dynamics for the societies which have not left written documents. There are three main approaches for doing that. The first of them is based on utilizing archaeological maps, the second deals with the number of burial sites and individual burials, and the third operates with the radiocarbon dates. The opportunities provided by each approach are somewhat limited. Archaeological maps include all known archaeological sites, but present mainly poorly-dated materials obtained by the surface surveying. The radiocarbon dates are not very numerous, especially outside of Europe. Moreover, they are distributed unevenly over different epochs, being substantially more numerous for pre-Medieval sites. In addition, the number of both the mapped archaeological sites and radiocarbon dates strongly depend on how well the area has been investigated. This problem can be solved by using demographic data from burial sites. This type of sites, however, cannot be used on its own as in many regions and periods the burial sites are unknown.

Apparently, combining all types of data may be a solution, however, the methodological principles of such analysis have not been developed yet. Some preliminary results of such approach were achieved for the Middle Volga region, where about 5000 sites and more than 300 radiocarbon dates were analyzed. All available data was normalized to the total number of archaeological sites in the region and frequencies of radiocarbon dates. The lack of radiocarbon dates was compensated by using the regional comparative chronology of artifacts. As a result of these calculations, a preliminary curve of population dynamics was obtained and compared with the paleoenvironmental and land use reconstructions, allowing us to outline the development of the region by various groups of peoples from the 1st millennium BCE to the 1st millennium CE.

08 VISIBLE AND INVISIBLE COMMUNITIES: QUANTIFYING PEOPLE AND MANPOWER IN DEMOGRAPHIC STUDIES

Author(s): Vicenzutto, David - Dalla Longa, Elisa (Università degli Studi di Padova, Dipartimento dei Beni Culturali: Archeologia, Storia dell'Arte, del Cinema e della Musica)
Presentation Format: Oral

Traditional analyses of demographic dynamics in archaeology generally focus on the variation, through time, of the number of settlements in a specific territory and on their dimensional changes. This models, however, do not quantify neither explain the number of people involved in demographic variations. A step forward may be done understanding how many people lived in the settlements and how much manpower was needed to carry on everyday life and infrastructural works. An attempt in this direction has been made in a research on Bronze Age fortified settlements of Northern Italy. In this study, two different methods are considered. The first one is a traditional count of the number of settlements for each chronological phase; the second one is a method developed at purpose, consisting in the count of the number of people who lived inside a fortified settlement and in a measure of the volumes of earth worked to realize ramparts, ditches and water canalization, evaluated using a quantitative approach. Then, referring to the nineteenth century literature about the earthworks in Italy and to the texts of soviet archaeologists on ancient irrigation systems around the Aral Sea, an estimate of how many people was needed to realize defensive and canalization structures has been obtained. This analysis shows that, in many cases, the manpower needed to build the perimeter infrastructures is much higher than the one that can be considered the average for the people who lived in the fortified settlement, substantially implementing the data set of a demographic study. Moreover, it unfolds new questions: where these people came from? Were there villages or hamlets surrounding

the settlements that do not leave archaeological trace? The aim of this paper is to show how quantifying methods for people and manpower estimate can be used to integrate and improve traditional demographic analysis.

09 COMBINED SPATIAL RADIOCARBON DENSITY MAPS AND REFINED SCPD METHOD TO EXPLORE FOOD PRODUCTION SPREAD THROUGH THE CENTRAL AND WESTERN MEDITERRANEAN

Author(s): Diez Castillo, Agustín (Universistat de València - GRAM) - García Puchol, Oreto (Universitat de València - PREMEDOC) - Bernabeu Aubán, Joan (Universitat de València - PREMEDOC) - Pardo Gordó, Salvador (Departament de Prehistòria. Universitat Autònoma de Barcelona)

Presentation Format: Oral

The neolithisation process in Europe constitutes a fundamental issue of interest in social evolutionary studies. The pioneer work of Ammerman and Cavalli-Sforza (1984) has been considered the basis for discussing the mechanisms involved in the expansion of farming and herding practices in a continental scale, assuming their spread from the Near East domestic core area. From an evolutionary perspective the introduction of agriculture and livestock implies major shifts in social dynamics including changes in demographic patterns as well as in settlement distribution and cultural models. Spatial analysis together with the use of radiocarbon data as a demographic proxy maybe one of the keys to better understand population dynamics involved in the neolithisation process. We compare if the evidence of domestic plants and animals expansion through central and western Mediterranean fit with the summed calibrated radiocarbon probability distributions (SCPD) calculated for the whole area and if the same is true for regional areas. We try to overcome the limits of the SCPD method that have criticized like sometime as imprecise and others as biased because we believe that, despite criticism, summed calibrated radiocarbon probabilities are the bare bone of any well funded paleo demographic approach to the arrival to the agriculture way of life to central and western Mediterranean.

10 COMBINATION OF DIFFERENT PROXIES FOR ESTIMATING DEMOGRAPHIC DEVELOPMENT IN THE TRANSITION TO THE BRONZE AGE ON THE IBERIAN PENINSULA

Author(s): Hinz, Martin - Kneisel, Jutta (Institut für Ur- und Frühgeschichte CAU Kiel) - Schirrmacher, Julien (Institut für Geowissenschaften CAU Kiel) - Weinelt, Mara (Graduiertenschule Human Development in Landscapes CAU Kiel)

Presentation Format: Oral

In many parts of the Iberian Peninsula, the transition from the Copper Age to the Bronze Age is marked by profound demographic changes. Although the local conditions and cultural development can vary greatly, the Iberian Peninsula can be divided into two zones. Especially in the south, which has been a hotspot of archaeological investigations for decades, a clear increase in settlement evidence can be observed for the Copper Age. With the transition to the Bronze Age, different trajectories become clear within the southern region: In the South West there is a widespread abandonment of settlements and discontinuity. Wherever stratigraphic continuity is evident, a significant change can be found in the archaeological material within a site. The rapid spread of early Bronze Age cultures on the southeastern Iberian Peninsula seems to be accompanied by a demographic boom. This can be derived from regional land use reconstructions and estimates of grain production. This is accompanied by signs of a highly stratifying society with control over resources and food production.

By means of aoristic analyses and 14C cumulative calibrations we try to understand these changes in more detail and to investigate whether climatic influences and the resulting population shifts may have played a role. To this end, we combine the existing evidence from different data sources and proxies, such as changed economic conditions, abandonment of settlements and palaeobotanical predictions of human influence, in a common quantitative framework in order to estimate and test temporal relationships and causality. The observed correlations are tested for their statistical significance using a Monte Carlo-based method. Firstly, we can suggest that a combination of environmental influences and socio-economic reconfiguration is likely to trigger the demographic shifts.

11 THE EMERGENCE OF MEGALITHISM IN PORTUGAL IN ACCORDANCE WITH 14C: AN INTERREGIONAL VIEW

Author(s): Pardo-Gordó, Salvador (Departament de Prehistòria. Universitat Autònoma de Barcelona) - Carvalho, António Faustino (Departamento de Artes e Humanidades, Universidade do Algarve)

Presentation Format: Oral

The reconstruction of demographic dynamics using dates as data approach is being increasingly used to look at prehistoric population patterns because a lot of archaeologists go beyond the simple lecture of 14C dates as absolute time or use it to create chronological frameworks. This approach has seen a rapid growth around the world, including the Iberia Peninsula where a lot of papers have been recently published focus on the last hunter-gatherer and the first agricultural societies.

The goal of this work is to analyse the onset of the megalithism in Portugal applying the Summed Radiocarbon Calibrate Dates (SPDs) in order to explore possible demographic consequences related with this phenomenon. In this sense the method used here is twofold: In first place, we show a protocol to select the radiocarbon dates related to megalithic monuments following previous works. On the other hand, we build the SPD based on radiocarbon information with statistical confidence envelope of simulated Summed Radiocarbon Calibrate Dates fitted under null model.

The results will be allowed to compare several geographical regions in Portugal in order to know if there are differences that could

be explained according to research intensity (like radiocarbon dating programs) and compare funerary practices during the Middle Neolithic (megaliths versus burial caves) applying non-parametric tests.

12 HUMAN ENVIRONMENTAL IMPACT AS PROXY FOR POPULATION DYNAMICS: A COMPARISON OF THE PALYNOLOGICAL AND SOIL EROSION RECORDS

Author(s): Feeser, Ingo (Institut fuer Ur- und Fruehgeschichte Kiel) - Dreibrodt, Stefan (Institut für Ökosystemforschung, CAU Kiel)
Presentation Format: Oral

Human impact on the landscape during pre-historic times was directly linked to population density. With the beginning of the Neolithic, human interference with the natural environment increases significantly. Woodland clearance led to fundamental changes in the vegetation cover and resulted in soil erosion. Whereas palynological data allows to reconstruct the degree of anthropogenic vegetation change, stacked erosion records are used to reconstruct land use intensity within selected regions. The degree to which population density is reflected in both records, however, depends partly also on climate conditions and land use practices. Soil erosion for example is positively affected by increased precipitation and the degree of vegetation change at a given population level might differ between extensive and intensive land-use practices. A comparison of both proxies not only helps to diminish uncertainties with respect to palaeodemographic reconstructions, but might further allow to indicate changes in land use practices.

In this paper we compare records for both proxies from northern-central Europe from the 5th to 1st millennium BCE. Both proxies generally show similar developments and provide a coherent record of population dynamic providing evidence for phases of widespread population decline at around 3200, 2200 and 1500 BCE. Furthermore low intensity of soil erosion in context of increased anthropogenic vegetation change during ca. 2000 to 900 BCE might indicate a fundamental change of land use practices with the beginning of the Bronze Age in northern and central Germany.

13 CHRONOLOGY, DEMOGRAPHY AND IMMIGRATION IN IRELAND DURING THE LAST 1200 YEARS: INSIGHT FROM POPULATION GENETICS AND 'BIG DATA' ARCHAEOLOGY

Author(s): Byrne, Ross (Trinity College Dublin) - Hannah, Emma L. - McLaughlin, T. Rowan (Queen's University Belfast) - McLaughlin, Russell L. (Trinity College Dublin)
Presentation Format: Oral

Studies of the contemporary genetic landscape of Europe have revealed a strong relationship between haplotypes — inherited stretches of genetic information — and geography. Discrete episodes of migration that occurred in the past can be identified through Bayesian techniques that model modern population data as admixtures of various modern source groups in proxy of historical populations. These techniques can also estimate how long ago the admixture events occurred, by modelling the rate of decay of these haplotypes. In a similar vein, emerging meta-analytical approaches to archaeological datasets have been developed that aim to reconstruct population levels or evolutionary trajectories through analysis of the frequency of archaeological data. These techniques can identify what impact episodes of cultural, economic and climate change had on the population.

In this paper we explore a case-study from Ireland where these approaches have been combined to explore the questions of immigration and population levels over the last 1200 years. Historical and archaeological evidence of migration from Europe and Britain to Ireland over this period abound. Yet, until now, the extent to which these episodes have contributed to diversity among the island's contemporary population has been underestimated by both archaeologists and geneticists, especially the immigrations associated with Viking Norse settlements founded in the 9th century CE. We argue that population levels during this time strongly influenced the course of history. These cannot currently be satisfactorily directly estimated using either genetic or archaeological approaches, but though the combination of both we can arrive at an account of relative population levels, provide fresh explanations of why certain migrations occurred when they did, and take a bold step forward in addressing the tricky problem of absolute population.

14 DEMOGRAPHY AND DIRT: MODELLING POPULATION ON THE BASIS OF MATTER FLUXES WITHIN TELL-LIKE SETTLEMENTS

Author(s): Martini, Sarah (Institut fuer Ur- und Fruehgeschichte Kiel) - Dreibrodt, Stefan (Institute for Ecosystem Research University of Kiel)
Presentation Format: Oral

Calculating the size of the populations which inhabited archaeological sites has been both a sought-after goal and source of controversy in archaeology for over a century. As tells and tell-like settlements are formed entirely through the anthropogenic movement of materials (matter) both on-to and off-of a site of habitation, they offer an excellent archive with which to approach this issue. Furthermore, the increasing precision of measurement capabilities over the last decade now allows the use of quantitative methods. In this poster, we present demographic modelling of populations on a transect of sites stretching across Europe from Anatolia to northern Central Europe and from the Neolithic through the Roman Iron Age by quantifying geochemical signatures and the micro-remains of anthropogenic activity present in sediment. By comparing profile data with data from horizontal archaeological plans, we assume that the studied layers represent a mean of settlement activity during respective settlement phases. These data represent minimum rates of matter fluctuation as post-depositional processes such as erosion, recycling and pedogenic alteration must be considered. An attempt is made to account for these processes through an analysis of soil formation within the archaeosediment

sequence of the site profiles, a comparison with other on-site environmental records, and the application of modern analogies. Population is first calculated based on a quantification of the total anthropogenic phosphorous content at each site before being queried with other quantified signatures related to human life through architecture and animal herding. The results of this process are compared with existing, conventional archaeologically-based population estimates.

628 THE PAST AND FUTURE OF HILLFORTS – CHALLENGES, CHANCES, PERSPECTIVES

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Ibsen, Timo (Center for Baltic and Scandinavian Archaeology Schleswig) - Kuncevińćius, Albinas (Archaeological Institute, University of Vilnius) - Šne, Andris (Archaeological Institute, University of Riga) - Zabiela, Gintautas (Archaeological Institute, University of Klaipėda)
Format: Regular session

Ancient hillforts resp. strongholds, earth works, fortifications and enclosures are registered in thousands all over Europe, in different geographical regions for diverse archaeological periods.

The history of their research goes back to the early 19th century and resulted in regional overviewing maps and registers as well as in-depth studies of single monuments. But many results remain unpublished in the archives without a clear concept to include this material into modern research by using educational systems.

On the other hand today's archaeologists can use a whole range of new powerful investigation methods like geophysics, aerial photography and LIDAR scanning, Pollen analysis, drilling, geochemical soil analysis, microstratigraphy, C14-dating and finally Geographical Information Systems to display, combine and analyze all the different data.

Nevertheless surprisingly little is known about general trends of hillfort development and questions about their different functions, terminology, chronology, typology or their role and interpretation in the cultural landscape.

The biggest lack is a comprehensive strategy, which breaks down the many single questions to a common sustainable concept. Developing and defining general mandatory standards for investigating the fortifications and their vicinity would form a perspective for future hillfort research.

The aim of the session is to name the main problems and needs for developing a common strategy for investigation and protection of these key sites of cultural landscapes.

The session invites scholars from different countries (especially from northern middle Europe) to present and reflect the state and perspectives of the relevant hillfort research in their field of activity.

ABSTRACTS

01 INTRODUCTION: PROBLEMS, NEEDS AND TASKS OF STUDYING HILLFORTS

Author(s): Ibsen, Timo (Center for Baltic and Scandinavian Archaeology Schleswig) - Kuncevičius, Albinas (Archaeological Institute, University of Vilnius) - Šne, Andris (Archaeological Institute, University of Riga) - Zabiela, Gintautas (Association of Lithuanian Archaeology)
Presentation Format: Oral

The big number of hillforts and hillfort researchers all around Europe as well as the big geographical, chronological and functional variety of the monuments logically led to different methodological approaches, strategies and results of hillfort investigation in the past.

In addition, there are many limitations and problems not only when excavating the often large and complex hillforts and their vicinity, but also interpreting the results and especially comparing them to the state of research. The many different methods like produce pieces of knowledge here and there, but in many cases do not help to understand the complex as a whole. The environment of hillforts and questions about their role in the cultural landscapes often remain untouched.

Furthermore it is difficult to keep track of the uncountable hillfort related archaeological activities and affiliated publications. And there is a big need of exchanging knowledge and offering access to all available data.

By reflecting the big variety of hillfort research and related problems the Organisers in this introduction will sensitize the participants for the aim of the session: to name the main challenges, chances and perspectives of future hillfort research and discuss, if it is possible to develop a common strategy and a stronger network for future studies of these fascinating monuments.

02 CENTER AND PERIPHERY IN THE SETTLEMENT SYSTEM IN THE IRON AGE CULTURES OF THE EAST EUROPEAN PLAIN

Author(s): Chaukin, Sergey (Institute of Archaeology Russian Academy of Sciences)
Presentation Format: Oral

An analysis of the structure of settlement in the cultures of the Iron Age of the Eastern European plain made it possible to single out special territories. The following features characterize them: the density of fortifications, the system of fortifications, «hill-forts-satellite», the items of imports, treasures and items of cult.

The results are based on the analysis of the settlement system of more than 600 hillforts. A database has been created that includes the following parameters: information about the name of the sites, its location, the area, shape, of the cultural layer, dating, cultural identity. In addition, the database contains information about the topographic situation in which the ancient settlement is located.

On the main rivers of the region, the areas with the largest concentration of fortifications are allocated, on average this value is 9-11 objects per 30km². This is recorded in the Moscow River, in the Volga, the Ugra River, on the Oka River. On the same sites are concentrated hillforts with 3lines of ramparts. It was possible to determine a special type of settlement with 3lines of ramparts; usually it is located on a narrow stretched cape on a small river within 1000m from its confluence into a large river. Another specific type of "hillforts-satellite" objects is their location near the main settlement within 500m and a small area. All this is marked by the presence in these zones of imports and a large number of treasures. Anthropomorphic figurines and tablets of clay were found only on certain sites and in large numbers.

Thus, we can talk about special territories, which are distinguished by the quantitative and qualitative characteristics among the others, but are similar.

03 HILLLFIRST OF THE IST MILLENNIUM AD OF THE FORMERLY NADROVIANS EAST PRUSSIA: A CASE STUDY WITH GIS AND DIGITAL TECHNOLOGIES

Author(s): Khomiakova, Olga - Chaukin, Sergey (Institute of Archaeology of RAS, Moscow) - Skhodnov, Ivan (NIC Pribaltijskaja Archaeologia, Kaliningrad)
Presentation Format: Oral

Hillforts of the central part of the former East Prussia (Sambian-Natangian and Prussian cultures) are studied more in comparison with unfortified settlements. Hilllforst of the central part, located on the Sambian Peninsula, are mostly in the focus of investigation. Nonetheless, about 30% of the discovered hillforts are located in the eastern part of the modern Kaliningrad region, in the territory of the historical region of Nadruvians along the Pregolya river and its tributaries, which played an important role in intercultural communications within the West Baltic Circle.

For the first half of the 1st millennium AD. a special group of archaeological sites – Inster-Pregolian is distinguished on this territory. Inster-pregolian sites hold an intermediate position between the Sambian-Nathangian and East and West-Mazurian areas. At the time of the 13th century this territory is known as the center of the land of Nadruvians. Archaeologically it's destinguished by a group of sites, formed around one of the main tributaries of the Pregolya river – Gremyachya/Dreye.

The case study is devoted to some results of the investigations of the most significant hillforts of Nadruvians which could be the central habitats in the 1st millennium AD. A micro-regional approach, modern digital technologies, creation of three-dimensional computer models of microrelief and methods of GIS analysis are used. The results can represent new data for the reconstruction of the archaeological situation in the intercultural spaces of the West Balts Circle.

04 WHAT HAPPENED TO ESTONIAN HILL-FORTS?

Author(s): Mägi, Marika (Tallinn University)
Presentation Format: Oral

Most countries in north-eastern Europe can boast with numerous Iron Age hill-forts. These fortifications have traditionally been considered political, trade and craft centres, elite's residences, and military check-points. The different functions of the fortifications have, however, not been discussed sufficiently, confining mostly to either military purposes or less-defined social changes as the main reasons for their development.

The presentation focuses on these Estonian Viking Age and Late Iron Age hill-forts that may be connected with internationally dominating trade-routes. Changes and crises in long-distance trade brought along changes of cultural landscapes around the main communication routes. The cessation of the inflow of Kufic coins at the turn of the 10th and 11th centuries caused that several hill-forts with adjacent settlements along Estonian coasts were abandoned. New ones were erected, or the old ones fortified anew, during the second half of the 11th century, when the trade with Russian princedoms gained momentum.

Special attention will be paid to the next transformation period of Estonian hill-forts – the incorporation of Estonia and neighbouring areas to the European political and economic systems, that took place during the first half of the 13th century. Some earlier fortifications were immediately abandoned after the wars of the first decades of the century, others flourished and stayed in use until the second half of the 14th century. Some hill-forts stayed as political centres, and we re-arranged as medieval towns. The speech

considers some possible reasons for such differences in development.

05 VIKING AGE HILLFORTS IN LATVIA: LATE PREHISTORIC SITES OF TRADE, POWER AND COMMUNICATION

Author(s): Šne, Andris (University of Latvia)
Presentation Format: Oral

There are altogether over 470 hillforts that are known in the territory of present-day Latvia, and about 200–250 of these may have been used in later prehistory. Hillforts became particularly important in the later prehistory (9th - 12th centuries) and the Age of the Baltic Crusades (13th century), when their number considerably increased, but in the early part of the Late Iron Age major reconstruction and fortification works were undertaken at several settlement sites in Latvia.

Hillforts represent different kinds of the archaeological sites used by local communities. Some of them have impressive fortifications and large plateaus; some are accompanied by the settlements, while other show only minor artificial modifications and weak cultural layer. Thus, most of the late prehistoric hillforts have been used for living purposes, and this might be considered the main practical concern in the establishment of the hillforts. The hillforts were inhabited by the local communities as well by governed by the local chiefs so hilfforts functioned both as communal living sites and as residences of the chiefs and their kins, they were considered both as symbol of power and prestige and as fortification where to seek refuge in case of danger. These were the sites were political decisions were made, too.

In the recent studies the concept of early town was applied to several sites that include large-scale hillforts with settlements and harbours, like Daugmale, Jersika and Mežotne. These sites were involved in the international trade routes as shown by a number of imported artefacts, while Daugmale had provided also the highest number of coins found in the living sites of Latvia. Such forerunners of towns were trading and craft centres located mostly around the most important waterways but they were not related to political power during the later prehistory of Latvia.

06 LANDSCAPE OF THE STATEHOOD: ENVIRONMENT TRANSFORMATIONS IN THE HISTORICAL CAPITALS OF LITHUANIA

Author(s): Kuncevicius, Albinas - Poskiene, Justina - Vengalis, Rokas - Velius, Gintautas (Vilnius University)
Presentation Format: Oral

The paper presents the results of the investigation, carried out in the historical capitals of Lithuania in order to reveal the scale and the character of extensive environmental transformations, which were carried out in the 13th–14th c. there. The main administrative centers – complexes of the castles in Kernavė, Senieji (Old) Trakai and Trakai – are situated in the central part of the dominion of the Grand Duchy of Lithuania. The ultimate task was set to examine the processes of transformation of the former landscape to the defensive one, as well as to interpret the obtained results in the context of the genesis of the State. The research was implemented by means of non-destructive and minimally destructive field research methods. Geophysical non-destructive (GPR, magnetometer) and minimally destructive (application of hand auger, archaeological test pits) field methods were applied in the hillforts' territory of Kernavė, territory of Trakai Peninsular castle on the hillfort, Senieji Trakai castle and settlement. Evidence obtained by non-destructive methods and boreholes' data was interpreted in order to model paleosoils and establish the circumstances for the development of paleolandscape, as well as to detect the initial natural environment. The paper will also address the question of feasibility of applied research strategy for attaining of expected results.

The research was carried out in the framework of the project "Landscape of the Statehood: Environment Transformations in the Historical Capitals of Lithuania" (S-MIP-17-36), supported by the Lithuanian Research Council.

07 BETWEEN NEED TO KNOW AND DUTY TO PROTECT. TWO MODELS OF MEDIEVAL HILLFORTS RESEARCH IN CENTRAL POLAND

Author(s): Sikora, Jerzy (Institute of Archaeology University of Lodz) - Kittel, Piotr (Department of Geomorphology and Palaeogeography, Faculty of Geographical Sciences, University of Lodz) - Wroniecki, Piotr (-)
Presentation Format: Oral

In recent years several research projects were undertaken in Central Poland in order to recognise medieval hillforts. The most notable examples are: research on the medieval stronghold in Tum (Łęczyca) run by a team from the Archaeology and Etnography Museum in Łódź and the program of non-invasive research on several medieval strongholds in Central Poland run by team from the Scientific Society of Polish Archaeologists as well as project of Rozprza stronghold research conducted by the University of Lodz. As the first mentioned project was based on large scale excavations and ended with a comprehensive recognition of the most important defensive feature in region, two further examples combined non-invasive approach with wide application of methods of environmental archaeology in Rozprza supported by limited trenching. All the programs used on large scale modern techniques of field documentation and number of supporting research: geomorphology, palaeoecological analyses, radiocarbon and dendrochronological dating. They differed substantially in the philosophy of monument protection. They differ also in approach to wider landscape. Tum/Łęczyca project was concentrated on the stronghold itself, two other tried to recognise their hinterlands and changes of archaeological landscape. The paper will be concentrated on advantages and disadvantages of both approaches and the substantial conflict between

our need to full recognise of stronghold and the duty to protect it for the future generations of researches, even for the price of limitation of our present-day knowledge.

Programs of non-invasive surveys were conducted by The Scientific Society of Polish Archaeologists (Lodz branch) and The Institute of Archaeology of The University of Lodz, financed by the Ministry of Culture and National Heritage in 2013-2017. Research in Rozprza was financed from a grant from the "National Science Centre, Poland" (DEC-2013/11/B/HS3/03785).

08 THE RELATIONSHIP BETWEEN CULTURAL LANDSCAPE AND THE CONSTRUCTION TYPE OF STRONGHOLDS - THE SLAVIC AND SAXON EXAMPLES

Author(s): Schneeweiss, Jens (Institute for the History of Material Culture RAS; Leibniz Institute for the History and Culture of Eastern Europe - GWZO)

Presentation Format: Oral

Northern Germany can be roughly divided into a Western part, in the Viking Age inhabited by Saxons, and an Eastern part with Slavic population. The geomorphologic natural environment was basically the same, but the cultural landscape differed significantly, including settlement structures, arable lands and proportion of forest area. Cultural landscape is not only directly connected to subsistence strategies, but also to resources for the construction of buildings or fortifications. In the Saxon area pasture of sheep, goat and cattle was practised for a long time, as well as fertilisation of the fields with manure and sods. Both is based on a long tradition reaching back to the Iron Age. In consequence the landscape became open with only little woodland. Timber was not everywhere sufficiently available. Houses were basically built in post technique, Saxon fortifications were erected mainly with sods and in some cases with additional wood. Slavic population was used to live in forested and swampy areas. They practised forest pasture. Fields are unknown, probably they occupied only relatively small areas. Typical buildings were blockhouses and elaborated timber-earth-walls as fortifications, both built mainly from oak. Obviously in the 10th/11th c. there was enough wood available to build an impressive number of those ringforts. Sods were additionally used only in very rare cases. It exists, therefore, a very close connection between subsistence strategy, material resources and the construction type of buildings or fortifications, respectively. Architecture and construction type of strongholds reflect to a certain extend the available natural resources as part of the cultural landscape.

09 METHODOLOGICAL APPROACHES TO THE INVESTIGATION OF A CASTLESCAPE – THE LOWER HARZ MOUNTAINS AS A SHOWCASE

Author(s): Bartrow, Anna - Rösch, Felix (Martin-Luther-Universität Halle-Wittenberg, Institut für Kunstgeschichte und Archäologien Europas, Seminar für Archäologie des Mittelalters und der Neuzeit)

Presentation Format: Oral

To date, the Lower Harz Mountains are among the peripheral regions in Germany. But there has been a time of thriving settlement dynamics from the 11th to the 14th century. Besides the foundation of over 100 agrarian settlements and the establishment of numerous mining facilities several castles differing in type and function have been erected as well. While most settlements were abandoned, the remains of the castles shape the cultural landscape until today.

One of them is Anhalt castle which belongs to the largest fortifications in the Harz mountains and is a famous example for the early use of brick stone as a symbol of a self-confident nobility. Investigated as early as the late 19th century the place recently moved into the focus of interest again. A variety of methods ranging from established techniques to up-to-date approaches like 3D-Photogrammetry were applied on the material remains drawing a more detailed image of the site and its surroundings. In contrast to Anhalt the majority of castles has not been subjected to closer investigations by now.

To achieve an overview of the castlescape in total, an approach has been developed that allows to deal with different types of fortifications and takes their varying state of research into consideration. By defining four scales, ranging from a minimum level dealing just with archival material, LIDAR-scans etc. at the office to full-level investigations including on-site fieldwork and a branch of archaeometrical methods. The outcome is a model enabling conclusions on the castles and their environment in general.

10 SOCIAL SPACE IN THE CONTEXT: MAPPING THE INTERACTION ZONES IN THE LANDSCAPES. EXEMPLIFICATION OF LATE BRONZE AGE FORTIFICATION FROM HUNGARY

Author(s): Czukor, Peter (Móra Ferenc Múzeum, Szeged; Eötvös Loránd University, Institute of Archaeological Sciences, Budapest)

Presentation Format: Oral

In the area of the Békés-Csanád loess table and the Banat in Southeast-Hungary and West-Romania, a series of the large fortifications enclosed by ramparts and ditches emerged in the period of 1300–1100 BC (Rei. BrD–HaA1). These huge structures, often hundreds of hectares large, have got into the focus of Hungarian and Romanian research only in the past decade. The fortifications are surrounded by a series of smaller rural settlements, forming a three-tiered settlement hierarchy, indicating a fairly complex society. The function of these settlements is debated to some degree, as they have not yet yielded substantial domestic remains, and their interpretation as refugia or ritual centers is also possible. This new type of settlement indicates significant although, up till now hardly known social and economic transformations in the last centuries of the 2nd millennia BC, in the Late Bronze Age. In my presentation, I will focus one of these fortifications, Makó-Rákos-Császárvár, and its hinterland. This middle size, 42 hectares large fortified site is investigated with use of various GIS-based (cost surface modeling, least-cost path modeling, viewshed analysis etc.)

and statistical analysis to the framework of a wider, microregional settlement study and will be interpreted in terms of the socio-political make-up the Late Bronze Age polities.

11 HILL-FORTS: CENTRAL PLACES OR PERIPHERAL? THE CASE OF THE WESSEX IRON AGE

Author(s): Collis, John, Ralph (University of Sheffield)
Presentation Format: Oral

In the 1960s a debate broke out initially between myself and Barry Cunliffe on the role and function of hill-forts in central southern England (Wessex) in the Early and Middle Iron Age (5th – 2nd century BC), based on our excavations, Cunliffe on the hill-fort of Danebury and my own on the farming settlement of Owslebury, near Winchester. Cunliffe interpreted Danebury as a 'central place', the residence of a local chief in a hierarchical 'Celtic Society', with trade and industry concentrated on Danebury and providing services for surrounding farming settlements. He envisaged a competitive system between the hill-forts with a 'rise to dominance', with some forts being abandoned as power became more concentrated on 'developed hill-forts'. My alternative 'crisis' model envisaged a period of instability in which populations moved into defended sites, followed by a period of peace in which, at one extreme, the population would abandon the open settlements and remain nucleated on the hill-fort, and other scenarios in which the hill-forts were partially or totally abandoned as the population returned to their open settlements. I also envisaged a relatively egalitarian population in which there were no extremes of social differentiation, and virtually nothing differentiated the inhabitants of the hill-forts from those of the smaller farming settlements. The much greater data we now have suggests a varied pattern and though the people of central Hampshire and northern Hampshire were very similar in terms of their material culture, the roles of the hill-forts were very different, Danebury remaining highly nucleated, while central Hampshire reverted to a mainly dispersed settlement pattern. I will reflect on the need for theoretical models to provide different interpretations and how these can be tested in the field, especially the need to concentrate on the minor settlements.

12 RESEARCH AGENDA IN HILLFORT-RICH REGIONS: THE CASE OF EASTERN ADRIATIC

Author(s): Novakovic, Predrag (University of Ljubljana)
Presentation Format: Oral

Eastern Adriatic is probably the richest European region in terms of a number of hillforts from the Bronze and Iron ages. It is our rough, but probably modest estimation that some 2000 – 3000 hillforts are sparsed along the whole eastern Adriatic coast, from N Italy to N Albania, its hinterland and on the Eastern Adriatic islands. The hillforts represent by far the most frequent type of the Bronze and Iron Age settlement (and built structure) in this region. They generally appeared in different forms and numbers with the Early Bronze Age and as dominant settlement type continued until the arrival of the Romans. Their importance as distinguished and permanent landmarkers is best illustrated with the fact that all local languages and dialects have special term/toponym for archaeological hillforts: castelliere, gradišče, kaštelir, gradina and their derivatives; they all all mean the same – enclosed/built place or fort.

The history of hillfort research dates back into at least mid-19th century, depending an a region, and the first systematic study was published in 1903 by Carlo Marchesetti, curator of the Trieste Natural History Museum. Since then, the hillforts developed into one of the central topics of prehistoric archaeology in NE Italy, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro and Albania and resulted in hundreds of papers and monographs containing rich arsenal of different interpretations, approaches, and ideas mirroring the development of archaeology in the named countries. If in the past seem to exist a strong trend of developing a unified 'theory of hillforts' today, due to their variabilty, this is not the case anymore. Instead, several different regional interpretations proved to be more productive. To this end, the paper examines actual state of art in hillfort research in the Eastern Adriatic region.

13 VITRIFIED WALL MATERIAL FROM THE HILLFORT BROBORG IN SWEDEN – GENESIS AND AGEING

Author(s): Sjöblom, Rolf (Luleå University of Technology; Tekedo AB, Nyköping) - Hjärthner-Holdar, Eva (The Archaeologists in Uppsala) - Pearce, Carolyn (Pacific Northwest National Laboratory, Richland) - Ogenhall, Erik - Englund, Mia (The Archaeologists in Uppsala) - McCloy, John (Washington State University, Pullman) - Weaver, Jamie (National Institute of Standards and Technology, Gaithersburg) - Vicenzie, Edward (Museum Conservation Institute, Smithsonian Institute, Suitland) - Peeler, David (Pacific Northwest National Laboratory, Richland) - Kruger, Albert (U.S. Department of Energy, Office of River Protection, Richland)
Presentation Format: Oral

Some nuclear waste in the United States is to be stabilized by means of vitrification. The glass is to remain intact in its final disposal facility for thousands and tens of thousands of years. Here, existing theoretical knowledge and results from laboratory experiments need to be supplemented by comparisons with similar material that has existed in a comparable environment for a long time. The hillfort Broborg near Uppsala in Sweden offers such a possibility, and pristine vitrified wall material was obtained in an excavation carried out in October 2017. There are two objectives of the project: firstly, to supply an anthropogenic analogue to the nuclear waste management work, and secondly, to contribute to the cultural heritage of Sweden by illuminating its distant past. This refers to the genesis of the glass, the rationale for and the use of the hillfort as well as the development of the landscape and the local water chemistry. One key issue is the origin of the glass, be it for constructive or destructive purposes, and also if the fire and firing was intentional. This issue has been a basis for arguments among archaeologists for the past 200 years. The artefacts are now under study using x-ray tomography, micro-XRF and other methods not often utilized previously for this purpose, and comparisons will be made between alternative interpretations using analytic network process analysis. At Broborg, it is obvious that the melting of the

amphibole stones has bonded the other stones together by means of vitrification, and thus strengthened the structure, whilst the granite stones themselves have been damaged and mechanically weakened by fire-cracking. The site itself was abandoned during the iron age and has been essentially left alone since. The landscape has changed due to land rise and deforestation, as evidenced by e. g. pollen analyses.

14 PLACE NAMES, FOLKLORE AND HILLFORTS OF LITHUANIA

Author(s): Montvydas, Zilvinas (Institute of Lithuanian Literature and Folklore)
Presentation Format: Oral

For decades, folklore was one of the main sources for finding archaeological sites in Lithuania. The attempts to explain the origin of archaeological, historical and geographical objects were common, mostly related to Iron Age or medieval burial sites and hillforts. According to the local legends, hillforts were poured by giants, the Swedish or Napoleon's Grande Armée soldiers. It contains underground caves and tunnels, connecting them with other places such as churches, monasteries or manor houses. Some of the hillforts considered to be churches buried under the ground. Treasures are hidden, ghosts appears and people get lost there, accidentally found prehistoric artefacts are associated with historical wars or other events. Widely spread place names are usually associated with castles, giants, Swedes and French. Such names and stories are first indicators for finding unknown archaeological sites. Legends about archaeological objects reflects the way people think, visualize and understand the past, reveal the length of historical memory, the traces of events and processes in people's consciousness.

Unfortunately, today most of the archaeologists in Lithuania do not consider folklore data as an important source or research object. Huge amounts of information gathered and forgotten in archives. This research will introduce folklore sources of Lithuania and the way it could be used in search and research of hillforts.

15 EARLY DEVELOPMENT OF HILLFORTS IN THE SOUTH EAST BALTIC: A REVIEW OF EARLIEST C14 DATES

Author(s): Podenas, Vytenis (Lithuanian Institute of History, Department of Archaeology; National Museum of Lithuania, Department of Archaeology)
Presentation Format: Oral

Appearance of hillforts has been a recurrently researched theme, especially with active publication of C14 dates (Егорейченко 2006; Lang 2007; Oinonen et al. 2013; Vasks, Zariņa 2014; Sperling 2014; Mittnik et al. 2018). Recently a couple of independent investigations acquired new C14 dates from hillforts excavated in Lithuania: Garniai I, Mineikiškės, Narkūnai, Sokiškiai, Kukuliškiai and others. A considerably supplemented absolute dates from the earliest hillforts had resulted in some interpretations that was based on unreliable samples: charcoal with no supplemented data from other kinds of samples or archaeological record, food crusts which had not been subject to additional isotopic analysis or unspecified animal bones with no determination whether samples were taken from carnivores/omnivores or herbivores. A situation has been a subject to a critique before (Motuzaitė-Matuzevičiūtė 2015). This has led to different narratives on the early development of hillforts in the South East Baltic, but a tendency to attribute their appearance as early as transition from XI to X cent. BC based on reassessment of typology is still prevalent (Čivilytė 2014; Vitkūnas, Zabiela 2017). Earlier treatment of intuitively based typological sequences resulted in dating appearance of early hillforts by different researchers to Period III (1400/1300–1200/1100) or roughly last quarter of II millenium BC (Luchtanas 1992; Grigalavičienė 1995). However the C14 AMS dating of the earliest paleobotanical or herbivore bone remains from hillforts resulted in attributing them to later period: mostly VIII–VI cent. BC (Hallstatt plateau). Thus, paper aims to reassess the hillfort appearance in the South East Baltic and see for the possible explanations why previous intuitively postulated chronological sequences seem to fail, and what could they indicate.

16 ARCHAEOBOTANY OF LITHUANIAN HILLFORTS: DEVELOPMENT AND PERSPECTIVES

Author(s): Minkevicius, Karolis (Vilnius University)
Presentation Format: Oral

Since the dawn of human history our existence was intertwined with the surrounding natural environment. The emergence of paleoethnobotany provided archaeologists with an invaluable tool allowing us to study these relations. It allowed us to recover, study, and interpret plants remains from archaeological sites. Yet, this seemingly methodologically straightforward discipline carries enormous interpretative complexity. This holds true for both selecting sampling strategies on site as well as interpreting the results of archaeobotanical analysis. This complexity increases even more when dealing with different chronological periods, geographic regions and types of sites.

This paper presents the current state, recent developments and the future prospects of archaeobotanical research of Lithuanian hillforts. Historically, in the Eastern Baltic region these methods were usually limited to the assessment of the usage of economic plants and the impact of anthropogenic activities on the natural environment. However, the last several decades have seen and rapid increase in both quantity and complexity of archaeobotanical projects conducted. Numbers of recovered material rocketed and the data from legacy excavations was being revisited. This inevitably resulted in the construction of increasingly complex picture of the agricultural development in this region. By presenting several case studies from Lithuania this paper summarizes the most recent developments in archaeobotany of Lithuanian hillforts dating from 1st to 12th century AD. It also illustrates how different contexts and a range of sampling strategies can help to shed some light on the daily lives of the hillfort communities.

17 HILLFORT RESEARCH IN FORMER EAST PRUSSIA – RESULTS AND STRATEGIES OF THE PAST 175 YEARS

Author(s): Ibsen, Timo (Zentrum für Baltische und Skandinavische Archäologie)
Presentation Format: Oral

With a number of approx. 3500 hillforts are one of the most numerous archaeological monuments in the Baltic countries. Just in former eastern Prussia their number is estimated to 450 exemplars. But despite a research history of 175 years hillforts are still little understood. To understand the reasons for our poor knowledge and develop a concept for future investigation it is worth to look closer to previous research activities and strategies of hillfort studies.

The history of research begins already in the 1830s with a systematical survey of all known hillforts by Lieutenant Guise, whose sketches of monuments partly survived until now as part of Prussia-Archive, today mainly kept in the Museum for Proto- and Prehistory in Berlin, Germany.

Since then several German scholars have mapped, registered and catalogued and also excavated the hillforts with various intension and intensity.

After WWII the region was divided between Poland, Lithuania and Russia. All 3 countries developed different activities in hillfort research and collected lots of material in several small- and large-scale excavations, but most of the material remains unpublished in the national archives. The post-perestroika-period has seen a varying intensive revival of hillfort investigation in all 3 countries and the Baltic region in general, with impressive results and many new information. Still, nearly all modern publications name the hillforts as the least understood archaeological monuments.

The paper gives an overview about hillfort research of the past 175 years in East Prussia with a special focus on its northern part, nowadays belonging as Kaliningrad Region to Russia. The different research strategies and results – including unpublished archival sources – of each time are analyzed to point out the main deficits of past hillfort research as a basis to define the needs and to develop new approaches for the investigation of these fascinating monuments.

18 THE ATLAS OF HILLFORTS IN LITHUANIA. AN ONGOING TASK

Author(s): Zabiela, Gintautas (Association of Lithuanian Archaeology)
Presentation Format: Oral

Lithuania is the country of hillforts. In territory of 63.200 sq.km now we know 922 hillforts. Such a big number of ancient fortifications consisted in long period of this use – from the beginning of 1st millennium BC up to 15 century AD. The knowledge of these archaeological monuments started in the beginning of 19th century. Until now we possessed about 10 different lists of hillforts, 2 full atlases and 4 updates of these atlases. In our time the discovery of unknown hillforts continue – in 2016-2017 92 sites were identified as hillforts. Using years of experience we can discuss the perspective directions of the discovery of the new hillfort sites. One of perspective directions is the use of high quality LiDAR scans for identify possible places of hillforts. Separate probleme is definition of term "hillfort" - what features shows the presence of hillforts in modern landscape, partly destroyed by natural and human activities. The last problem is the demands of knowledge of full number of hillforts in the investigations of prehistory – Medieval time. Hillforts as special sort of archaeological heritage always indicate the threats inside prehistorical societies between neighbour or distant tribes or other social organisations. Every hillfort indicate the capacity of defence in concrete time and place. The wide knowledge of hillforts network help understand more the our past.

19 HILLFORTS FROM A TRANSNATIONAL PERSPECTIVE: COMMON DATABASE AS THE WAY FOR COMMON STRATEGIES

Author(s): Valk, Heiki (University of Tartu, Estonia)
Presentation Format: Oral

The study of hillforts is usually limited to source material from a definite country. Approaches on a broad, trans-national level are hindered and complicated because of lack of a general survey of the source material – it is located in archives of different countries, presented in different languages, and often unpublished. There exists no common survey neither on the number and location of hillforts, nor on the state of their research. Because of these reasons the knowledge of researchers is often limited to that concerning his/her own country and, in good cases, with fragmentary data from outwards.

For a more profound understanding of the topic of hillforts a common transnational database of these sites, equipped with a map application were needed. The database might include data on the location, form or type, chronology, fortifications and occupation layers of the hill forts, it might present references to their (former) connections with land or water routes, related monuments and hinterlands, supposed functions, as well as references to research history, finds and publications. The trans-national database might be an useful tool to overcome the limitations set to researchers by national and language borders and greatly contribute to a deeper understanding the topic, both in spatial and temporal aspects.

Designing the structure of such trans-national database is the future task for international workshops, participated by researchers from different countries.

a. INTO THE WOODS: INTERDISCIPLINARY RESEARCH OF THE OPPIDUM BIBRACTE (MONT BEUVRAY, FRANCE)

Author(s): Milo, Peter - Goláňová, Petra (Department of Archaeology and Museology, Masaryk University, Brno) - Milová, Beáta (Institute of Archaeology, Slovak Academy of Science, Nitra) - Tencer, Tomáš (Department of Archaeology and Museology, Masaryk University, Brno) - Tencer, Dorota (Institute for Preservation of Archaeological Heritage Brno) - Vágner, Michal (Department of Archaeology and Museology, Masaryk University, Brno)

Presentation Format: Poster

The famous Oppidum Bibracte (Mont Beuvray) is situated in central France. In 52 BC, Vercingetorix was proclaimed head of the Gaulish coalition on Bibracte. Afterwards, Julius Caesar, the victor at the battle of Alesia, spent the winter of 52–51 BC on the oppidum and completed his work Commentarii de Bello Gallico, where he mentions Bibracte as the capital of the Celtic tribe Haedui. The first excavations were initiated in the 19th century but further research activities were conducted only after 1985 when Bibracte was proclaimed a site of French national interest. Bibracte is currently being excavated by a number of research teams from multiple European universities. The main coordinator and patron of archaeological research is the European Archaeological Centre of Mont Beuvray. The Czech research team of the Department of Archaeology and Museology (DAM), Masaryk University has been participating in the research since 2009. In 2011, we began to carry out a geophysical survey in the areas planned to be excavated in the near future.

The oppidum itself is located in a mountainous landscape where a major part is covered by forest, limiting meadows to a small area. Due to these challenging conditions, geophysical survey is an extremely tedious task and time-consuming. The enormous extent of the fortified complex with many steep slopes and densely forested terrain do not allow continuous prospection of the whole site. However, the information gained through prospection has already helped the excavation teams to understand and to better interpret the conditions in the trenches. The overall task of the survey and excavation is better understand space organisation and urbanisation process at the oppidum.

630 ADVANCING GLOBAL ROCK ART AS AN ARCHAEOLOGICAL AND A COMMUNITY RESOURCE

Theme: Theories and methods in archaeological sciences
Organisers: Brusgaard, Nathalie (Leiden University) - Hoerman, Rachel (University of Hawaii at Mānoa)
Format: Regular session

Rock art research is rapidly becoming mainstream archaeological practice the world over. Unlike most archaeological materials, rock art is a fixture in past and present cultural landscapes. It therefore has unique potential as an archaeological resource and priceless, tangible heritage. Presently, rapid methodological advancements (e.g. dating and recording techniques) and new discoveries dominate and determine rock art research's trajectory, often outpacing interpretive reflection, theory, and heritage management research. Yet, approaches integrating these methodological developments with theory and conservation hold the potential to advance and promote rock art as an archaeological data source and a vital component of native and local communities.

In this session, we explore these issues by asking: How do we stimulate the rapid technological developments in rock art research, while also pausing to reflect on the theoretical and interpretative implications? How can and should these advances best serve the native and local communities rock art is ensconced in? Additionally, how can methodological and theoretical advances safeguard and contribute to the long-term management of rock art as world heritage? And what does the optimal forward progress look like for each of these issues?

We invite scholars working on rock art from all areas and periods to discuss these topics from their own perspectives and experiences. We especially welcome papers featuring combined approaches to methodological, theoretical, and heritage issues.

ABSTRACTS

01 SESSION INTRODUCTION: ADVANCING GLOBAL ROCK ART AS AN ARCHAEOLOGICAL AND COMMUNITY RESOURCE

Author(s): Veth, Peter (University of Western Australia) - Hoerman, Rachel (University of Hawaii Manoa) - Brusgaard, Nathalie (Faculty of Archaeology, Leiden University)

Presentation Format: Oral

A global, yet highly local phenomena, this session assesses the current state of rock art research from three different, and sometimes overlapping, perspectives. These include a) the integration of rock art into mainstream archaeology; b) technological advancements in rock art research, management and conservation; and c) the unique status of rock art as heritage which is fixed-in-place in past and present cultural landscapes. This session will discuss the intersection of theoretical approaches, methodological innovations, and rock art heritage management strategies and debate optimal ways forward.

The following questions structure this session: 1) How do we stimulate rapid technological developments in rock art research, while

also critiquing the theoretical and interpretative implications? 2) How can and should these advances best serve the host native and local communities? 3) Finally, how can methodological and theoretical advances help safeguard and contribute to the long-term management of rock art as global heritage?

We invite approaches that integrate advances in theory, method and conservation to advance and promote rock art as an archaeological data source and also as a living heritage for native and local communities. These papers will aim to illustrate the improved integration of rock art research into mainstream archaeological practice as well as the robust, dynamic and local nature of the sub-discipline.

02 ROCK ART, CULTURAL HERITAGE, IDENTITY : CONTRASTING PATTERNS IN MOROCCO BETWEEN LOCAL COMMUNITIES AND FIELD ARCHAEOLOGISTS

Author(s): Bailly, Maxence (Aix-Marseille Université) - Graff, Gwenola (Institut de Recherche pour le Développement)
Presentation Format: Oral

The Kingdom of Morocco owns one of the richest cultural heritage in Africa, ranging from early Palaeolithic to the Colonial period. Among thousands of archaeological sites, rock art is extensively documented. Rock engravings are dated to the Holocene (paintings are less frequent), most of which are quite recent, belonging to the last four millenia.

As moroccan rock art is widely spread all over this large country, rock art sites occur in very different geographical and ecological contexts, from high altitude ranges in the Atlas mountains for instance to the rocky desert in the southern part of the country (Draa drainage basin). The local contexts are really varied too and provide very contrasted situations for scholars involved in fieldwork campaigns.

This paper aims to present a comparative sketch of the relationships between rock art sites, local communities and scholars based on our experience in two different places where we did several fiedwork campaigns within the last six years : the Yagour plateau in the high atlas moutains near the city of Marrakech, in a context of Amazirs native communities and the Draa area, south of the city of Guelmin, a desert area inhabited by nomadic arabic people. These two contexts (mountain agriculture vs extensive herding ; amazirs vs arabic) provide opposite situations and discourses between local communities and rock art sites : from political claims to denial ie from ancestral sacredness to remote evil devices. These very contrasted situations are challenging for archaeologists on fieldwork and require skill and caution. In the mean time, they provide genuine insights into the traditional culture of the communities whose landscapes are bearing numerous rock art places, where engravings are still performed today.

03 ROUTES BEYOND GANDHARA: EARLY BUDDHIST ROCK CARVINGS FROM THE KARAKORUM MOUNTAINS

Author(s): van Aerde, Marike (Leiden University)
Presentation Format: Oral

This paper presents the first results of new analyses and interpretations of a long-neglected data set of over 10,000 ancient rocks carvings from the Karakorum mountain range between North Pakistan (Gandhara) and Western China (Tarim Basin). The carvings include a large percentage of early Buddhist imagery, caravan and hunting scenes, a wide variety of animal species, and inscriptions. The research project focuses on the currently available documentation of Buddhist carvings from the Western parts of the mountain range, in order to contribute new insights concerning: 1) the functionality and iconography of Buddhist rocks carvings as part of early Silk Roads caravan routes between ancient Gandhara and the Tarim Basin; 2) new empirical archaeological evidence of direct mountain routes between Gandhara and Han China from ca. 2nd-1st century BCE onward (much earlier than the traditionally suggested 6th century CE dating for the spread of Buddhism to China), including landscape context and aerial footage analysis.

In presenting these new findings, the paper focuses on the most recent challenges of these rock carvings' preservation (including threats of extremism, destruction by dams, and melting glaciers), and explores how archaeologists may be able to actively help promote the important cultural heritage of this very rich and diverse, but unfortunately much-threatened data set of rock carvings – which has already proven invaluable for expanding our understanding of inter-regional culture contact in this dynamic ancient region.

04 ROCK ART AS ARCHAEOLOGY: A CASE STUDY FROM THE BLACK DESERT, JORDAN

Author(s): Brusgaard, Nathalie (Leiden University)
Presentation Format: Oral

Rock art is increasingly becoming a major sub-discipline within archaeology and more than ever large research projects are integrating rock art into their research as an important data source. However, in many areas of the world it is still neglected as a significant part of the archaeological record, despite its value as an in situ material.

In this paper I discuss how we can better integrate rock art into archaeological research as a source of valuable information about past societies. I do so using a case study on rock art from the Black Desert in northeastern Jordan. This rock art has rarely been studied before and has always been documented and researched in second place to the epigraphic evidence from this area. As part of the recently completed Landscapes of Survival project, I carried out a comprehensive study of this material in tandem to research on the archaeology and epigraphy of this desert region. In this paper I show how a material approach to the rock art, studying as we would any material culture, focusing on aspects of production and consumption, can provide new insights into the ancient desert societies

of this region. Additionally, this paper demonstrates how rock art data can be successfully combined with other data sources in a large research project, to form a new perspective on past peoples.

05 UAS MAPPING OF A ROCK ART SITE IN THE PACIFIC

Author(s): Jalandoni, Andrea (Griffith University) - Kottermair, Maria (University of Guam)
Presentation Format: Oral

Our research is focused on new technologies that assist in the documentation and interpretation of rock engraving sites. Given the rarity of rock art sites in this region and the limitations on accurate recording, we aimed to develop the best possible methods for recording the rock art of Pohnpei to better understand its place in the wider archaeological landscape. Pohnpei, one of the four island states of the Federated States of Micronesia (FSM), is fast becoming a tourism hot spot since Nan Madol was listed as a 2016 World Heritage site. A mere 7km northwest of Nan Madol are the Pohnpaid Petroglyphs, which is the only confirmed rock art site on Pohnpei and the FSM. The site is promoted on tourism brochures and signage from the road but no further signage or interpretation can be found at the actual site.

The size of the site, about 80m x 20m, and time limitations made it difficult to collect data for SfM photogrammetry using a hand-held DSLR. Therefore, we recorded the entire site using an UAS (Unmanned Aerial System), while training local Historic Preservation Office staff on new recording techniques that can be used for other archaeological sites on the island. The condition of the volcanic rock obfuscated the engravings and enhancement was accomplished using the HS-TPI (Hillshade-Topographic Position Index) method we piloted (Jalandoni & Kottermair in press). Aside from providing the data to effectively analyse the rock art and compare with previous records, a site map was produced that can be used by the tourism office of Pohnpei to promote the site. While our analysis is ongoing, our research to-date has demonstrated that these new recording techniques can provide ample data to explore important archaeological questions.

Jalandoni, A. & Kottermair, M. (in press). Rock art as micro-topography. Geoarchaeology. doi: 10.1002/gea.21677

06 DIGITAL EXPERIMENTATION IN THE AFRICAN ROCK ART IMAGE PROJECT AT THE BRITISH MUSEUM

Author(s): Wexler, Jennifer - Galvin, Elizabeth (British Museum)
Presentation Format: Oral

The African Rock Art Image Project at the British Museum (www.britishmuseum.org/africanrockart) was launched in 2013 to catalogue, curate and make publicly accessible a collection of 24,000 images from 19 countries throughout the continent of Africa. The project has focused principally on how to make the project's data available to both researchers and members of the public. As part of this, we have been looking at new ways of visualizing and transforming the 20-year-old archival rock art images by experimenting with innovative digital tools. This has allowed us new and inventive ways of engaging with the rock art data, including 3D modeling for online curation and the further contextualization of rock art landscapes through the creation of immersive VR tours. Using these digital techniques has wide-reaching implications for the way museums and cultural heritage agencies use their historical data. Archival resources are not only key educational and research resources, but also increasingly play an important role in possible reconstructions of endangered or destroyed heritage. This paper will focus on what we have learned in the 4 years of running a major digital heritage project in a museum environment, and how we are working to ensure ongoing, open access to the archive.

631 AFRICAN COSMOPOLITANS: THE HORN OF AFRICA AND THE WORLD (1ST-20TH CENTURIES AD)

Theme: The archaeology of material culture, bodies and landscapes
Organisers: de Torres Rodríguez, Jorge (British Museum) - González-Ruibal, Alfredo (Institute of Heritage Sciences-Spanish National Research Council) - Balzano, Shane (London School of Economics; School of Oriental and African Studies) - Phillips, Jacke S. (University of Cambridge)
Format: Regular session

The Horn of Africa is often depicted in negative terms in today's mass media, as a place of famine, ethnic conflict, war and terrorism. This negative picture reinforces ideas of Africa as a dark continent without history. However, the Horn has been historically the home of a bewildering variety of societies, both indigenous and diasporic, who have interacted in a myriad ways to create rich, hybrid cultures. In this session we will explore the place of materiality in the creation and development of religious, cultural, economic and political networks involving people from the Horn and societies along the Indian Ocean, Arabia ad Europe. We welcome papers that address issues of connectivity, hybridity and interaction from a long term perspective.

01 TRACING BACK THE TAZKAR: INTERACTION, COMMEMORATION, AND INTEGRATION IN NORTHERN ETHIOPIA

Author(s): Singh, Dilpreet (Northwestern University)
Presentation Format: Oral

This paper examines the long-term change and continuity in religious/mortuary structures that accompanied the adoption of Christianity in northern Ethiopia. Christianity arrived in Ethiopia during the Aksumite period (50-800 AD) and soon became central to the northern Ethiopian cultural traditions. Art historians have noted that early Christian churches incorporated the design of earlier pre-Christian elite structures. While ostensibly a cosmetic similarity indicating religious syncretism, added to this is that the enigmatic "house" symbolism was also carved onto pre-Christian funerary stelae. Reviewing Aksumite mortuary practices, I argue that the "house" symbolism on Aksumite pre-Christian monuments indexed their integrative purpose for Aksumite social groups. I then suggest that the "house" symbolism, as part of a larger package of symbolisms associated with material sites (including stone, water, etc.), then carried its way into Christianity through the subsequent importance of the church to community building efforts, notably through commemoration rituals such as the "Tazkar." These similarities and continuity in commemoration ritual belie against an initial tension that appears to have existed between pre-Christian and Christian mortuary traditions. While it is uncertain when the Tazkar comes into being, this long-term view allows us to understand why the Tazkar needed to emerge – not just as a religious ritual, but as a social institution that reproduced valued aspects of the social order.

02 THE COSMOPOLITAN MARGIN: THE SUDANESE-ETHIOPIAN BORDERLAND IN THE LONGUE DURÉE (500 AD TO THE PRESENT)

Author(s): González-Ruibal, Alfredo (Incipit-CSIC)
Presentation Format: Oral

The area between Sudan and Ethiopia has been a buffer zone between states for around two millennia. During this period, tribal communities living in the borderland have negotiated their relations with those states, covering all the spectrum from resistance to accomodation and collaboration. The archaeological record shows that local communities were well acquainted with other cultural worlds and often integrated key components from them, but at the same time they refused to be incorporated into the cultural and political koinés of the area.

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03 SMALL OBJECTS OF DESIRE: IMPORTED MATERIALS IN SOMALIA FROM THE ANTIQUITY TO THE 19TH CENTURY

Author(s): de Torres Rodríguez, Jorge (British Museum)
Presentation Format: Oral

The presence of imported materials is usually cited everywhere as the most widespread and obvious evidence of trade. Artifacts are presented as the irrefutable proof of commercial contacts, either direct or indirect, and the study of their chronologies and origins constitute the backbone on which the analyses of historical trade networks are built. From that perspective, the case of Somalia is somehow exceptional: although it's undeniable the key situation of the region as a crossroads for trade routes coming from the Mediterranean Sea, Asia, Arabia or the East African Coast, the historical trajectory of the region has prevented a proper study and publication of the imported materials which are usually referred to but only very occasionally described or published.

This paper aims to set, for the first time, a state of the art for the dispersion, chronology and origins of the imported materials recorded in Somalia. Based on the results of the Spanish Archaeological Mission in Somaliland and other series of data, it will analyze the evolution of the trade in the region throughout its importations, the main goods and commodities exchanged and the caravan system that connected the Somali coast with the interior. This systematic study will provide the material framework from which to reconstruct the social, economic and historical settings that made of Somalia a major trade hub in the Indian Ocean trade network.

04 GLOBALIZATION AGAINST TRADITIONS: WHAT IS THE FUTURE FOR THE POTTERY TRADITIONS IN THE NORTHERN ETHIOPIA?

Author(s): Gaudiello, Michela (Freelance archaeologist)
Presentation Format: Oral

The Ethiopia is the land where few modern cities and their facilities (electricity, water supplies, infrastructures and asphalt roads) clearly contrast with the old landscape and with most of the surviving "poor" villages. At the same time those cities, as well as all the non-modern Ethiopian communities, are still strongly bound with two main old traditions: coffee and several different kinds of local foods. Herein, ceramic pottery (shakla) reigns as queen in the vessel and ceramic world. The potsherds which several archaeological sites in Tigray yielded, the northernmost region of Ethiopia, tell many histories of ancient contacts with the southwestern Arabian Peninsula during the 1st millennium BCE as well as the interconnections and exchanges of materials and skilled female potters from villages, which have been in existence for centuries. The ancient pottery attests the religious conversion and the Christianization of the ancient kingdom of Aksum and marks the main phases of its historical and political developments (ca. 50 BCE – 650/700 CE). The pottery analysis, in combination with the archaeological interpretation, allows archaeologists to reconstruct the formation of complex societies and the ancient economic and socio-political networks. But, what happens when the aesthetic taste and the choice of more durable materials will definitively replace the ancient pottery traditions and with them the religious, cultural, socio-economic differences? How will this the unchangeable future affect the təgrəññə communities? Will the attachment remain strong for their traditional food? Will the typical stylistic pottery productions to break down the social barriers about the bad reputation of female potters and rescue their work and pottery specialities?

05 THE VALUE OF THE MIFSAS BAHRI (TIGRAY, ETHIOPIA) RESULTS DESPITE THE BEWILDERING CRITICISM OF THE PUBLISHED REPORT OF 2017

Author(s): Gaudiello, Michela (Heidelberg University) - Yule, Paul Alan (Heidelberg University)
Presentation Format: Oral

Four seasons of excavation, two surveys and the analysis of pottery materials and human skeletal remains of the Late Aksumite site of Mifsas Bahri (ca. 7th CE) in southern part of Tigray, Ethiopia, provide important results and new information about a region that has been little known from an historical and archaeological point of view. The final publication seems have been attracted more negative criticisms than appreciation about the work done and the aims achieved. Mifsas Bahri is an ancient church site which lies on the south-western shore of a Lake Hashenge and is the southernmost Late Aksumite site known. The next closest archaeological site, Maryam Nazret church, is located about 60 km north and about 70 km to the south there is the most important monastic city of Ethiopian Christianity – Lalibela. Even if Mifsas Bahri is closer to the centre of that second renewed religious and political core of Ethiopian medieval history (ca. 12th CE) than the ancient city of the first powerful Aksumite kingdom (c. 50 BCE – 650/700 CE), still we recognize more architectonical and ceramic similarities with the ancient city of Aksum. The church itself and the pottery reveal significant long-range contact with the northernmost archaeological sites of Aksum and Matara (Eritrea) during the Late Aksumite period, and contextualise Mifsas Bahri in a complex exchange network of Aksum's sphere of influence, which embraced not only the northern region of Ethiopia, but todays Eritrea and the Red Sea trade.

06 AND THEN WHAT HAPPENED? A 'MICRO' VIEW OF ASSIMILATION

Author(s): Phillips, Jacke (SOAS, University of London; McDonald Institute, University of Cambridge)
Presentation Format: Oral

Beyond the 'macro' scale of interaction within and beyond the Horn of Africa also exists a 'micro' undercurrent of the peoples, goods, ideas and technologies impacting on the regions beyond their origin. Transported from one location to another, they could be appropriated and adapted to varying degrees beyond their original 'home' culture, from virtually unchanged to virtually nil. Such assimilation - whether physical importation, direct copying ('imitation'), adoption, adaptation, incorporation, interpretation, imposition or even complete rejection of an external 'something' beyond its normal cultural sphere, is a byproduct of long-distance physical transmission and cultural interaction and, to some degree, the ultimate result of networking beyond the major players. The most directly relevant factors are the nature of the material being transmitted, the actual means of its transmission, and the form of its assimilation within its 'host' culture.

Over the past two millennia, the Horn of Africa region has witnessed the rise and fall of numerous cultures, all of whom interacted with others both adjacent and, by both land and sea, the world beyond to Europe, Japan and the Swahili coast. Text and excavation have documented what was transferred, but some sense of the multiple meanings behind the acceptance of specific goods and ideas can be gleaned by considering them within the 'host' culture. This paper will focus on Aksumite Ethiopia as 'host', but will also reference other interacting cultures.

07 COSMOPOLITAN COMMUNITIES. ARCHAEOLOGICAL PERSPECTIVES FROM EASTERN ETHIOPIA

Author(s): Insoll, Timothy (Institute of Arab and Islamic Studies, University of Exeter)
Presentation Format: Oral

Recent excavations at the medieval Islamic site of Harlaa in eastern Ethiopia have provided extensive evidence for the existence of

a cosmopolitan community strategically situated mid-way between the desert plain and the highlands. This community seems to have been entangled within a variety of networks that range from long-distance, focused on the Indian Ocean and the northern end of the Red Sea, regional, focused on the coasts of East Africa and the Horn of Africa, and local, focused on the eastern highlands. These networks involved trade and exchange, but also, apparently, the movement of ideas, both technical, architectural, and religious (Islam), as well as, potentially, people. The material indicating this (beads, coins, burials, architecture, etc.) will be reviewed and the importance and value of archaeology for a period with limited historical sources emphasised as a means for providing insights into a little known area of African history.

The excavations at Harlaa form part of the European Research Council funded project, Becoming Muslim: Conversion to Islam and Islamisation in Eastern Ethiopia (694254-ERC-2015-AdG). This 4-year project is seeking to explore, for the first time, Islamic conversion and Islamisation in eastern Ethiopia through focusing on Harlaa, and Harar, the most important living Islamic centre in the Horn of Africa, as well as its surrounding region. Project partners are Addis Ababa University, and the University of Leuven.

633 ROCK ART AND THE SEA: THE SYMBOLS OF PREHISTORIC COASTAL SOCIETIES AND MARITIME INTERACTION IN EUROPE

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Schulz Paulsson, Bettina (University of Gothenburg) - Dawson, Helen (Topoi Excellence cluster; Freie Universität Berlin) - Ling, Johan (University of Gothenburg; Swedish rock art research archives) - Mattioli, Tommaso (University of Barcelona, Dept. of History and Archaeology)
Format: Regular session

Rock art, encompassing engravings and paintings on rocks, rock shelters, caves and in graves, is a widespread phenomenon in the coastal regions of Europe. Thousands of known sites display multiple symbols, ranging from abstract motifs (such as angular designs, curvilinear and circular motifs, waves, zigzag lines, spirals, triangles) to naturalistic representations (including anthropomorphic figures, boats, animals, trees, house sketches, and weapons). Some symbols are combined to form complex systems. Strikingly, identical motifs and symbol groups can be found separated by long distances, which can be taken as evidence of human mobility or other forms of cultural interaction. In this session, we take a diachronic and comparative look to the whole of Europe.

Did rock art develop independently in separate regions and time periods? Conversely, are these images the results of intercultural maritime exchange? If so, how was such transfer accomplished? How does rock art inform our understanding of prehistoric activities such as rituals, journeys, hunting, farming and warfare? What does rock art tell us about the process of Neolithisation and the relation between hunter-gatherers/foragers-fishers and farmers? Finally, what key elements of Bronze Age maritime interaction are reflected in coastal rock art?

The session will examine:

1. Convergence and divergence in time and space of symbolic identities from hunter-gatherer, Neolithic and Bronze age coastal societies
2. The ways in which images and ideas were transferred
3. Iconographic, semiotic and performative approaches and the significance and function of the symbols

ABSTRACTS

01 SYMBOLIC IDENTITY AND MARITIME INTERCULTURAL EXCHANGE IN MEGALITHIC EUROPE (4500-2500 CAL BC)

Author(s): Schulz Paulsson, Bettina (University of Gothenborg)
Presentation Format: Oral

Recent research into megalithic mobility reveals that the rise of long-distance maritime journeys proceeded in Europe much earlier than hitherto proposed. Most of the ~35´000 still existing European megaliths, which include megalithic tombs, standing stones, stone circles, alignments, and megalithic buildings or temples, were constructed during the Neolithic and the Copper Ages and are located along the Atlantic and the Mediterranean coast. Temporality and coastal setting of the megaliths, the circulation of green stone artefacts and the depiction of maritime symbols as boats and sea mammals along the Atlantic coasts emphasize the maritime linkage of these societies and a developed maritime technology. From several hundreds of the European megaliths, especially from Brittany, Andalusia, Portugal, Galicia, Catalonia, Sardinia, the Maltese archipelago, Ireland and Scotland are paintings and engravings known, both with simple symbols and figurative depictions. Some are combined to form complex symbolic systems, identical motifs and symbol groups can be found separated by long distances. The transfer of symbol packages between the regions indicates cultural interactions in all its variety from travels to population migrations, the transmission of a similar cosmological worldview and a shared symbolic identity. This paper presents selected outcomes of an ongoing comparative study of the megalithic art in Europe, in order to discuss intercultural maritime exchange and symbolic transmission along the Atlantic coast of megalithic Europe.

02 FAR AWAY BUT CLOSE? SCHEMATIC ROCK ART AND NEOLITHIC SEABORNE CONNECTIONS IN THE CENTRAL-WESTERN MEDITERRANEAN

Author(s): Dawson, Helen (Topoi Excellence Cluster, Freie Universität Berlin; Gerda Henkel Stiftung) - Mattioli, Tommaso (Prehistoria i Arqueologia, Facultat de Geografia i Historia, Universitat de Barcelona; ICREA) - Diaz-Andreu, Margarita (Prehistoria i Arqueologia, Facultat de Geografia i Historia, Universitat de Barcelona; ICREA)

Presentation Format: Oral

Schematic rock art, consisting in paintings – mainly in red colour - of basic figures and symbols in rock shelters, is a well-known rock art tradition in the Iberian Peninsula. It is generally believed to have originated towards the middle of the 6th millennium BC, when the first economic and technological evidence of the Neolithic is documented in this area. Intriguingly for us, its geographical distribution extends far beyond this region: iconographic parallels can be found in many coastal regions of the central and western Mediterranean, from Andalusia to the Gulf of Lyon in France to the southern part of the Italian Peninsula, from the biggest islands (Corsica, Sicily) to the immediate hinterland of the Balkan Adriatic coast. These similarities suggest coastal cabotage routes, with potential stopping points and direct open-sea crossings. While identifying the exact details of such routes is challenging, they open up important questions about human mobility, cultural interactions, and convergence phenomena. In this paper, we present the interim results from our on-going comparative study, exploring the range of Schematic rock art and its various interpretations on a macro- and diachronic scale. In particular, we consider the potential meaning of rock art through a model of maritime spread of the Neolithic across the Mediterranean.

03 CONNECTING CIRCLES: THE CULTURAL TRANSMISSION OF ATLANTIC ROCK ART

Author(s): Valdez-Tullett, Joana (Historic Environment Scotland; University of Southampton)

Presentation Format: Oral

Rock carvings of cup-and-ring motifs, cup-marks, spirals, labyrinths, curvy lines and other similar images spread across Western Europe, are often classified under the term "Atlantic Art". This expression was coined in the 1940s by MacWhite but only popularised in the 1990s with the seminal work of Bradley. On one hand, this term illustrates both how widespread the distribution of this prehistoric rock art assemblage was, as well as the scope of this investigation. Effectively, Atlantic Art's iconography is identified in modern countries spreading from Scotland in the North to England, Ireland, northwest Spain and Portugal as its southernmost boundary.

This paper springs from a research project which was set out to explore the differences and similarities between the rock art of the aforementioned regions, and whether Atlantic Rock Art is a widespread, unified phenomenon across geographically dispersed regions.

The approach was based on a multi-scalar and multi-disciplinary methodology which enabled a dynamic perspective of an extensive set of empirical data. Results revealed an intricate network of relationships and connectivity between the study areas. Through the use of network analysis and principles of developmental psychology, the research demonstrated that these connections facilitated the cultural transmission of Atlantic Art. The paper will present a review of the project and explore some of the main conclusions, shedding light on Neolithic connectivity and other transformative processes that characterise the period.

04 DATING BACK THE SOUTH SCANDINAVIAN ROCK ART TRADITION TO THE NEOLITHIC

Author(s): Iversen, Rune (University of Copenhagen) - Thorsen, Michael (Bornholm Museum)

Presentation Format: Oral

This paper presents new and conclusive evidence for the presence of cup marks in the South Scandinavian Neolithic and opens for the opportunity that simple rock art could have been part of the Neolithization process in the region.

New finds from Vasagård on Bornholm have decisively proven that the most widespread rock art motive, the cup mark, dates back to the earliest 3rd millennium BC, i.e. the Middle Neolithic following the Scandinavian chronology. The Vasagård site is situated on the southern part of the island of Bornholm in the Baltic Sea. The site holds a 'double' causewayed enclosure (Vasagård East and West) in addition to a palisaded enclosure. The palisaded enclosure is contemporary with the final phase of the causewayed enclosure ditches dating to the end of the Funnel Beaker culture, the Middle Neolithic phase V.

Cup marks are the most common rock art motive and are explicitly part of the Bronze Age rock art repertoire. However, due to the simple nature of cup marks and their presence on primarily dolmen capstones, some scholars have long suspected that they might reach back to the Neolithic. This has not been possible to prove until excavations at Vasagård in 2016 and 2017 recovered a cup mark stone in one of the causewayed enclosure ditches and one in a palisade trench, where it had functioned as support for one of the wooden posts.

05 ROCK ART OF THE CYCLADES: AN OVERVIEW

Author(s): Angliker, Erica (Institute of Classical Studies – School of Advanced Studies- University of London)

Presentation Format: Oral

During Prehistory in the Cycladic archipelago, a number of islands displayed rock art depicting the ocean, waves, spirals, boats, hunting scenes, human figures, and a variety of other symbols. Some of these representations, which also appear on other artifacts

such as seals, ceramics, and clay artifacts (the so-called "frying pans"), are considered to be evidence for the maritime circulation of people in the archipelago. The present paper aims to further understand the significance of the prehistoric rock art of the Cyclades by addressing several points. In the first part of this paper, we will present an overview of the places where the rock art was manifested, together with a comparative analysis of its most prominent symbols. In order to understand further these symbols, when appropriate they will be compared with similar symbols that appear on other art media .We will also discuss the association of these symbols with possible navigation routes and maritime hubs. In the second part this paper, we will examine the presence of rock art during different historical periods. These data will then be compared to data from the prehistoric period in order to speculate about possible changes in Cycladic navigation routes and the evolution of major maritime hubs.

06 BRONZE AGE AGRICULTURAL DEITIES IN PASTORAL ROCK ART: FROM MEDITERRANEAN TO CASPIAN COAST

Author(s): Abdullayev, Rahman (Gobustan National Historical Artistic preserve; Azerbaijan Institute of Archaeology and Etnography)
Presentation Format: Oral

Science has more information about the social life and the spiritual culture of the Bronze Age compared to the earlier periods. The fact that today we are able to read some of the texts written during the Bronze Age is a consequence of the emergence of writing during that period. Then, what information can clay tablets of the developed civilizations of Bronze Age ,which were known to us in the form of bureaucratic documents, religious texts, poems, etc., give us about rock art created at that time? What was the nature of the relationships between the Mesopotamian and Egyptian civilization centers and the remote areas that rock art was created?

To answer these questions we need to draw iconographic parallels between the visual art of the developed civilizations of the Bronze Age and the rock art, and try to explain the similar motives on the basis of ancient texts.

Archaeological evidence confirms the strong influence of the Mesopotamian civilization on Caucasian Bronze Age cultures. The traces of Mesopotamian culture began to appear in the archaeological monuments of the Caucasus starting from the 4th millennium BC. The study of the rock art of Gobustan and Absheron on the Caspian Sea coast of the Southeast Caucasus creates basis to say that Mesopotamian gods are reflected in rock art. Information about these gods and rituals performed in honor of them can be obtained from the written texts that have been found in the ruins of Mesopotamian cities. Remnants of some of these rituals still remain in the folklore of the peoples of the region. The gods of Mesopotamia discovered in rock art and the rituals performed in their honor tell us about the character of the Bronze Age rock art.

07 PURSUING MEANING IN ROCK ART: A SEMIOTIC APPROACH TO BRONZE AGE VISUAL CULTURE AND ONTOLOGY

Author(s): Lawrence, Joanna (Department of Archaeology, University of Cambridge)
Presentation Format: Oral

This paper presents an interpretive perspective for examining Bronze Age rock art through a semiotic lens. Developed through study of the Southern Tradition rock art of Scandinavia, this approach is grounded in the fact that every detail of the carvings must have been painstakingly and intentionally added, and the subsequent inference that each component carries meaning. The details annotating schematised figures are proposed to have served a semiotic function, communicating meaning that was situated within a visual ontology that was widely shared across areas connected by waterways and the sea. Meanings that would have been understood from an emic perspective were likely not straightforward, but could have been simultaneously plural, flexible, contextually dependent, or subtextual, rendering the carvings 'unreadable' to the modern eye. However, such meaning might yet be approachable through identifying patterns of association between a figure's annotations, narrative interactions, and spatial context in relationship to other carvings.

To illustrate how this perspective might be used to explore questions of Bronze Age ontology, I present a case study in which I examine the phallic annotations made on anthropomorphic figures from the coastal region of Tanum, Sweden, and explore what can be learned about Bronze Age sexuality through this lens. By recording and coding features of figures in a statistically accessible format, I identify patterns that differentiate phallic anthropomorphs from non-phallic anthropomorphs, and suggest interpretations for the nature of Bronze Age sexuality in relation to maritime and other spheres of life based on this analysis.

08 TRAVEL, TRADE, WARFARE, ASTRONOMY, MYTHOLOGY, AND VISIONS: JIIMAN IN CANADIAN SHIELD ROCK ART

Author(s): Weaver, William (Laurentian University, Indigenous Studies; Ontario Archaeology Society) - Kujala, Kathryn (Ontario Archaeology Society)
Presentation Format: Oral

'What is a canoe? A canoe is a vehicle for moving language across the land' (Elder William Commanda) Jiiman…the canoe… has played a pivotal role in travel and trade throughout the plateau region of Precambrian rock called 'the Canadian Shield' in the Boreal Forest of the Great Lakes Basin surrounding Canada's freshwater inland 'seas'. The Anishinaabe…the First Nation Peoples of the Great Lakes- believe that the trickster Nanabush created the Jiiman as a gift for human kind. It's similarities to the canoes of the Amur River area of Siberia belie its probable origins, and considerable refinement in its design over distance is evident. It's central

focus in the daily activities of the Anishinaabe has been elevated to its position as a metaphorical agent in the Rock Art of the Canadian Shield. The canoe motif is therefore ubiquitous at pictograph and sometimes petroglyph Rock Art sites. It is both secular and spiritual. It fulfills multiple purposes both functionally and figuratively. Jiiman acts as a point of convergence- it brings together local and long-distance travel, trade of key items along known routes, food and medicine acquisition, warfare, and spirituality and metaphor in ceremony. Mythological manitous, astronomical understanding, and symbolism in both pubertal vision quests and shamanic dreaming are also a part of this motifs' unique character. Linguistic and cultural divergence have resulted from its widespread use over distance and time.

This presentation will cover the development and history of the Jiiman, it's role in the Anishinaabe world, its importance as a symbol in Canadian Shield Rock Art, and its multiple metaphorical meanings. The presentation will incorporate many First Nations understandings such as 'Ways of Seeing' and the Medicine Wheel teachings.

09 METAL TRADE AND MARITIME INTERACTION IN ATLANTIC EUROPE 1400/1300–900 BC

Author(s): Ling, Johan (SHFA)
Presentation Format: Oral

The growing evidence for maritime contact between the regions of Atlantic Europe, from Iberia in the South to Scandinavia in the North, in the period c. 1300–900 BC is clearly an under-researched phenomenon. New ground-breaking research on BA copper alloys from Scandinavian and British Isles shows a shift in the sources of copper at this time. A large group of artefacts is consistent with ores from SW Spain. The SW Iberian rock art dated to this period are concentrated in the metal-rich region, near sites with evidence for ancient mining and the routes to and from them. Its iconography shares many similarities to the Scandinavian rock dated to the same phase. Moreover, recent research on sourcing amber from LBA contexts in SW Iberia shows it to be of Baltic origin. Thus, the density of parallels of shared rock-art motifs between Late Bronze Age Scandinavia and the SW Iberian Peninsula dated to 1300-800 BC, and relative lack of comparanda in the intermediate territories, points to long-distance maritime exchange during this phase. This praxis was probably conducted by seafaring groups with a shared warrior ideology, linking the principal southern metal-producing area in Atlantic Europe with the northern metal consuming zone of ship-building and amber export. Our working hypothesis involves a balance of long voyages and shorter ones to intermediate hubs, some in Britain, or Brittany. Represented in Scandinavian rock art are canoe-like boats propelled by paddling, but also some with sails. The costal rock art appears at the same time as Scandinavian societies became engaged in long distance trade of metal. The ability to fund boat construction and crew ships provided a new social institution for maritime ventures, based on ship ownership. This would have favored the rise of maritime institutions and warriors in Scandinavia.

634 LIVED ANCIENT RELIGION IN NORTH AFRICA

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Gasparini, Valentino (University Carlos III of Madrid) - Alvar Ezquerra, Jaime (University Carlos III of Madrid) - Mastino, Attilio (University of Sassari)
Format: Regular session

The session claims to explore how, in the Roman provinces of North Africa, local religious preferences were strongly influenced by shifting social networks, changing over time according to specific historical contexts. The historical issue at the core of this panel is the process of integration of the pre-Roman gods within the Roman 'pantheon' and, at the same time, the permeability of the 'traditional' Roman deities in encounters with the cults problematically labelled 'Oriental'. Speakers will be asked to approach the study of these 'cults in motion' not from the perspective of the civic religion as the dominant structure (based on the static and standardised performance of public, collective rites, and on elite-driven ideology), but of the individual as an active (often unpredictable) actor, capable of situational and creative innovation. This line of research is interested in the single cultic agents, not as 'normalising' actors (viz. representatives of institutional entities or local oligarchies), but as individuals who (independently of their social position) act as decision-makers and conscious modifiers of established religious patterns. Papers will deal with the archaeological evidence attesting the social dimension of this religious practice, including variety, creativity, religious multiplicity, fluidity and flexibility of identities, changes in forms of individuality, and spaces for individual distinction. The goal is to examine empirically religion as a practical resource available to emergent or self-styled religious providers, and explore how this resource was selected and instrumentalised by other agents, whether individuals, families, cities, or other social groupings.

01 INTRODUCTION. THE LARNA PROJECT

Author(s): Gasparini, Valentino (Universidad Carlos III de Madrid)
Presentation Format: Oral

This paper is meant to trace the methodological framework of the session by introducing the project 'Lived Ancient Religion in North Africa' (LARNA). This research will be led at the University Carlos III of Madrid during the next four years (2018-2022) and generously funded by the Autonomous Community of Madrid, Talent Attraction Program (2017-T1/HUM-5709), in synergy with the Instituto de Historiografía Julio Caro Baroja (Madrid), the Scuola Archeologica Italiana di Cartagine (Tunis/Sassari) and the Université Jean Jaurès (Toulouse). LARNA aims at exploring how different local small-scale religious providers and entrepreneurs filtered, appropriated, adapted, instrumentalised, or even invented new religious offers in North Africa, between the Republic and the Late Empire. This project does not investigate elements of coherence and homogeneity within an allegedly shared religious worldview, but instead concerns itself with particularities, discrepancies and distortions within situational contexts. A particularly important feature of this research (and consequently of this panel) concerns the relationship and interactions between 'group-styles' and religious individualisation, regardless of the degree of complexity that characterises group identity (families, neighbourhoods, associations, cities, etc.; domestic, local, regional, transregional, etc.). A particular emphasis will be given to narratives through which religion is treated by individuals and groups (including families, sodalitates, legions, etc.) as both a status marker and an instrument in the processes of formation and orientation of groups. The range of dynamics of religious appropriation that this project is interested in includes a rich number of very different actors using very different communication tools.

02 GOD, RITES AND INDIVIDUALS IN ROMAN AFRICA

Author(s): Sebaï, Meriem (Paris 1 Panthéon-Sorbonne)
Presentation Format: Oral

The purpose of the study is to consider the ways in which pre-roman gods were integrated in the Roman pantheons of Africa. Through the critical study of multiple sources, the study considers contact dynamics and religious transfers that were at play in the private sphere (gens and individuals). One of the avenues of reflexion is to focus on the choice of divine protagonists by human individuals originating from various social and cultural contexts. Relying on funerary and votive documentation - some from extra-urban contexts - consisting in epigraphical, iconographical and coroplastic media, as well as precise archaeological contexts, the study aims to reveal the religious exchanges that took place between individuals and rites in a multilateral and intercultural perspective. The study will review contact points that created intercultural situations; careful consideration will be given to the reasons for these transfer situations, the level of intensity of religious exchanges and their links with the people that were involved. The study will also focus on individuals as agents of these multilateral exchanges, notably on humiliores, id est individuals excluded from the political world, slaves as well as women, craftsmen as well as children, who were all marked by imposed or fixed social dimensions. Thus, this study is an archaeological study of rites through senses and experience that adjusts to everyday-life situations.

03 DEDICATORS – RIDERS – BEARDED MEN: INDIVIDUALS AND INDIVIDUALIZATION IN THE CULT OF SATURN

Author(s): Schörner, Günther (Institute of Classical Archaeology, University Vienna)
Presentation Format: Oral

Saturn was surely one of the most prominent deities in Roman Africa. Because he is commonly considered as the successor of the Punic Ba'al Hamon the veneration of that god is seen as proof for the persistence of pre-Roman belief systems and rituals in Imperial times.

Archaeological and epigraphical evidence, however, indicates that the cult of Saturn was not a mere conservation of Punic religion under a Roman varnish but experienced a considerable expansion and intensification in connection with changes or additions of rituals and the material culture involved.

That process of augmentation was not systematically guided by superior authorities, e.g. the provincial administration, but to a significant extent by individuals. That can be impressively demonstrated by a closer look on individual dedications to Saturn which provide the infrastructure and material framing of the cult.

The religious choices of individuals can diverge from the general cultic behaviour of larger groups as it can best be seen using the Roman military as example: Although the legions preferred cults for Roman traditional deities (pace Y. Le Bohec for the legio III Augusta) single soldiers evidently decided to venerate Saturn. Thereby they developed even specific forms of their personal representation on stele dedications found in sanctuaries in Numidia and the western part of Africa proconsularis to express their military identity also in terms of the traditional Saturn cult.

In a last step the epigraphical and iconographical means the dedicators have chosen to present themselves and their families as single persons on the stelae from these sanctuaries shall be presented more in detail. By that it can be shown that the increasing identification of individuals is not haphazard but individualisation is an intended objective.

04 NEPTUNE AUGUSTUS AND THE FONS THIGNICENSIS

Author(s): Mastino, Attilio (Universita' di Sassari - Scuola Archeologica Italiana di Cartagine)
Presentation Format: Oral

The project aims to summarize the variegated practices of the cult of Neptune in North Africa attested by around one hundred inscriptions and mosaics. The paper will specifically make reference to the recent study (to be published in "Epigraphica") of the fons Thignicensis and the collection of spring waters provided by the knight Publius Valerius Victor Numisianus Sallustianus, his father Valerius Tertullianus and his mother Cecilia Faustina. The so-called "Temple of the waters" of Ain Tounga (Tunisia), an area affected by the provisions of the lex Hadriana de rudibus agris, was provided with these facilities as part of the imperial cult during the reign of Gallienus, who bestowed the neighboring centers of Thubursicum Bure and Thugga with the status of colonies. The temple of the god Neptune of Thignica is located on the hill near the natural springs of Ain Tounga and consists of a square cella partially excavated in the rock and a colonnaded gallery provided with a niche containing a statue and with tanks to collect spring water. The paper will discuss the topic of the relationship of the cult of Neptune undarum dominus Nereidumque pater with North African springs, baths, aqueducts and the contemporary veneration of the Nymphs, but also of Apollo, Liber Pater, Frugiferum, Mercury, Vulcan, Silvanus, Concordia, Serapis, and others deities. Particular attention will be consecrated to the relationship between Neptune and the imperial cult, to the euergetic character of some dedications, to the adoption of the god by the supreme magistrates of colonies and municipalities as well as by soldiers.

05 BEYOND THE OFFICIAL RELIGION. AFRICAN AND EASTERN CULTS AMONG THE CENTURIONS OF LEGIO III AUGUSTA

Author(s): Ortiz de Bruguera, Jorge (University of Salamanca)
Presentation Format: Oral

The purpose of this proposal is to analyse the existence of African and Eastern cults among the centurions of legio III Augusta during the High Empire (27 BC-AD 284), using epigraphic and archaeological sources. The traditional assumption is that this unit showed no particular devotion to these deities. However, within such a socially, culturally and ethnically heterogeneous group, so given to geographical mobility, there are certain testimonies that challenge such view.

Evidence confirms that in the Lambaesis camp (occupied by the legion c. AD 115-120) there were private cults addressed to African and Eastern deities, which, sometimes, appear alongside others belonging to the traditional Roman pantheon. This concerns both individuals who intentionally prioritized their own beliefs, and others whose case suggests assimilation of foreign worships. The outposts located around the Sahara at the time of Septimius Severus (AD 193-211) seem to have taken a similar line. The main novelty lies in the fact that, in this case, the veneration of certain gods reveals the centurions' desire to secure the loyalty of the Eastern numeri under their command and gain the protection of the nomad tribes' deities.

In short, it is possible to discern the existence of phenomena of integration and coexistence of these cults, sometimes under a veil of interpretatio romana. Likewise, these centurions' beliefs go beyond the official sphere, evincing not only a rich assortment of religions, born from the desire to express their own devotions, but also the introduction of certain religious patterns that led to a shift towards the instrumentalization of religion. Archaeological findings have confirmed this situation with the discovery of temples and enclosures built ex profeso to practise these cults, as well as of votive items, spaces where these centurions could leave traces of their initiatives.

This work has been carried out in the framework of co-financing by the Consejería de Educación de Castilla y León (Spain) and the European Social Fund. / Ayudas a la contratación de personal investigador, Orden EDU/10 de noviembre/2016. Cofinanciación por parte de la JCyL y el FSE.

06 NEIGHBOURHOOD AND RELIGIOUS INTERACTION

Author(s): Alvar, Jaime (Universidad Carlos III de Madrid)
Presentation Format: Oral

It has been installed in the historiography of the ancient religions the idea of a diffusionist dynamics of religious innovations imported from North Africa and inserted in the Iberian Peninsula as the last stage of a process of expansion affecting different cults. This idea is based on an alleged African origin of Hispanic Christianity, which is an issue raised by M. Díaz y Díaz and developed with literary and archaeological arguments by J.M. Blázquez. Although this specific thesis does not enjoy a current predicament, it has inspired other researchers to defend the introduction of cults (e.g. the gens isiaca or Mater Magna) from the same radiating centre. This historical reconstruction, heavily built on colonialist assumptions, can not be frankly supported, since it does not address the diversity of origins of the agents activating the implementation of the different cults. The latter has to be substantially related to the individual agency, in connection with the parameters of the lived religion. The idea of expansive flows from Africa (ex Africa lux) is not supported by the information provided both by epigraphy and current postcolonial models. In this contribution, these arguments will be analysed and a more complex image of the reception of religious innovations outside the criterion of proximity or neighbourhood will be proposed.

635 CREATING FOODSCAPES IN COLONIAL AND IMPERIAL CONTEXTS: FOOD, CUISINES AND FOOD ENVIRONMENTS IN GLOCAL PERSPECTIVES

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Delgado Hervás, Ana (Universitat Pompeu Fabra) - Ferrer Martín, Meritxell (Universitat Pompeu Fabra) - Pezzarossi, Guido (Syracuse University)
Format: Regular session

Colonial and Imperial contexts are especially dynamic arenas generative of new subsistence environments, cuisines, and foodways. Born of multiple and fragmentary experiences of migration and displacement that remain entangled in broader scale networks and relations, these contexts were particularly active in the production of new and/or expanded "Foodscapes."

Foodscape, a term derived from Appadurai's concept of "scapes," is defined as the physical, social and cultural spaces and processes that mediate the interactions between people, food, technology, values and material culture related to subsistence and eating. This concept highlights how culinary communities, and communities of consumption, including the social and material environments they are embedded in, emerge and are transformed in a dynamic, and fluid manner, albeit in particular places/spaces, variably influenced by their "global" connections, and engagements with other places and their foodscapes. This perspective allows for more complicated readings of food, cooking and food environments in colonial contexts, beyond dominant narratives of culinary practice, and consumption as nostalgic identity expression/self-identification practices or as the product of domination(change)/resistance(continuity).

This session explores persistence, innovation, transformation and hybridizations of and in food environments, cuisines, and foodways in colonial, imperial and diasporic contexts characterized by their connectivity to other places and the mobility and flows of people, practices, knowledge and material culture between them. This session works from an expansive geographic and temporal perspective that incorporates archaeological case studies from ancient to modern contexts.

ABSTRACTS

01 FOODSCAPES IN COLONIAL AND IMPERIAL CONTEXTS: AN OVERVIEW

Author(s): Pezzarossi, Guido (Maxwell Syracuse University) - Delgado, Ana - Ferrer, Meritxell (Universitat Pompeu Fabra)
Presentation Format: Oral

Colonial and Imperial contexts are especially dynamic arenas generative of new subsistence environments, cuisines, and foodways. Born of multiple and fragmentary experiences of migration and displacement that remain entangled in broader scale networks and relations, these contexts were particularly active in the production of new and/or expanded "Foodscapes."

Foodscape, a term derived from Appadurai's concept of "scapes," is defined as the physical, social and cultural spaces and processes that mediate the interactions between people, food, technology, values and material culture related to subsistence and eating. This concept highlights how culinary communities, and communities of consumption, including the social and material environments they are embedded in, emerge and are transformed in a dynamic, and fluid manner, albeit in particular places/spaces, variably influenced by their "global" connections, and engagements with other places and their foodscapes. This perspective allows for more complicated readings of food, cooking and food environments in colonial contexts, beyond dominant narratives of culinary practice, and consumption as nostalgic identity expression/self-identification practices or as the product of domination (change)/resistance (continuity).

This paper is an introduction to the session focused on foodscapes in colonial and imperial contexts, from ancient to modern times. Through this concept we want to explore persistence, innovation, transformation and hybridizations of and in food environments, cuisines, and foodways in colonial, imperial and diasporic contexts characterized by their connectivity to other places and the mobility and flows of people, practices, knowledge and material culture between them.

02 MILLET, RICE, PEANUTS: FUGITIVE FOODSCAPES AND FRENCH COLONIAL RULE IN RURAL SENEGAL

Author(s): Richard, François (University of Chicago/Anthropology)
Presentation Format: Oral

This paper examines the dialectics of colonial governance in rural Senegal through the intersecting histories of millet, rice, and peanuts. If rice and peanuts are today staples of national cuisine in Senegal and integral parts of the country's culinary identity, this was not always the case. On the eve of colonization, rural societies in northern Senegal relied on millet subsistence farming, and rice and peanuts were ancillary crops. With the advent of colonial occupation, the regional economy was restructured around cash cropping, and peanuts became a primary instrument of economic government. Peanut agriculture was designed to compete with millet, thus severing farmers ties to mechanisms of food self-sufficiency, and fostering dependence on imperial markets. As the French were trying to promote complementariness between different parts of the empire, rice grown in Indochina started to flood Senegalese ports to feed urban laborers and rural populations, create new tastes and needs, while tightening the African countryside's reliance on imperial supply circuits. Using documentary and material archives, I track how transformations in Senegal's colonial agriculture

and food economy re-contoured foodscapes in the small province of Siin. Specifically, I am interested in 1) the material work which these different crops performed, 2) how they alternatively assisted, complicated, and obstructed the operations of colonial rule, and 3) how they refashioned social dispositions and subjectivities in Siin's village communities. In this analysis, the African countryside emerges as a 'fugitive foodscape,' a terrain of colonial intervention that also foiled the dreams of colonial control.

03 THE 19TH-CENTURY CHINESE DIASPORA AND A TRANSPACIFIC SALT FISH FOODSCAPE

Author(s): Kennedy, Jonathan (Tulane University)
Presentation Format: Oral

In the 19th century, more than 2.5 million people migrated from China to places throughout the world. This process was the catalyst for multi-directional flows of people, things, money, and ideas that maintained connections between Chinese home villages and diaspora communities abroad. Food played a central role in these flows, and diaspora communities localized their foodways by combining imported foods from China with locally available ones and by transplanting Chinese crops and food production techniques. Foodways in the diaspora responded to social and political pressures abroad and to consumer demand in China, as Chinese food industries sold to both the diaspora and the larger markets of China itself.

I leverage the notion of foodscapes to explore the multiple flows between Chinese diaspora communities and home villages in China. I use fish data from Chinese archaeological sites in the American West as a case study to show how Chinese diaspora foodways were tied to local, regional, and global flows through the multi-directional movement of Chinese-produced salt fish. The trade of this ingredient, ubiquitous at Chinese archaeological sites in North America, was impacted by Chinese taste preferences, importation of Chinese fishing technologies, racist anti-Chinese legislation, and market demand in China. I use data from urban and rural North American Chinese contexts including the kinds of fish present, their relative abundance, and their fisheries of origin to highlight the existence of a transpacific salt fish foodscape, and I explore its implications in understanding the broader relationships between Chinese communities abroad and at home.

04 FOOD AND CUISINE IN SPANISH COLONIAL GUAM (17TH AND 18TH CENTURIES)

Author(s): Peña-Filiu, Verónica - Monton-Subias, Sandra (Universitat Pompeu Fabra)
Presentation Format: Oral

Historical archaeologists working in the Spanish colonial Americas have widely recognized the significant efforts that colonial agents made to "recreate" Iberian foodways in the New World. Independently of their greater or lesser success, scholars have also signalled the important consequences that the previous efforts had on native communities. In this paper, and drawing from the previous scholarship, we will move to the western Pacific and discuss the social implications that food imperial politics had in Guam (Mariana Islands) during the seventeenth and eighteenth centuries.

The incorporation of Guam by the colonial network of the Spanish empire took place in 1565, but the permanent occupation of the island began latter, in 1668, in the framework of Jesuit global missionization. Since then, new animals, plants, recipes, culinary equipment and cooking technologies were introduced to "recreate" foodways deemed appropriate by missionaries. Importantly, new forms of land exploitation and native labour followed, as well as new attitudes towards food in terms of gender and class.

Through the analyses of historical and archaeological evidence we will discuss how these new foodscapes took shape through everyday life practices, and their main repercussions for Guam's indigenous inhabitants –the Chamorro– in terms of food production, cooking and consumption.

05 FOODSCAPES IN AN EMPORION: CONTINUITIES, INNOVATIONS AND GLOCALITIES IN THE CULINARY PRACTICES OF EMPÚRIES (6TH - 4TH CENTURIES BC)

Author(s): Delgado Hervás, Ana - Ferrer Martín, Meritxell (Universitat Pompeu Fabra)
Presentation Format: Oral

Between 8th and 4th centuries BC, new foodscapes emerged in western Mediterranean. The available foods, the ways of producing or obtaining them, the technologies, installations and tools used to process, prepare and cook them, the consumption modes, their appearance and taste, as well as their social and cultural meanings were transformed in these Mediterranean settings. In the configuration of these transformations were also significant the multiples experiences of migration, displacement, connectivity and trade that characterized the Mediterranean Sea during this period. These experiences entailed the mobility of foods and ingredients, tablewares and consumption practices, but also recipes, cooking sets and implements and culinary practices that got new meanings in different local contexts. The aim of this paper is to explore the dynamics experimented by foodways and food habits in Empúries between 6th and 4th centuries BC. In particular, we want to focus on continuities, innovations, transformations and hybridities produced in relation to the ingredients engaged in the elaboration of foods, the installations, tools and wares used to cook and the culinary practices and traditions. Through this study we want to place value on the role of cooking sets, culinary practices and cooking practices employed in the daily life by those who lived in this emporion, in the transformation of the consumption practices and in the articulation of global and local economies in this Mediterranean enclave.

06 UNDERSTANDING FOODWAYS AND INTERCULTURAL DIFFERENCES IN COLONIAL CONTEXTS THROUGH ORGANIC RESIDUE ANALYSES ON COOKWARE: AN EXAMPLE FROM PHOENICIAN-PUNIC SARDINIA

Author(s): Bison, Leonardo (University of Bristol)
Presentation Format: Oral

The application of organic residue analyses to archaeological pottery plays an increasingly relevant role in understanding past societies. Such methodologies enable us to recognize fats, resins and other commodities processed in ancient vessels, and thus help us to understand better cultural changes (Cramp et al. 2014) and colonial interactions (Cramp et al. 2011). However, the Central and Western Mediterranean has remained on the margins of this debate, with few such analyses undertaken thus far.

My PhD project, supervised by Tamar Hodos and Lucy Cramp (University of Bristol), is overturning this situation. In partnership with several institutions, and especially the Soprintendenza Archeologia per le province di Cagliari e Oristano (Sardinia, Italy), we are analysing c.500 fragments of cookware from eight different Sardinian sites, including Phoenician, Punic and indigenous settlements. The material includes Phoenician and Punic pottery and local/indigenous pottery from between the 8th and 2nd centuries BCE, and all from recently excavated and stratified contexts. This paper presents our aims and our preliminary results in which, via gas chromatography (GC), GC/mass spectrometry (GC/MS) and GC-combustion-isotope ratio MS, we are assessing the contribution of different commodities, including animal carcass and dairy fats, aquatic products and plant waxes and oils in the sampled vessels, to assess dietary patterns and developments within and between sites during this period.

07 MAYA PORK, PIPIL SUGAR AND SPANISH TORTILLAS: COLONIAL FOODSCAPES IN HIGHLAND GUATEMALA

Author(s): Pezzarossi, Guido (Syracuse University)
Presentation Format: Oral

This paper explores how Spanish colonial intrusions into highland Guatemala catalyzed the emergence of a new, locally situated, yet globally expansive foodscape. As colonial populations became embedded in new foodscapes, eating practices were transformed for all, as new ingredients and food preparation techniques were integrated into existing cuisines (out of need, force and/or desire), while the meanings and properties of foods were reconfigured, and the lure of new market opportunities to feed established and emerging tastes for foods old and new were taken advantage of. The dynamics of colonial power were central to transforming the contours of the highland Maya foodscape, including the situated perceptions of it, as labor and tribute demands forced new crops and livestock onto Maya communities, while food shortages, and concerns over the health and vitality of native populations, and the now resident Spanish populations generated colonial prohibitions and guidelines for the types of foods and drinks deemed appropriate for native, colonist and african/african descendent bodies inhabiting the Guatemalan landscape.

Drawing on archaeological and archival evidence from highland and coastal Guatemala, this paper explores some of the myriad processes that recontoured foodscapes such that introduced pork, beef, and chicken became a staple of Maya commerce, tribute and consumption; wheat became laden with racialized class values; cacao and chocolate became an important daily ritual for colonists; wine a vice for natives and a virtue for colonists; sugar cane and its derived products (sugar and alcohol) an important, yet subversive, cash crop for native communities, and maize in tortilla form ubiquitous on the tables of all. These examples provide ample evidence of how colonial foodscapes did not Hispanicize native, or Mayanize Spanish cuisine, but instead reconfigured local and global cuisines relationally, within the overlapping and intersecting social, material and political fields of colonial Guatemala.

08 A STORY OF PERSISTENCE: PALEOETHNOBOTANICAL STUDY OF THE COLONIAL SITE OF ACHIUTLA, OAXACA, MEXICO

Author(s): Bérubé, Éloi (McMaster University)
Presentation Format: Oral

This paper explores the Mixtecs' reaction to the arrival of Spaniards at Achiutla, one of the biggest religious centres of ancient Oaxaca. The study employs paleoethnobotanical analysis of ancient plant remains to investigate foodways, an important component of everyday life. This paper provides information about how the inhabitants of Achiutla, located in the Mixteca Alta, negotiated the arrival of new food items and to what level they accepted, incorporated, and resisted them. I present here the results obtained following the paleoethnobotanical analysis of macrobotanical samples (carbonized seeds) obtained from soil samples, and microbotanical samples (phytoliths and starch grains) extracted from unwashed artifacts.

By combining samples coming from the Postclassic (900 – 1521 AD) and the Early Colonial Period (1521 – 1600 AD), this study establishes the Mixtec diet prior to the arrival of Europeans in the region, enabling comparisons between pre- and post-Colonial foodways. This study is influenced by the notion of foodscapes, as it explores how social and cultural processes impacted foodways at Achiutla during the Early Colonial Period. This research examines the plants consumed by the Mixtecs, but also provides ideas explaining their food choices, involving different factors. This study provides new, interesting data that contrast with the narrative present in historical texts.

09 BETWEEN ROMANS AND CELTIBERIANS: POTTERY IN COLONIAL MINING DOMESTIC CONTEXTS OF "CERRO DEL CALVARIO DE TABUENCA" (SPAIN)

Author(s): Bonilla Santander, Oscar (Universidad de Zaragoza) - Serrano Arnáez, Begoña (Universidad de Granada)
Presentation Format: Oral

Cerro del Calvario de Tabuenca is a mining-metallurgical sitelocated south of the Moncayo dedicated to the exploitation of the mining resources of the Iberian System. The settlement is a fortified village of one hectare of extension and located in the top of a small mountain. The site is built after the Roman conquest of the territory and remains inhabited a short period of time while the mining operations are active between the end of the II century BC. and the beginning of the first century BC.

The excavations carried out since 2016 in the site have allowed us to locate several domestic contexts. These houses with a tripartite plant, in whose central rooms have been preserved the kitchens and the storage area have allowed to recover abundant ceramic material related to subsistence and food; data that are complemented by the appearance in the material register of fauna and seed remains. All this allows us to reconstruct the diet of the miners and metallurgists who worked in this territory and to know the food dynamics of a mining town in which the Mediterranean influences are mixed with Celtiberian practices. In this work we will focus on the study of the ceramic repertories located during the excavation process that provide us with data on a continuity in culinary and consumer practices.

10 CHANGES AND PERSISTENCES IN THE PUNIC KITCHEN WARE OF IBIZA (V-II CENTURY A.E.)

Author(s): Vendrell-Betí, Alicia (Universitat de València)
Presentation Format: Oral

This presentation seeks to analyse the culinary panorama of Punic Ibiza between 500 and 120 a.E. To achieve this goal, we will use the morphological analysis of the different ceramic vessels found in the old excavations of the island, as well as their associations and parallelisms. This paper will try to point out the evolution that Punic cuisine experienced during these centuries, paying attention not only to the changes but also to the persistence over time. The presentation will talk about new conceptions in the kitchen, new foods or even different ways of cooking, without forgetting the survival of meals and essential ingredients for the inhabitants of 'Iboshim and the farms of its dispersed rural environment.

11 CHANGING THE FEAST: SOCIAL AND MATERIAL TRANSFORMATION OF FOODSCAPES IN IRON AGE AND ARCHAIC SICILY

Author(s): Balco, William (University of North Georgia)
Presentation Format: Oral

Feasts were significant loci of social and material transmission, gathering individuals to share food, drink, and ideas. Concomitant to the transmission of knowledge between groups was a gradual transformation of the behaviors and material culture of the feast, particularly among complex social entanglements. For example, as Iron Age Sicilian populations encountered Greeks and Phoenicians, they experienced new behaviors and material culture, transforming their own foodscapes in the process. The incorporation of Greek-like cups and other vessels into Iron Age Sicilian feasting assemblages demonstrates the conspicuous consumption of imported material culture. Likewise, local populations began to manufacture commensal vessels combining Sicilian and foreign forms and styles. This paper focuses on the use and discard of these vessels as evidence of shifting feasting behaviors. Commensal vessels from Iron Age and Archaic Sicilian contexts are discussed. Changes to commensal foodscapes are but one component of a broader social transformation during the Late Iron Age and Archaic periods. The possession and use of these vessels empowered individuals with the agency to redefine their social identities via the conspicuous consumption of material culture. In this manner, the foodscape was a complex forum of power and wealth negotiation as individuals expressed an identity that others would perceive.

12 MEATSCAPES IN THE IMPERIAL ANDES OF PERU

Author(s): Rosenfeld, Silvana (High Point University)
Presentation Format: Oral

Meat has been a special food item in the Andean region of South America. During pre-hispanic times, the main sources of animal proteins and fat were camelids -domestic and wild-, guinea pigs, and wild game such as deer and viscachas. From ethnohistorical sources, we know the Inka rulers considered meat to be special, and that the commoners only ate it in particular occasions (Cobo 1997 [1653]). Ethnographic sources on contemporary herders in Peru point out how the average diet is mostly meatless but camelid meat consumption peaks during ceremonies and special events (Flannery, Marcus, and Reynold 1989). Archaeological data suggests a connection between the consumption of great quantities of meat and feasts. As a special food item, meat -its provision, preparation, and consumption practices, is a strategic point of entry to the study of sociopolitical and ritual relations. This talk will explore meatscapes, those sociocultural spaces that mediated the interactions between Andean people, meat, and material culture as a way to understand the creation, negotiation, and differentiation of human relationships in imperial and colonial contexts. In particular, I will focus on the Wari Empire (600-800 AD), the Inka Empire (1438-1532 AD), and the early colonial times in what is now Peru.

a. ANALYSIS OF THE CERAMIC MATERIALS FOUND IN A SPACE ASSOCIATED WITH FOOD PROCESSING AT THE ROMAN CITY OF LOS BAÑALES

Author(s): Delage, Inmaculada (Univerisdad de Navarra)
Presentation Format: Poster

The realization of a detailed analysis of the "domestic and workshop" space of the Roman city of Los Bañales (Uncastillo, Zaragoza, Spain)follows the need to break with the classic discourse of "literary archaeology", focused on the description of architecture and the creation of the catalogue of the movable objects, in order to carry out an assessment that covers the social, economic and cultural functionality of this area from the household archaeology, perspective of analysis that allows access to a register in which all the social groups are taking into account, as well as studying virtually any aspect of human experience.

Based on this analysis, one of the areas that has generated the most interest is the so-called Space 5, which, due to the characteristics of its burnt soil and the traces of wells for pots, burnt holes, as well as a buried pain until the beginning of the handles, it seems that was the kitchen of the house or a workshop for artisian work that needed stoves. Whether or not a kitchen, with all that the modern term implies, we venture to think that at least it would be the place where some kind of food would be processed and as such, one of the spaces where one of the expressions of Identity more characteristics of humanity, food. With this poster, we therefore want to analyse the ceramic materials found in this space and thus approach the culinary and do a general approach to the customs of the inhabitants of this house.

636 CONSERVATION ISSUES AND PREVENTIVE MEASURES IN OPEN-AIR ROCK ART SITES

Theme: Archaeology and the European Year of Cultural Heritage
Organisers: Domingo Sanz, Ines (ICREA; Universitat de Barcelona) - Marshall, Melissa (Nulungu Research Institute. The University of Notre Dame Australia) - Rodríguez, Irene (Universitat de Barcelona)
Format: Regular session

While related to different chronologies and cultural traditions around the world, open-air rock art sites share high levels of vulnerability derived from their continued exposure to the action of different degrading natural and anthropogenic agents, threatening their long-term preservation.

This session aims at bringing together scholars, cultural managers and stakeholders with an interest in the long-term preservation, conservation and management of open-air rock art to share knowledge, discuss and/or develop:

- An inventory of pathologies affecting the art and the rock surface
- The different methods used to identify pathologies
- Preventive measures introduced to mitigate impact, in addition to ongoing evaluation and improvement strategies
- Long-term monitoring methods and protocols of both the art and the preventive measures introduced
- Specific strategies for the identification and mitigation of impacts relating to climate change

ABSTRACTS

01 TRIALS AND TRIBULATIONS OF ARTIFICIAL SILICON DRIPLINES IN KAKADU NATIONAL PARK, AUSTRALIA

Author(s): Marshall, Melissa (Nulungu Research Institute, University of Notre Dame Australia) - O'Loughlin, Gabrielle - May, Kadeem - Lee, Jeffrey (Kakadu National Park)
Presentation Format: Oral

Kakadu National Park in northern Australia contains one of the largest bodies of rock imagery in the continent. The product of Aboriginal people who still reside in the area and are connected to the narratives interwoven through time and place, the Park plays an important role in supporting Traditional Owners and site custodians to look after these jewels. With approximately 20,000 sites across the Park, this has been no easy task.

Kakadu sits in Arnhem Land in the far-north of the Australian continent and covers an area of 20,000km sq. More than 13 clan groups reside in the area and have long looked after this country. As pressures from mining, pastoralism and development increased in the 1970s, the Park itself was established in response. Conservation and management programs were subsequently trialled to support the long-term protection and preservation of the rock art in particular.

One of the key programs including a response to water management – that of the installation of artificial silicon driplines to deviate water away from the fragile pigments, protecting them longer. Over the past decade, doctoral research has supported Park programs and aspirations of Traditional Owners to investigate these 40-year-old practices. This paper will provide a review of the successes and failures of this technique.

02 MURUJUGA: A CLASH OF CULTURES AND PRIORITIES PUTS AT RISK A SACRED LANDSCAPE

Author(s): Mulvaney, Ken (Rio Tinto; University of Western Australia)
Presentation Format: Oral

Murujuga, with a cultural occupancy spanning some 50,000 years, has for the past 50 years been exposed to the destructive force of the resource industry. Back in 1964, with no legal authority, the Aboriginal custodians of this place could not prevent the development of a port to export iron ore from the inland mines of this remote part of north-western Australia. Some 50 years later, the estimated one million images that are engraved into the rock surface of this landscape are exposed to the changing conditions brought on by the industrial expansion of petroleum and allied chemical processing plants.

The footprint of industry had removed upwards of 10,000 petroglyphs; however a far greater number are at risk of obliteration. The chemical emissions from industry is altering the ph of the rock surfaces, changing the chemical and biological patterns which have protected the rock art for tens of millennia. It has fallen to a dedicated few concerned citizen, with the support of the Traditional Owners, to force industry and government to take seriously the adverse impacts that have been imposed.

Short of shutting down the resource sector operating on Burrup Peninsula, options for the protection of the petroglyphs require financial and physical effort by industry to eliminate harmful emissions. The Murujuga petroglyphs are a globally significant and irreplaceable cultural treasure.

03 MULTIDISCIPLINARY AND INTEGRAL APPROACHES TO ROCK ART AS A STRATEGY FOR ROCK ART CONSERVATION: LA COVATINA SITE AS CASE STUDY

Author(s): Domingo Sanz, Ines (ICREA; University of Barcelona / SERP) - Roman, Didac (University of Barcelona / SERP) - Zalbidea, Mª Antonia (Universitat Politècnica de València) - Barreda, Gemma (Conservation and restauration consultant) - Lerma, José Luis (Universitat Politècnica de València) - Vendrell, Marius (University of Barcelona) - Ballester, Laura - Guillament, Eudald (Conservation and restauration consultant) - Rodríguez, Irene (University of Barcelona / SERP)
Presentation Format: Oral

Levantine rock art (LRA) is a millenary rock art tradition unique to Mediterranean Iberia, and containing extraordinary works of art with narratives of hunting, violence, war, maternity and death. It is protected as BIC (Property of Cultural National Interest) by the Spanish Heritage Act and awarded World Heritage Status since 1998. LRA sites are very singular and fragile artistic phenomena located in the open-air and thus exposed to changing microclimates and other natural and human threats menacing the long-term preservation of this cultural heritage. The current and future preservation of this art requires developing research, preventive conservation and management strategies enabling scientific research, conservation priorities and potential contemporary uses to coexist, collaborate and even benefit from each other. However, in LRA research, archaeology and heritage approaches have usually developed separately, with research scholars concerned with the scientific study of rock art, and regional administrations dealing with management and conservation.

To bridge the existing gap between archaeology and heritage approaches to LRA, we put together a multidisciplinary team to develop a pilot project bringing together archaeology, heritage science and cutting-edge digital technologies to change the way we understand, care, use and manage this millenary legacy. This communication presents the results of this pilot project, developed at la Covatina del Tossalet del Mas de la Rambla site (Vilafranca, Castelló).

04 PREVENTIVE ANALYSIS FOR THE CONSERVATION AND RESTORATION OF OUTDOOR ROCK PAINTINGS. BARRANCO DE LAS OLIVANAS (ALBARRACÍN, TERUEL).

Author(s): Zalbidea, Maria Antonia (Polytechnic University of Valencia) - Rasque, Rosa (UPV)
Presentation Format: Oral

The Barranco de las Olivanas site was declared a World Heritage Site by UNESCO in 1998 as well as Historic-Artistic Monument and BIC (Site of Cultural Interest) in 2002.

However, these distinctions do not solve the problem of conservation and restoration of the rock shelter and the rock paintings identified at this site.

This article presents the results and progress of the study conducted at Las Olivanas. Non-invasive techniques have been used to scientifically analyse the site and the art and to develop a methodology and intervention protocols to prepare the preventive conservation proposal here exposed.

The preventive conservation process has encompassed chemical analysis -of the bedrock-, the use of a colorimeter to measure the colours of the pictorial film, photographic record, the use of optical microscope of visible light and ultraviolet, and also thermo-hygrometric monitoring of micro-climatic conditions. A scientific study of a healing process is carried out, based on the consolidation and fixation of the bedrock. This study shows the need to consolidate both the bedrock and of pictorial film.

In order to deal correctly with existing and future damages, the interaction and use of ethyl nanosilicates (TEOS), applied by injection or by impregnation in areas where fixation or consolidation is necessary, have been proposed and evaluated. In order to verify a reliable, objective, complete and reproducible methodology, tests and analysis have been carried out under the microscope, colorimetric and chemical analysis (SEM-EDX) both in an area close to the shelter and in the laboratory.

Through this analysis we can now empirically choose the materials and appropriate methodologies to be applied to this case study: Abrigo de los Toros del Barranco de las Olivanas.

05 EVALUATING THERMAL-HYGROMETRIC DYNAMICS AT A LEVANTINE ROCK ART SITE: LA COVATINA (VILAFRANCA, CASTELLÓ)

Author(s): Rodriguez Ruiz, Irene Mael (University of Barcelona / SERP) - Domingo Sanz, Inés (ICREA; University of Barcelona / SERP)
Presentation Format: Oral

Levantine rock art is a prehistoric rock art tradition with figurative paintings and more rarely engravings preserved in a wide range of outdoor locations ranging from well-protected rock shelters to vertical walls with nearly no overhang to protect the art from weather conditions. As such, LRA sites are extremely vulnerable to the negative impacts of steep and fluctuating daily and seasonal climate changes causing material stress or fatigue. To mitigate or at least anticipate the impacts of such changes, appropriate monitoring is necessary. Since LRA sites are located all across Mediterranean Iberia, with altitudes ranging between 200 and more than 1000 m over sea level and at various distances from the coast, significant variations or microclimates among the different sites are expected. Thus, more than universal protocols for LRA conservation, the reality is asking for the development of site-specific strategies considering the peculiarities of each location. This paper presents the results of a medium-term monitoring (starting in July 2016) of yearly and daily environmental deterioration agents such as light exposure, temperature and relative humidity, using different environmental control systems, at a specific site: La Covatina del Tossalet del Mas de la Rambla (Vilafranca, Castelló). The potential and problems of the methods used will be discussed. The results are used to develop a series of recommendations for the preventive conservation of this site considering the specificities of the natural environment.

06 NANOPARTICULATE CONSOLIDATING MATERIALS OF INORGANIC ORIGIN BASED ON CALCIUM HYDROXIDE. TESTING OF MATERIALS FOR THE CONSOLIDATION OF THE COVA REMIGIA

Author(s): Zalbidea, Maria Antonia (Polytechnic University of Valencia) - Barreda, Gemma (Diputació de Castelló. Servei de Restauració. Partida Penyeta Roja)
Presentation Format: Oral

The present research work shows part of the work accomplished in the doctoral thesis: "Consolidants for stone supports with manifestations of rock art in the Valencian Community. Practical analysis in Cova Remígia (Barranc de Gassulla-Ares del maester)". The study focuses on the comparison made between various nanoparticulate consolidating materials of inorganic origin. These are colloidal solutions based on calcium hydroxide Ca (OH)2 dispersed in different types of alcohols and in different concentrations, applied on stone supports with carbonic matrix. Specifically, the testing of these materials has been carried out on rocky material from the shelter of Cova Remigia (Barranc de Gassulla-Ares del Maestre).

To make this comparison, 7 nanostructured consolidating products have been selected, such as: the Nanorestore® and 6 products from the CaLoSiL® range. Designed for the heritage conservation, specifically for stone supports treatments, mortars, wall painting, etc.

Previously, when testing the products, the chemical-mineralogical characterization of the support has been carried out and the nanostructural characteristics of the consolidants have been analyzed individually in order to know their physical crystallization behavior and their possible benefits. At the same time, the evolutionary follow-up of these treatments has been carried out, through the support of colorimetric, thermo-hygrometric studies and analysis of the SEM-EDX.

This previous scientific knowledge about consolidating materials is part of the preventive conservation protocol of the shelter, since this action methodology sets the guidelines that it is advisable to use and follow conservators-restorers, in the case of finding a need to solve problems of consolidation, fixation and decohesion of this type of stone support.

07 DOCUMENTING YUCATÁNS MAYA HERITAGE – RESCUE EXCAVATIONS AT CUEVA DE LA ESTRELLA

Author(s): Nessel, Bianka (Department of Prehistory, Protohistory and Near Eastern Archaeology, Heidelberg University; Institute of Earth Science, Heidelberg University) - Hildenbrand, Anne - Austermann, Gregor (Institute of Earth Science, Heidelberg University) - Gómez Cobá, Maria Jose (Fundación Ajau, Grupo espeleológico/ bioarqueología en cuevas) - Rosario Tec Pool, Fátima (Fundación Ajau, Grupo espeleológico/expresión gráfico rupestre en cuevas) - Rojo, Roberto (Planetario Sayab Playa del Carmen / bioespeleología) - Avilés, Jerónimo (Instituto de la Prehistoria de América) - Lases, Fernanda (Río Secreto) - Stinnesbeck, Sarah (Naturkundemuseum Karlsruhe) - Stinnesbeck, Wolfgang (Institute of Earth Science, Heidelberg University)
Presentation Format: Oral

The Cueva de la Estrella, Chemax, is a cave site on the northern Yucatán Peninsula which contains not only prehistoric human burials, but also rock art of different styles. The site is located only 40 meters from one of the main roads that connects the popular holiday destinations Valladolid and Cancún, and the ruins of the well-known Maya city Cobá. This means that groups of tourists frequently visit the cave, which is used by the local population as a shelter and temporary campsite. Both these activities have seriously damaged and threaten the preservation of the site. Waste has accumulated in the cave, the remains of several of the interred have been put out of place and some bones are even shattered, and the paintings suffer damage from natural and anthropogenic agents. To prevent the definite loss of archaeological information, all the rock paintings and visible features were recently documented in

combination with a small rescue excavation of burials in the cave. This paper presents the preliminary results of the work conducted at the site thus far, including an inventory of the rock surface pathologies affecting the paintings and a first outline of a preservation strategy for Cueva de la Estrella.

638 MAKING THE CASE: COLLATING AND USING EVIDENCE ON THE VALUE OF RURAL HERITAGE TO INFLUENCE EU AND DOMESTIC POLICY

Theme: Archaeology and the European Year of Cultural Heritage
Organisers: Holyoak, Vincent (Historic England) - Cordemans, Karl (Vlaamse Landmaatschappij; European Archaeological Council)
Format: Regular session

Land use issues such as agricultural production, farm restructuring and forestry continue to be the biggest causes of degradation and loss to Europe's rural heritage. Although these impacts have been recognised and in some cases mitigated by programmes such as the European Agricultural Fund for Rural Development, cultural heritage generally has not figured prominently within EU policy, nor has its conservation been accorded the same priority as that of the natural environment. Policy relies upon evidence - and recent work to influence politicians, policy-makers and others (such as the EU Reflection Group EU and Cultural Heritage's non-paper "Farming the Historic Landscape") has attempted to use information on impacts, threats and values to move the discussion on once more. Making the case for rural heritage is reliant upon demonstrating not only the challenges it faces - but also identifying the scale of these problems and the socio-economic value that conserving it might bring. The session will have contributions from across Europe. It will look at what types of evidence has already been collected, how has it been used - and identify both the gaps and what more can we do to make future progress in this area.

ABSTRACTS

01 ARCHAEOLOGICAL HERITAGE MANAGEMENT IN RURAL FLANDERS: FALLOW LAND OF OPPORTUNITIES

Author(s): Cordemans, Karl (Flemish Land Agency) - Meylemans, Erwin (Heritage Agency Flanders)
Presentation Format: Oral

In this presentation the authors explore and confront the existing geographical datasets and policies, starting from their respective fields of work (policy & data analysis vs. development & management) to identify opportunities for a better, more targeted and effective management of archaeological sites.

In the last few years lots of datasets that map and quantify physical aspects of the landscape, such as LIDAR-data, soil properties, land use and erosion models, have been generated. Especially the availability of two lidar-datasets that have been created with an interval of 10 years (2004 and 2014), proofs to be very efficient to assess erosion processes. Besides, because of new archaeological legislation from 2015 onwards, lots of geographically defined policy-data such as designations and archaeological inventories have also been generated. Combining these data in a geographical information system results in the highlighting of well-defined areas where the destructive nature of agriculture can be mitigated through a more suitable land management or environment friendly farming practises. However, farmers are in the first place mostly unaware of the presence of archaeological heritage on their land, and in second place are often reluctant to voluntarily implement measures for archaeological heritage management purposes outside common agricultural practice, because of the financial cost and in fear of becoming bounded to these in the future. The government on the other hand lacks the legislative framework to impose and the financial means to stimulate this, or is uncooperative in fear of opposition to this by the farmers.

European policy such as CAP and Rural Development can play a pivotal role in this and can be an easy and cost-effective instrument to promote and enhance the management and conservation of archaeological sites in arable land.

02 ARCHAEOLOGY AND AGRI-TECH

Author(s): Webber, Henry (University of Bristol)
Presentation Format: Oral

Many past approaches to conserving rural heritage have involved collecting and using evidence on the degradation and loss of rural heritage to demonstrate the impact of that loss to contemporary societies and policy makers. In these approaches, there is an underlying need to engage with individuals and groups of people who do not have time for a deep understanding of the subject, often fighting to engage policy makers alongside other natural environment, or socio-economic issues.

Different approaches are always necessary to adapt to changing contexts, one approach that is gathering more interest is the integration of archaeology and agri-tech. This approach builds on the already booming use of technology within agriculture that is helping farmers enhance their management of land. This area holds great interest in policy makers, and farmers, minds for the wider benefits that it could bring to farm businesses and farm management. But what potential is there for valuing rural heritage in this forum?

Research pulling together soil mapping datasets over selected agricultural fields using both agricultural/precision farming data as well as archaeological data shows how archaeological sites can impact agricultural datasets. These impacts are complex, involving varying types of impact on soil variations and crop growth, but do demonstrate significance for farm agronomy. This significance could represent new ways of engaging farmers and policy makers on the value of understanding rural heritage.

03 SPREADING THE LOVE: SOME IRISH EXAMPLES OF GETTING MONUMENTS VALUED IN OTHER PEOPLE'S POLICIES

Author(s): Carey, Hugh (National Monuments Service)
Presentation Format: Oral

For millennia, Irish agriculture has been based, for the most part, around grassland and cattle rearing. Even in more recent times, the country has been spared the ravages of war and upheaval, and the need to turn as much land as possible to food production at the expense of field monuments. As a result, many archaeological monuments survive in the Irish landscape. About 120,000 monuments are officially recorded and most of them are on farmland.

This is recognised to some degree, by the incorporation of archaeological measures into GLAS, the agri-environment scheme introduced as part of the Rural Development Programme, and in Greening. The evolution, current state and future potential of these measures will be discussed.

Archaeological heritage often features prominently in campaigns aimed at attracting tourists to Ireland. This is not always matched by the availability of good quality information that would enable visitors to find or understand that heritage during a stay in Ireland, or even to plan a trip around it.

This presentation will discuss the degree to which the survival of archaeological monuments in the landscape is recognised as a special characteristic of the country and if so, whether or not, this translates in any meaningful way into policy.

04 REPAIRING OLD FARM BUILDINGS AS A MEANS OF CONSERVING THE IRISH RURAL LANDSCAPE

Author(s): Doyle, Ian - Meenan, Anna (The Heritage Council of Ireland)
Presentation Format: Oral

The Heritage Council of Ireland manages a grant scheme to conserve traditional farm buildings in partnership with Ireland's Department of Agriculture, Food and the Marine. This is an element of successive EU funded agri-environment schemes in Ireland. The recognition of these buildings as being worthy of support in this agri-environment context is significant as the grant scheme was conceived of as a contribution to the conservation of Irish rural landscape character.

While there are some medieval buildings, these are mainly eighteenth to twentieth century structures. The prevailing traditional construction materials are stone, lime or earthen mortar with roofs of slate, thatch or corrugated iron sheeting as well as timber windows and doors. These are unassuming buildings at the heart of modernized farm complexes yet they represent an important means to discuss cultural and natural heritage with the farming community and agricultural administrators.

These buildings have tended to be overlooked and are generally not protected by legislation. In many farms owners can trace their presence back through several generations. In devising the detailed aims for the scheme, we set out to encourage owners to carry out their own repairs. By connecting the owner with the buildings in this way it improves their chances of being cared for and lasting into the future and also maintaining the vitality of the rural landscape.

Through an assessment of the Heritage Council's experience on the conservation of over 400 vernacular farm building projects this paper will consider the experience of supporting conservation of the Irish rural landscape and explain how the investment of effort into building relationships between key parties makes for a positive values changing process.

This scheme has been a notable success in advancing cultural and natural heritage conservation through agri-environmental schemes and this paper will explore the reasons that underpin this.

05 DEVELOPING EVIDENCE TO INFORM LAND-USE DECISION MAKING IN SCOTLAND

Author(s): Raven, John (HES - Historic Environment Scotland)
Presentation Format: Oral

Historic Scotland argued for the inclusion of nationally important, scheduled, archaeological sites within the aims of the Scottish Rural Development Programme, under Pillar 2 of the EU Common Agriculture Policy, mostly where historic environment outcomes compliment natural environment ones. The ability to measure success was demonstrated through a pre-existing Field Officer programme which monitors and scores the condition of scheduled monuments.

In 2015 Historic Scotland was replaced by Historic Environment Scotland (HES), a non-departmental government body tasked by Scottish Ministers to become the lead body in regards to the historic environment. A new strategy document, published along with HES' creation, emphasised the need to mainstream aspirations to preserve and care for the historic environment throughout Scottish Government policy across different ministers' portfolios.

As we move to a new agriculture scheme there is a fresh opportunity to work with colleagues from across the regulatory spectrum and present new evidence of the impacts current land use have on the historic environment and on the success or otherwise of the

existing programme in order to inform future decision making. This will include analysing how the historic environment has affected decisions on grant applications and awards, coupled with continued Field Officer monitoring to record the impact the current programme has had. Ongoing Aerial Photography over many years is also allowing us to begin to demonstration the impact of soil erosion over scheduled crop mark sites. The Historic Land-use Assessment (HLA) data has a semi-automated updating and review process, which, together with comparisons to OS map data since 1930s, we are working together with Scottish Natural Heritage to monitor and express the extent of land-use and landscape change. We are also experimenting with how the HLA data can inform eco-system services, such as through adding values to land-use types.

06 DETERMINING THE IMPACT AND VALUE OF HERITAGE CONSERVATION UNDER CAP AND LOCAL AGRI-ENVIRONMENT SCHEMES IN THE UK

Author(s): Gaskell, Peter (University of Gloucestershire; Countryside and Community Researh Institute)
Presentation Format: Oral

For over 30 years Common Agricultural Policy (CAP) funded agri-environment schemes (AES) have been a major source of investment for the conservation and management of the rural historic environment in the United Kingdom (UK). This investment has been complemented by a range of local AES funded by Local Authorities and designated conservation area bodies such as National Parks and Areas of Outstanding Natural Beauty. However, research to determine the impacts of AES on the conservation and management of the rural historic environment has tended to focus on specific features within specific schemes over limited time periods. This has resulted in many isolated reports and the fragmentation of the evidence base which is a barrier to effective AES policy making. There is an urgent need for research that draws together this disparate evidence and provides an overview and evaluation of the impact of AES on the rural historic environment. This paper traces the evolution of CAP and local AES policy in the UK from 1986 to the present day. It compiles and summaries the research that has investigated the impacts of AES on a range of historic environment features. It concludes with an evaluation of the evidence base and makes recommendations for future monitoring and evaluation.

07 INTEGRATING HERITAGE INTO WORK ON ECOSYSTEMS SERVICES AND NATURAL CAPITAL ACCOUNTING - INSOLUBLE PROBLEM OR A SHINING OPPORTUNITY?

Author(s): Holyoak, Vincent (HE - Historic England)
Presentation Format: Oral

The UN's Millennium Ecosystems Assessment (2001-05) suggested that the environment provides a range of goods and services (called Ecosystem Services) which can be divided into four categories: supporting, provisioning, regulating and cultural services. Cultural ecosystem services are quite often narrowly defined as just the non-material benefits people obtain from ecosystems (eg. spiritual/religious, inspirational, recreational, educational etc). Despite the adoption of the ES approach by many organisations - tangible heritage has therefore (unlike tangible nature) struggled to be included in assessments. More recently, there has been a move towards a slightly different way of capturing both environmental change and value. Natural capital accounts are a series of interconnected accounts that provide a structured set of information relating to the stocks of natural capital, and the flow of services supplied by them. Natural Capital Accounting (NCA) is a rapidly developing field which has increasing currency with governments and with businesses as a way of demonstrating sustainability and net environmental gains. It has yet to fully embed the breadth of cultural services which our environment provides however. This paper will outline the principles, the potential obstacles, but also the opportunities that Historic England has identified on this topic. It will give an overview of work that has already been done - but also an insight into future research.

639 THE VALUE OF OBJECTS IN MEDIEVAL RURAL SETTLEMENT

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Forward, Alice (Cardiff University) - Haggren, Georg (University of Helsinki) - Jervis, Ben (Cardiff University)
Format: Regular session

Much of the focus of medieval artefact studies has been on the large corpus of finds from urban settlements across Europe. The majority of the medieval population, however, resided in rural areas, which are increasingly being investigated through development-led and academic research projects. There is great potential to use artefacts to understand the living standards and everyday lives of medieval people, addressing fundamental questions of 'what did medieval people own?' to more complex economic and social questions surrounding consumption behaviour and value systems. Moving focus to the material life of rural settlements enables a better understanding of urban life and defines urbanism on the grounds of the archaeological record.

This session invites discussion on the material culture of rural households at the European scale. It builds upon the interdisciplinary Living Standards and Material Culture in English Rural Households (www.medievalobjects.wordpress.com) project, drawing together the study of finds from rural settlement excavations and historical records for the 95% of the English population who were not members of the elite.

Papers are invited which address the following themes:

- The range of objects being found in association with rural households and settlements and how this relates to the living standards of those inhabiting these places

- Interdisciplinary work which looks at different ways of interpreting material culture

- Theoretical models which enable new ways of thinking about objects in the European medieval world

- Ideas of value placed on objects; this could be economic or social.

ABSTRACTS

01 OBJECTS FROM MEDIEVAL RURAL SETTLEMENTS: MORE THAN JUST NAILS?

Author(s): Forward, Alice - Jervis, Ben (Cardiff University)

Presentation Format: Oral

This paper presents initial results from the inter-disciplinary Leverhulme funded project Living Standards and Material Culture in English rural households, 1300 – 1600. The research is being carried out by a team of archaeologists and historians and focuses on the range of objects represented in both archaeological and historical records and the value of these in association with non-elite households. The archaeological research uses both developer-led and non-commercial excavations, which enables a wide range of sites and their data to be interrogated. The data being collected are all the medieval non-ceramic objects. In total twelve counties are being targeted and two additional counties are the focus of more in-depth research where the urban centres will also be included within the data collection process.

It has been assumed by some that medieval rural sites typically produce high numbers of objects but this is actually a misnomer. Instead the majority of finds from many of these sites are nails. When compared with the object lists produced through the Escheator and Coroner's records, the archaeological data can be interpreted within greater parameters and the complexity of meaning even of the smallest nail enables further considerations of the material culture represented in the archaeological record.

02 THE CONSUMPTION OF EVERYDAY OBJECTS IN RURAL WESTERN NORWAY, C. AD 1100-1350

Author(s): Nesset, Therese (University Museum of Bergen)

Presentation Format: Oral

Research on medieval artifacts in Norway has, as in other parts of Europe, focused on urban areas, on mass-production of objects in outland areas, national and international trade, and studies of large corpuses of the same type of objects (primarily found in urban areas). The knowledge about rural households in early medieval Norway is mostly based on later written sources and social conditions, and much less on contemporary archaeological sources from "normal" rural households. This paper will be based on my PhD-project, which is in its final stages. The project's main research questions concern everyday life of ordinary people in rural western Norway, with a social bottom-up-perspective. The source material is from five archaeologically excavated (single) farms, focusing on the period c. AD 800-1350. The farms have different topographic and geographic conditions; belong to different social strata of society; and range geographically from central to peripheral (by present day standards).

Traditionally, medieval peasants in Norway have been regarded as fairly self-sufficient, and have rarely been studied as consumers, or as part of wider economic networks or trade. This paper will focus on the peasants as consumers of goods, and will present the objects found within, or connected to, the house remains at the farms. The focus of the paper will be on the period from the late 1100s to c. 1350. By looking closer at what people actually owned, I will discuss the value of the everyday objects from the different households; the provenance of the objects and raw materials is addressed: were they home-made/local or from trade?; also life-style is addressed: did people prefer a traditional rural life style or can we trace new cultural (and maybe urban) impulses, and if so: where?

03 WHAT DO THE FINDS FROM PETERSBORG REVEAL? SMALL FINDS FROM A DESERTED RURAL SETTLEMENT, 12TH – 14TH CENTURIES AD

Author(s): Hartvig, Anders (Museum Sonderjylland)

Presentation Format: Oral

During the last few years, the Museum Sønderjylland (Denmark) has excavated a deserted rural settlement dated to the 12th-14th centuries AD. So far, the excavations have revealed the remains of ten farms belonging to two phases of the settlement. In the first phase, the farms are aligned along a street while in the second phase they are placed around the village green. The specific settlement is not known from written sources, but one later source mentions a certain lord of the manor, Urne, who apparently lived in a settlement in the area.

In connection with the excavation, a systematic survey using by means of metal detecting was carried out. All finds have unique GPS coordinates showing the exact distribution of the finds. The distribution map reveals a marked concentration of finds around the buildings, assumedly reflecting that the objects were lost here by the people who lived in the buildings. The excavations have produced a comparatively large number of finds including different types and categories of objects revealing information about the owners of the buildings, their lives, and contacts.

The distribution of small finds indicates areas where activities such as smithing, bronze working, and the trimming of quern stones had taken place. The large amount of everyday objects such as pottery, spindle whorls, buckles, brooches etc. indicate a high degree of social equality. However, a small group of finds such as a gilded fingering, gilded harness pendants, and a small coin hoard, differ markedly from the rest of the material evidence. Do these high status objects imply the presence of the lord Urne?

04 TWO WORLDS APART? A COMPARISON OF MATERIAL CULTURE FROM URBAN AND RURAL MEDIEVAL HOUSEHOLDS IN DENMARK

Author(s): Dahlström, Hanna (UrbNet, Aarhus University; Museum of Copenhagen)
Presentation Format: Oral

In studies of medieval urbanism the contrast between urban and rural life has often been taken for granted. There is a pre-conception of urban life as being more socially and economically complex, which in archaeology should be seen in the different repertoires of objects recovered from urban and rural excavations. However, actual comparative studies of the material culture of towns and countryside are not in abundance, and the studies which have been made in recent years indicate a more complex picture than the predominant contrast of "urban vs. rural". This paper aims to contribute to the nuancing of our understanding of life in towns and villages in medieval Denmark. The overall question for the paper is: How does the material culture of rural households compare to those in the nearby towns? By looking at a few specific categories of objects found in the towns Copenhagen and Malmö and in selected villages in their surroundings, issues of sustenance, consumption, trade and interaction with the outside world in these places will be addressed. The paper forms a part of my ongoing research where I investigate how to identify the emerging phases of an urban way of life, with Copenhagen as a case study. The comparative study presented here will allow me to form a more qualified opinion of how (and if) life was different in these medieval towns compared to their neighbouring rural settlements. It also has the potential to contribute to the wider discussion of the diversity within the concepts of "urban" and "rural".

05 URBAN LIFESTYLE IN RURAL PERIPHERY? THE MATERIAL CULTURE OF MEDIEVAL COASTAL SETTLEMENTS IN FINLAND

Author(s): Haggren, Georg (University of Helsinki)
Presentation Format: Oral

Towns were rare in Finland during the Middle Ages. Only one of them, Turku (Sw. Åbo), was among the larger towns in the Swedish realm of which Finland was a part of. Towns people in Turku followed the material culture typical for North Western Europe where Hanseatic merchants acted as middle men between towns and ports along the Baltic and North Sea coasts.

During the Middle Ages Finland was located in the northern periphery of Europe. However, people in Finland were able to follow the material culture and fashion in Western Europe. Recent archaeological excavations and the growing activity of metal detectorists show that imported items were affordable not only for towns people but for many of the peasants too.

Archaeologists are used to the abundance of finds in towns and a lack of objects on rural sites. However, recent results have forced us to reconsider our understanding of this matter. For example, excavations in the small coastal village of Mankby in Espoo, have revealed objects such as table knives, stoneware jugs and glass beakers typical for late medieval urban settlements. What's up? Did the peasants try to follow an urban lifestyle? Or did rural and urban people only share similar values and a common material culture?

06 MEDIEVAL AND MODERN RURAL SETTLEMENT AND MATERIAL CULTURE IN THE GUADIANA RIVER VALLEY (PORTUGAL)

Author(s): Marques, João (Directorate General for Cultural Heritage - DGPC; CEAACP / Universidade de Coimbra)
Presentation Format: Oral

In the late 1990s, in the Portuguese region of Alentejo, an important program mitigating the impact of the construction of the Alqueva dam on archaeological remains began.

This work aimed to record and catalogue the location of hundreds of archaeological sites in the valley area of the River Guadiana. This enabled changes and continuities in settlement and material culture to be recognised and in particular on the ceramic material being made and used in this region.

Archaeological excavations were carried out at sites that were deemed significant in this rural landscape as well as in places which have not traditionally been focused on in archaeological research. In particular, sites that dated between the Late Antique and the High Middle Ages, as well as many which carried up until the Modern Period were targeted.

This work has highlighted issues in the interpretation of the existing data and the models and narratives within which we understand this period. With a lack of written sources and other documentation, the need for more work on the archaeological data is apparent. The theoretical model which is followed here sees a cultural continuity of Mediterranean influence, with regional patterns that can be seen to have existed from the Roman Period. This work seeks to demonstrate the socio-economic continuity of this rural region, highlighted through material culture, a phenomenon which persisted up until the mechanization of agriculture and industrialisation.

07 TORRE VELHA 1 (ALENTEJO, PORTUGAL), RURAL SETTLEMENT AND THE TRANSICION BETWEEN LATE ANTIQUITY AND THE ISLAMIC PERIOD: SOME CERAMIC CONTEXTS.

Author(s): Nunes da Ponte, Teresa (CEAACP/FCT)

Presentation Format: Oral

The archaeological excavation works developed at the site of Torre Velha 1 (Serpa, Southern Portugal) between 2008 and 2010, focused on the space occupied by the Late Roman villa have allowed us to know a long occupational sequence developed between Roman times and Medieval Cristian times. In this work we present the study of ceramic contexts associated with Late Antiquity and Emirate levels. These contexts allow us to identify ceramic groups and to know the Late Antiquity and Emirate sequence – in this area of the site of Torre Velha 1, an ancient roman villa, with a huge renewal on the fourth century d. C. and the monumentalization of its pars urbana, true the construction of a balneum. Later this area assumed another form and function, when one of the basins was refurnished and transformed into a ceramic kill, and finally in Islamic times the area was still in use, although the its function had changed again. Furthermore we will discuss some issues connected with de organization and the development of the site, in its transformation from roman times to a rural Islamic settlement and we will discuss some of its relations with other Islamic sites located nearby like Torre Velha 12, a small rural settlement.

08 CHARACTERIZATION OF THE CERAMIC PRODUCTIONS IN A RURAL MOZARABIC VILLAGE OF THE EARLY ISLAMIC PERIOD IN THE SOUTH OF AL-ANDALUS

Author(s): Martinez Alvarez, Cristina - Mattei, Luca (University of Granada)

Presentation Format: Oral

The aim of this work is to present the results obtained after carrying out several archaeological campaigns in the village of Tózar, located in the western mountains of Granada, in which it has been possible to identify a few of housing structures and a complete ceramic trousseau associated with them. The ceramic study seems to indicate that it is a case of an Islamic village from the emiral-caliphal period (mid-9th to the late 10th) as well as other early medieval ones that are detected in the whole of the al-Andalus territory. However, this rural settlement has a very marked peculiarity due to the presence of a necropolis associated with the village, whose only funerary ritual identified so far is the Christian. Judging by the visible remains, we could therefore be faced with a Mozarabic settlement. The trousseau of this settlement is made up of typical vessels from a rural inhabited space, where storage vessels and everyday use stand out, but also pottery that we could consider "luxurious" less typical of this type of habitat.

In short, through our work we want to show the characteristics of the ceramic trousseau of a rural domestic space of early medieval Islamic tradition and try to elucidate the presence and origin in these contexts of high value pottery.

09 BUCK(L)ING THE TREND? NATIONAL VERSUS REGIONAL TRENDS IN DRESS ACCESSORIES IN RURAL AREAS IN LATE MEDIEVAL ENGLAND

Author(s): Burnett, Laura (Portable Antiquities Scheme; South West Heritage Trust) - Webley, Robert (British Museum; University of York)

Presentation Format: Oral

Across Europe buckles are one of the most common small finds on medieval sites, yet they have received relatively little scholarly attention. Their ubiquity and variability, led by fashion more than function, and the importance placed on dress as a marker and constructor of status in the medieval period, makes them an ideal object through which to examine questions of the urban-rural divide and of regionality. This paper will draw upon the massive, largely rural dataset provided by the Portable Antiquities Scheme, currently over 28,500 medieval buckles, yet underutilised.

The pan-English similarity of 13th to 15th century buckle types found in urban sites was recognised by Egan (2007, 79-80) and studied further by Cassels (2013), who also placed these English examples in the context of similar finds from northern Europe. Their work emphasised national access to a shared market in dress accessories. Cassels, in examining fifteen urban sites nationally, found limited evidence for regionality or variation in access to national styles (ibid, 147-8). He argued (ibid, 6) that with urban areas as distribution hubs rural areas should therefore look similar.

This paper will use various regional case studies to test these hypotheses, employing tests of statistical significance to verify observed variations. Did people in these rural areas also have access to the products of national markets and did they choose to follow these trends, perhaps as a form of peasant resistant identity as argued by Smith (2009)? Is regionalism a stronger force than for urban areas? Are the differences in popularity of certain styles recognised by Cassels in certain urban centres also seen in their hinterlands, or do rural areas follow a different trajectory? Through the lense of the humble buckle these larger questions of regionality, national trade patterns and identity, can all be examined.

10 VALUE OF MEDIEVAL DRESS ACCESSORIES FROM RURAL SETTLEMENTS. CENTRAL EUROPEAN PERSPECTIVE

Author(s): Sawicki, Jakub - Levá, Kateřina (AU - Institute of Archaeology of the Academy of Sciences of the Czech Republic)
Presentation Format: Oral

Recently researchers have put more focus on small finds from the outside of large urban settlements and started asking complex questions not only about artefacts themselves but also about economic and social issues (Jervis, 2017; Lewis, 2016; Smith, 2009). Noteworthy is also fact, that recent studies over this topic from British Isles use data gathered by PAS (Portable Antiquity Scheme - finds.org).

In this paper we would like to discuss the problem of value, both economic and social, placed on medieval dress accessories from rural settlements. We are especially interested in the way how comparing assemblages from rural sites to urban settlements and castles can contribute to our knowledge about consumption patterns, status and identity problems in all those environments.

We will focus mostly on small finds from Central Europe, mainly from Czech Republic and Poland. Despite the early state of research on this topic in mentioned regions we would like to address the problems of home production (unprofessional production), distribution, trade and quality of dress accessories. Moreover, we would like to refer to the problem of often forgotten or neglected iron artefacts, especially in relation to data gathered by PAS or from other metal detector surveys.

Jervis B (2017) Consumption and the 'Social Self' in Medieval Southern England. Norwegian Archaeological Review 50(1): 1–29.

Lewis M (2016) Mounts for Furnishings, Padlocks, and Candleholders: Understanding the Urbanization of Medieval England through Metal Small Finds Recorded by the Portable Antiquities Scheme. In: Objects, Environment, and Everyday Life in Medieval Europe. History of Daily Life. Brepols Publishers, pp. 157–185.

Smith SV (2009) Materializing resistant identities among the medieval peasantry: an examination of dress accessories from English rural settlement sites. Journal of material culture 14(3): 309–332.

a. MEDIEVAL RURAL SITE RAZVILKA (CHRONOLOGY, STRATIGRAPHY, MATERIAL CULTURE)

Author(s): Chirkov, Maksim - Fatkov, Alexey - Anikin, Ilya - Polyakov, Fedor (Institute of Archaeology Russian Academy of Sciences)
Presentation Format: Poster

The settlement Razvilka is located in the north-eastern part of the Leninsky district of the Moscow region, Russian Federation. The cultural layer of the site is composed of dark gray-brown loam with inclusions of charcoal and fragments of the furnace. Individual finds and ceramic material have been found in cultural strata and the filling of continental pits. Pottery found on the site is divided into two blocks: I. The second half of the XII - the first half of the XIII century; II. The end of XV-XVI centuries.

The artefacts found on the site Razvilka represent all the main spheres of life of the medieval Old Russian community, starting from the household (knives, locks, stone stitches, crematorial, flint, chisel, spindle), construction (iron nails, chisels), agriculture (spit), crafts (forging, metallurgical slag), ending with the satisfaction of personal aesthetic (glass bracelets, rings, temple rings, bracelets, pendants, beads) and religious needs (crosses).

Razvilka is the typical, rural medieval settlement of the basin of the river Moskva, the left tributary of the Oka river (the Volga river basin). The only thing that distinguishes it from the mass of the similar settlements of this time is the amount of jewelry finds, which, together with the classic inventory, can tell us about the relatively high status and standard of living of the local population.

Settlement of this territory starts in the second half of the 12th century. The most intensive development occurs in the middle - second half of the XVI century. At the turn of the XVI-XVII centuries the territory of the site Razvilka became desolated

646 WHAT'S THE USE? USING ARTEFACTS FOUND BY PRIVATE METAL DETECTING FOR RESEARCH, OUTREACH, AND EXHIBITION

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Pentz, Peter (National Museum, Denmark) - Dobat, Andres (Aarhus University, Institut for Kultur og Samfund) - Lewis, Michael (The British Museum)
Format: Regular session

In many countries the expansion of private metal detecting has resulted in an explosion of archaeological material. For the archeological museums in particular the challenge is overwhelming, claiming resources for recording, preservation and storing this apparently ever growing supply. Avoiding creating orphaned archaeological collections, museums and researchers are deeply concerned with the difficulties and opportunities when transforming material gathered by a conscientious public into a useful source for both scholars and the public.

For the amateurs, the image of metal detection as a scrupulous treasury hunt has changed to into a hobby that has responsibilities. For the professional archaeologists, changing what some has called "an uncontrollable threat" into a proper study of the past has been demanding.

Papers may explore efforts done to build a relationship between archaeologists and metal-detector users over the past fifty years and also

how collaborations between the archaeological and the metal-detecting communities have developed. Papers discussing the use of artefacts found by non-professional metal detecting in research, exhibition and outreach activities are very welcome.

ABSTRACTS

01 DECODING THE CODE: ENCOURAGING BEST PRACTICE AMONG METAL-DETECTOR USERS

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

In 2003 the Portable Antiquities Advisory Group agreed a Code of Practice for Responsible Metal Detecting in England and Wales. This was endorsed by the main archaeological, landowner and metal-detecting organisations, but it was unclear how many individual finders took it upon themselves to follow this voluntary guidance; in England and Wales archaeology and metal-detecting are not regulated so (in most cases) it is up to landowners who they allow to search on their land; they also decide the fate of any items (apart from Treasure) found. In 2017 the Code was revised, but to date the main detecting organisations have chosen not to endorse it.

This paper examines the situation where the State (in most cases) does not have title to the archaeological past and searching for archaeological objects is not regulated. Here then, the only option open to archaeologists wishing to make use of metal-detecting data (considered by many to be very useful in the advancement of knowledge) is to appeal to the better nature of finders, and encourage them to follow best practice voluntarily. Here will be highlighted the challenges of that task, especially when dealing with a disparate group of individuals - some having a genuine interest in the past, whilst others are completely self-interested.

02 METAL DETECTING IN SOUTHERN NORWAY BETWEEN SERIOUS AMATEURS AND TREASURE HUNTERS

Author(s): Sayej, Ghattas (Vest-Agder County Council, Norway)
Presentation Format: Oral

To involve amateurs such as detectorists in the field of cultural heritage is not always an easy task. The majority of organised detectorists are genuinely interested in cultural heritage, and will report the objects they find to the authorities. Unfortunately, some detectorists are more or less nighthawks, and use their detectors as a means to acquire objects illegally for personal gain.

Archaeologists who work in the public sector in Norway have witnessed a large increase in detector activities during the last few years. This increase generates extra work hours for archaeologists to follow up the finds handed in – i.e. registering, analysing and classifying the finds. This extra workload has lead archaeologists to put pressure on the Directorate of Cultural Heritage to implement a national guideline for dealing with this issue. There is also an ongoing discussion regarding whether it is necessary to take even further steps such as banning this hobby or legislate it more.

Many archaeologists are sceptical to detectorists but the interest for metal detection is on the increase in Norway. Regardless of the negative aspects, a large amount of artefacts has been uncovered and delivered to the authorities, and many of these artefacts have generated an increased focus on research, which overall is a positive side effect.

This paper will attempt to give a view into the collaborations between Vest-Agder County Council and local detectorists.

03 100 YEARS LATER: MATERIAL MEMORIES OF A PRISONER OF WAR CAMP IN CZERSK (POLAND) BETWEEN TREASURE HUNTING AND ARCHAEOLOGY

Author(s): Kobialka, Dawid (Institute of Archaeology and Ethnology Polish Academy of Sciences)
Presentation Format: Oral

The year of 2018 is a centenary of the end of the Great War. However, material remains of the Great War, including relicts of prisoner of war camps, have not been the subject of a closer archaeological research in Poland so far. One of the rare examples is a prisoner of war camp in Czersk. Apart from the non-invasive research (geophysical survey, aerial photography, airborne laser scanning), part of the project goals was searching for and documenting artefacts that were in private collections. One of the project's results was a collaboration with a private museum located in Czarna Woda. The museum was created and is headed by a metal detectorist. It presents a unique collection of artefacts from the camp, including astonishing examples of trench art and other kinds of material objects related to the day-to-day life behind barbed wire.

In my paper I will discuss cultural, social and scientific benefits and pitfalls of collaboration with metal detectorists taking the Czersk camp and the private museum in Czarna Woda as a case study. It will be argued that such archaeological collaboration with metal detectorsits is the first and necessary step in any archaeological project under the banner of modern conflict archaeology.

04 METAL DETECTING AS PARTICIPATORY HERITAGE - ENGAGING AMATEUR DETECTORISTS IN FIND RECORDING, RESEARCH AND EXHIBITION

Author(s): Dobat, Andres (Department of Archaeology, Aarhus University)
Presentation Format: Oral

In Denmark, recreational metal detecting is traditionally considered a legitimate means for members of the public to directly and

actively engage with tangible elements of cultural heritage, disregarding educational, cultural or social preconditions. Instead of passively consuming expert knowledge and narratives, detector users cherish the idea of actively contributing to the writing of history with their findings. Both detector associations and individual practitioners actively promote this ideal as being their most central incentive. In practice, metal detecting in Denmark has challenged the classic division of roles in archaeology and heritage management, with amateur collectors producing finds but otherwise being more or less passive recipients of professional authorities' expert knowledge. At least a large part of the Danish detector community can be characterized as not only very committed to their hobby but also highly competent, both with respect to the recording of relevant contextual data in the field and the identification and dating of finds.

In order to fully exploit this potential, the DIME portal was officially launched in 2018 to facilitate the user driven recording of metal detector finds produced in Denmark by members of the public. The aim of DIME is to provide a platform for different user-groups: Danish metal detectorists, curators at the Danish museums, the general public and researchers. As such it functions as a portal for the registering and hence safeguarding of the increasing number of metal detector finds and to make them accessible for the general public and for research. The more overarching vision behind the DIME project is to realise the potential of recreational metal detecting as a medium to implement an inclusive and democratic approach to heritage management in Denmark and to advance the incorporation of principles of citizen science and crowd sourcing in museum practice.

05 VIKING VIRTUAL REALITY: INSIDE THE GREAT ARMY'S WINTER CAMP

Author(s): Hadley, Dawn - Richards, Julian - Murphy, Damian (University of York) - Beale, Gareth (University of Glasgow) - Beale, Nicole - Schofield, Guy - Hook, Jonathan (University of York)

Presentation Format: Oral

Since 2011 Dawn Hadley and Julian Richards have been working with metal-detectorists as part of their research into the Viking Great Army, and their winter camp at Torksey (Lincolnshire, UK), of AD872-3. Over 1500 artefacts have now been catalogued, and published online for study by researchers. However, it can be difficult to present these often fragmentary objects to a wider audience, and to help them understand what the finds are able to tell us about life in the winter camp, and the wider Viking world. In 2017 we had the opportunity to work with colleagues at the Yorkshire Museum in York, and the University of York's Centre for Digital Heritage and Digital Creativity Labs to develop an immersive Virtual Reality experience based on our archaeological research. The experience presents a series of vignettes based upon metal-detected objects found in the camp, and features a soundtrack developed by York's Acoustics Lab, incorporating authentic Old Norse dialogue. Our immersive experience takes the user back in time to the banks of the River Trent in the winter of AD 872-3, where an Army of several thousand Viking warriors was camped. Viking VR featured in the British Museum/ York Museum Trust exhibition Viking: Rediscover the Legend which was at the Yorkshire Museum from May-November 2017, where it was visited by some 75,000 people, and we won the Excellence in Media Arts prize in the 2017 York Culture Awards. Our paper will illustrate how digital technologies can have a significant impact on public understanding of the past, and of the contribution of metal-detecting.

07 CULTURAL HERITAGE WITHOUT CONTEXT? A BROAD DISTRIBUTION ANALYSIS OF METAL-DETECTING FINDS IN NORWAY

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

Presentation Format: Oral

This paper seeks to explore some of the new patterns that emerge through broad distribution analyses of metal-detecting finds in Norway. Varying notions of what constitutes heritage, concepts of ownership, and (mis)trust has affected the ways in which archaeologists and metal-detectorists in Norway have interacted and communicated with each other. One clear consequence of this is that ~6000 detector finds are rarely utilized in research, with a few notable exceptions. Uncertainty surrounding the find-context of the objects is the most commonly stated reason for excluding them, especially when conducting e.g. distribution analyses. For some, metal-detecting finds are perceived as almost direct links to past societies, while for others their potential lack of context reduces them to nothing more than 'pretty objects'. Arguably, in most cases, the truth lies somewhere in between these opposites.

Critical assessment of the registered information in the country's find-bases has made it clear that several aspects affect their accuracy, such as how finds that are handed in to the museum or county municipalities are recorded initially. In addition, some metal-detectorists will provide exact GPS-coordinates of a find, while others may only provide a more general find context. When comparing the distribution of metal-detecting finds across the country it is also clear that—similar to what recent research in the UK has shown—physical constraints, like woodland and water, limit the use of metal-detectors which are mostly used on arable land. While rare and singular finds with missing or misleading information about the find-context could influence the results of a study focused on, for instance, regional identity, it will be illustrated that they are not useless. Metal-detecting finds, like any other material group, will invariably reflect varying degrees of information – in "low-resolution" studies even finds with relatively poor precision can be included.

08 ROSE-COLOURED GLASSES; ARCHAEOLOGISTS, METAL-DETECTORISTS AND TREASURE-HUNTING FORUMS

Author(s): Beaulieu, Kiara (University of Birmingham)
Presentation Format: Oral

The real world of archaeology is very different from its depiction in popular culture. Movies regularly show well-financed archaeologists flying by private jet into remote locations in search of lost treasures. In reality, of course, archaeologists often fund their work on a shoe-string budget and they generally excavate sites that are the opposite of glamorous or exciting. Though the realities of archaeological excavations are generally mundane, practitioners of the craft are also recognized as by most members of the public as important guardians of the past.

While public perception is most often positive, many metal-detectorists have been outspoken in their contempt for academics. Much of the opposition has arisen because of fears of how the hobby could be policed due to restrictive heritage policies advocated by archaeologists. At the same time, the rise of popular television shows glorifying metal-detecting have further inflamed the situation. Many hobbyists log on to "member only" websites that cater to treasure-hunters; these sites allow their members to showcase finds, provide advice on legislation and hunting grounds, ask questions about treasure-hunting abroad, and socialize with like-minded people.

This paper examines the attitudes expressed by North American metal-detectorists on these "members only" treasure-hunting forums and investigates how the rifts between academics and hobbyists have developed and continue to expand. This paper does not intend to fan the flames of an "us versus them" controversy, but it does highlight some of the issues involved and focuses on how those attitudes have come to exist. Finally, this paper discusses the feasibility of a volunteer reporting site in North America (similar to PAS) and ways in which academics can create positive interactions with detectorists whose expertise in these matters is often second only to those of the archaeologists themselves

a. RESPONSIBLE METAL DETECTING - TOWARDS A UNIFIED EUROPEAN STANDARD AND REGULATIONS

Author(s): Murawski, Igor (European Council for Metal Detecting)
Presentation Format: Poster

Only a few decades ago there were plenty of archaeologists in Europe who did not want to even consider using metal detectors as part of their excavations. Today such views are an exception rather than the rule and metal detecting techniques are widely employed wherever there is a possibility of encountering metal artefacts. Increasingly it is the private individuals, volunteers and hobbyists who are being involved in the field work. Early apprehension about cooperating with metal detectorists gives way to the appreciation of their skill, knowledge and passion for history. And yet the practice of metal detecting, a growing phenomenon, is treated very differently throughout Europe.

From the barely legal stalemate in Bulgaria, through the attempt at control and encouragement for finds recording in Flemish part of Belgium, to a very liberal system in England and Wales. It could be argued that it's because each country has its own specific conditions related to metal detecting and heritage protection, but is that the real answer? After all, the excavation techniques and metal detecting methods do not vary greatly from country to country. Archaeologists in some countries evidently benefit from close cooperation with responsible detectorists whereas in others there is a continuous fight with illegal detecting and looting of the artefacts. Would a common, European-wide, set of rules, recommendations and policies, based around the concept of responsible metal detecting help to change this situation? If so, how should it be constructed and what exactly is responsible metal detecting? European Council for Metal Detecting was set up with the aim of providing answers to those questions. Through our presentation we will show some examples of excellent cooperation between archaeologists and detectorists in various countries and in that way tangibly demonstrate that the establishment of shared-common standards is not only appropriate but also possible.

b. A TIGER ON THE PLOUGH-FIELD

Author(s): Szabó, Dénes (Ópusztaszer National Heritage Park)
Presentation Format: Poster

An Eastern Roman bronze artefact fragment, depicting a tiger hunting scene had been found during hobby metal detecting on a plough-field nearby a village in Southeastern Hungary. The scene (a hunter on fott is fighting a tiger with a lance nearby a palm tree) has clear paralels in representative Eastern Roman art, including prestigious mosaics.The item shows signs of secondary usage as a belt fitting, a strap end by the Avar people, therefore being one of the direct examples of theoretised influences of Byzantine imaginery on Avar iconography. Even though it was broken through by rivets in order to fix it to the leather, the scene was kept intact during the modification into a belt fitting. Being previously an example of Gesunkenes Kulturgut in Byzantine society, after being obtained by members of a diferrent culture through either looting or trade, it became part of an Avar belt, itself a smbol of prestige, freedom and adulthood. What secondary, "Barbarian" meanings and interpretations could be adjusted to decorative imaginery of a different culture?

The emergence of such unique finds during hobby metal detecting shows the importance of well-minded legalization of the practice, which is a (sometimes quite hotly) debated question in Hungary.

647 NEW TOOLS AND PRACTICES USED TO IMPROVE THE UNDERSTANDING OF ARCHAEOLOGICAL HERITAGE IN URBAN CONTEXT

Theme: Archaeology and the future of cities and urban landscapes
Organisers: Forn Perramon, Clara (Museum of Badalona) - Padrós, Pepita (Archeology department, Museu de Badalona) - Gurri Costa, Esther (Archeology department, Museu de Badalona) - Havas, Zoltán (Head of Department of Antiquity, BHM Aquincum Museum) - Abonyi, Zsanett (Cultural Manager, Department of Antiquity, BHM Aquincum Museum)
Format: Regular session

The session we propose aims to be a reflection of the challenge of presenting the different archaeological spaces found in an urban context through a structuring discourse that helps to interpret them as a single site. This problem arises because of urban archaeology where archaeological actions are not programmed according to the need for archaeological or informative knowledge, but rather of the urban dynamics of a city, revealing archaeological remains without spatial continuity, often hidden in the middle of the urban fabric of modern cities. This fact causes a great variability of spaces where archaeological remains are located, and pose a huge range of problems that must be dealt with individually but within a unified management system.

Faced with this problem, archaeologists, restorers and museologists, as well as other professionals involved in the process of excavation, interpretation and enhancement of archaeological sites, will adopt as allies a multitude of disciplines, having a relevant role the new technologies, such as reality virtual, augmented reality or mobile devices, which often make interpretation of these large archaeological sites easier.

ABSTRACTS

01 NOW WHAT? HOW URBAN ARCHAEOLOGICAL SITES BECOME MUSEUMS

Author(s): Padros, Pepita - Forn, Clara (Museu de Badalona)
Presentation Format: Oral

Urban archaeological sites have their own characteristics and properties, and some of them are definite by the cities that have developed over them for many centuries. Mostly of the urban archaeological site are preventive works, so we don't have the same time to planned and argue our final goals as in other archaeology excavations. As archaeologist and heritage managers, we should also consider from the outset, not only the scientific development of the excavation, but also its potential to be preserved in the future and how. We have to be able to project its potential to be transformed into a visitable site, even before we know the final results of the archaeological works.

The intervention we propose, will focus on some examples resulting from our own experience and from other urban archaeological sites that have had this transformative process. Starting from different typologies of urban archaeological spaces, we will point on the main problems: the physical -state of the remains, buildability, conservation – and the interpretative -lecture of the remains, representativeness, model, etc.-. According to those, we will describe the criteria that we have followed and also, we will see the result of its transformation by using museography and technological tools that have allowed them to open them to the public.

02 WALKING ON THE PAST – TO PRESERVE AND PRESENT THE PAST IN URBAN SPACES

Author(s): Byszewska, Agata (Narodowy Instytut Dziedzictwa / National Heritage Board Of Poland)
Presentation Format: Oral

Last years there is a lot of projects of the revitalization of historical urban spaces. Centers of cities with an old metric are particularly exposed to problems resulting from the collision of dynamic development and relics of the past. One of the major problems is the inability to establish a comprehensive research program. Interpretation of research results in urban space must take into account previous works, it's a like stacking a puzzle. Archaeological heritage is an important part of the process of revitalization and urban development, often ignored and treated as an obstacle. Investments in the city area are a challenge both for investors and archaeologists and conservators. It is necessary to search for such a ways of management and presentation of archaeological heritage that will ensure to maintain its scientific value and will make archaeological and historical landscape understandable for local communities and visitors. In my presentation, I would like to present some examples of different ways of presenting the archaeological remains in an attractive and understandable for visitors way. The use of modern forms of communication, new technologies allows not just reaching a wider audience, young people especially, but to update the interpretation of the past as research and science progress.

03 A NEW PUBLIC EXPERIENCE FOR URBAN ARCHAEOLOGICAL SITE-MUSEUM, THE ROMAN TOWN OF BAETULO

Author(s): Forn Perramon, Clara - Gurri, Esther - Padrós, Pepita (Museu de Badalona)
Presentation Format: Oral

In 2006 the Museum of Badalona started a new presentation of the Roman Town of Baetulo archaeological site, changing the point of view and giving to visitors the leading role by creating a new atmosphere in a new museum experience. The use of technology cre-

ates a visit where the lights, sounds and the remains let the public discover the roman city by steps, and make them live a unique and emotional experience that connect them to the roman past. Also this new proposal makes it possible to highlight the archaeological remains and focus the discourse on the everyday life, which create a great interest to the public.

This new presentation responds two challenges: one is the location of the remains preserved in the basement of the actual city buildings, so they are not visible by the potential audience. And the other is, that the different venues that complete the visit of the Roman Town of Baetulo are not connected to each other's. It is for this reason that we have created a discourse that helps understand that there is a unique archaeological site.

Meanwhile we are writing this abstract, a new venue will be incorporate in the Roman circuit. That means a total of four places, five adding the main site located in the Museum basement, that represents an urban archaeological site with more than 4.700 m2 visitable. In all this places the presentation follows the same museology. Since 2010, we reach 214,000 visitors which reflects a high degree of satisfaction in their visit. This fact reaffirms us in the line of work that we started in 2006 and a connection with actual society.

04 HADRIANUS® - HADRIAN AS A TRADEMARK

Author(s): Abonyi, Zsanett - Havas, Zoltán (Budapesti Történeti Múzeum/ Budapest Historical Museum)
Presentation Format: Oral

Today's new trend in audience is the cultural enjoyment, however, reveals that museums will face a new challenge or crisis because of that audience's changing attitude in cultural consumption. We need to acknowledge this changing culture and begin to see them in a different light.

Last year the Aquincum Museum hosted an exhibition dedicated to Hadrian to commemorate his accession to the throne 1,900 years ago. The exhibition was the part of Aquincum's "Hadrian's Year 2017" event series, which offered a whole-season program. The main goal of the branding the Hadrian's Year was attracting a new and young audience. Putting focus on the figure of Hadrian seemed like a great way to engage the young adults, because this age group still have information about him and it means that they can feel a personal attachment to the emperor.

The thematic year gave us a good opportunity, because we thought that this new kind of approach of a historical figure can reposition the museum to the targeted group. In the Hadrian's Year we needed to step across our physical borders and to think bigger. It means the scope of the museum activities was extended. The exhibition, the educational programmes, but the logo and the advertising as well adapted the changing attitude. In this year we focused on creating and distributing the valuable, relevant and consistent content depending on current social needs. In our lecture we're going to highlight some of our recent initiatives as examples. It's a way that we have expanded how reach and engage the new visitors.

05 REBUILDING THE PAST. THE 3D RECONSTRUCTION, VISUALISATION AND VR/AR PRESENTATION OF MEDIEVAL HISTORY IN SLANY (CZECH REPUBLIC)

Author(s): Unger, Jiri - Květina, Petr (AU - Institute of Archaeology of the Academy of Sciences of the Czech Republic)
Presentation Format: Oral

The contribution describes a project focused on presentation of the history of the medieval town Slany in central Bohemia. Over the last few years there have been several rescue archaeological excavations. In addition to expanding scientific knowledge, an important part of archeological research in cities is connected to municipality and community engagement. This can be difficult because all the archaeological features found remain hidden under current buildings and it is therefore impossible for the public to be in direct contact with them. We will explain step by step how the 3D computer graphic visualizations have been created to preserve as much historical accuracy as possible, e.g. using historical and iconographic sources and rescue archaeological excavation results. We will outline how existing standing relics of city fortifications and other medieval constructions provide unique data for the process of computer reconstruction using 3D photogrammetry. In the second part of the lecture we will focus on the possibilities of presentation of these 3D visualizations, stressing the use of mobile applications in addition to the classical formats. Employment of both virtual reality and augmented reality has proven to be the tool that has the potential to both grasp the invisible and to describe what has disappeared.

648 WHO'S COUNTING? EXPLORING NEW AVENUES FOR A UNIFIED QUANTIFICATION FRAMEWORK OF ARCHAEOLOGICAL DATA IN MATERIAL STUDIES

Theme: Theories and methods in archaeological sciences
Organisers: Revello Lami, Martina (Leiden University) - Waagen, Jitte (University of Amsterdam) - Busto Zapico, Miguel (University of Oviedo) - Ferrandes, Antonio F. (Sapienza University of Rome) - Manzini, Ilaria (University of Amsterdam)
Format: Regular session

Reconstructing ancient social dynamics through the lens of material culture lies at the core of archaeological interpretation. Evidence of

people's actions and natural events materialize in concentrations of artefacts and ecofacts that enable us to trace human past behaviors. Not surprisingly, quantification methods are a recurrent issue in archaeological research about all categories of objects, their typologies and distributions. Traditionally, much attention has been paid to the development of increasingly sophisticated techniques of quantitative analysis, greatly expanding the amount of data at our disposal. Yet, the lack of uniformity in their application does not always allow for comparison, making therefore those datasets not fully usable (Orton 1993; Arcelin&Tuffreau-Libre 1998). This lack of unified quantification methods is not only a hindrance to the interpretation of datasets, but also for engaging with formation biases, which are essential for understanding whether the analysis are valid in the first place. This session aims to go beyond diverging enumeration methods of observed evidence in the present, and make a step towards more synergy in the fragmented landscape of quantification in material studies. We seek to do this by having presentations that engage with these issues, but also by providing a context for stimulating discussion. Therefore, we encourage contributions that provide (new) quantitative frameworks to investigate the material record, engage with methodological issues in quantifying material assemblages, seek to quantitatively integrate different datasets and/or discuss the problems and the needs for doing so.

ABSTRACTS

01 FROM ACT OF FAITH TO COUNT OF FREQUENCY: A BRIEF REVIEW OF THE QUANTIFICATION ISSUE IN ARCHAEOLOGY

Author(s): Revello Lami, Martina (Leiden University)
Presentation Format: Oral

Quantifying the size and nature of archaeological assemblages and characterizing their composition involves the definition of a sampling strategy in time and space, and the choice of methods for measuring quantities that can lead to reliable comparisons at both intra-site and inter-site dimensions. So far, the main contenders have been: sherd count, sherd weight, sherd volume/area, vessels represented and estimated vessel equivalents (eves). This paper will focus in particular on some of the most discussed issues related to these choices, outlining the development of the studies on the subject.

Over the years, the debate on quantification, its aims and methods has been raging to such an extent that serious doubts have been cast on the very point of studying archaeological data quantitatively, questioning the foundation of well-established methodologies such as seriation and spatial analysis. Much of the discussion revolves around the nature of the archaeological record, which is the result of natural and cultural processes that inevitably alter the intrinsic characteristics of the deposit. The deformation and incompleteness of material data is further aggravated by the different spatial units and time spans in which the archaeological record forms, making the task of quantifying any aggregation of objects particularly challenging or, as aptly framed by Clive Orton, "an act of faith" (Orton, 1989:94). The simple enumeration of observed evidence in the present is thus not sufficient to retrieve information about the events that took place in the past. Rather, we need to reach an agreed measure of the frequencies of different types of artefacts within a group, by minimizing the risk of bias from factors not related to the original life of those artefacts. To do so, any quantification effort should go beyond counting and aim to reconstruct the set of interactions among different depositional and post-depositional processes.

02 A QUANTIFICATION EXPERIENCE BASED ON THE ANALYSIS OF TRADE DYNAMICS DURING THE ROMAN AGE

Author(s): Mateo Corredor, Daniel (University of Alicante)
Presentation Format: Oral

The quantitative study of ceramics, and specially amphorae, has become a necessary tool for the understanding of ancient economy. Despite the fact that during the last decades a high number of quantitative methods and several protocols have been presented, nowadays there is still no consensus on which ones are the most useful. During our research in the study of the Roman trade from the South of the Iberian Peninsula, due to the lack of uniformity in quantification methods, several difficulties were acknowledged. Based on our experience, we analyse the problems and some solutions adopted in order to establish comparisons between assemblages quantified using different methods, especially regarding the study of large volumes of material.

Moreover, I am going to present two statistical correctors, Modulus of Rupture, a method to compensate skewed values of amphorae rims' count, and, secondly, Average Capacity, to counteract the big differences in the capacity of the transport containers. The utility and potentiality of both correctors for the study of trade dynamics are evaluated, through its implementation in the comparative study of several amphorae assemblages from the South of the Iberian Peninsula. It is argued that future statistical analysis of transport containers, like amphorae, should include both statistical coefficients to produce more accurate and reliable analysis of assemblages and, consequently, more accurate research on ancient economy.

03 BETWEEN QUANTIFICATION AND ARCHAEOLOGICAL RECORD: SOME REFLECTIONS TROUGH THE PRACTICE

Author(s): Abelleira, Manuel (University of Granada) - Moreno, Manuel (University of Cambridge; University of Granada) - Adroher, Andrés (University of Granada)

Presentation Format: Oral

Pottery quantification is a very useful key when we want to research about economical, spatial and ideological processes in the past. At the same time, this approach can help us to date and to interpret the historical function of the structures of the site when we put in relation the quantity of the pottery with the quality of the archaeological record. Unfortunately, the quantification in Spain is not very common in ceramological enviroments further than the specialist in amphoric commerce.

In this communication we apply the Protocol of Sevilla (PRCS/14) to quantify three different types of assemblage that proceed from different chronological periods, in order to show the potentiality of this method of research. The first one is a deposit of materials founded in Zacatín Street in the city of Granada, the second one is a filling of a cistern in Álamo del Marqués street, in Granada too, and the third one is a rest of a contemporary plunder documented in El Laderón site in Doña Mencía, in the province of Córdoba. The main results allow us to discuss some aspects of the interpretation of the different assemblages and, finally, to do some theoretical and technical considerations that could be useful for other colleagues in their field and laboratory experience

04 COUNTING ARTIFACTS IN ARCHAEOLOGICAL FIELD SURVEY: THE ISSUE OF BREAKAGE

Author(s): Waagen, Jitte (University of Amsterdam)

Presentation Format: Oral

Distribution maps showing densities of archaeological artifacts are elementary heuristic tools for studying human activity in the past. In many cases these maps are based on numbers of finds. However, research on quantification in pottery studies has shown that enumeration based on counts is problematic, at least in cases where sherds in the collected datasets can originally stem from the same vessel. Certainly, the collection of sherds belonging to a single vessel can occur in archaeological field survey, at least in cases where surface material is likely to originate from deposits such as buried stratigraphy. Past studies that have shown correlations between number and weights of sherds are problematic. Other quantifiers such as the Estimated Vessel Equivalent are usually impossible with the very weathered material assemblages picked up in the field. Therefore, understanding breakage and comparing metrics such as counts and weights is essential for understanding underlying patterning in the surface assemblages. This paper will present a statistical assessment to shed light on these issues: what is the least-biased metric for quantification surface assemblages, what do breakage patterns mean in themselves and what are the best statistical approaches to study them? The results of this work have implications for the use of distribution maps for studying human activity in the past, and strongly argues the case for weighting of collected material in archaeological field survey.

05 WITHIN-SITE ANALYSIS OF 'LOCAL' COARSE WARES: THE CASE OF FABRATERIA NOVA (LATIUM, ITALY)

Author(s): Manzini, Ilaria (University of Amsterdam) - Venditti, Caterina Paola (Ministero dei Beni e delle Attività Culturali e del Turismo)

Presentation Format: Oral

One of the main aims of the quantitative comparison of pottery assemblages is to shed light on differences in chronology, function, and formation processes among diverse layers or areas within a broader site. However, comparisons are often hindered by the lack of homogeneous criteria in the collection or publication of data. In this view, the urban site of Fabrateria Nova is an ideal case-study to test different quantification methods for within-site analysis. Several areas of the ancient city, founded right after the destruction of Fregellae (124 BC), have been investigated over almost a decade (2007-2015) by a partnership of Italian and German research institutions. Over 26,000 potsherds, spanning from the mid-Republican to Modern times, have been excavated and analysed following a unified and standardized procedure. This paper will focus on the Roman coarse wares of supposed local production, which have been uncovered in large amounts in all the investigated contexts, including in the filling layers of the late-Republican criptoporticus, where a kiln was installed and active probably in the 1st-2nd centuries AD. Coarse wares from this assemblage – in particular, cooking pans, casseroles, and jars – include a significant number of whole pots, which allow to identify both morphological and quantifiable features (weight and diameters of the different size formats) for each type. Different methods will be applied to determine: i) the frequency of such types in the various deposits of the urban area; and ii), the feasibility of a comparison between broken sherds and whole pots for a ceramic class with a limited degree of standardization.

06 A WIDTH ONCE WOVEN: A NEW WAY TO COUNT LOOM WEIGHTS

Author(s): Nelson, Thaddeus (Stony Brook University)

Presentation Format: Oral

Archaeologists have devoted countless words to the problem of quantifying artifacts made of stony, clay, and bone. Lithicists, ceramicists, zooarchaeologists, and other specialists have developed derived measures in order to transform quantities of artifacts into interpretations of the labor, production, and consumption of material culture. Among specialists, textile archaeologists do not benefit from the use of derived systems of quantification. Although fabrics are usually lost to archaeologist through decay and other destructive processes, the material record of textile production if often rich, with sites containing hundreds or thousands the tools

once used to spin and weave. These tools permit archaeologists to fill in the gaps in the material record. In Europe and the Mediterranean, loom weights, which are components of warp-weighted looms, are a significant part of this record from the Neolithic until as recently as the Twentieth Century CE. However rich the record, archaeologists lack a meaningful way of interpreting and comparing the quantities of these stone, clay, and bone artifacts. This paper describes a new method of quantifying loom weights to reconstruct the size of fabric woven in the past, called the Textile Width Index (TWIx). Application of this method to a sample of sites from the Iron Age II Levant (c. 1000-586 BCE) demonstrates the utility of this method in comparing the scale of textile production between sites.

07 LOST IN QUANTIFICATION. TRACING MATERIAL CULTURE IN ANCIENT ROME BETWEEN EXISTING DATA AND INNOVATIVE ANALYTICAL CHOICES

Author(s): Ferrandes, Antonio F. (Sapienza - Università di Roma)
Presentation Format: Oral

Is it possible to trace the history of ancient world's exchanges? Is it possible to quantify the economic vitality in the main centers of that world? Is it possible to make sure that all the categories of excavated evidence contribute equally to depicting this wider picture? These are only apparently rhetorical questions, because the answers are not straightforward at all. Even though studies on Mediterranean exchange networks in Roman times have placed the same emphasis on issues related to artefacts typology as well as their quantification, a uniform theoretical framework on the latter aspect is still lacking. Quantitative studies, particularly abundant in Anglo-Saxon literature, have been largely neglected or, at best, reinterpreted, if not misrepresented by most south-European scholarly tradition. Moreover, though much attention has been paid to specific classes of material (mainly ceramics), many others (metals, bricks, building materials, etc.) have been often 'forgotten' or otherwise overlooked in the reconstruction of ancient economies.

The same considerations apply to the city of Rome, which for many centuries has been the main consumption center within the whole Mediterranean: in fact, based on extant evidence, current works on the supply economy of the city span from the Archaic up to the Modern age. However, if we try to compare even the most recent studies on the subject we will soon come to a dead end, since the criteria for collecting, recording and processing the data are hardly made explicit or just summarised in a few charts and graphs. The lack of uniformity in recording and quantifying strategies has led us to launch a new project on the Urbs that, through a review of the available documentation and a thorough theoretical reflection, aims to shed new light on the economy of Rome and its material record.

08 EXCAVATING DATA AND MEANINGS: HARMONIZATION AND ANALYSIS OF BURIAL DATA FROM UAXACTUN, GUATEMALA

Author(s): Horáková, Lenka (Center for Mesoamerican Studies, Comenius University, Bratislava; Via Magna Ltd.)
Presentation Format: Oral

The town of Uaxactun was one of the first Maya sites that was thoroughly studied by means of archaeological investigation. Since its discovery in 1916, three separate archaeological projects excavated this site and in the process, more that 180 burials were discovered. This attempt to analyze these burials in a single work was carried out after more than 100 years of field investigations. As these projects used slightly different methods of context description and terminology, the first necessary step was data harmonization and creation of unified descriptive system, focusing not only on mortuary variables present within the burial contexts, but also relation between these burials and surrounding built environment. Harmonized datasets can be analyzed by variety of quantitative methods. Due to the fragmentary state of data, this part of analysis of Uaxactun burials became more problematic. However, some patterns in burial practice were extracted.

In the second step, during the examination and interpretation of resulting patterns, several questions concerning the validity of these observations were brought to light. Is the examined dataset a representative sample? To what degree are these patterns a result of decisions made by the archaeologists during the excavation and data analysis? How should we reflect these biases when interpreting the resulting patterns? How are these patterns determined by the input data?

In this paper, several patterns observed in the analyzed data will be presented together with suggested interpretations, with careful reflection on these biases that can not be avoided completely in archaeological practice.

09 REFITTING ARCHAEOLOGICAL FIELDWORK: CONCERTED CERAMIC SAMPLING DESIGN IN CENTRAL NICARAGUA

Author(s): Donner, Natalia (Leiden University) - Geurds, Alexander (Leiden University; University of Oxford)
Presentation Format: Oral

Generally, ceramicists working with archaeological samples are expected to process, quantify, analyse, and classify sherds often without the ability to design or revise sampling strategies in accordance with diverse contexts in the field. For this task, we usually apply regional standardised methodologies. Therefore, it is worth asking ourselves what would happen if suddenly we had the opportunity to design a research plan aimed at studying ceramics, which included selecting the methods and techniques to be applied both in the field and in the laboratory. As a result, ceramic analyses would not be isolated -for example- from survey, mapping, excavations, an overview of site formation processes, archaeobotanical and archaeozoological sampling, studies on other archaeological

materials, and absolute dating. In this paper, I present the strategies applied in my doctoral research at Leiden University, which constructs a chronology of ceramic technologies in the Mayales river subbasin, Central Nicaragua. The project, supervised by Alexander Geurds under the auspices of the Proyecto Arqueológico Centro de Nicaragua (PACEN), included a systematic surface survey, recording sites with architecture visible on the surface; stratigraphic excavations at 18 different sites; quantification and sampling of ceramic fragments; as well as a technological study of ceramics comprised of macro-fabric, macro-traces, compositional analysis, stylistic and morphometric examinations. Every step of the research was designed in order to produce a holistic understanding of diachronic and synchronic continuity and change within ceramic manufacturing practices, so decisions such as which sites to excavate, and where to dig within these sites, were made accordingly. Preliminary results indicate the importance of incorporating a clear, systematic ceramic sampling strategy into archaeological fieldwork rather than restricting these decisions and the specialists who make them to the laboratory.

10 FROM SHARDS TO INTEGRATE SPATIAL ANALYSIS: EXPLORING SPATIAL PATTERNS OF USE AT THE BRONZE AGE SETTLEMENT OF COPPA NEVIGATA

Author(s): Recchia, Giulia (University of Foggia, Department of Humanities) - Cazzella, Alberto - Lucci, Enrico (‚Sapienza' University, Rome, Department of Antiquities)

Presentation Format: Oral

The fortified costal settlement of Coppa Nevigata (southern Italy) is one of the most extensively excavated Bronze Age sites in Italy. Being continuously occupied for one millennium (18th - 8th centuries BC), with only occasional episodes of destruction/ sudden collapses, its archaeological record reflects the repeated use and reorganisation of spaces and structures over the time. Cycles of use and discarding of pottery at the site produced a massive amount of shards, whose primary deposition has been subject to alteration by anthropic and natural processes.

Pottery productions are indeed a significant source for the understanding of socio-economic dynamics, besides their potential as chronological markers. Quantitative analyses have been applied to investigate different dimensions of the pottery assemblages from Coppa Nevigata, ranging from stylistic variability through time, to synchronic stylistic variability among different areas of the settlement, to pottery function and archaeometric analyses. However, most of the ceramic record at the site consists of non-diagnostic fragments. How can we fully exploit their potential as indicators for depositional processes? To what extent are they significant for the understanding of the patterns of use of settlement areas?

We will present the spatial analysis of a case study area from the site, belonging to the Late Bronze Age (12th century BC). Through a multi-scalar approach to the quantitative analysis of pottery distribution -including non-diagnostic shards, we seek to recognise patterns of activities and use of spaces. Statistic-based quantitative analyses are adopted to define potsherd size groups and identify patterns of pottery disposal, categories of pottery refuse and depositional processes, also considering variables such as the intended function of pottery and the nature of deposits.

11 TRACING THE VARIABILITY OF CERAMIC SURFACE SCATTERS, CASE-STUDIES FROM INTRA-SITE SURVEY RESEARCH

Author(s): García Sánchez, Jesús (Leiden University)

Presentation Format: Oral

Pottery scatters from field surveys are often very little diagnostic or expressive to achieve historical interpretations. Nevertheless, those scatters reflect processes of deposition and other formation process in which human agency might be also present. In order to deal with this (still) unconventional archaeological record sherds can be classified using many systems and when possible, also including valuable information about their relation to other fragments (context or assemblage). This classification process of sherds and space allows multivariate statistical approaches to pottery assemblages in intra-site contexts or reduce spaces where we could assume similar formation processes.

This paper will explore the analytical possibilities of multivariate analysis of survey assemblages using some of the most common variables recorded during field surveys by many research projects in the Mediterranean area and beyond. These usual variables are: sherd count, weight, ware and functionality. I will use datasets from intra-site oriented surveys in Roman sites in Spain (urban and rural contexts) and Italy to illustrate how multivariate statistics and alternative procedures of visualizing statistical information could maximize the information we obtain from the surface record, and eventually how we can use this information to establish inferences about the ancient society behind the creation of such archaeological scatters.

12 A NEW WAY OF CLASSIFYING CERAMICS USING THE BAG OF WORDS MODEL (BOW)

Author(s): Jimenez-Badillo, Diego - Roman-Rangel, Edgar Francisco (Instituto Nacional de Antropología e Historia)

Presentation Format: Oral

In this paper we introduce the bag-of-words model (BoW) for the effective description and classification of archaeological sherds.

Originally, the bag-of-words model was developed to statistically analyse textual documents with the intention of improving the browsing, classification and retrieval of its content.

The idea is that a document can be represented by a histogram that models the frequency of the most discriminative features of its

content. In the case of text documents, a BOW model can be easily constructed by counting the frequency of certain words that are of high discriminative power (i.e. semantically important) given the topic of the document.

In the last decade the BOW model has gained popularity in the computer vision community as a method to compare 2D images and 3D point clouds, giving rise to the bag-of-visual-words approach. Instead of textual words, this version of BOW extracts and analyses visual patterns and local geometric features. This development offers great opportunities to analyse 3D shape data in many fields, including archaeology.

In this paper, we provide an intuitive but extensive explanation of the BOW model, and give details of two approaches that are popular in the computer vision literature to construct bag-of-visual-words representations. We evaluate the potential of these methods in the task of content-based retrieval of 3D models corresponding to a collection of sherds from archaeological sites in Mexico.

a. STATISTICAL ANALYSIS OF ARCHITECTURAL FRAGMENTS OF THE BOSPORAN KINGDOM

Author(s): Kolosov, Vladimir (The State Hermitage Museum)
Presentation Format: Poster

The paper presents the potentialities of applying multivariate statistics and geometric morphometrics to the analysis of archeological finds. The architectural fragments found in the ancient cities of the Bosporan Kingdom during archaeological excavations provides the material for the present study. Such finds have been compared with similar architectural objects known from other regions of the ancient world. The study involves 83 Ionic capitals. Five capitals from the Bosporan kingdom have been studied in comparison with other from Asia Minor, Attica, Peloponnese, Graecia Magna and Aegean islands. The chronological framework spans from the Archaic period to the Hellenism. The Ionian capitals were analyzed based on 63 different decorative and dimensional features, among which key elements such as design and proportions have been particularly important. The resulting information revealed both regional and chronological differences in the proportions of capitals as well as the degree of similarity in measures and diversity. Bosporan capitals demonstrate similarity in proportions and appearance. These observations may indirectly point towards stylistic unity of the early Ionic architecture across the Bosporan region, proving therefore the effectiveness of these analytical methods when dealing with large assemblages of homogeneous objects with a consistent amount of characteristics to take into account, a pivotal factor in the analysis of massive archaeological materials.

b. STANDARDISATION AND UNITS OF MEASUREMENT USED IN POTTERY PRODUCTION. THE CASE OF THE POST-MEDIEVAL SPANISH OLIVE JAR

Author(s): Busto-Zapico, Miguel (University of Oviedo)
Presentation Format: Poster

The standardisation or diversity of ceramic productions is one type of evidence provided by the archaeological record that allows researchers to form hypotheses regarding pottery artisan specialization. In addition to this evidence, the study of ancient ceramics can also provide information about production structures, processing techniques, and scales of production.

The aim of this paper is to determine the degree of standardisation of a pottery production and units of measure that regulated or determined their production. The group chosen to test the methodology has been known as Spanish Olive jar. It is a series of productions manufactured in the south of the Iberian Peninsula throughout the Modern Age. The methodology starts from the morphometric characterisation of each vessel around a series of quantitative variables. As previous steps to the rest of the analysis the Test for normality is performed and the product-moment correlation coefficient is calculated. Subsequently, different groups of Spanish olive jar are created through the cluster analysis. The principal component analysis provides information that allows a deeper understanding of the groups obtained. On the other hand, the coefficient of variation allows to know the degree of standardisation of each variable. Finally, once all these data are known, the possible units of measure that governed the production system of the Spanish olive jar may be recognised.

651 EUROPEAN PROJECTS IN AMERICA: PAST, PRESENT AND FUTURE

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Moragas, Natalia (University of Barcelona) - Pecci, Alessandra (university of Barcelona) - Barba, Luis (UNAM)
Format: Regular session

For a long time, different European institutions have carried out research projects in America and in Latin America in particular. The session expects – although it is not limited to- contributions that show the results and perspectives of these projects. In particular, we welcome papers addressing the theme of the social interpretation of material culture in Latin America and North America, including the interpretation of people's tangible and intangible worlds in the past, the social and spatial aspects of archaeological sites and archaeological landscapes, themes related to subsistence and economy, politics, social behavior and ideology.

Investigations can be related with archaological and ethnoarchaeological projects, as well as the study of Museum collections.

Papers involving the European and American teams are especially welcome.

ABSTRACTS

01 LIVING WITH THE ANCESTORS: PRE-HISPANIC ARCHAEOLOGICAL SITES AS TERRITORIAL MARKERS IN CENTRAL QUINTANA ROO

Author(s): Picas, Mathieu (University of Barcelona)
Presentation Format: Oral

Archaeological sites allow different interpretations and uses depending on sociohistorical, economic and political contexts. In Mexico, the pre-Hispanic archaeological remains have been incorporated into the national heritage and in the Mayan area ceremonial centers are now understood as symbols of high historical value for both regional and national identities. The administration of these sites by national institutions, however, has led to changes in the way locals interact with them. In the state of Quintana Roo, mainly populated by Maya groups, there are a number of archaeological structures called muulo'ob that still are highly important for local communities. The research for this paper was undertaken in March and April 2017 in the Mexican state of Quitana Roo. During my field work the main methodology was based on interviews: series of Mayan individuals, some related to the conservation and transmission of cultural heritage in the region, and ritual experts such as the jmeeno'ob were interviewed. In my paper I would argue that the local interpretations of muulo'ob represent a cosmological way of understanding Maya archaeological sites. I will examine the mechanisms of creation / appropriation of an historical-mythological territory by local Maya communities based on pre-Hispanic archaeological sites from an interdisciplinary perspective. To that end, this research will analyze the interpretation of certain múulo'ob considered as the household of the ancestors and supernatural entities necessary for the agricultural cycle and the ritual life of certain communities.

02 ARQUEOLOGÍA Y NUEVAS TECNOLOGÍAS PARA EL PATRIMONIO EN EL ÁREA MAYA PROYECTO LA BLANCA (PETÉN, GUATEMALA)

Author(s): Vidal Lorenzo, Cristina (Facultad Geografia e Historia. Avda. Blasco Ibanez; University of Valencia)
Presentation Format: Oral

El Proyecto La Blanca es un proyecto interuniversitario liderado por la Universidad de Valencia y la Universidad Politécnica de Valencia que desde el año 2004 desarrolla su actividad en la cuenca del río Mopán, una región del departamento guatemalteco de Petén bañada por caudalosos ríos que en época antigua actuaron como activas vías de comunicación e intercambio entre las Tierras Altas y las Tierras Bajas Mayas. Seguramente atraídos por el beneficio proporcionado por estos intercambios comerciales, en época antigua se fundaron en este territorio numerosos centros urbanos, destacando entre ellos La Blanca y Chilonché.

Los principales objetivos de este proyecto son 1) la investigación arqueológica y arquitectónica de ambos asentamientos mayas, utilizando para ello las nuevas tecnologías digitales para la documentación y análisis de los edificios y monumentos exhumados, 2) la puesta en valor de su rico patrimonio cultural y 3) contribuir al desarrollo social, económico y cultural de las poblaciones de su entorno. Para ello se realizan determinadas acciones destinadas a reforzar su identidad histórica y cultural, haciendo que el patrimonio cultural pueda actuar de motor para el desarrollo sostenible de la zona.

Los resultados derivados del proyecto piloto en La Blanca demuestran la viabilidad de estas intervenciones y la conveniencia de aplicarlas en otros asentamientos de similares características del Petén guatemalteco, al tiempo que se ha podido comprobar los excelentes resultados que se han obtenido con la incorporación de las nuevas tecnologías digitales de documentación, gracias a las cuales se han podido generar productos de 3D y realidad virtual y aumentada del patrimonio cultural maya de alta calidad.

03 LA PUNTILLA PROJECT: SOCIAL ARCHAEOLOGY IN NASCA (ICA, PERÚ)

Author(s): Castro-Martinez, Pedro (Universitat Autonoma de Barcelona) - Escoriza-Mateu, Trinidad (Universidad de Almería) - Gonzalez-Ramirez, Andrea Karina (Universidad de Chile) - Guerrero Perales, Maria Dolores (Universitat Autonoma de Barcelona) - Irazabal Valencia, Samy Lucan (Archaeologist Universidad Nacional Mayor de San Marcos, Lima) - Penagos Cabestany, Alejandro (Universitat Autonoma de Barcelona) - Saez-Sepulveda, Arturo (Universitat de Barcelona) - Salazar Ibañez, Victor Fernando (Archaeologist Universidad Nacional Mayor de San Marcos, Lima)
Presentation Format: Oral

La Puntilla Project aims to produce sociological research about communities dating 1400 cal BCE to 400 cal CE in the coastal desert regions of the Central Andes. The focus is the Rio Grande of the Nasca Basin, where cultural historicism has placed the "Paracas Culture" and the "Nasca Culture", benchmarks of periodization of the entire Andean region. Our team has been carrying out fieldwork since 2005 in two sites at El Trigal (La Puntilla, Orcona, Nasca). Excavations have provided evidence about singular buildings for centralised work, communal fortifications, domestic units and burials. These contexts make possible the analysis of production of social life, and if there was a dominant class controlling production or patriarchal relations.

The main purpose of the project is to obtain and analyse archaeological information about social spaces, particularly about architectural units, urban organisation, household characteristics and extradomestic economic or political-ideological places. Research

tries to review and update relevant archaeological contexts of social spaces, and define categories in settlements of the region. It is an indispensable starting point to advance the knowledge of social practices, real conditions of production and technological foundations, dynamics of emergence or crisis of the first state in the zone, and in involved networks for women and men at each temporal horizon.

Another objetive is the social use of archaeological sites in La Puntilla, and we are linked with people of the Orcona community. Self-organization and mutual support in management is the basis for designing an itinerary for visitors of the region.

The project is financed by Spanish institutions: IPCE (Exterior Archaeological Projects), MINECO (HAR2009-12625, HAR2013-44276-P) and Fundación PALARQ. Our team is composed of professors, researchers and students from Catalonia, Andalusia, Chile and, evidently, Peru.

04 INTERDISCIPLINARY PROJECT FOR IDENTIFICATION OF A NEW NEIGHBORHOOD CENTER IN TEOTIHUACAN, MEXICO

Author(s): Moragas, Natalia (CINAF. Departamento de Historia i Arqueologia, Universitat de Barcelona) - Ortiz, Agustín - Barba, Luis (IIA-UNAM) - Miriello, Domenico - Barca, Donatella (Università della Calabria) - Pecci, Alessandra (ERAAUB, Departamento de Historia i Arqueología, Universitat de Barcelona)

Presentation Format: Oral

In this paper we show the objectives and preliminary results of the first campaign of the project "Proyecto interdisciplinario para la identificación de un centro de barrio en Teotihuacan", carried out in 2018 in Teotihuacan.

The main goal of the project is to identify the presence of a possible neighborhood center so far unknown in Teotihuacan, located by geometrical symmetry, according to Ortiz (2015) in the sectors N2E2 and possibly N2E1 on the Millon's map (1973). Starting from the hypothesis that the neighborhood centers are composed of different architectural units such as the main temple, the public square, public buildings, residences of the elite groups, housing complexes, craft workshops and common use areas, it is expected that we should find this composition in quadrants N2E1 and N2E2 from the distribution of structures proposed for these two sectors by Millon in 1973 (Ortiz 2015).

During the first campaign archaeological and geophyscal prospection (georadar, magnetometry and electric) have been successfully carried out contributing to the understanding of the urban system of Teotihuacan.

The paper is part of the projects Q 0818001 J financied by the Ministerio de Educación, Cultura y Deporte (MECD) and the PALARQ Foundation (2017-18).

Millon, R., 1973 Urbanization at Teotihuacan, México. The Teotihuacan Map. University of Texas Press, Austin

Ortiz, A., 2015 Determinación de las características de un barrio teotihuacano con arqueometría. El caso de Teopancazco. Tesis doctoral, UNAM, México

05 CONSTRUCTION OF ANDEAN OTHERNESS THROUGH AMERICAN ARCHAEOLOGICAL COLLECTIONS IN EUROPEAN MUSEUMS

Author(s): Molina, Bárbara (Barcelona University)

Presentation Format: Oral

In a diverse Europe that has to deal with complex issues such as immigration, otherness and the colonial legacy, the representation of non-European cultures through their archaeological and ethnological heritage is vital as it constructs an image of otherness from the past and in the present that supposes an intercultural dialogue. In this context, this article focuses on the representation of the Andean Region cultures of Ecuador, Peru and Bolivia through their material culture in the archaeological and ethnological exhibitions of some archaeological and ethnographic European museums. The study has been developed through an analysis of available literature, data collection in different European museums from Italy, Spain, France, Germany and Sweden, especially their photographic archives and the analysis of current museum exhibitions. The main objective of this paper is to determine how this otherness is constructed today in the context of what ICOM has called the "diffused museum". This is a necessary analysis considering the historical and current relationships between Europe and Latin America where the material culture issue is a complicated one. In this regard, the analysis focuses on the themes, strategies and different actors involved in creating the message and contextualization of the Andean otherness in European museums through their most visible aspect, their exhibitions, and thus answering the question of whether this representation allows the development of an intercultural dialogue.

06 WHAT'S THE WAY FORWARD? HOW CAN EUROPEAN STUDENTS CARRY OUT RESEARCH INTO LATIN AMERICAN ARCHAEOLOGY?

Author(s): Torras Freixa, Maria (Universitat de Barcelona)

Presentation Format: Oral

Latin America offers a huge diversity of archaeological sites, but the attention to them paid by researchers has been uneven. European institutions are involved in ongoing research projects at some of these sites, but PhD students in Europe keen to pursue a career in this area are difficulty able to participate in projects at the settlements that they are investigating. Moreover, due to cuts

in archaeological funding, they are forced to find new ways of carrying out their dissertations. It is important to discuss these and other difficulties that PhD students face and to try to find solutions.

The paper explores the different stages of a doctoral research project from the perspective of the PhD student and examines the limitations and difficulties facing investigations of Latin American archaeological sites carried out from Europe. Ways of combining theory and practice when the geographical distance is an impediment are discussed. The merits of bringing together the educational tradition of European archaeology and the more anthropological approaches that characterise American archaeology are stressed. New technologies and digitisation have made intercontinental research easier; however, the scarcity of doctoral fellowships for students who are not members of a research project creates financial problems and limits the opportunities to carry out research abroad, attend international congresses, or publish in high impact journals. In sum, the paper discusses ways of dealing with these problems and offer solutions and tips for European students hoping to carry out research into Latin American archaeology. The results may be of interest to institutions intent on increasing their participation in international research projects.

07 DOING ARCHAEOLOGY AND WORKING WITH AMAZONIAN COMMUNITIES: THE CASE OF THE EARTHEN STRUCTURES KNOWN AS GEOGLYPHS

Author(s): Diez Castillo, Agustín (Universitat de València) - Rampanelli, Ivandra (Fundacão Elías Mansur de Cultura e Comunicação Elias Mansour) - Fernandes, Tarcisio J. G. (Universidade Federal do Acre - UFAC) - Orfanó Figueiredo, Evandro (Empresa Brasileira de Pesquisa Agropecuària - EMBRAPA) - Sousa Mascarenhas, Fluvio (Instituto Chico Mendes de Conservação da Biodiversidade - ICMBIO) - Mardini Sobrinho, Jorge (Instituto de Patrimonio Histórico Artístico Nacional - IPHAN)

Presentation Format: Oral

The project of study of earthen structures known as geoglyphs led by the universities of Valencia (Spain) and the Federal University of Acre (Rio Branco, Brazil) has different objectives but the main one, beyond, the study of the structures is the implementation of plans that allow the necessary protection of these monuments having an impact on local communities.

The project pretends to move away from interventions that could be labeled as 'neocolonialist' and contribute to the development of archaeological activity in the state of Acre. For this, it has the collaboration of the Acrean delegation of the Instituto de Patrimonio Histórico Artístico (IPHAN), la fundación Elías Mansur de Cultura e Comunicação and institutions of great social relevance as the Instituto Chico Mendes de Conservação da Biodiversidade (ICMBIO) and the Empresa Brasileira de Pesquisa Agropecuària (EMBRAPA).

The study of the geoglyphs, paradoxically, has been possible due to the deforestation of the Amazon rainforest with absolute contempt of the local communities, both indigenous and rubber workers (serengueiros). The sustainable development of these communities implies a management of the extractive reserves, mainly of the Chico Mendes one, and to that sustainable development it intends to contribute the integral study of the earthen structures known as geogplyphs. The extraordinary dimension of the phenomenon, more than 500 structures in the state of Acre (more than 150000 km2 of mainly forested surface) makes its conservation very complicated if local communities are not involved.

From the archaeological point of view, the necessary excavations have to weigh the sustainability of the project and plan activities of protection.

652 UNDERSTANDING CHANGE DURING THE UPPER PALAEOLITHIC AND MESOLITHIC

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Grimm, Sonja (Centre for Baltic and Scandinavian Archaeology - ZBSA; SFB 1266 "Scales of Transformation") - Reynolds, Natasha (UMR 5199 PACEA, Université de Bordeaux)

Format: Regular session

The Middle/Upper Palaeolithic and Mesolithic/Neolithic transitions in Europe have long been major foci of research attention. But what about the changes that occurred between these two important transformations? In the Upper Palaeolithic and Mesolithic record, we see clear evidence for changes through time in social organisation, technologies, hunting strategies, mobility, and cultural practices.

Describing and interpreting these changes is of major interest, despite the challenges. More precise and robust chronologies and the ever-increasing volume of archaeological data have strengthened our understanding of the modern human hunter-gatherer past. Environmental and climatic changes as well as the appearance and spread of new technologies are often seen as key to understanding cultural change. Beyond this, our discussions of mechanisms and meaning behind changes seen in the archaeological record seem quite limited, and there is scope for improving our interpretations and theoretical frameworks.

Questions we wish to address are:

- What kind of methodological and theoretical problems do we face when trying to compare periods and how do we overcome them?

- How do we conceptualise units of comparison (periods, cultures) and to what degree do these heuristics determine our research outcomes?

- What lessons does current research teach us about our understanding of change in the hunter-gatherer past?

In this session, we seek to provoke an epistemological debate using Upper Palaeolithic and Mesolithic case studies. Therefore, papers that

address methodological and theoretical issues are particularly welcome. Through this session, we hope to improve our understanding of a principal concept used in archaeology: change.

ABSTRACTS

01 CHANGE AND THE ARCHAEOLOGICAL RECORD

Author(s): Reynolds, Natasha (UMR 5199 PACEA, Université de Bordeaux) - Grimm, Sonja (ZBSA - Centre for Baltic and Scandinavian Archaeology)

Presentation Format: Oral

Much of our conceptualisation of change during the Upper Palaeolithic and Mesolithic is structured by our understanding of the sequence of units that have been identified since the beginning of Palaeolithic research in the late 19th / early 20th century. These units have been named and interpreted differently, for example as "archaeological cultures" or "technocomplexes". As a first level of analysis, the culture-historical framework built by them is useful for gaining an overview of variation and change and for organising our knowledge. However, although the existence of variation and temporal change within each of these units is well-acknowledged, we perhaps underestimate the influence of these heuristic categories in shaping our research. Furthermore, the history of development of this culture-historical framework has led to various idiosyncrasies and shortcomings. Here, we discuss some of this history, including the "Perigordian debate", the application of the Aquitanian sequence to other parts of Europe, and the influence of nationalist concepts, as well as more recent developments. We consider what a systematic overhaul of the framework might look like, and how we as a community could achieve that with the aim to get closer to some of our science's basic questions such as the mechanisms behind major transformations in past societies.

02 PUTTING OLD IDEAS INTO NEW BOXES - A NOVEL TYPOLOGY OF HUNTER-GATHERER SOCIOECOLOGICAL SYSTEM STATES

Author(s): Bradtmöller, Marcel (University of Rostock) - Solich, Martin (University of Cologne)

Presentation Format: Oral

Strong environmental changes on the global and local level are well documented in the Northern Hemisphere for the last 40.000 years. However, our classic Paleolithic and Mesolithic analytical units seem often to be too course-grained to properly reflect how human societies responded to these dynamics. For a better understanding how societies were able to maintain or adjust their socio-cultural structures in contexts of environmental change, an adequate approach is needed to define characteristics and strength of resilience providing structures and mechanisms in hunter-gatherer societies.

By referring to ideas from complexity theory, a new typology of hunter-gatherer systems will be presented. Specific indicators are proposed based on ethnographic and archaeological case study data to assign particular societies to a range of system states and to explain key drivers of change.

These indicators, like the complexity of land-use systems or the connectedness of networks, are not in the least new. However, they are not often used in a single classification system for diachronic analysis.

Based on a robust absolute chronology, this fluid classification system could be one solution for measuring social and economic change within hunter-gatherer groups and thereby to better investigate diachronic variance within these societies and the possible reasons behind.

03 LOOKING FOR ANT IN PALAEOLITHIC

Author(s): Mugaj, Jakub (Institute of Archaeology and Ethnology Polish Academy of Sciences)

Presentation Format: Oral

In recent years the increase interest in new theory which developed in 1980's social sciences can be observed. Emerged from post-structuralist debate in science and technology studies (STS) the Actor-Network Theory, related particularly with work of Bruno Latour, Michel Callon and John Law, focus on the relation between human and non-human actors and redefined concept of 'society' in material-semiotic approach. An attempt to combine empiricism of scientific research with relational concept of social networks established by ANT carry high interpretative potential in archaeological studies. The concept of technology derived by the theory can be significantly useful in studies of Paleolithic societies, where lithic artifacts and its technological value are often the central point of research. The question on role of technology in shaping social processes is focal point in these perspective.

Despite the rising popularity of ANT in humanities, these approach is rarely used in archaeological studies. Article is an attempt to summarize the main concepts ant terms used in Actor-Network Theory. In presented paper, I argue that Paleolithic studies may benefit from using Actor-Network Theory perspectives. Finally, the implication of using of ANT in archaeology and possible issues where the application of ANT would bring interesting results will be presented.

04 COMPARISON OF LITHIC RAW MATERIAL TERRITORIES DURING THE UPPER PALAEOLITHIC: METHODS, LIMITS AND CHALLENGE

Author(s): Caux, Solène - Sécher, Anthony - Langlais, Mathieu - Bordes, Jean-Guillaume (De la Préhistoire à l'Actuel: Culture, Environnement et Anthropologie - PACEA - UMR 5199; Université de Bordeaux)

Presentation Format: Oral

During the Upper Palaeolithic, lithic raw material territories and provisioning strategies show major changes inter and intra-techno-complexes. These provisioning territories are mostly studied to discuss mobility, distances and circulation ways of Upper Palaeolithic nomad groups. The important methodological advances in petroarchaeology, that we can observe these last decades, could have led to the division of petroarchaeological and techno-economic studies. However, provisioning strategies and selection of raw materials regarding to their properties are deeply connected to economic management and tools conception. What tools are made on which blanks (size, typo-technology)? According to which production system? What is carried on long distances and why? These concepts have changed during the Upper Palaeolithic as tools and production systems are very different from one techno-complex to another, and so lithic raw material territories are specifically defined by and adapted to each provisioning strategy. Therefore, do the distances and circulation ways observed have always the same significance in terms of mobility? How to study, compare and interpret provisioning territories during the Upper Palaeolithic?

We present here cross-studies of raw material territories and production systems for blades-bladelets lithic industries from Aurignacian (Caminade, Dordogne) and Magdalenian (Moulin-Neuf, Gironde) sites of south-west France. Highlighting the link between petroarchaeological and techno-economic approaches, we will discuss the methods and limits of study of raw materials intra-site but also the way to compare (qualitative or quantitative criteria) and interpret (in terms of mobility systems) such different results.

05 THE TYPOLOGY OF FEMALE FIGURINES OF THE EASTERN GRAVETTIAN ON THE RUSSIAN PLAIN

Author(s): Gavrilov, Konstantin (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

The Eastern Gravettian of the Russian plain is characterized by a series of realistic female figurines. It is now generally accepted that the majority of these statuettes can be divided, according to the classification developed by M.D. Gvozdover, into Kostenkian and Gagarino-Khotylevian types. However, this scheme did not describe the whole diversity of female figures within Late Gravettian in Eastern Europe. It is necessary to consider that both the Kostenkian and Gagarino-Khotylevian types can also be divided into subtypes. These relate to the images of pregnant and mature/non-pregnant women. We can also identify another subtype within the Gagarino-Khotylevian type, depicting a seated mature, perhaps elderly woman. This subtype corresponds to only one figure from Khotylevo 2. We can summarize that female figurines of the Eastern Gravettian form a complete iconographic series and include statuettes that correspond to several semantic plans.

The typological features of female figurines of the Eastern Gravettian attest, as do other types of archaeological data, that the Eastern European (Eastern) Gravettian is a complex phenomenon in terms of its internal structure, uniting culturally diverse sites. Simultaneously, the Eastern Gravettian is not an artificial combination of sites based on one or two criteria. The people who created these sites exchanged ideas, as demonstrated by the unity of the visual program. Furthermore, during the transition to the late Upper Paleolithic, the canon of female body imagery changed dramatically, corresponding to the general patterns of development of the Upper Paleolithic of Europe and reflecting people's changing worldview.

An analysis of Paleolithic art can help in understanding people's motivations. Hence, art and its changes are important for us in understanding how ancient people could comprehend the changes that took place within their world. Reducing everything to technological progress and to the "environment-human" system over-simplifies our understanding of the past.

06 UPPER PLENIGLACIAL HUNTER-GATHERER ARCHAEOLOGY IN THE WESTERN CARPATHIANS

Author(s): Lengyel, Gyorgy - Wilczyński, Jarosław - Wojtal, Piotr (The Institute of Systematics and Evolution of Animals Polish Academy of Sciences)

Presentation Format: Oral

The Upper Pleniglacial brought the coldest period to Europe in the past 130 thousand years between 21 and 17 ky uncal. BP. Gravettian hunter-gatherers occupied the region of the Western Carpathians during the Upper Pleniglacial until the maximum extent of the Fennoscandian ice sheet. The Gravettian hunters changed the knapped stone components of their hunting weaponry as the ice advanced towards their territory. During the maximum extent of the ice sheet the variety of lithic hunting tools drastically decreased, and the amplitude of this change was significant enough to distinguish the Last Glacial Maximum hunters with the term Epigravettian that represents another archaeological culture. With the ice sheet maximum extent the lithic weaponry remained poor in types. When the ice began retreating the variety and abundance of lithic hunting tools increased again in the Epigravettian, moreover the Magdalénian of western Europe partially occupied this territory. The archaeological literature of the past 40 years contains several sites which do not fit the scenario presented above. However, our revision of the archaeological record of the western Carpathians suggests that the changes in the lithic inventories were consistent and the cultural variability therefore is related with the climatic and environmental changes of the Upper Pleniglacial.

07 BONES AND LITHIC ARTEFACTS: HUMAN SUBSISTENCE STATEGIES AT WILLENDORF II SITE

Author(s): Wilczynski, Jaroslaw - Lengyel, György (Institute of Systematics and Evolution of Animals, Polish Academy of Sciences) - Göhlich, Ursula - Antl-Weiser, Walpurga (Natural History Museum Vienna) - Wojtal, Piotr (Institute of Systematics and Evolution of Animals, Polish Academy of Sciences)

Presentation Format: Oral

Willendorf II is one of the most significant Gravettian sites in central Europe, containing rich materials from an Upper Palaeolithic occupation. The site has a long history of archaeological research concentrated on lithic technology and typology, but no detailed analyses have been done of the Pleistocene faunal assemblage. Our presentation introduces the results of a recent archaeozoological analysis of animal remains, focused on mammalian bones, both carnivores and herbivores. Our results provide the basis for a fuller interpretation of Gravettian hunting strategy, the function and spatial organization of the hunter-gatherer camp, and postdepositional processes responsible for the preservation or disturbances of animal remains. The zoological materials were subjected to the standard analytical procedures used in archaeozoology, with documentation of visible traces of both biotic and abiotic processes. Our results are supported by the data collected for lithic artefacts (especially retouched tools) and newly received radiocarbon dates obtained on mammalian bones. On this basis we offer a more detailed picture of the Gravettian societies which settled the Middle Danube region, and the changes revealed in this important archaeological material.

Acknowledgments

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08 CHANGES IN THE HUMAN SUBSISTENCE PATTERNS DURING THE PLEISTOCENE-HOLOCENE TRANSITION: A REVIEW OF DATA FROM THE IBERIAN MEDITERRANEAN CENTRAL REGION

Author(s): Margalef, Cristina (Departament de Prehistòria i Arqueologia. Universitat de València) - Sanchis, Alfred (Museu de Prehistòria de València. Servei d'Investigació Prehistòrica. Diputació de València) - Morales, Juan Vicente (Departament de Prehistòria i Arqueologia. Universitat de València) - Pérez, Leopoldo (Institut Català de Paleoecologia Humana i Evolució Social - IPHES; Àrea de Prehistòria, Universitat Rovira i Virgili - URV) - Vadillo, Margarita - Aura, Emilio - Villaverde, Valentín - Pérez-Ripoll, Manuel (Departament de Prehistòria i Arqueologia. Universitat de València)

Presentation Format: Oral

In the Mediterranean Iberian region, the subsistence model during Upper Palaeolithic and Mesolithic has common characteristics: specialized hunting based on one medium-sized speciments (red deer or ibex), with a complementary consumption of other ungulates, carnivores and small preys (leporids), and even marine resources. At least from the Gravettian (Malladetes, Cendres), rabbit has an important presence (>80%) in the assemblages, mainly related to anthropogenic origin. The subsistence activities do not focus only on immediate consumption, but also on the preparation of skins and preservation activities, traditionally understood as "deferred consumption". This is a long-term strategy that continues during the Tardiglacial phases (Magdalenian and Epimagdalenian).

The Mesolithic phase supposes a breakage of this tendency, with an increase of the marine resources and a markedly drop of the rabbit presence (30-40%). The complex sequence of several archaeological sites (Santa Maira, Tossal de la Roca, Cueva de la Cocina), show a sudden change in the presence of rabbit between Epimagdalenian and Mesolithic, without an erosive hiatus between these two levels. This significant change does not fit with the long-term tendencies to diversification and exploitation of the new forest, but could be related to all the deep changes that occur with the arrival of the Mesolithic: different technologies and territorial conceptions, etc. Therefore, in this work we explore how site functionalities, relation between the costal and the interior zones and technological development have influenced the changes in hunting strategies, trying to understand why this happened. Probably the change in the rabbit and the other taxa roles in the human subsistence are not only due to prey availability, according to ecological or climatic variations. On the contrary, these could be as a result of different factors related to the human groups: more reduced mobility range, the characteristics of occupations (intensity, duration, recurrence), and/or the group size.

09 UNDERSTANDING HUMAN-ENVIRONMENT INTERACTION DURING THE UPPER PALEOLITHIC IN PORTUGAL: A MULTI-SCALE PERSPECTIVE ON THE HELP OR HINDRANCE OF TECHNO-TYPOLOGICAL FRAMEWORKS

Author(s): Haws, Jonathan (University of Louisville; ICArEHB) - Cascalheira, João - Bicho, Nuno (Universidade do Algarve; ICArEHB)

Presentation Format: Oral

At a macro-scale, the Upper Palaeolithic is marked by techno-typological changes in lithic assemblages organized into discrete chrono-stratigraphic phases thought to involve concomitant changes in social organisation, non-lithic technologies, hunting strategies, mobility, and cultural practices. Regionally, these cultural periods may be further divided. These units of comparison significantly impact our research outcomes because they set the parameters by which we ask questions and interpret data. Improvements in various dating techniques and fine-tuning of paleoclimate and paleoenvironmental data sets have significantly enhanced our ability to link climate change with cultural change but have not solved the inherent epistemological problems associated with understanding the archaeological record. Archaeologists speak and write of transitions between each phase, too often overlooking the limits and variability of existing data sets while forcing new ones into the same straightjacket. Newly excavated lithic assem-

blages from sites in Portugal offer a case study into the problem. The focus here is on the Last Glacial Maximum (LGM) and associated Upper Paleolithic cultural phases.

During the Last Glacial Maximum, abrupt climate changes created highly variable paleoenvironments inhabited by human populations across the Iberian Peninsula. Pollen and sedimentary analyses from deep-sea cores off Portugal provide records of regional-scale paleoenvironmental responses to the climate shifts that punctuated the LGM. Regional scale archaeological assemblages have been placed into a 3-part model of transition between the Gravettian and Solutrean. One site in particular, Lapa do Picareiro, has yielded a continuous, stratified sedimentary sequence that provides a diachronic record for MIS 2 human occupation and environmental change. Here we present archaeological data from the Late Gravettian, Proto-Solutrean, and Solutrean occupations (Levels U-O) in order to show how local-scale, assemblage-level variability may or may not help our understanding of human-environment interactions during this period when we try to fit them into the traditional techno-typological framework.

10 EXPLORING PERSONAL ORNAMENT PRODUCTION VARIATIONS DURING THE FINAL PALEOLITHIC

Author(s): Rigaud, Solange (CNRS)
Presentation Format: Oral

The circulation of personal ornaments in the South West of France during the Upper Magdalenian has been intensely documented, but solely based on the sourcing of exogenous shells (Taborin 1992). The recent reassessment of several key sites has allowed the analysis of bead types made of other raw materials and the registration of functional data formerly never documented. The reconstruction of the full manufacture sequence of the Magdalenian personal ornaments, from their acquisition to their discard at the sites, provides fundamental information. Results identify a complex economy involving sites dedicated to the storage of a large amount of exotic raw materials, sites where bead manufacture was intensely performed and sites where only few beads were accidentally lost. The presence of similar bead types at each category of site indicates that the chaîne opératoire of ornament production was a spatially and temporally segmented process during the Upper Magdalenian. Bead manufacture therefore played a significant role in the complex settlement pattern adopted by the last Magdalenian communities in the south west of France. This picture drastically differs from the local Epipalaeolithic. During this period, personal ornaments appear less diverse, are found in small number and no evidence of raw material management, neither manufacture at specific sites, is documented so far. These differences question the factors (environmental, demographic, ideological…) responsible for such changes.

11 HOW CAN ARTIFICIAL INTELLIGENCE HELP US UNDERSTAND THE FINAL PALAEOLITHIC PIONEERS?

Author(s): Grimm, Sonja (ZBSA - Centre for Baltic and Scandinavian Archaeology)
Presentation Format: Oral

The discussion about human pioneer populations in Northern Europe after the last glacial maximum, likewise many other archaeological records, is often restricted by the patchiness of the material preservation. The main source of information are lithic artefacts and assemblages. During the course of establishing archaeology as a science, typologies and technocomplexes were developed based on these artefacts and assemblages. However, Northern European assemblages usually originate from open air sites of which many were the result of palimpsests. Consequently, the associated appearance of specific artefacts in these assemblages was occasionally rather coincidental than a true chronological or cultural co-occurrence. Furthermore, only a small number of sites and material were excavated with modern standard procedures. Hence, the already small record of Final Palaeolithic assemblages becomes even more limited when a rigid source criticism is applied. In northern Germany, only about a dozen sites from a handful of find regions currently exist where distinct assemblages were excavated and/or well documented.

Using this record, I'm going to show that we need useful taxonomies for our records when we want to consider change in the archaeological record across larger and longer periods of time. These taxonomies must allow some synchronic as well as diachronic variation on different scales, for example within the assemblages as well as for single artefact groups and single artefact types. A possible help for analysing our record based on this kind of greyzone definitions could come from artificial intelligence and computer science where systems are increasingly taught to distinguish in probabilities rather than clear yes/no relations. Based on the northern German record, I'm going to discuss the usefulness of this approach for studying change in the past.

12 TALKING STONES - RECONSTRUCTING A CHANGE IN SUBSISTENCE AND LANDSCAPE USE DURING THE MESOLITHIC IN SOUTHERN BAVARIA

Author(s): Richter, Thomas (Kreisarchäologie Landshut)
Presentation Format: Oral

Due to climate change after the last ice age the reforestation of southern Bavaria led to a continuous change of hunter-gatherer habitats. Understanding of how hunter-gatherer groups adapted to this changing environment, is therefore crucial for understanding Mesolithic industries. The current state of Mesolithic research in southern Bavaria unfortunately comprises very few analysed sites and inventories. The vast majority of excavations on Mesolithic sites were conducted during the 1970´s and 1980´s. Since that time excavation activity on Mesolithic sites has been almost non-existent. Hence most of the known and lately discovered sites, most of which were located and secured by volunteers, yielded only surface collections. Given that most of the few excavated sites as well as the surface collections featured no – or only poor preserved – organic material, lithic artefacts represent the only source of

information for Mesolithic research in Southern Bavaria.

The present case study thus combines the statistical investigation of lithic artefacts and raw material analysis, in order to enable the recognition of settlement patterns and their adaptation to changing habitats during the Early and Late Mesolithic. Furthermore it allowed the reconstruction and comparison of changes in land use from Early to Late Mesolithic period. By integrating ethnological and archeobotanical data to research a significant change in subsistence and, consequently, landscape use from Early to Late Mesolithic period was asserted.

a. HOW CAN WE DEFINE DIFFERENT VARIANTS OF THE GRAVETTIAN? THE CASE OF THE KOSTENKI COMPLEX, RUSSIA

Author(s): Bessudnov, Alexander (Institute for the History of Material Culture RAS)
Presentation Format: Poster

At least five variants of Gravettian lithic assemblage are defined on the Russian Plain, and four of these are represented in the restricted area of the Kostenki complex. All variants have different lithic and bone assemblages, art objects and dwelling structures that are sufficient for their association with various 'archaeological cultures'. However, all share a general technology of blank production and secondary modification technique that allows them to be described as Gravettian.

Until recently it was thought that, with the exception of the Early Gravettian of Kostenki 8(II), all other Kostenki Gravettian assemblages are geologically simultaneous within the range 24-22,000 uncal BP. However, recent re-dating of most of these sites, employing up-to-date sample pretreatment methods, indicates that these Gravettian variants are relatively uniformly distributed through the period 28-22 ka uncal BP. It is now possible to trace changes in Gravettian lithic industries for at least 5000 (radiocarbon) years.

All assemblages demonstrate a similar primary knapping technique - the production of large and mid-sized blades using intensive platform preparation. Approaches to secondary modification also show no significant changes. Edge backing and the burin blow technique were widely used, as was trimming using flat retouch. The "background" tool-kit is represented by different burins, end-scrapers, splintered pieces, backed bladelets, points etc. The main difference between the variants can instead be seen chiefly in artefact types usually related to 'hunting weapons'. For the Early Gravettian of Kostenki 8(II) the presence of microgravettes is a distinctive feature. Bladelets and points with ventrally retouched edges are typical for the "Alexandrovka" variant (Kostenki 4; Kostenki 9; Borshchevo 5[I]). The Kostenki-Avdeevo Culture is characterized by wide shouldered points. Finally, Late Gravettian sites (Kostenki 21[III] and Kostenki 11[II]) contain small shouldered points and 'Anosovka' points.

The research is supported by grant RFBR №17-06-00319a.

653 BEYOND THE STEREOTYPE – THE DIVERSITY OF BEAKER BURIALS

Theme: The archaeology of material culture, bodies and landscapes
Organisers: McVeigh, Thor (National University of Ireland Galway) - Jones, Carleton (National University of Ireland Galway) - Ó Maoldúin, Ros (National University of Ireland Galway; The Irish Fieldschool of Prehistoric Archaeology) - Scholma-Mason, Owain (Independent Researcher; University of Edinburgh)
Format: Regular session

Beaker studies are a vibrant field of study and our understanding of the Beaker phenomenon is no longer constrained by a rigid definition of the 'Beaker package'. But do we yet fully appreciate the diversity of burial traditions associated with Beakers between regions and through time? This session aims to bring together researchers from all areas where Beakers are found to explore variations and consistencies in Beaker-associated burial practices.

The idea that there exist 'classic Beaker burials' has been a cornerstone of Beaker research for many decades. The 'classic Beaker burial' is widely accepted as a single adult male inhumation accompanied by a Beaker pot, a dagger, and a full set of archery equipment including a bracer. Burials incorporating elements of this grave set are certainly present across Europe in varying combinations and frequencies suggesting a widely accepted conceptual norm, but the 'classic Beaker burial' itself is extremely rare.

This raises questions about the validity of using the 'classic Beaker burial' as a template guiding interpretations of the Beaker phenomenon not only at the European scale, but also on regional and local levels. This session aims to look at the diversity of Beaker burial practices throughout the Beaker-using world. Can we now question the idea of a classic template by looking at things such as gender and age representation, diverse social structures, the influence of pre-existing local and regional burial traditions, the significance of collective burial, and the existence of differing concepts of individual identity or forms of expressing 'personae'?

01 SESSION INTRODUCTION: BEYOND THE STEREOTYPE – THE DIVERSITY OF BEAKER BURIALS

Author(s): McVeigh, Thor (National University of Ireland Galway)
Presentation Format: Oral

This paper serves as an introduction to this session on the diversity of Beaker burials and offers a brief exploration of some aspects of manifestations of 'Bell Beaker Ideology' from a multi-regional perspective. Archery symbolism, as manifest within the 'Bell Beaker Package' and the practice of individual burial are regarded as archetypal Bell Beaker funerary practices. However, individual male inhumations associated with archery equipment are not chronologically or geographically ubiquitous across the entire Bell Beaker World, and in fact great variation can be observed within the regional and local funerary practices utilized by numerous Bell Beaker-using groups. Following the adoption of Bell Beaker material culture, regional burial practices often retained elements derived from pre-existing conventions indicating varying degrees of 'ideological' continuity. Ultimately, archery associated 'warrior' or 'hunter' personae, as discernible identities constructed or negotiated in burial practices, could indicate an overarching Bell Beaker-associated 'ideology'. However, at regional and local levels negotiation of the Bell Beaker Phenomenon and this 'ideology', was undertaken with reference to pre-existing belief systems, and was not a passive or unidirectional transaction. As a multifaceted process the emergence, transmission and development of 'Bell Beaker ideology', may have involved influences derived from various geographic regions, with new ideas sometimes filtering back to the original transmission centres. Variations in Bell Beaker burial practices may in fact represent the material expression of an ongoing and progressive process of group identity formation accompanied by the redefinition of ceremonial and religious (ritual) practices. It would seem that at regional and local levels, manifestations of 'Bell Beaker ideology' in the funerary sphere probably represent a blend of 'international' ideology, material culture, traditions and beliefs, with 'regional' indigenous traits, local traditions and beliefs.

02 BEAKERLESS BEAKER BURIALS AND OTHER REGIONAL BURIAL PRACTICES IN MID-THIRD MILLENNIUM IRELAND

Author(s): O Maolduin, Ros (The Irish Fieldschool of Prehistoric Archaeology; IT Sligo; NUI Galway) - Jones, Carleton (NUI Galway)
Presentation Format: Oral

Beaker pottery and other elements of the 'Beaker package' are present in Ireland from the mid-third millennium BC. However, classic beaker burials, typified by crouched inhumations accompanied by burial goods, do not occur. Nonetheless, we still tend to define 'beaker burials' by the presence of beaker pottery or other grave goods.

Excavations of mid-third millennium BC settlements and associated wedge tombs in the Burren, Co. Clare, in the southwest of Ireland, found beaker pottery in the settlements but not with the burials. An earlier Neolithic court tomb, located in the centre of the later settlements and wedge tombs, also received burials during the mid-third millennium without any accompanying pottery. Elsewhere, within the same region, burials were placed in other Neolithic tombs, a portal tomb and Linkardstown type cist, accompanied by only a sherd of beaker pottery. Clearly there was a complex range of burial options. Choice may have been influenced by real or imagined relationships with past burials, age, gender, status or several other factors.

This paper will report on the results of three recent wedge-tomb excavations, review the varied burial practices within the Burren and Ireland during the mid-third millennium, and consider what the range of burial choices might reflect.

03 SPERM-WHALE V-PERFORATED BUTTONS FROM GALERIA DA CISTERNA (ALMONDA KARST SYSTEM, POTUGAL)

Author(s): Zilhao, Joao (Univ de Barcelona, Fac de Geografia i Historia; UNIARQ - Centro de Arqueologia da Universidade de Lisboa) - Monge Soares, António - Pereira Gonçalves, António (Campus Tecnológico e Nuclear, Instituto Superior Técnico, Universidade de Lisboa)
Presentation Format: Oral

Even though no characteristic ceramics were found, a small set of V-perforated buttons indicates that the Galeria da Cisterna cave (Torres Novas, Portugal) was used for funerary purposes by people of the Beaker culture. A small fragment of a gold spiral completes the site's Beaker context. Direct dating of human bone shows that the bodies of at least four adult individuals were deposited here during the second half of the 3rd millennium BC. The dating evidence and the broader context suggest contemporaneity with the later, so-called "incised" phase of the culture. Ancient DNA analysis has shown that two of the dated individuals were women, supporting Harrison and Heyd's (2007) suggestion that these items are female associated. The buttons belong to well-known types and their textural properties suggested they were made of sperm whale ivory. To confirm this hypothesis, we measured their density. This indicator was used because it is non-destructive and had been found by Schuhmacher et al. (2013) to discriminate well between the different types of ivory known from the Iberian Chalcolithic: hippopotamus (average, 1.8), elephant (average, 1.7), and sperm whale (average, 2.2). The values obtained for 13 specimens from Galeria da Cisterna range between 2.12 and 2.60, for an average of 2.32±0.12. These values lie well outside the range for elephant and hippo, and corroborate the proposition that sperm-whale was indeed the raw-material used.

04 BEYOND THE BURIAL VASE, THE PERSONAE? NETWORK ANALYSIS OF BELL BEAKER DECORATION DIVERSITY IN CAMINO DE LAS YESERAS (MADRID, SPAIN)

Author(s): Caraglio, Agnès (Lampea - UMR 7269, Aix Marseille Université; Departamento de Prehistoria y Arqueologia - Universidad Autonoma de Madrid) - Rios Mendoza, Patricia - von Lettow-Vorbeck, Corina (Departamento de Prehistoria y Arqueologia - Universidad Autonoma de Madrid)

Presentation Format: Oral

In the archaeological literature, the Bell Beaker tradition is usually suggested to have been epitomized by the figure of the warrior, especially through grave goods. However, the Bell Beaker tradition does not reflect a monolithic cultural "identity" but rather a real social mix reconciled at regional levels through ongoing interactions between collective and individual representations. In Central Iberia, recent studies of the Bell Beaker funerary horizon have revealed certain recurrent human behaviours and traditions, such as in the well-known Camino de las Yeseras site (San Fernando de Henares, Madrid). Our aim is to shed new light on the distribution of Bell Beaker ceramics in funerary structures through the utilization of "Social Network Analysis". For instance, are we able to establish relationships between the decoration of Bell Beaker vases and the individuals buried in single graves? Does the presence of some decorations link to age or gender? The degree of similarity between the decorations executed on the vases from single graves and those deposited in collective graves could help to highlight specific burial categories or personae involved in the spread of particular collective representations. Network analysis tools can lead us to visualise these intra-site interactions, and in some cases, gain greater understanding of the social context and the diversity of burial dynamics.

05 BELL BEAKER FUNERAL PRACTICES IN THE SOUTHERN PLAIN OF THE UPPER RHINE

Author(s): Vergnaud, Luc (ANTEA Archéologie; UMR 7044 Archimède) - Roth-Zehner, Muriel (Archéologie Alsace; UMR 7044 Archimède)

Presentation Format: Oral

In the last ten years, several Bell Beaker graves have been discovered in Alsace. Last autumn, a new funeral group was found by one of us in Ensisheim (Unpublished, still in study). With at least nine tombs, it's already the largest group ever found in our region. All these new discoveries come in addition to the forty graves previously known in the southern plain of the upper Rhine. This geographic area, flanked by the Vosges and the Schwarzwald mountains, is split between France, Germany and Switzerland. As a consequence, archaeological data are spread out among these three countries. For this paper, we attempted to regroup all the data actually available in order to make an overview of the region's Bell Beaker funeral practices. First results show that, for a large part, the graves fit particularly well into the "usual" Bell Beaker burial tradition. Thus, graves south of the upper Rhine share strong links with the Bavarian area. But there are also some elements that appear more "unusual", such as graves containing two or three corpses, bodies buried in a well, cremations, etc. Some parts of the region's Bell Beaker burial practices (gendered orientations of the bodies but also spatial organisation of funeral groups) exist in the regional Corded Ware practices as well as in the Early Bronze age ones. Despite the lack of "classic Beaker burials" (as defined in the call for papers) or megalithic graves, the southern plain of the upper Rhine seems to be a good example, on a local scale, of the diversity that can exist even in a burial tradition that appears "standardised" such as the Bell Beaker one.

06 'ADDING INSULT TO INJURY': VIOLENT DEATH FOLLOWED BY GRAVE ROBBING OF A BEAKER BURIAL AT KNOWLE HILL FARM, DORSET, UK.

Author(s): Delbarre, Gabrielle (Bournemouth University) - Pollard, Joshua (University of Southampton) - Green, Martin (Down Farm Museum, Dorset) - Smith, Martin - Allen, Michael (Bournemouth University) - Endicott, Phillip (Musée de l'Homme, Paris)

Presentation Format: Oral

This study presents the preliminary results of analysis on an unusual early Beaker burial discovered in 2016 during the excavation of an anomalous small long barrow at Knowle Hill Farm, near the "Knowlton Henge complex" in Dorset, UK. Knowlton is one of several later Neolithic monument complexes in southern England, a region where 'classic' Beaker graves are well attested.

Southeast of the barrow was a large grave pit containing traces of a wooden chamber/box, the disarticulated remains of a c. 25 years old male individual and grave goods, including an exceptional European Beaker and a large stone wristguard. Typologically, the Beaker should belong early within the currency of Beakers within the UK (c.2450-2200 BC: radiocarbon dates forthcoming).

Osteological analysis and 3-Dimensional microscopy applied to studying the human remains shows evidence for trauma consistent with a violent death, likely inflicted with a metal blade. This takes on a special significance as potentially one of the earliest instances of 'death by metal' in the UK.

The absence of metal objects from the grave assemblage is anomalous given comparison with similar Beaker burials in this area. Moreover, from taphonomic and archaeothanatological perspectives, the disposition of the bone elements within the grave suggests that the skeletal remains were rearranged after the grave was disturbed by anthropogenic action. Some of this was done with apparent care, but the widely distributed skull fragments suggest it may have been intentionally smashed.

In the absence of evidence for post-mortem manipulation of the body in a region where forms of curation of the bodies, including mummification, is well documented during the Beaker period and Bronze Age, coupled with evidence for anthropogenic agency in grave disturbance and the remarkable absence of 'classic Beaker' grave goods, Knowle Hill Farm presents an early instance of possible grave-robbing or desecration in southern England.

07 (RE)DISCOVERING AVA: THE IDENTITY OF A FEMALE BEAKER BURIAL FROM ACHAVANICH, CAITHNESS, SCOTLAND

Author(s): Hoole, Maya (HES Historic Environment Scotland)
Presentation Format: Oral

This paper will discuss the results of recent research on a Beaker burial discovered in the late 1980's in Achavanich, Caithness, Scotland. Believed to date to the Scottish Chalcolithic or Early Bronze Age, the grave – unlike the 'classic Beaker burial' – contained the remains of a young, adult female accompanied by a Beaker pot, a cattle scapula and three pieces of flint; the cist was placed within a rock-cut pit, rarely uncovered in prehistoric Scotland.

The objectives of this paper are to address the wealth of knowledge that can be extracted from historical assemblages, and to discuss the distinct identity of the individual buried at Achavanich. Recent research has revealed previously unknown data about this site through: stable isotope, osteological, pottery, zooarchaeological and pollen residue analysis; radiocarbon dating and facial reconstruction. This site, the most northerly example of a recent European wide study of ancient DNA (Olalde et al, 2018), will be set in context of its European contemporaries and compared with the earlier, local Neolithic population of Caithness.

The paper brings to life a young woman, with dark hair and brown eyes, possibly a first or second generation migrant from the continent but raised in the north of Scotland, who had no relation to the local Neolithic population. She had a meat heavy diet, farmed cattle, and was part of a community who appear to have understood the medicinal properties of the local flora. In early childhood she suffered from an illness or malnutrition and was lactose intolerant. The picture painted by this research reveals an individual quite unlike that associated with the 'classic beaker burial'.

Olalde et al 2018 'The Beaker phenomenon and the genomic transformation of northwest Europe' Nature doi:10.1038/nature25738

08 ARE WE DOING THE SAME THING? TRAJECTORIES OF BEAKER USE IN THE SCOTTISH HIGHLANDS

Author(s): Scholma-Mason, Owain (Independent Researcher)
Presentation Format: Oral

Current explanatory models of Beaker use tend to emphasise an almost linear development of Beaker pottery. This is often coupled with a stereotyped view of Beaker burials, where recurrent packages are identified and connected to wider networks. Recent critiques of this model have highlighted that whilst similarity exists there are marked regional differences, both in terms of form and the way vessels are deployed in the grave. The Scottish Highlands, extending from Inverness to Caithness, comprises regions that are often seen on the periphery of the 'Beaker network'. The low number of Beaker burials of Inverness seemingly reinforces this marginal position. In this paper I wish to highlight the potential importance of these burials in understanding the development, spread and use of Beaker pottery, from its initial emergence to its 'final floruit'. This includes the role of domestic assemblages and their relationship to funerary material. Following Needham's tri-partite structure for the earlier Bronze Age I will examine the evidence for each phase, outlining a series of regional trajectories that highlight the varied nature of Beaker burials and use across the region. Throughout this talk I will seek to highlight the polycausal nature of changes during the period, and the diversity encountered in Beaker burials, going beyond the stereotype.

09 BELL BEAKER BURIAL CUSTOMS IN NORTHWEST FRANCE

Author(s): Favrel, Quentin (UMR 8215 Trajectoires; Université Paris 1 Panthéon-Sorbonne) - Nicolas, Clément (UMR 8215 Trajectoires)
Presentation Format: Oral

Although Bell Beaker pottery and related artefacts have been recovered from Neolithic megaliths since the mid-19th century, re-examination of old and more recent excavations suggests a greater diversity of funerary practices in northwest France. Over the last decades, it has been demonstrated that the Bell Beaker grave goods are secondary in the Neolithic monuments and it has been assumed that it was the main funerary practice at that time. In older Neolithic collective graves, Bell Beaker grave goods are generally individualised and associated with few inhumations due to the soil acidity. This re-use testifies to the re-appropriation of ancestors' monuments. In addition, regional trends can be observed in the composition of the Bell Beaker set. Several apparently Neolithic megaliths seem to have been emptied in prehistory and yielded exclusively Bell Beaker materials when excavated. Such practices make some unusual megalithic graves questionable: are they the results of prehistoric emptying or Bell Beaker construction? In addition to the secondary use of collective megaliths, several individual graves are known representing less than 10% of the known burials. These graves are made of large slabs in a 'megalithic' way or, later, of dry-stone walls and could be covered by small barrows. Some of the early cists have been built re-using Neolithic barrows or carved slabs. This original architecture has few parallels in Atlantic coasts (Galicia) and also seems to be disconnected to the tradition of flat graves from Central Europe. However, such pit burials are known in Normandy and Central-Western France and we cannot exclude the possibility of their occurrence in Brittany, especially in areas lacking burial evidence.

10 KEEPING UP APPEARANCES: THE ROLE OF SOCIAL FRONTS IN BELL BEAKER EUROPE

Author(s): Wentink, Karsten (Leiden University)
Presentation Format: Oral

At first glance many Beaker graves look highly similar, but upon closer inspection a large degree of variation can be observed. Not

only between the different regions in Europe, but also on a local level. Despite the notion of a "stereotypical" Beaker grave, hardly any of them appear to be the same. When looked at in detail, they are actually all unique, but at the same time we can instantly recognize them as "Beaker".

My research focusses on the biography of grave goods and the identity of the dead in Corded Ware and Bell Beaker burials in the Netherlands. This includes functional analysis and experiments to determine how objects were made, used and deposited. Traditional interpretations were questioned and tested: Were stone battle axes really used as weapons? Were objects like beads and wristguards produced for the grave, or worn by the living? How and why were these objects selected to be placed in graves while others were systematically avoided? It will be argued that the objects found in Bell Beaker graves reflect the widespread adoption of a specific "social front" (i.e. manner of presenting oneself in a social context, a term introduced by the sociologist Erving Goffman, 1959, The Presentation of Self). The adoption of a standardized manner of social interaction between exchange partners facilitated the widespread exchange of knowledge, people and goods. It helped structure relationships between strangers, hosts and guests. The formalization of social interaction simultaneously helped to insulate local culture and local history. It therefore explains why we find a widespread adoption of "stereotypical artefacts" often either made in supra-regional styles and/or made of exotic imported materials, but at the same time both graves and settlements show a distinct local signature and connectedness with local cultural history.

11 QUINTESSENTIAL AND TYPICAL OR ECCENTRIC AND UNORTHODOX? RETHINKING BEAKER BURIAL PRACTICES IN SOUTHERN BRITAIN

Author(s): Gibson, Catriona (University of Reading)
Presentation Format: Oral

While it is now widely accepted that the pan-European spread of the Beaker complex was neither uniform nor homogenous, there are certain regions where more standardised Beaker funerary practices have been observed. This would include southern Britain where the archetypal furnished single crouched burial was seemingly routinely adopted and 'Beaker conventions' quite strictly adhered to. Yet, thanks to the wealth of data resulting from developer-led archaeology, this picture has been slowly changing over the last two decades. This paper will highlight the diverse nature of burial practices from the so-called 'classic' Beaker-using regions, which do not conform to the 'norm'. I will draw on examples of graves with unusual architecture or containing individuals adorned with eclectic grave goods. I will also tease out the wide range of burial positions and mortuary processes evident, including curation, excarnation and manipulation of bodies and parts of skeletons. An evaluation of the varied temporalities of adoption, uptake and adaptation in these different regions is also pertinent. In some areas, the Beaker phenomenon was seemingly a 'flash-in-the-pan' event, while in others, Beaker use spanned many centuries. Finally I will reconsider what these varied customs may reveal about underlying social traditions and how existing ideologies competed with or were interleaved over novel Beaker practices.

12 DISENTANGLING DIVERSITY: ATYPICAL BRITISH BEAKER BURIALS IN THEIR EUROPEAN CONTEXT

Author(s): Bloxam, Anna (University College London)
Presentation Format: Oral

The Beaker phenomenon in Britain has traditionally been strongly associated with a highly standardised crouched articulated inhumation rite. In this paper I argue that the enduring focus on these 'classic' Beaker burials has led to the evidence for a variety of other contemporary funerary practices being largely overlooked.

While some researchers have highlighted individual examples of Beaker-period burials that fail to match the stereotype, until now there has been no systematic review of the available evidence for the full range of burial practices across Britain during this period. Having carried out this study as part of my doctoral project, I provide an overview of my findings and argue that a high degree of funerary diversity continued throughout the British Beaker period (c.2450-1950 BC). I adopt a multidisciplinary approach drawing on archaeology, osteology, and probabilistic radiocarbon modelling, and present new osteological and radiocarbon analyses to support my findings.

Focusing on the cremation burials, I explore the implications of these results for our understanding of the nature of the Beaker phenomenon in Britain as well as its relationship to both pre-existing and subsequent insular cultural forms and their funerary practices. I consider my findings in relation to the evidence from Continental Europe and explore how my work fits into the growing evidence for local and regional variability across the Beaker phenomenon more widely.

13 BEAKER-ASSOCIATED BURIAL ACTIVITY AND IDENTITY CONSTRUCTION FROM AN IRISH PERSPECTIVE

Author(s): Carlin, Neil (University College Dublin)
Presentation Format: Oral

The Irish manifestation of the Beaker phenomenon is often presented as being rich in settlement remains, yet lacking in a funerary component. However, the archaeological reality is more complex. Although stereotypical burials are rare, there is a much greater body of evidence for Irish Beaker-associated funerary activity than has been previously recognised. Furthermore, it is important to note that in Ireland, many of the supra regionally styled items such as tanged copper daggers, wrist bracers, v-perforated buttons

that typically occur in Beaker graves were actually deposited within natural places, either as single finds or in hoards. In this paper, I will characterise Beaker-associated activity in a sepulchral context and situate this within the wider context of Beaker-associated deposition in Ireland and beyond. I will highlight that Beaker objects were very selectively deposited in particular ways within specific types of contexts. I will argue that collectively, this seems to strongly relate to the construction and expression of shared group identities and values. It seems that whether Beaker objects were deposited in a grave or another context, that people in various regions were enacting different versions of the same ceremony. This situated them within a much wider community linked together through exchange and sharing of objects, values and cosmology. I will examine the implications of this for current understandings of Beaker burials and the Beaker phenomenon in Europe.

14 THE BEAKER PEOPLE PROJECT – AN OVERVIEW

Author(s): Montgomery, Janet (Durham University) - Sheridan, Alison (National Museums Scotland)
Presentation Format: Oral

The Beaker People Project was a major research project, funded by the Arts and Humanities Research Council, which ran from 2005 to 2010 and was led by Professor Mike Parker Pearson (University College London). It set out to investigate mobility and diet among the people who were buried with Beaker pottery in Britain, and it constitutes the largest programme of isotopic analysis yet undertaken for British prehistory. This presentation summarises the results of that project, and also those of a similar but smaller-scale project, Beakers and Bodies, that was funded by the Leverhulme Trust and which focused on individuals in north-east and south-east Scotland; the results of that project have been integrated within the larger Beaker People Project. Overall, over 370 individuals were studied, and of these a large proportion were analysed for their carbon, nitrogen, strontium, oxygen and sulphur isotope values (in various combinations). A large number of radiocarbon dates were also obtained. This reseach was able to address questions of long vs. short-range movement and of regional dietary variability; the results complement those more recently obtained through ancient DNA analysis. While the latter clearly demonstrate immigration from the Continent shortly after 2500 BC, the isotopic data have identified only a few individuals who seem to have travelled significant distances during their life; most of the movement detected isotopically is over smaller distances, usually around 30 km. This discrepancy is largely a function of sampling, since most of the individuals studied in the Beaker People Project post-date the first generation of settlers, and the inability of isotopes to identify movement between regions of similar climate, environment and geology.

15 WOMEN AND MEN IN BELL BEAKER FUNERARY CONTEXTS : CHALLENGING GENDER PATTERNS' INTERPRETATION THROUGH RITUAL PROCESSES

Author(s): Bailly, Maxence (Aix-Marseille Université)
Presentation Format: Oral

The display of Bell Beaker material culture in graves has been extensively investigated since the beginning of Bell Beaker studies one century ago. The relevance of a gender pattern in grave goods deposits has been underlined for a long time. It is nowadays a common idea shared for years by european archaeologists that a deep and clear gender pattern separated women and men in Bell Beaker funerary practices.

Since then, much attention has been paid to the constitution grave goods assemblages, mostly focusing on drinking set and weapons from male graves. These facts are closely linked to the image of the Bell Beaker that archaeologists built over the years, where male identity seems to be defined by war paraphernalia.

Less investigations have focused on the grave goods from « female graves ». It is supposed that the lack of weapon and the lesser amount of decorated vases provide lesser informations about the Bell Beaker phenomenon. One may think that a clear gender bias has been created by archaeologists themselves minoring the scientific potential of the female half of the funerary record (nothing new under the sun).

The purpose of this paper is to investigate the relevance of such an assesment. Examinig archaeological datas from several area of the Bell Beaker phenomenon, we would like to pinpoint gender complementarity in the ritual performances and we shall underline gender invisibility in economic field of the bell beaker communities. Furthermore, and once more, the differences between central and western Europe raise several questions to deal with.

16 'EXTRAORDINARY' BELL BEAKER BURIALS FROM THE NETHERLANDS

Author(s): Drenth, Erik (BAAC)
Presentation Format: Oral

The Bell Beaker Culture in the Netherlands, dated to c. 2400-1900 BC, is well known for its barrows and flat graves. Despite the apparent similarities between the burials within the Dutch dataset, burial customs were more diverse than they may first appear. Firstly, there are secondary interments known from megalithic tombs erected by the West Group of the Funnel Beaker Culture c. 3400- 3000 BC. Practically every megalithic tomb that has been investigated has yielded evidence of secondary burials. Alongside these there is evidence for, partial interments, including the burial of skulls under inverted Beakers. The context in which these took place seems to have varied, with examples from within and outside settlements. The question arises of course what these 'extraordinary' burials mean. To a large extent this remains to be seen. At present there are no hints that the secondary interments

in megalithic tombs and partial interments were an age- and gender-related phenomenon. The international Bell Beaker 'package' is typified by archery equipment and its associated 'ideology' is often suggested to have been connected with a 'warrior ideal'. Although it is not plausible to suggest that these burials all relate to a specific cause of death, in particular one by bow and arrow, within the Dutch burial record there are at least a barrow grave and a flat grave in which the interred appear to have been the victims of archery based violence.

17 THE PLACE OF THE BELL BEAKER TRADITION IN THE BURIAL PRACTICES OF THE NORTH EUROPEAN LOWLANDS

Author(s): Czebreszuk, Janusz (Adam Mickiewicz University, Poznań) - Mueller, Johannes (Christian Albrechts University, Kiel) - Szmyt, Marzena (Adam Mickiewicz University, Poznań) - Matuszewska, Agnieszka (University of Szczecin) - Teska, Sebastian - Jaeger, Mateusz (Adam Mickiewicz University, Poznań) - Bock, Annalena (Christian Albrechts University, Kiel) - Ławniczak, Marcin (Adam Mickiewicz University, Poznań) - Raese, Hendrik (Cristian Albrechts University, Kiel)

Presentation Format: Oral

In the North European Lowland zone (North-eastern Germany and North-western Poland), the Bell Beaker tradition manifests itself in a specific way, mainly in settlement contexts. Therefore, its presence within the sepulchral sphere has not been a central aspect of previous research. The authors intend to show that the presence of the Bell Beaker tradition in funerary contexts across the lowlands south of the Baltic has great scientific potential. These features appear both in the context of megalithic tombs, the roots of which reach back to the Funnel Beaker culture, as well as in the graves of people with traditions connected with or referring to the Corded Ware culture. Within the study area the Bell Beaker characteristics exist alongside other cultural traditions and represent one component of the specific regional cultural milieu present within this geographic area during the Neolithic-Bronze Age transition. Thanks to new chronological data, it is now possible to more accurately recognize the juncture during which Bell Beaker features first appeared within the study area, as well as a deeper insight into the dynamics of their stylistic changes. An ongoing question concerns reconstructing the cultural significance of the Bell Beaker tradition and its role in the transformation of communal identities.

18 VARIABILITY OF BURIAL RITES AND BEAKER COSMOLOGY

Author(s): Turek, Jan (Institute of Archaeology, Czech Academy of Sciences, Prague)

Presentation Format: Oral

At the beginning of the 3rd Millennium BC a new cultural phenomenon emerged in the north Black Sea area. A very influential concept of cultural uniformity wherein personal social status was signified by symbolic artefacts and emphasized through burial in individual tombs was established in the environment of the Yamnaya Culture. It is likely that this development was the catalyst which facilitated the establishment of the early complex societies which dominated most of central, western and northern Europe during the 3rd Millennium BC and laid the foundations of European Bronze Age Civilisation. This process was probably fuelled by a new ideology/religion spread alongside the highly prestigious, essential technology of copper metallurgy. The Corded Ware and Bell Beaker phenomena represent a specific period that differs in many respects from preceding cultural and cosmological developments. Funerary activity from this period is highly visible archaeologically. The individual burials represent age and gender social categories in a very orthodox way. In contrast to burial activity, contemporary settlement evidence is less visible archaeologically. It is likely that this absence of visible settlement traces is not the result of changing subsistence strategies, but rather a consequence of strict fundamental cultural norms which halted the construction of sunken profane (settlement) features and the use of hill-tops (Neustupný, 1997; 2008). It should be noted that in some regions the prevalence of the Beaker Package, including the burial rites, influenced only a certain portion of the cultural tradition. Regarding the motivation for abandoning, or partly diverting from the local cultural traditions by local populations, and for accepting new Beaker cultural norms we have to bear in mind that not all of these elements were fully accepted within whole territory of Beaker impact. In this paper I am going to discuss the temporal and spatial variability of Beaker burial rites.

655 ROCK ART AND ARCHAEOLOGICAL SCIENCE – EXPLORING METHODOLOGICAL ADAPTATIONS, INNOVATIONS AND LIMITATIONS

Theme: Theories and methods in archaeological sciences

Organisers: Wesley, Daryl (Research Fellow Department of Archaeology Flinders University) - Jones, Tristen (Visiting Fellow Research School of Earth Sciences The Australian National University) - Domingo Sanz, Ines (ICREA Research Professor Section of Prehistory and Archaeology The University of Barcelona) - Veth, Peter (Kimberley Foundation Ian Potter Chair in Rock Art Centre for Rock Art Research and Management The University of Western Australia)

Format: Regular session

Over the past 30 years contemporary archaeological rock art research projects have expanded in their breadth of focus. Increasingly archaeologists do not only record art images and their context but now also employ a variety of archaeological scientific methods requiring specialist scientific expert knowledge and skills. These methods often require novel adaptions and innovations in order to be applied in rock art research

contexts. In many instances the uniqueness of rock art contexts combined with multiple micro and macro geo/environmental settings can place significant limitations on the viability of some methods, the instrumentation and the sampling and research strategies employed on a project. In this session we invite colleagues from around the world to detail research case studies that highlight the successes, failures and potential of novel scientific methodological approaches to investigating rock art. Suggested topics that are welcomed in this session include (but are not limited to):

- Rock art dating methods, protocols and standards (Uranium-Thorium series, AMS radiocarbon, Thermoluminescence, OSL) and geochemical / isotopic analysis of associated dated materials;
- Materials characterisation (microscopy and spectroscopy) and technique application in rock art research;
- Quantitative analytical methods (statistical and computational research methods such as GIS, geometric morphometrics)
- Digital recording technologies (3D modelling, digital image enhancement and processing)

ABSTRACTS

01 SERPENTS GLEN (KARNATUKUL): NEW WAYS OF CONTEXTUALISING OLD (AND YOUNG) ROCK ART IN AUSTRALIA'S WESTERN DESERT

Author(s): McDonald, Jo (UWA CRAR+M)

Presentation Format: Oral

The re-excavation of Karnatukul has recalibrated the oldest occupation site in the Australian arid zone to 50,000 years ago. But it is the contextualisation of the Holocene rock art assemblage – though direct pigment dating (using plasma oxidation and AMS) and the correlation of the art and occupation assemblages which has allowed us to better understand how arid zone hunter-gatherers have inscribed their social geographies through time. Analysis of pigment found in occupation deposits – as well as that found in motifs on the shelter walls, has included the use of X-ray diffraction. Superimposition analysis using Harris Matrix Composer has disentangled the sequence of pigment art production across the site's 13 panels; and the mapping of the phased art production using a 3D model of the shelter panels has assisted in understanding how signalling behaviour has changed spatially through time. This paper discusses the suite of innovative techniques including AMS direct dating, pXRF, image enhancement (DStretch and digital tracing using Adobe Illustrator), 3D photogrammetry, and Harris Matrix Composer which have been used to understand pigment art production in this important arid zone site. These applications of novel methodologies highlight the increased research potentiality of rock art as an archaeological dataset.

02 OXALATE MINERALS FOR ROCK ART DATING: NEW DEVELOPMENTS AND APPLICATIONS

Author(s): Levchenko, Vladimir (ANSTO) - Jones, Tristen - King, Penelope (Australian National University) - Williams, Alan (ANSTO) - Finch, Danien (University of Melbourne) - Pecchioni, Elena - Vasseli, Orlando (University of Florence)

Presentation Format: Oral

Development of AMS allowed targeting oxalate minerals – whewellite and wedellite as a dating material for rock art. Further studies have demonstrated that carbon in oxalates is not derived from the substrate on which they grow but most probably originate from bacteria and other microbiota residing on rock surfaces utilising atmospheric source. The other rock surface objects which potentially carry oxalates are the remnants of mud dauber nests. Oxalates could form post-construction from bacterial activity utilising favourable conditions in the nest stump. One more recognised source of oxalates associated with rock art is the use of plans sap as a binder for mineral pigments. In all instances oxalates on the rock surface exist in a mixture with other materials which could be carbon bearing contaminants. Hence the study of a bulk sample ends in radiocarbon concentrations of an average of all carbon compounds with unknown source and relationship with the inferred art. Therefore, chemical pretreatmed methods were developed to isolate and target a specific compound, in our case calcium oxalate. We present and discuss some methodological data of studying oxalate crusts from various objects following a compound-specific dating approach and some further applications to date rock surface deposits from Australian and African rock art sites. The presence of whewellite and mineral skins compositions were also investigated with X-ray diffraction, scanning electron microscopy and infrared spectroscopy methods. Selectiveness of the method and planned studies are considered.

03 ROCK, PIGMENTS, AND BIODEGRADATION: CHALLENGES AND POTENTIALS OF THE PHYSICOCHEMICAL STUDY OF ROCK ART. AN AFRICAN OVERVIEW

Author(s): Gallinaro, Marina (Dipartimento di Scienze dell'Antichità, Sapienza Università di Roma) - Zerboni, Andrea (Dipartimento di Scienze della Terra 'Ardito Desio', Università degli Studi di Milano)

Presentation Format: Oral

In the last decade, physicochemical analyses have been largely applied to examine the composition of rock art paintings and obtain direct radiometric dating. Different sampling and analytical methods have been applied on rock art from different parts of the world. However, results are often problematic in terms of their reliability, mainly for what concerns the chronology. This is due to a wide range of fossil and active biodegradation processes affecting rock surfaces and pigments; such processes are still widely underes-

timated. Furthermore, even if the development of the techniques allows minimizing the amount of pigment to be analyzed, also fresh methodologies remain largely invasive, sometimes accelerating the deterioration of this fragile heritage. The action of sampling, in fact, intrinsically triggers the possibility to enhance the threatening of rock art, perturbing a metastable system and enlarging the surface on which biochemical processes may act.

This paper aims to propose a systematic review of physicochemical analyses carried out in several African contexts, in order to evaluate their potentiality and limitations. On the basis of some case studies from different African countries, we discuss the relevance of the results in the framework of biodegradation processes and the invasiveness of sampling. We believe, indeed, that to define protocols and best practices on the sampling and analyses of pigments is now mandatory, in order to limit an indiscriminate increase of samplings, that risk to have as a main result the loss of a non-renewable heritage.

04 3D RECORDING AND ABSOLUTE DATING OF THE LATEGLACIAL ART RECORD OF SICILY (ITALY)

Author(s): di Maida, Gianpiero (Graduate School Human Development in Landscapes, Christian-Albrechts Universität zu Kiel) - Mannino, Marcello (Department of Archaeology and Heritage Studies, School of Culture and Society, Aarhus University; Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology, Leipzig) - Pastoors, Andreas (Institut für Ur- und Frühgeschichte, Friedrich-Alexander-Universität Erlangen-Nürnberg) - García-Diaz, Marcos (Faculty of Humanities and Social Sciences, Universidad Internacional Isabel I de Castilla) - Zilhão, João (UNIARQ - Centro de Arqueologia da Universidade de Lisboa, Faculdade de Letras de Lisboa, Universidade de Lisboa; Institució Catalana de Recerca i Estudis Avançats - CREA; Universitat de Barcelona, SERP - Seminari d'Estudis i Recerques Prehistòriques; SGR2014-00108, Departament d'Història i Arqueologia, Facultat de Geografia i Història) - Hoffmann, Dirk (Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology, Leipzig) - Pike, Alistair (Department of Archaeology, University of Southampton) - Olsen, Jesper (Department of Physics and Astronomy, Aarhus University) - Terberger, Thomas (Niedersächsisches Landesamt für Denkmalpflege)

Presentation Format: Oral

Following a short but successful pilot study (Tusa et al. 2013), in 2014 one of the authors (GdM) started a PhD, focusing on the rock and mobile art record of Lateglacial Sicily: the aim was to record it anew with digital methods and - if possible - of attempting to indirectly or directly date it, to establish the exact chronology of its production and environmental context.

After 3 years of work, the outcomes of that research will be presented in this talk, by using the case of the Grotta delle Incisioni all'Addaura - one of the most important caves with Upper Palaeolithic art in Sicily.

In particular, the 3D models executed with both a structured light scanner (di Maida 2016) and with the Structure from Motion (SfM) will be compared, and the potential and limitations of these two methods briefly discussed. Additionally, the first attempt to obtain an absolute age estimate for the engraved panel - containing, among other images, also the famous and enigmatic scene known as the 'Addaura scene' (Bovio Marconi 1953) - will be reported, with a discussion on the problems connected with a similar dating attempt.

Bovio Marconi, J. 1953. "Incisioni rupestri all'Addaura (Palermo)." Bullettino di Palentologia Italia- na, Nuova Serie 8 (5):5-22.

Di Maida, G. 2016. "3D in the cave: Hey young deer, why the long face (and no tail)?" Rock Art Research 33 (2):209.

Tusa, S., G. di Maida, A. Pastoors, H. Piezonka, G.-C. Weniger, & T. Terberger. 2013. "The Grotta di Cala dei Genovesi-New studies on the Ice Age cave art on Sicily." Praehistorische Zeitschrift 88 (1-2):1-22. https://doi.org/10.1515/pz-2013-0001.

05 FROM 3D TO 4D: A STEP FURTHER IN ROCK ART DIGITAL RECORDING, MODELLING AND VISUALIZATION. COVATINA SITE AS CASE STUDY

Author(s): Domingo Sanz, Ines (ICREA; University of Barcelona / SERP) - Román, Dídac (University of Barcelona / SERP) - Lerma, José Luis - Cabrelles, Miriam (Universitat Politècnica de València)

Presentation Format: Oral

This communication presents a further step towards the comprehensive documentation of prehistoric rock art: the combination of 2D historical and recent photographic records and digital tracings with 3D models to build a 4D metric model of a Levantine rock art site.

Both digital photogrammetry and terrestrial laser scanning were combined for the metric documentation of the Levantine paintings located at la Covatina del Tossalet del Mas de la Rambla site (Vilafranca, Castellón).

The aim of this project was to create a digital product to be used as a tool to improve archaeological research on the dynamics of rock art through time.

Since the discovery of the site in the 1970s both natural and anthropogenic actions have been responsible of a clear worsening of the visualization of the motifs. Our recent study led us to suggest two preventive conservation interventions, to remove surface dust and graffiti, resulting in a significant improvement of the view of some motifs and the discovery of some others. This case study is of special interest since the resulting product is not only of interest to evaluate and monitor rock art deterioration through time but also to observe the improvement of rock art visualization after the two preventive conservation interventions conducted in 2015 and 2017.

06 DOCUMENTING ROCK ART WITHIN ITS WIDER LANDSCAPE. AN EXPERIENCE OF 3D MAPPING IN THE HUALFIN VALLEY (CATAMARCA, ARGENTINA)

Author(s): Parcero-Oubiña, César - Fábrega-Álvarez, Pastor (InstiCiencias del Patrimonio, Consejo Superior de Investigaciones Científicas) - Lynch, Julieta (División Arqueología, Museo de La Plata, CONICET, FCNyM, UNLP)

Presentation Format: Oral

The use of digital tools for the 3D documentation of archaeological sites and artifacts, rock art among them, has become extremely popular in archaeology in the last years. When compared to other archaeological features, rock art poses some additional challenges for 3D documentation, namely the need to combine different granularities in order to document both the details of the engravings and the general layout of the terrain around, assuming that we are interested in approaching rock art from a landscape perspective.

In this paper we will present the process we followed for the 3D documentation of the site of Villavil 2, in the Andean valley of Hualfin (Catamarca, Argentina). This site that occupies a scenic location in the landscape, on top of a vertical cliff with difficult access that gives access to a dead-end gorge where different remains of ancient activity are visible on the ground. Different engravings exist on some rocks located near the edge of the cliff, dating from the Desarrollos Regionales (ca. 1000 -1430 AD) and Inca (1430-1532 AD) periods. A combination of low altitude aerial images taken from a UAV and ground photography allowed us to create a mosaic of different granularity of both the rock engravings and the whole area, that were processed to produce different 3D models, not without some difficulties.

The paper will discuss the challenges, costs and benefits of the field documentation and the production of the 3D models, with a special emphasis on the possibilities and limitations for the use of the 3D datasets that we have produced. We will also present some preliminary results of the archaeological characterization of the site.

07 PIGMENT, ROCK ART PAINTINGS AND ARCHAEOLOGY OF COLOR IN ATACAMA DESERT (NORTHERN CHILE). METHODOLOGICAL APPROACH FOR COLORFUL MATERIALS

Author(s): Sepulveda, Marcela (Universidad de Tarapaca; UMR 8220 LAMS- CNRS- Sorbonne Universités; UMR 8096 ARCHAM- CNRS)

Presentation Format: Oral

In the last decade, the analysis and physical-chemical characterization of pigments in rock or parietal art have become important. This archaeometric trend has been demonstrating the wealth of analytical approaches available, as well as the variability of problems that can be addressed from the study of pigments. However, it rarely reveals the archaeological implications related to the use of one technique over another, to the advantages or limitations of specific sampling protocols or sample preparation.

In the Atacama Desert from Northern Chile, the pigment is present on a large number of support: rock art, ceramic, wood, among others. We can also find it in different form of shell, wood and ceramics containers. The presence of several sources of raw material can contribute to understanding the importance of pigment production and the different stage involved in its exploitation. All of these allow us to study not only its economic implication but also its social uses. Contexts of consumption and signification of pigment can finally allow us to insert rock art practice in a more general archeology of color.

In this approach, the methodology established must contemplate the diversity of supports. Rock art pigment analysis must consider the possibility to compare their results with analysis realized on other supports. Two problems are very significant: 1) the nature of rocky support and 2) the formation of patinas over the paintings. Both limits the option of portable instrument analysis. The sample is necessary but moreover, it is their preparation. Elemental and molecular analysis are essential, but microscopic and images obtained by Scanning Electronic Microscopy are very important as they make possible to precise the morphology, the dimension and mixture of the different compounds. We present few cases of analysis to illustrate our purpose.

08 CAVE AND ROCK ART IN PRE- AND PROTO-HISTORIC ABRUZZO, CENTRAL ITALY. A STUDY ON USE AND PIGMENTS

Author(s): Vianello, Andrea - Tykot, Robert (University of South Florida) - Di Fraia, Tomaso (University of Pisa - ret.) - Palmerini, Guido (Independent researcher)

Presentation Format: Oral

In 2017 a survey of rock art recently discovered in Abruzzo, Italy, was carried out in parts of the Italian region after reports of cave and shelter art. A non-invasive portable X-ray fluorescence (pXRF) spectrometer was used to chemically characterize the pigments and determine whether the paintings are compatible with prehistoric techniques (e.g. use of ocher, charcoal, etc.) in the absence of reliable radiocarbon dates and evidence of modern use at some locations. The sites are located near the modern towns of Civitaluparella ("Parete Manzi" and "Parete Di Cicco") and Pescosansonesco Vecchio. Further (incised) rock art has been surveyed at Montelapiano near Civitaluparella. The art includes incised and painted figures and geometrical signs probably associated with activities in the landscape such as hunting and transhumance.

The spatial distribution of the rock art shows scattered sites, generally in areas difficult to access but on or near traditional routes between settlements (mostly found on top of hills since protohistoric times at least). They represent special locations on the anthropized landscape, which were likely frequented often from the known trails from the past, and some show evidence of intensive wear of stones. However, the production of the art was very limited until modern times, so that there must have been cultural or ritual constraints in producing the art. Stylistically, the art appears relatively late, perhaps Bronze Age, according to the earliest

archaeological traces found near the sites. There is no evidence of Roman inscriptions or art except for a single line of text in a local Italic language, suggesting that the practice of producing art was relatively short-lived, likely the remnant of a very old tradition. In one cave, the art consists primarily of hand impressions made with red paint (ocher).

09 THE COLOR PALETTE OF THE PAINTS IN THE CHAMBER OF CHAOS AT SHULGAN-TASH (KAPOVA CAVE), RUSSIA

Author(s): Pakhunov, Alexander - Devlet, Ekaterina (Institute of Archaeology Russian Academy of Sciences) - Grigoriev, Nikolai - Gainullin, Danir (Centre for the Protection and Management of Immovable Cultural Heritage of Bashkortostan Republi)

Presentation Format: Oral

Shulgan-Tash (Kapova Cave) in the Southern Urals is a unique Upper Paleolithic site with numerous parietal art made with red paints of differed shades from light red to dark cherry. Different recipes of these paints have been found, as well as that charcoal was used as an admixture to the red or independently for outlining some images. Painting techniques were versatile and varied in different parts of the cave.

Implementation of the program on cave preservation in autumn 2017 led to a unique discovery: from under the thick calcite sediments there was revealed an image of a camel, which is chronologically synchronous to the rest of the figures on the plane with a negative slope, formerly known as the panel "Horses and Signs" in the Chamber of Chaos.

One may think that the camel image uncovered from under the calcite sediments of different thickness and structure was made with paints of different colors. However, the documentation in the infrared and ultraviolet ranges suggests that the figure is painted in the same color, and the visual difference between the dark and light parts within the image is due to the state of preservation on the edges of the figure: some components could be washed out from the paint already in the antiquity. It was also confirmed with the help of Raman spectroscopy since small particles of charcoal were preserved at the weathered parts of the image. This finding confirms that the recipe with the use of ochre and charcoal mixture is used at least two times at cave and it probably may be a chronological indicator for the paintings. This study was supported by the Russian Foundation for Basic Research Projects 17-29-04172, 17-31-00025.

10 A COMBINATION OF IMAGING AND ANALYTICAL STUDIES OF PAINTED BURIAL SLABS FROM THE KARAKOL (ALTAI REPUBLIC, RUSSIA)

Author(s): Devlet, Ekaterina - Pakhunov, Alexander (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Oral

The combination of imaging techniques with the analytical studies of pigments significantly broadens our understanding of prehistoric art at slabs in the stone cists of the Karakol burial ground. This site from the Altai Republic is well-known for its unique examples of the Bronze Age art. New AMS 14C dates confirm the second half of the 3rd - the early 2nd millennium BC. Karakol images are among the brightest manifestations of the artistic and ritual activities of the Bronze Age. For the construction of stone cists, Bronze Age inhabitants of Altai re-used stone fragments with petroglyphs made on them earlier. In most cases, those fragments were deliberately arranged not vertically, but horizontally. This act of overthrowing idols was accompanied by painting of new images - the important characters of the new period.

The images of the ceremonial procession participants were done with a combination of various techniques. With the help of RTI a lot of fine engraved lines was revealed. Some of them formed into new undocumented figures. Infrared imaging was used for the visualization of pecking technique due to the difference in reflectivity of host rock and weathered surface of the slabs. Samples of paint were analyzed using OM, SEM-EDX and Sy-XRD at the National Research Center "Kurchatov Institute". Results make it possible to differentiate, using the instrumental analysis, intentional painting from natural coloration. The composition of pigments suggests that both the images and the contouring lines were made with one and the same red paint. However, while the pigment's composition is homogeneous in each burial, it differs between the burials. Some of rock art image solar-headed anthropomorphs, etc.) find analogues in the Bronze Age rock art of the Middle Yenisei area, Kazakhztan, Kirgizia, etc.

This study was supported by the Russian Foundation for Basic Research Projects 16-01-00418.

11 CHASING THE PLEISTOCENE? METHODOLOGICAL ISSUES ESTABLISHING CHRONOLOGIES FOR DEPICTIONS OF ANIMALS IN ROCK ART OF ARNHEM LAND, AUSTRALIA

Author(s): Wesley, Daryl (Flinders University) - Jones, Tristen (Australian National University) - Levchenko, Vladimir (Australian Nuclear Science and Technology Organisation)

Presentation Format: Oral

The earliest evidence of Australian rock art could exist in the rugged sandstone plateau of Arnhem Land, Australia. Within this abundant early rock art are paintings of animals, some of which are extinct. Arnhem Land rock art could have significant antiquity given the finds of pigment on a detached sandstone slab of rock dated to 28,000 years old and ochres pigments found in rockshelter sediments up to 65,000 years old. Rock art has generally been resistant to being easily dated. Advances have revealed the world's oldest depiction of an animal to 35,400 years old on an Indonesia island. Along with rock art's chronological problems is the lack of

paleontological evidence in Arnhem Land to tell us about animals, and how people interacted with them, beyond the mid-Holocene in northern Australia. Investigating the potential antiquity of rock art paintings of animals in Arnhem Land and how people interacted with changing environments in northern Australia especially in the LGM. The application of archaeozoology, traditional ecological knowledge and radiocarbon dating approaches to the analysis of animals in rock art are integral to combine scientific approaches. Reliably establishing the antiquity of an early phase of rock art in Australia has significant implications for understanding past human interactions with animals, environments, and climate change in northern Australia.

a. MODERN METHODS FOR THE EXPERIMENTAL-TRACEOLOGICAL STUDY OF THE WHITE SEA PETROGLYPHS

Author(s): Fedorova, Daria (Institute of history of material culture of Russian Academy of Sciences)
Presentation Format: Oral

Petroglyphs of the Russian North are amongst the most famous rock art assemblages in Russian nation. This study examines the petroglyphs of New Zavaluga which are part of the White Sea rock art complex. However, determining the age of these images and other monumental rock art of this region is very problematic and difficult to resolve. The application of experimental and traceological analyses provides an opportunity to define and interpret the types of technology utilised when creating these petroglyph assemblages. Digital 3D fixation in combination with both experimental and traceological analyses assists in defining the material traces from petroglyph production. Therefore, this combination of methods allows us to determine which of the petroglyphs are made by stone and those that are made by metal. This innovative approach provides the potential for chronological interpretations to be made about the timings of different petroglyph creation. Through the application of these innovative methods and interpreting the method of production of the petroglyphs, it is possible to define images produced prior to the emergence of metal tools in this region. Classification of the production of the different petroglyph motifs provides a means to specify their relative periodization. These methods support the ability to provide age estimates of the different petroglyph monuments of the region executed on the various types of underlying geology. This program of experimental and traceological research is has only been recently applied to rock art in this region. An objective of this research is the continued development and application of these techniques for other petroglyph assemblages elsewhere. In the future, it is proposed that these methods will lead to reconstructing the oldest and most ancient technologies for the production of petroglyphs of the Russian North, with opportunity to gain further interpretations of which petroglyphs were made from stone or metal tools.

657 BOUNDARIES AND REGIONS IN IRON AGE (CELTIC) AND ROMANO-CELTIC RELIGIONS

Theme: The archaeology of material culture, bodies and landscapes
Organisers: King, Anthony (University of Winchester) - Haeussler, Ralph (University of Wales, Trinity Saint David) - Spickermann, Wolfgang (Institut für Alte Geschichte und Altertumswissenschaften, Universitat Graz)
Format: Regular session

Boundaries are important in ancient religions. Sacred landscapes marked boundaries between communities, while religious ceremonies created the boundaries in towns and cult places. This is well-studied for the Greek world, but for the Iron Age and Roman Europe is still comparatively ill-understood. The aim of this session is to gain a better understanding of the nature of religious boundaries as seen in archaeological contexts from across Europe.

It seems that there is a much wider range of religious boundaries in Roman times. For example, new Roman-style temples would challenge pre-existing understanding of religious space in the community. While Iron Age sanctuaries continued with pre-Roman forms of boundaries (e.g. ditch and palisade), other cult places demonstrate innovation, like the natural springs that became monumentalised. Pre-Roman features were frequently appropriated as sacred boundaries, e.g. Iron Age ramparts for new Roman sanctuaries on hilltop sites, e.g. Le Castellar, Provence. We also need to study temporarily sacred spaces, often created for a seasonal/annual event, and how they were demarcated in the landscape.

The session also explores broader concepts, like the boundaries between 'religions' (local/native deities, Graeco-Roman deities) – that become very permeable in the 1st–3rd century AD. Traditional 'polis religion' seems to have reduced as a result: reducing further in the 3rd-4th century when greater individualism in religious identities, especially amongst elites, sees increasing focus on personal, not public spaces. Data distribution patterns allow us to study changing religious boundaries within Iron Age and Roman Europe, and their relationship to regional identities.

01 BOUNDARIES AND REGIONS IN CELTIC AND ROMANO-CELTIC RELIGIONS: INTRODUCTION

Author(s): King, Anthony (University of Winchester) - Haeussler, Ralph (University of Wales, Trinity St David) - Spickerman, Wolfgang (University of Graz)

Presentation Format: Oral

Boundaries play an important role in the study of ancient religions. We find cult places in the sacred landscape marking the boundaries between vici, pagi and civitates, while religious ceremonies created the boundaries of towns, cemeteries and cult places. While this is a rather well-studied phenomenon, for example, for the archaic and classical Greek world, our knowledge for the Iron Age and the Roman period is still comparatively sparse and fragmented. Taking into account the profound changes to religious understandings, architecture and media between the Iron Age and Roman times, the aim of this session is to gain a better understanding of the nature of religious boundaries as seen in the archaeological contexts from across Europe.

The theme of boundaries naturally also leads us to broader concepts, like the boundaries between 'religions' (local/native deities, Greco-Roman deities, henotheistic and monotheistic religions) – boundaries that seems to have become extremely permeable in the 1st–3rd century AD. Also the traditional concepts of 'polis religion' seems to have become redundant as a result: the boundaries of civitates hardly correlate to the boundaries of particular religious identities – and this process seems to be even aggravated in the 3rd-4th century AD when elites focus their religious activities on their personal estates and not on public and urban spaces. Distribution patterns of deities, iconography, religious practices, etc. allow us to the study the changing boundaries and their relationship to regions of religious identities.

02 ROMANO-CELTIC RELIGION AND CIVITATES IN BRITAIN: DISTRIBUTIONS, CONSTITUENCIES AND BOUNDARIES

Author(s): King, Anthony (University of Winchester)

Presentation Format: Oral

This paper explores distributions of religious data, e.g. altars, figurines, cult images, and looks at their goodness of fit with our current geographical knowledge of civitates and regions in Roman Britain. At the local level, religious sanctuaries develop their own ritual characteristics and orthopraxy, that tend to make each temple site distinctive and a marker for potentially detecting the wider influence of the sacred site in the surrounding community. At the regional level, civitates (usually derived from Late Iron Age political territories) may provide a geographical basis for official or quasi-official ritual practices and their distribution in the landscape, i.e. so-called polis religion. Can this be detected archaeologically? Or were sacred landscapes at variance with secular/administrative regions. Finally, at the supra-regional scale, how did widespread cults, such as Epona or Jupiter (as represented in Jupiter-giant columns), integrate with local and regional cults. Were their worshipping constituencies (cultores) different from local cult practitioners? Was the requirement for Imperial loyalty superimposed on local/regional cult practices, and did it suppress local distinctiveness? The paper examines these questions and themes by means of the data available for Roman Britain, but also includes relevant reference to material and sites from Roman Gaul and Germany, where necessary.

03 MOVEMENT AND PERFORMANCE IN IRON AGE AND ROMAN BRITAIN: AN EXAMINATION OF PROCESSIONAL ROUTEWAYS ACROSS RELIGIOUS BOUNDARIES

Author(s): Garland, Nicky (Newcastle University)

Presentation Format: Oral

The archaeology of movement has much to offer in understanding religious and ritual behaviour within past societies (Insoll 2009, 2011). The examination of processional routeways, for example, has been used in Roman studies to better understand the process of religious movement, whether associated with worship or burial, and its interaction with different forms of space (e.g. Esmonde Cleary 2005). The movement of people to/from religious 'spaces' deliberately crossed the social and physical boundaries between different 'places' in the landscape, whether they be considered 'ritual', 'domestic' or somewhere in between. In part, interpreting processional movement also requires us to understand performance, to allow us to reconstruct mortuary and ritual activities in the past (e.g. Fitzpatrick 1997; 2000; Giles 2012). By examining both human action and the material world (DeMarrais 2014), comprehending religious performance helps to understand the choreography of ritual action within specific 'places' in the landscape and the wider social implications of these activities (Giles 2012, 175–213).

This paper will examine a series of case studies from southern Britain including Hayling Island Temple, Hampshire (King and Soffe 2001, 2008, 2013); North Bersted (Taylor et al. 2014) and Lancing Down Temple (Bedwin 1981), West Sussex; and Brisley Farm, (Stevenson 2013) and Springhead, Kent (Andrews et al. 2011). This diverse group of Late Iron Age/Roman ritual and mortuary locales will be examined using a holistic landscape approach (experiential, computer based, traditional forms of landscape investigation) to gain a greater understanding of how and why religious boundaries were crossed during this transition period. By understanding how ritual space was articulated and navigated across these sites, this paper aims to examine the similarities and differences of boundary crossing during this period and give some insight into the motivation for these actions, whether from pre-existing tradition or external influences.

04 ROMAN TRADITIONS WITH CELTIC STYLE – GALLO-ROMAN RELIGION IN THE PROVINCE OF GERMANIA INFERIOR

Author(s): Schmölzer, Astrid - Spickermann, Wolfgang (University of Graz)
Presentation Format: Oral

Within the context of 'Romanisation', issues concerning history of religion are of great importance. Religious set-ups are always linked to political and social conditions and serve to legitimise values and norms. That applies to religious phenomena in territories occupied by Rome in general as well as to Celtic components of the Gallo-Roman Religion in a more particular case.

The analysis of all Celtic divine names that are preserved in the inscriptions of the Roman Province Germania Inferior should lead to fundamental insights into the development and manifestation of the Gallo-Roman Religion and shall at the same time contribute to the study of the process of what is commonly known as Romanisation. Moreover, this will provide deeper knowledge of the distribution of languages in Germania Inferior.

Furthermore, it is important to underline the role of the archaeological evidence, by meanings of distribution and finding spots (leading to new insights on sanctuaries etc.), as well as iconography or specific decoration on the votive stones. To give an example, the appearance of the non-Roman gods and goddesses (their clothing, hairstyle, jewellery) could lead to new insights on religion as a system of representation and of representing one's own identity. Here, the term of "sacred landscapes" describes perfectly the southern region of the province, characterized by the richness of sanctuaries and the huge number of votive stones donated at the various matronae.

05 ATTENDANCE OF WORSHIP PLACES WITH A NATURAL VOCATION IN THE PO AREA BETWEEN THE IRON AGE AND EARLY ROMANIZATION

Author(s): Fogliazza, Silvia (Université Paris Nanterre) - Mazzetti, Enea (Alma Mater Studiorum - Università di Bologna)
Presentation Format: Oral

The political and economic changes involving the Po area in the transition from the Iron Age to Romanization imply a change in the cultural assets of the territory. The contacts between different peoples (Celts, Ligurians, Etruscans), which populate the region at this stage, involve a permeability that makes it difficult to identify the boundaries between the various communities. The extra-urban sanctuaries, the sacred enclosures and, more simply, the natural places characterized by the presence of physical phenomena are privileged scenarios of ritual linked to the sacred and, therefore, important witnesses of this cultural porosity. In particular, the sacred sites linked to the trans-Apennine road system and associated with the peaks cult document how the Ligurian presence, during the 4th century BC, holds strategic points control to protect the trade routes, in some cases replacing the Etruscan element, where present, weakened by a new territory reorganization and by new cultural dynamics, attributable to the Laten Celts expansion starting from the late 4th century BC. Characterized by a cultual continuity until the threshold of Romanity, sites such as the Pietra di Bismantova, Mount Barazzone, Mount Valestra, Mount Cimone, Mount Penna, Mount Alfeo and La Sella del Valoria can provide important informations about the communities involved, the venerated deities and their acceptance within the Roman world.

The focus of this study is to highlight the contribution that the archeology of the sacred can provide to the knowledge of the political, economic and religious dynamics of the Po Valley in the transition from the Iron Age to Romanization.

06 CITY-TYCHE – LOOKING FOR WAYS OF SELF-REPRESENTATIONS IN SOUTHERN GAUL

Author(s): Müller, Isabell (Institut für Archäologie, Universität Graz)
Presentation Format: Oral

Personifications or deified representations of abstract concepts are known since the beginning of Greek literacy. At the latest in Classical Athens, the various representations of the demos as a personification were used to create an identity while at the same time establishing a common cult. This paper wants to investigate which techniques cities or gentes in the western Roman provinces used as a way of self-representation in the high imperial period. In a time of great historical and religious changes, the art of personifications and allegorical groups survived even the transition to Christianity. Though an overcome, pagan artistic form it was still regularly used and also functioned in Late Antiquity. The concept of city personification, though basically traditional, helped at the same time to set boundaries. Based on various, analogous representations of the Tyche of Antioch especially the mural crown illustrates the simultaneous demarcation of the cities outlines and its borders. Though up until now we know of no city personifications in the Western Roman Empire – excluding the sculptural representation of Dea Roma and Africa in the northern African provinces – there must have been a sense of community in the celtic regions of the Roman Empire. This is shown through new findings from Mušov and Czarnówko (the so-called 'Germanenkessel') dating approximately to the 2nd century AD, being the first and only self-representations of Germanic tribes that we have. The aim is to identify a relating way of self-representation and identification for the Tres Galliae. Hereby, I will focus my search on the décor and especially sculptural interior of theatres in Southern Gaul.

07 CROSSING BOUNDARIES? THE COMPLEX WEB OF CULT PLACES AND DEITIES IN SOUTHERN GAUL

Author(s): Haeussler, Ralph (University of Wales Trinity Saint David, Lampeter)
Presentation Format: Oral

Scholarly debate on ancient religions has been dominated by the socio-political role of sanctuaries and the allegedly pragmatic

choices of deities, whether we deal with large collective sanctuaries in the Iron Age or Roman times, creating a sense of regional and socio-political identity, or with cult places aimed at demarcating political and ethnic boundaries. But this is often an oversimplification. The situation is much more complex when we have a wealth of archaeological and epigraphic evidence, as in the case of southern Gaul. There, we can reconstruct a rather complex sacred landscape, consisting of a web of interrelations between religious practises, settlements, natural features, local society, and cultores. Even within the boundaries of a single civitas, one can recognise countless localised particularities. Evidence for the idea of state/civitas-financed 'polis' religion is increasingly sparse the more evidence we have. We can see that each cult place and each expression of religious devotion is distinctive to its location and may at most be an expression of more confined politico-religious authority, e.g. a local landlord's aim to assert his status. Moreover, being part of an interconnected, entangled Mediterranean world, where migration of people is commonplace, we see the increasing importance of religious individualisation, a process that accelerated in the Roman period: for example, immigrants and pilgrims provide their personal re-interpretation of local sacred sites, introducing new theonyms and forms of religious communication; some people promote new religious trends, like Near Eastern cults. All of these developments seem to diminish the role of boundaries by creating new supra-regional trends as well as very localised, personal expressions of devotion.

660 ENGAGING THE PUBLIC. THE IMPACT OF VOLUNTEERS IN ARCHAEOLOGICAL OUTREACH

Theme: Museums and the challenges of archaeological outreach in the 21st century
Organisers: Woltering, Marjolein (ArcheoHotspots) - Veldman, Anouk (Huis van Hilde) - Jennings, David (York Archaeological Trust) - Høst-Madsen, Lene (Museum Skanderborg)
Format: Session with presentations of 6 slides in 6 minute

Volunteers play a vital role in nowadays society. Also in the cultural heritage sector where they work in research, conservation and documentation, or as museum guide or educator. What are the roles of volunteers and how to manage theirs and others expectations? How can volunteers contribute in archeological outreach? Can the public become volunteer itself?

In this session we would like to give an overview of the different settings in which volunteers operate. Some inspiring examples on volunteers and archaeological outreach from the Netherlands, United Kingdom and Denmark will be presented.

ABSTRACTS

01 TOWARDS A PROFESSIONAL ARCHAEOLOGY: PUBLIC ARCHAEOLOGY IS MORE THAN TO LET VOLUNTEERS PLAY ARCHAEOLOGISTS!

Author(s): Kars, Eva - Vanderhoeven, Timo (EARTH Integrated Archaeology B.V.)
Presentation Format: Oral

Abstract: In the Treaty of Valletta, Article IX states that the public should be engaged in archaeological research. This should be done in order to develop public awareness of the value of archaeological heritage and to create access to it. Unfortunately, Article IX is yet to be implemented in Dutch heritage laws. The authors would like to discuss why engaging the public is essential for the existence and future of our discipline. In addition, the authors will also discuss what engaging the public means and compare archaeology to other academic disciplines. Our experience with the practice of public archaeology in the Netherlands is that it often means the use of volunteers for archaeological excavations and the washing and sorting of finds. However, archaeology is not synonymous with excavating; engaging the public should be something different. Although Dutch archaeology is being carried out by commercial companies, there is no commercial mindset and volunteers are mostly being used to replace professional archaeologists in order to lower the costs. In Dutch practice public archaeology is a trend but there is a lack of vision regarding the public's involvement. In our view, engaging the public is a completely separate discipline that should not be conducted by archaeologists. We need professionals to innovate and develop new methods in order to reach the public and generate public support and, in so doing, benefit the discipline. Now is the right time to invest in such innovation. The authors will present an example from an ongoing archaeological project carried out by their own company.

02 COMMUNITY ARCHAEOLOGY AS PART OF THE ROUTINE? VOLUNTARY ENGAGEMENT AS A KEY ELEMENT IN THE DEMOCRATIZATION OF MALTA ARCHAEOLOGY

Author(s): Deckers, Pieterjan (Department of History, Archaeology, Art, Philosophy and Ethics, Vrije Universiteit Brussel; Centre for Urban Network Evolutions - UrbNet, School of Culture and Society, Aarhus University) - Marchal, Clémence - Tys, Dries (Department of History, Archaeology, Art, Philosophy and Ethics, Vrije Universiteit Brussel)
Presentation Format: Oral

The professionalization of archaeology in the past 25 years has effectively side-lined the public from archaeological practice in many European countries. As a result, public archaeology is often synonymous to communication to a largely passive audience, while

opportunities for more active public participation are limited to a small number of projects in the academic or local heritage spheres, not integrated in regular, state- or developer-funded and development-led archaeology.

This exclusion of the public has eroded public understanding of archaeology, its methods, goals and, most importantly, its underlying motivations. For developers and passers-by, development-led archaeology is often a costly and time-consuming nuisance with little obvious benefit.

In this presentation, we develop the concept of a 'democratic' archaeology through a discussion of experiences during community archaeology-inspired fieldwork campaigns conducted by the Vrije Universiteit Brussels (Belgium) between 2014 and 2017. We explore how volunteer participation and even initiative can become a core element of such a democratic archaeological practice, building (in citizen science terminology) true collaborative or co-created rather than contributive projects and, ultimately, increasing public support for archaeology. We argue that the alternative motivations and goals of such voluntary public actors should be acknowledged on equal footing with those of heritage management and archaeological research, consider how this shifting relationship with the public affects the role of the professional archaeologist, and suggest ways to implement this perspective in policy.

03 NOTHING IS AS IT SEEMS: A VALUE-ORIENTED APPROACH FOR THE PARTICIPATION OF VOLUNTEERS IN ITALIAN ARCHAEOLOGICAL OUTREACH

Author(s): Ripanti, Francesco (University of Pisa)
Presentation Format: Oral

Over the last years, the spreading of outreach initiatives in Italian public archaeology has fostered the participation of volunteers. Defined in the Collins dictionary as "people who does work without being paid for it, because they want to do it", their participation in archaeology is still lacking a proper regulation. As a result, the legitimacy of their involvement in archaeological activities has been and keeps on being a hot topic of debate in many cases: for instance, currently volunteers cannot take part in archaeological excavations.

Since the situation is very complex and can not be solved with a yes-no question, what logic should we adopt for regulating their participation and addressing their impact? Trying to go one step further, this paper wants to question the volunteers' participation and their impact from a value-oriented approach, considering their role in archaeological outreach. Data from quantitative and qualitative analysis – collected in some selected case-studies currently under investigation in my PhD research - will help to engage with three main considerations: the volunteers are not a single and monolithic body, they refer to different kinds of secondary stakeholders (or outsiders, those who have an interest in cultural heritage but little or no say in the decision-making process); they have different expectations and do not ask for the same level of participation; these levels are related to different sociocultural and economic values.

04 DREAMS COME TRUE WHEN DOING ARCHAEOLOGY

Author(s): Johnston, Helen (Thames Discovery Programme, MOLA)
Presentation Format: Oral

For the last decade, Thames Discovery Programme has worked with volunteer Foreshore Recording and Observation Group (FROG) members to monitor and record the fragile archaeology of the Greater London Thames foreshore. The programme has developed a flexible model of volunteering, which means that once FROG members have completed their training they can choose where, when and how often they get involved. We provide a range of different ways people can contribute, including fieldwork, desk-based research, outreach and oral history projects.

It's increasingly being realised that volunteer roles which expect people to make large and/or regular time commitments, do not reflect modern lifestyles. In this paper, I will explore how flexible volunteering roles provide the opportunity for people to fit volunteering into increasingly busy and time-pressured, 21st century lives. Volunteer-involving organisations are increasingly developing flexible volunteering opportunities to encourage more people to get involved and ensure the sustainability of their services.

In this talk, I will demonstrate how Thames Discovery Programme's flexible volunteering model has allowed us to enable more people to volunteer in archaeology. I will discuss how what we have learnt could be used by other community archaeology projects and anyone working with volunteers, to make volunteering in archaeology more accessible and attractive to more a diverse range of people.

05 THE IMPORTANCE OF COMMUNITY ENGAGEMENT IN RECORDING AND MONITORING COASTAL HERITAGE AT RISK.

Author(s): Kearns, Therese - Hutchinson, Oliver (CITiZAN, Museum of London Archaeology)
Presentation Format: Oral

Volunteer engagement lies at the very heart of the work of CITiZAN - the Coastal and Intertidal Zone Archaeological Network. Members of local communities are invited to free training sessions in which they are provided with the skills to identify, record and monitor archaeological features around the coast which are at risk from processes such as coastal erosion and tidal scour. This paper will illustrate the crucial role that local volunteers play in recording and monitoring these dynamic coastal sites. Their impact is demonstrable in the number of individual features which have been recorded since the CITiZAN project began but also in the furtherance of our understanding of the archaeology of specific areas. Two different areas will be presented – Mersea Island, Essex and Chichester Harbour, Hampshire. These areas differ not just in the the diverse range of archaeological features that they encompass, but also

in terms of the volunteer groups who undertake work there. These two case studies will provide an insight into the diverse settings in which CITiZAN volunteers operate. They will also illustrate how fundamental the work of volunteers is to recording and monitoring what may be considered to be the largest archaeological site in the country spanning over 5000 miles of coastline and 500 miles of tidal foreshore.

06 THE VALUE OF VOLUNTEERS IN COLLABORATIVE RESEARCH AND RESOURCE MANAGEMENT: AN EXAMPLE FROM COASTAL HERITAGE AT RISK IN SCOTLAND

Author(s): Hambly, Joanna - Dawson, Tom - Graham, Ellie (University of St Andrews; The SCAPE Trust)
Presentation Format: Oral

SCAPE, a charity based at the University of St Andrews in Scotland, has a core ethos of involving the public in the research and rescue of archaeological heritage at the coast. Between 2012 and 2016, over 1,200 volunteers took part in the SCAPE Trust's Scotland's Coastal Heritage at Risk Project. SCHARP put volunteering at the heart of a national survey to review and update condition data of important coastal heritage sites threatened by coastal processes and to carry out investigations into locally-valued, but vulnerable coastal heritage sites. The outcomes have been transformative to how coastal heritage information is collected, managed and shared in Scotland. The project has resulted in a new body of data that helps us understand and manage a highly threatened resource, including a prioritised list of the most significant and the most vulnerable coastal archaeological sites within the survey areas. These can be referred to with confidence by heritage managers for strategic planning and resource allocation, and by academic and local communities as a valuable research and learning resource. This presentation will give an example of the value of volunteers in collaborative research and resource management - and will demonstrate the value of the collaboration to all involved.

07 DIGGING THE ORIGINS OF SURIA WITH VOLUNTEERS: THE GUIXERES SUMMER CAMP

Author(s): Belmonte, Cristina (iPAT Serveis Culturals)
Presentation Format: Oral

Súria is a small village in the center of Catalonia, which started in 2005 a pioneer project in the area. The town hall in collaboration with the High School, designed a summer camp with students between 12 to 16 years old, led by a professional archaeologist. The first season was a success and it has continued uninterruptedly until today.

The activity take place in the Guixeres site, which is formed by different settlements, among which stand out the Vilella Vella farmhouse, Sant Pere del Puig church, and the Domus de Torre tower, all of them dated in medieval times.

From the beginning, the goal has been to recover and study the sites, but also approach the archaeology to the students. They can learn the archaeological methodology and feel that they are part of the recovery process of historical data in their municipality. However, it is a village project, the landowners allow the digging, a women association makes every day breakfast, a retired men group help in the excavation tasks and local companies offers different facilities. Every year we manage to have a dig team with more than 30 people.

The results have also helped to continue the project, has been confirmed that the area was the first inhabited place in the municipality and around the XIII century, the population moved progressively to the place where the village is currently placed.

The project have manage to raise awareness of the site and bring it closer to its inhabitants. In a long term, the plan is made visible and establish a guided cultural and tourist route explaining the area. Many people of the village could say that they contributed to put in value the origin of their village.

08 ARCHEOHOTSPOTS: A NEW CONCEPT OF PARTICIPATORY ARCHAEOLOGY

Author(s): Woltering, Marjolein (ArcheoHotspots)
Presentation Format: Oral

A couple of years ago a new concept started in the Netherlands: ArcheoHotspots. The idea behind the concept is to encourage the public to actively participate in archaeological research and to introduce people (non-scientists) to the field. ArcheoHotspots consists of a collection of places, close to museums, excavation sites and historical locations, where the public can take part in archaeological research and meet an actual archaeologist.

In the ArcheoHotspots the public, supported by volunteers, assists with aspects of research that would otherwise be left undone, such as puzzling together fragments or sorting residue from a cesspit. These volunteers are the driving force behind the ArcheoHotspots. They man the ArcheoHotspots and process the archaeological finds on the days when there are few to no visitors present. Volunteers don't necessarily need to be members of the dutch association of volunteers in archaeology. It could also be people who simply enjoy engaging the public and are interested in archaeology and history.

ArcheoHotspots can be set up in different types of locations such as museums or heritage centres. Currently there are 9 permanent hotspots situated all over the Netherlands and around 120,000 people have now been reached. Within the ArcheoHotspot the emphasis lies on archaeological research, learning and informing.

09 HUIS VAN HILDE; HILDES HOME FOR / BY VOLUNTEERS

Author(s): Veldman, Anouk (NMF Huis van Hilde)
Presentation Format: Oral

Huis van Hilde Archaeological Centre North Holland ("Hildes Home") is a vibrant centre for archaeology with a depot and a public function. As such, Huis van Hilde fulfils the obligations as stated in article 9 of the Treaty of Malta . Huis van Hilde wishes to expand the knowledge of, and the support for the past through the sharing of archaeological and historical knowledge.

The Exhibition is centred around sixteen people (human figures with facial reconstructions reconstructed from excavated skeletons) from all the periods of North Holland's history, from the early pre-history and up to and including the Second World War.

History experienced through the eyes of historical human figures; an experience unique for all of Europe, accessible for a width range of public.

The daily operations are run by volunteers. In total there are 4 permanent employees (NMF) and 95 volunteers.

The permanent employees and the volunteers are overall responsible for the day to day management of Huis van Hildes public functions: reception and registration of visitors, tours, accompaniment of school groups, provision (and renewal) of education (programs), ArcheoHotspot, shop sales, reception of guests in the museum cafe, and/or meeting rooms, acquisition, fund raising, temporary exhibitions, training of the trainees, the organisation of events and budgeting. The manager acts as the contact person for the Province and the archaeological depot.

Volunteers play a vital role in Huis van Hilde. This paper will show how the volunteers contribute in archaeological outreach and how they operate (to involve the public).

10 ARCHAEOLOGICAL OUTREACH AND THE ROLE OF VOLUNTEERS IN JAPAN

Author(s): Bausch, Ilona (Sainsbury Institute for Japanese Arts and Cultures)
Presentation Format: Oral

In Japan, volunteers and their supporting activities are highly valued, and considered essential in archaeological outreach. Japan is characterized by great regional diversity in its archaeological and cultural heritage, which often plays a vital role in influencing local economies and shaping local identities—especially in distant rural regions, which lack the affluence and connectivity of the metropolitan areas. Volunteers that get involved in archaeological outreach tend to be (or become) intensely proud of their local archaeological heritage. Museums and designated Historical Sites frequently use volunteers to welcome and show around visitor groups, and so they receive some level of training from professionals (museum curators, or archaeologists working for regional archaeological centres). They also assist in organising special archaeological-themed events, and activities for small children.

Frequently (but not always), such volunteers tend to be retired, and they relish the opportunity to stay active and meet many people, as well as to explain the deep history of their local community to visitors. In some cases, volunteers (usually women) help out by manufacturing small, affordable souvenirs for the museum to sell.

This short six-slide presentation will introduce several volunteers who are connected with archaeological sites and/or museums across Japan, and their motivations, aspirations, schedules and tasks.

11 WHEN CO-CREATION CREATES IDENTITY - ESCAPE AND PUBLIC OUTREACH

Author(s): Mollerup, Lene - Høst-Madsen, Lene (Museum Skanderborg) - Bangsbo Dissing, Nina (Skanderborg Kommune) - Purup, Marianne (Visit Skanderborg)
Presentation Format: Oral

The French artist Olivier Grossetête's 17 meter high cardboard installation was created during an event called 'Rebuilding the Abbey' next to a Danish monastic ruin in May 2017. Behind the event is the concept eScape that seeks to combines art, archeology and tourism to create and tell stories through art in places where important historical finds have been made during archaeological excavations.

The purpose of the event was to create public engagement as part of attraction development of Øm Abbey.

The installation was to be created in one day, stand for 24 hours and to be demolished in a co-creative event. This required hundreds of volunteers who were advertised for by the press, in the radio and on social media. 4300 people visited the event and almost all helped create the sculpture in one way or another. All participants were part of a larger organism with a common goal. Everyone could join in, no one was too young or old. The process can be described as spontaneous interaction between people and was full of joy, helpfulness and creativity.

People clapped themselves, each other and the process when another element was lifted in place. People talked spontaneous with each other, new ways for cohesion were found and a strong community feeling created.

The co-creative event's most prestigious result was against expectation, not the impressive sculpture, but the sense of community that arose during the process and the special interest of the place and its particular identity, which was created that day.

The community and the process created a cardboard sculpture that resembled the monastery, that no longer existed - and it gave the contributing volunteers a sense of identity and the opportunity to take ownership of their local heritage.

661 LATE GLACIAL AND POSTGLACIAL POPULATION HISTORY AND CULTURAL TRANSMISSION IN IBERIA

Theme: Theories and methods in archaeological sciences
Organisers: Fernandez, Javier (Institut Català de Paleoecologia Humana i Evolució Social - IPHES; Àrea de Prehistòria, Universitat Rovira i Virgili - URV) - Yanes, Yurena (Department of Geology, University of Cincinnati)
Format: Regular session

This session introduces the current state of the art of PALEODEM (ERC Consolidator Grant 683018). This project aims to investigate patterns of population history and cultural transmission from the Late Magdalenian to the Late Mesolithic in Iberia. This period witnessed major environmental changes and cultural transformations on settlement distribution, technology and social organisation. In this scenario this project specifically addresses two major research questions: Firstly, to what extent demographic behaviour was driven by environmental factors; and secondly, how did regional population patterns influence cultural transmission processes.

The aim of the session is to present (i) the theoretical and methodological bases of the project and the multi-scale approach; (ii) a set of multi-disciplinary case studies based on the new empirical data obtained at open-air residential sites in the Iberian Mediterranean region, and (iii) the current work on palaeodemographic research at regional and macro-regional scales.

The project members and collaborators will present papers featuring a broad array of scientific disciplines such as geoarchaeology (geochronology, micro-morphology and micro-stratigraphy), palaeobotany, bioarchaeology, environmental geochemistry, lithic technology, spatial analysis, Bayesian radiocarbon modelling, network analysis and computational modelling. The contributions will allow to discuss the correlation between palaeoenvironmental and cultural proxies to understand the impact of climate change and hydrological stress over local occupation areas and regional settlement systems.

We invite researchers with similar or related investigation scope to join the discussion of the results presented in this session.

ABSTRACTS

01 INTRODUCTION TO THE PALEODEM PROJECT

Author(s): Fernandez, Javier (Institut Català de Paleoecologia Humana i Evolució Social - IPHES; Àrea de Prehistòria, Universitat Rovira i Virgili - URV)
Presentation Format: Oral

The study of Late Glacial and Postglacial demographic patterns has emerged as a major research topic in European Prehistory, given its broader implications for understanding processes of cultural evolution, human resilience to climate and environmental change and genetic inheritance. Even though the last decade, has witnessed major advances in the field of prehistoric demography, there is a need of incorporating multi-scalar approaches to examine the relationship between demographic trajectories with climate and cultural change.

In this paper, we present the theoretical and methodological framework underlying our multi-scalar approach, which are based on human behavioral ecology and evolutionary theory. Over the past two years, our main research efforts have been focused on the local scale of analysis. Particularly, in order to understand the impact of climate change and hydrological stress on human settlement areas our project has obtained new occupational evidences from open-air residential sites in SE Iberia to be compared with recent multi-proxy palaeoclimate and palaeoenvironmental reconstructions. Six months of continuous fieldwork has been carried out in two Early Holocene archaeological sites in Villena (Alicante, Spain) –Arenal de la Virgen and Casa Corona- uncovering cultural assemblages and occupational features spanning the Early and the Late Mesolithic periods.

At regional scale we present the first results on the reconstruction of population patterns in the Iberian Peninsula between the Upper Magdalenian and the Late Mesolithic using summed probability distributions of calibrated radiocarbon dates. Finally, we will present the ongoing work conducted on computational network analysis at a macro-regional scale to identify how variations on hunter-gatherer settlement networks affected the transmission of cultural traits and technological innovations.

02 LAST GLACIAL-MIDDLE HOLOCENE CLIMATE AND ENVIRONMENTAL DYNAMICS IN THE UPPER VINALOPÓ INFERRED FROM THE MULTI-PROXY ANALYSIS OF LAKE RECORDS

Author(s): Burjachs, Francesc (ICREA, Institució Catalana de Recerca i Estudis Avançats; IPHES, Institut Català de Paleoecologia Humana i Evolució Social; URV, Universitat Rovira i Virgili) - Jones, Samantha E. (School of Geosciences, Department of Archaeology and Geography, University of Aberdeen; IPHES, Institut Català de Paleoecologia Humana i Evolució Social) - Schulte, Lothar (UB, Universitat de Barcelona, Departament de Geografia) - Giralt, Santiago (ICTJA-CSIC, Institut de Ciències de la Terra 'Jaume Almera') - Fernández-López de Pablo, Javier (IPHES, Institut Català de Paleoecologia Humana i Evolució Social; URV, Universitat Rovira i Virgili)
Presentation Format: Oral

One of the research objectives of the PALEODEM project is to understand how hunter-gatherers settlement intensity and population levels were affected by vegetation cover palaeohydrological changes from the Younger Dryas to the 8.2 cal BP event. The selected

area was the Upper Vinalopó Valley (SE Iberian Peninsula), where two open-air Mesolithic sites –Arenal de la Virgen and Casa Corona- have been the subject of extensive fieldwork in 2017.

In this paper, we present a synthesis of the palaeoecological information recovered from two lake deposits located in the immediate vicinity of the Villena palaeolake and the Salines playa lake (Alacant Province). Both records have been the subject of multi-proxy investigation which includes pollen and non pollen palynomorph (NPP) analysis, lithology, XRF core scanning, X-ray diffraction, grain size analysis, magnetic susceptibility and sedimentary charcoal analysis.

In this work we will correlate and integrate the different sources of palaeoenvironmental evidence from both sequences to gain a better understanding about the local vegetation and hydrological responses of the Villena area from the Last Glacial to the Middle Holocene. This information will be compared with temperature and relative humidity reconstructions based on oxygen and carbon isotope data from land snails recovered at the Casa Corona and Arenal de la Virgen sites. Minor arid events have been found at 13.4, 13.0, 12.55, 12.2, 11.9, 11.45, 11.00, 10.6, 10.3, 10.00, 9.5 and 8.2 ky cal BP, providing a new context to discuss human socio-ecological responses at local and regional scales.

03 INTEGRATIVE GEOARCHAEOLOGICAL APPROACHES TO THE INVESTIGATION OF EARLY AND LATE MESOLITHIC CAMPSITES IN SE IBERIA

Author(s): Polo-Diaz, Ana (IPHES - Institut Català de Paleoecologia Humana i Evolució Social) - Poch, Rosa Maria (Departament de Medi Ambient i Ciencies de Sol. ETSEA. Universitat de Lleida) - Ferrer, Carlos (Museu de Prehistoria i Servei d'Investigacio Prehistorica de la Diputacio Provincial de Valencia) - Gómez Puche, Magdalena (IPHES - Institut Català de Paleoecologia Humana i Evolució Social) - Fernádez López de Pablo, Javier (IPHES - Institut Català de Paleoecologia Humana i Evolució Social; Area de Prehistoria, Universitat Rovira i Virgili)

Presentation Format: Oral

Investigation of Early Holocene campsites is crucial to shed light on the subsistence modes and palaeoclimatic contexts of late prehistoric hunter-gatherer communities. In spite of their relevance, the evidence of these archaeological deposits remains scarce. The Upper Vinalopó Basin holds two of the very few deposits attestting the presence of Early and Late Mesolithic campsites in the Iberian Peninsula: El Arenal de la Virgen and Casa Corona (Villena, Alicante). These two sites formed in a continental dune system developed at the margins of the Villena paleolake. The archaeological deposits together with their geomorphological setting and associated Early Holocene soils are currently subject to exhaustive multi-scalar and multi-proxy geoarchaeological investigations within the frame of the project PALEODEM -Late Glacial and Postglacial Population History and Cultural Transmission in Iberia (ERC-CoG 2015-ref 683018).

The objectives of this geoarchaeological programme are summarised as follows:

1- to characterise occupation surfaces at intra-site level using routinely micromorphology coupled with sedimentary analyses as core tools for the study of domestic features.

2- to establish the origin and formation process of the continental dunar system and associated Early Holocene soils where the sites are located. To this end intra-site profiles together with of a dense network of off-site excavated trenches have been systematically studied using stratigraphic, sedimentary and micromorphological means.

3- to provide a reliable chronological framework for the dunar system and associated soils where the sites are located using Optical Stimulating Luminiscence (OSL) as part of the dating programme of the sites.

Our overall goal is to gather direct evidence on human behaviour and its environmental contexts to draw an integrative picture on settlement patterns, occupational intensity and how climatic flutuations during the Last Glacial-Early Holocene transition may have shaped cultural responses of the last hunter-gatherer groups in the SE of the Iberian Peninsula.

04 DECIPHERING EARLY HOLOCENE PALEOCLIMATE CONDITIONS USING OXYGEN AND CARBON ISOTOPE RATIOS OF LAND SNAILS FROM MESOLITHIC ARCHAEOLOGICAL CONTEXTS IN VILLENA

Author(s): Yanes, Yurena (University of Cincinnati) - Fernández-López de Pablo, Javier (Institut Català de Paleoecologia Humana i Evolució Social - IPHES; Àrea de Prehistoria, Universitat Rovira i Virgili)

Presentation Format: Oral

Human-harvested land snail shells are generally abundant and accessible across the Mediterranean region from the Late Paleolithic. The shells are frequently well preserved and offer direct evidence of ancient human subsistence strategies regarding species selection, intensity of exploitation and resource handling processes. Moreover, the oxygen and carbon isotope composition of the shells present valuable paleoenvironmental information during snail growth. Thus, archeological land snails can potentially inform about the paleoenvironmental evolution during important cultural transitions in the recent past. However, different species may record climate and vegetation in a different fashion so a calibration with modern specimens is recommended prior to using ancient shells retrieved from archeological settings.

In this paper we present the current work on paleoclimate reconstructions in the Upper Vinalopó Valley, based on the oxygen and carbon isotope analysis of the shells Sphincterochila candidissima (Gastropoda: Sphincterochilidae) recovered from Early and Late Mesolithic features in the archaeological sites of Arenal de la Virgen and Casa Corona (Villena, Alicante, Spain).

These records present a unique opportunity to infer local paleoclimate shifts and paleoatmospheric coditions during the Early Holocene in human settlement areas. In this presentation, we illustrate how this archaeological archive tracks climate and vegetation, and we show preliminary paleoenvironmental reconstructions using these shells.

05 RECOVERING METHODS AND PRELIMINARY RESULTS ON THE PALAEOBOTANICAL REMAINS OF ARENAL DE LA VIRGEN AND CASA CORONA (VILLENA, SPAIN)

Author(s): Cantó, Ana - Carrión, Yolanda (Universidad de Valencia) - Fernández López de Pablo, Javier (Institut Català de Paleoecologia Humana i Evolució Social - IPHES; Àrea de Prehistòria, Universitat Rovira i Virgili)

Presentation Format: Oral

Prehistoric open-air sites are often affected by intense post-depositional processes of washing, dispersion or alteration of archaeological materials. Among these materials, the organic remains are especially sensitive to degradation and disappearance. This fact causes a general scarcity of this type of remains in these sites, although the exploitation of plant resources is closely linked to human habitats and these must always be present in everyday life. It is evident, then, the need for a strict sampling protocol for the recovery of as many botanical remains as possible.

We present the sampling protocol for the recovery of archaeobotanical remains at the Early Holocene sites of Casa Corona and Arenal de la Virgen, along the preliminary results on the analysis of palaeobotanical remains. About 3700 liters of sediments have been processed by a careful flotation system, with 1 mm and 0,25 mm meshes, for the recovery of organic remains of different nature.

After we treated samples dried in the laboratory with a binocular microscope, first results of the classification and identification of these plant remains are presented. Among them, charcoal and wild seeds are the most frequent, but also several charred logs and a large quantity of termite faecal pellets, with hexagonal shape, not associated with preserved plant remains, which constitutes indirect evidence of the presence of wood (likely dry wood) that has probably disappeared due to the natural processes of biodegradation. The whole plant assemblage deals with the human and natural dynamics of gathering, use and decay of plant resources, and allows the reconstruction of exploited plant formations.

06 RADIOCARBON DATING PROGRAM AND BAYESIAN CHRONOLOGICAL MODELLING AT THE EARLY HOLOCENE SITES ARENAL DE LA VIRGEN AND CASA CORONA

Author(s): Gómez, Magdalena - Polo-Diaz, Ana - Fernández-López de Pablo, Javier (Institut Català de Paleoecologia Humana i Evolució Social - IPHES)

Presentation Format: Oral

Building robust and accurate chronological frameworks is crucial to establish the occupational intensity on Early and Late Mesolithic residential open-air sites, and its correlation with palaeoclimate and palaeoenvironmental dynamics. In this contribution, we present the preliminary results of the radiocarbon dating program developed in the context of the PALEODEM research project, at the Early Holocene sites of Arenal de la Virgen and Casa Corona (Villena, Alicante, Spain).

At the Arenal de la Virgen site, different Early Holocene occupational surfaces and combustion structures have been identified in Level IV, associated to Early Mesolithic lithic assemblages. This site has been subject of a new radiocarbon dating program, using micro-morphological and micro-stratigraphic studies on the stratigraphic sequence and the archaeological features in the C14 sampling strategy and the model selection approach. Different Bayesian chronological models have been developed to determine the duration of the Early Mesolithic occupations, as well as its internal chronology in different subphases.

In Casa Corona site, recent fieldwork and undergoing geoarchaeological investigations have allowed to gain a better understanding about the stratigraphic context. The site's stratigraphy is formed by a polycyclic sequence of different edaphic horizons spanning the early and the middle Holocene, interrupted by phases of aeolian reactivation of the dune system. This novel stratigraphic and sedimentary data will be used as prior information in two different bayesian chronological models with the following objectives: 1) to constrain the chronology of the dune formation and the Early Holocene edaphic horizons by integrating OSL dates and radiocarbon dates of archaeological features into the same Bayesian model; and 2) to define and constrain the chronology of the phases and subphases of human occupation using radiocarbon dates from archaeological features.

07 LITHIC ASSEMBLAGES FROM ARENAL DE LA VIRGEN AND CASA CORONA SITES (VILLENA, ALICANTE): PRELIMINARY RESULTS ON MORPHO-TECHNICAL AND SPATIAL ANALYSES

Author(s): Rabuñal, José Ramón - Fernández-López de Pablo, Javier (Institut Català de Paleoecologia Humana i Evolució Social - IPHES; Àrea de Prehistòria, Universitat Rovira i Virgili - URV)

Presentation Format: Oral

This paper presents an advance of the ongoing works on the morpho-technical and spatial analyses of lithic assemblages recovered at the open-air Mesolithic sites of Arenal de la Virgen and Casa Corona. Both sites were extensively excavated in 2017, over an area of 100 m2 and 300 m2 respectively, uncovering occupational surfaces and features.

Different analytical approaches have been designed to infer the occupational intensity at both sites, depending on the spatial and chronostratigraphic resolution of the archaeological contexts.

On one hand, Arenal de la Virgen is a lakeside site located on a dune. This site has yielded a palimpsest of lithic scatters and occupational features reflecting successive occupations along the Early Mesolithic, dated between 9.3 and 8.4 ky Cal BP. By applying several methods and techniques of archaeoestratigraphy, intra-site spatial analysis, lithic technology and lithic refits, our work is aimed to identify discrete spatial units and occupational events, to dissect the palimpsest and approach to site formation processes and site structure.

On the other hand, Casa Corona is a multi-component site on the top of a Late Pleistocene dune, containing occupational evidences spanning the Early Mesolithic to the Chalcolithic periods. In this case, the focus of the morpho-technical and spatial analysis is to disentangle Early and Late Mesolithic phases to evaluate occupational intensity and artefact accumulation rates.

08 EARLY HOLOCENE SOCIO-ECOLOGICAL DYNAMICS IN THE IBERIAN PENINSULA: A NETWORK APPROACH

Author(s): Lozano, Sergi (Institut Català de Paleoecologia Humana i Evolució Social - IPHES) - Prignano, Luce (University of Barcelona) - Gómez-Puche, Magdalena - Fernández-López de Pablo, Javier (Institut Català de Paleoecologia Humana i Evolució Social - IPHES)
Presentation Format: Oral

Late Glacial and Early Holocene environmental changes affected different domains of human demography, settlement, and subsistence patterns. The variable spatial patterning produced by the prehistoric hunter-gatherers archaeological record, demands new approaches for analysing the multi-scalar nature of human-environmental interactions. In this contribution, we present part of a long-term research program aimed to cover this gap in the context the Iberian Peninsula from the Late Magdalenian to the end of the Late Mesolithic.

PALEODEM ("Late Glacial and Postglacial Population History and Cultural Transmission in Iberia (c.15,000-8,000 cal BP)"), is an ERC project that addresses the role of human population levels and geographical distribution over the relationship between climatic events and cultural dynamics in our context of study. To do so, it will develop a three-level (micro-regional, regional and macro-regional) analysis. Here we will focus on the macro-regional scale, which will be based on a combination of network analysis and computational modeling.

In particular, it will develop a three-steps methodology. First, we will construct spatial networks corresponding to the scenario before and after selected climatic events, where nodes represent archaeological sites (i.e. human groups). Second, we will perform a structural comparison between the two snapshots. Such a study will assess both properties of networks as a whole (e.g. degree distributions) and local indicators (e.g. motifs' distribution). Finally, the third step will be devoted to computational modelling efforts. If the structural comparison in the previous step does not reveal relevant differences, our models will consider the network as a static substrate supporting cultural transmission (i.e. basically, adoption of cultural traits) among human groups. On the contrary, if the network comparison in the second step uncovers significant differences between the two snapshots, we will consider a more complex modelling scenario where both cultural attributes and structural features evolve (modelling on dynamic networks).

09 LATE GLACIAL - EARLY HOLOCENE POPULATION PATTERNS IN THE IBERIAN PENINSULA USING SUMMED RADIOCARBON DATE PROBABILITY DISTRIBUTIONS

Author(s): Fernandez, Javier (Institut Català de Paleoecologia Humana i Evolució Social - IPHES; Àrea de Prehistòria, Universitat Rovira i Virgili - URV) - Gómez-Puche, Magdalena (Institut Català de Paleoecologia Humana i Evolució Social - IPHES) - Lozano, Sergi (Institut Català de Paleoecologia Humana i Evolució Social - IPHES; Àrea de Prehistòria, Universitat Rovira i Virgili) - Silva, Fabio (Institut Català de Paleoecologia Humana i Evolució Social - IPHES)
Presentation Format: Oral

The reconstruction of human demographic patterns during the Late Glacial-Early Holocene transition has major implications for the study of socio-economic change and cultural evolution of prehistoric hunter-gatherers. Particularly, under the unstable climatic conditions of this period, the Iberian Peninsula witnessed major cultural and economic transformations such as the disappearance of the rich Magdalenian rock art, the transition from specialized hunting to more diversified foraging strategies and the emergence of cemeteries. Even though the relationship between these cultural and economic changes with demographic shifts has long been debated, the long-term reconstruction of population dynamics Iberia during this period has not been subject of detailed investigation confronting regional and macro-regional scales.

This paper summarizes the work and first results on radiocarbon paleodemographic research during the first two years of the PALEODEM project. A new database of radiocarbon dates has been collected and critically scrutinized. Different analytical procedures have been implemented using a model-based SPD approach, combining SPD empirical observations with bootstrap simulations to test the statistical significance of the observed fluctuations against the uncertainty of the radiocarbon calibration curve. Finally, different dynamic models of demographic growth with different growth rates and break points have been tested using theoretic-information model selection approaches.

Our results allow to uncover different millennial scale regimes of positive exponential demographic growth during the Upper-Final Magdalenian and the Early-Late Mesolithic. In contrast, we identify a regime of population contraction and stabilization during the Epimagdalenian/Epipaleolithic periods. In this contribution we will discuss the regional variability observed in the inferred trends as well as the potential drivers of specific human regional responses using environmentally-mediated demographic models.

662 THE SOUL OF REPLICANTS: FROM ALTAMIRA TO BLADE RUNNER? TRIBUTE TO JOSÉ ANTONIO LAS HERAS

Theme: Museums and the challenges of archaeological outreach in the 21st century
Organisers: Criado-Boado, Felipe (Incipit, CSIC) - Karlsson, Hakan (University of Gothenburg, Department of Historical Studies) - Barreiro, David (Incipit, CSIC) - Nicolau, Antoni (Kultura, Ideas y Estrategias)
Format: Regular session

José Antonio Las Heras was the director of the Altamira Museum, from 1991 until 2016, when he died in a fateful car crash. He was responsible for the new strategy for presenting prehistoric rock art to the public that was unveiled in July 2001 with the new Altamira museum. This strategy was largely based on an exact replica of the cave to absorb a higher number of visitors than the original, providing didactic information to stimulate the public curiosity. As a result, the new Altamira museum not only set the standard for archaeological museums in the twenty-first century in Iberia (followed by MARQ-Alicante, Human Evolution-Burgos, MAN-Madrid ...), but also started the increasingly widespread trend in creating replicas (being Lascaux and Chauvet the best examples to date). As a tribute to Las Heras, this session brings together contributions that raise questions about ersatz, authenticity, copies, identity, and emotion in the use of cultural heritage. The key aspect is addressing these issues from the perspective of Walter Benjamin's art in the age of mechanical reproduction, but also in terms of the impact of digital technologies, the "ontological turn" and the emergence of an age of replicas and fakes that challenge conventional ways of addressing identity, originality and veracity. Which is the balance between conserve the heritage and disseminate its significance? Is the original the only way to approach historical discourses to the public? Could copies transmit the same emotions as the original? José Antonio had many ideas about these topics.

ABSTRACTS

01 JOSÉ ANTONIO LASHERAS AND THE ALTAMIRA REPLICA IN CONTEXT

Author(s): Marti, Nicolau (Kultura, Ideas Strategies for Cultural Heritage) - Fatás Monforte, Pilar (Museum and Research Center of Altamira)
Presentation Format: Oral

José Antonio Lasheras died in traffic accident in February 2016. He was the director of the Museum and Research Center of Altamira. He had been appointed to this position in 1991. Under his leadership and the work of the team he led, Altamira (a world heritage site well known for its exceptional Paleolithic paintings) took a tremendous step forward. It would not be an exaggeration to say that because of Jose Antonio, Altamira entered, like many other places and topics of Spain after the return of democracy, into Modernity. Spain had an hazardous history during the nineteenth and twentieth centuries causing that the necessary modernization of the country was a project still pending in 1980. Altamira did not escape, despite its exceptionality, this story.

The paintings of Altamira were discovered in 1879. But its authenticity was not recognized until 1902. Its full history was complex. It soon became a national monument and one of the icons of Spanish identity. They were about to be bombed by Nazi aviation during the Civil War. In 1977, the provisional closure of the cave was decided, while studies were carried out to determine its conservation status. In 1982 the cave was reopened, but the number of visitors was reduced from 150,000 to 11,320 per year. In 1991, Jose Antonio Lasheras is named director of Altamira and proposes a new strategy, which he worked on since his arrival. This included a totally new museum and a replica conceived as a displaying asset (named "Neocueva") that provided the didactic information about the cave. The Neocueva was conceived not as a substitute if the original cave, but as a replica designed to work in parallel with the original. The museum and the replica would provide information to the visitor, and the original the emotion.

02 THE UNBEARABLE LIGHTNESS OF NEW CAVE

Author(s): Ayán, Xurxo (Independent Researcher)
Presentation Format: Oral

The replica of the Altamira's cave (Santillana del Mar, Cantabria, Spain) was a historical and technological milestone in the history of heritage management in Spain. It was tried to solve this way the problem derived from the closure of the cave to the public. The situation is complicated: a site that is a World Heritage Site can not be enjoyed by humanity. Nowdays the controversy persists on the reopening or not of the cave. It is an interesting public debate in which Heritage, ideology, politics and identity are mixed. To illustrate this reality and see what the public thinks, we have analyzed the visitors' book of the Altamira Museum in the period 2003-2014. This research was carried out within the framework of the project The social value of Altamira (INCIPIT, CSIC). In this book thousands of people leave their opinion about the replica of the original cave. Like the opinions of scientists and technicians, people's assessments must be taken into account, for something Altamira is public Heritage. A tour of this book dismantles many prejudices and ideas such as citizens' disinterest in heritage or their role as mere consumers in archaeological parks. Our study also reaffirms the need to carry out a phenomenological archaeology: nothing can replace physical contact with the past.

03 DIGITAL, MUSEUM, AND ON-SITE EXPERIENCES OF GÖBEKLITEPE: CONTRIBUTIONS AND FLAWS OF REPRODUCTIONS AND REPLICAS FOR THE PERCEPTION OF SPATIO-TEMPORAL CHARACTERISTICS

Author(s): Akture, Zeynep (Izmir Institute of Technology, Department of Architecture)

Presentation Format: Oral

Promoted as the oldest temple on the Earth constructed by hunter-gatherers, Göbeklitepe is among the most sensational of recent prehistoric discoveries in challenging the commonly-accepted post-Neolithic dating for the emergence of monumental architecture. This hilltop complex, featuring T-shaped stone pillars with geometric and zoomorphic symbols in concentric circles with dry masonry perimeter walls, has inspired different interpretations including archaeoastronomical ones, as in Stonehenge and Nazca.

Landscape surveying for contextualizing the complex is still on the agenda of the research team, whose re-investigation of some areas unearthed since 1994 is revealing domestic spaces. This challenges the hunter-gatherer temple identification, which has been the basis for Göbeklitepe's nomination for the UNESCO World Heritage List in 2018, and for the supporting promotion campaign.

Research and management of Göbeklitepe is coordinated by the director of Şanlıurfa Museum in the nearest city centre, which is the largest archaeology museum in Turkey that was converted from a shopping mall construction. The itinerary proposed in the management plan for Göbeklitepe starts from the museum wherein are exhibited, alongside original small finds, styrofoam replicas of two pillar circles, passes by the on-site visitor centre for a glimpse of its largely digital displays, and ends after touring around four of the pillar circles now under a protective shelter, with limited access to other parts of the complex.

In this paper, I propose to scrutinize the influence of the museological accent thus put on the T-shaped pillars (through visualization for the promotion campaign, replication physically in a museum space that was not specifically designed for the purpose and digitally using popular media, and museumification as display objects under a protective roof) on visitor perception of this oldest-dating monumental space organization so far known in history, its possible environmental references that inspire archaeoastronomical and other interpretations, and its Outstanding Universal Value.

04 STILL LIFE, ON THE NATURE OF ARCHAEOLOGICAL SITES, ON THE CHARACTER OF VISITANTS AND ON THE EXPERIENCE OF THE VISIT

Author(s): Diniz, Mariana - Martins, Andrea (UNIARQ, Faculdade De Letras, Universidade De Lisboa; Associação Arqueólogos Portugueses - AAP) - Neves, César (Associação Arqueólogos Portugueses - AAP; UNIARQ, Faculdade De Letras, Universidade De Lisboa) - Arnaud, José (Associação Arqueólogos Portugueses - AAP)

Presentation Format: Oral

Using the calcolithic settlement of Vila Nova de São Pedro (Portugal) as a case study this presentation aims to discuss the meaning of the site to those who have worked in 1937-1968 field campaigns and to those who have visit the site since then.

Vila Nova de São Pedro as an archaeological site stands in an open field with no fences whatsoever allowing people to enter the walls lines to move around the site to walk over the stone walls freely. Vila Nova de São Pedro as an archaeological site do not have - until the moment - any kind of visitors information so people visiting the site use their own previous data - of different kinds and sources (scientific/know scientific) - that can be enhance by sensorial stimulus when walking around on this calcolithic settlement. According to this scenario Vila Nova de São Pedro visit is the anti-fake experience since everything in the site/around the site is genuine even if deterioration is threatening several parts of the site.

From 2017, a new field work project started at Vila Nova de São Pedro - lead by these presentation authors VNSP3000 team. Restarting archaeological campaigns making the site "understandable" to the public are some of this team goals that will at some point change the nature of the site as it is today. Discussing the nature of this change – concerning site features and visitants movements over it will be herein debated.

05 "EL MURAL MÁGICO": WHEN REPLICA, RITUAL AND POLITICS BECOME "ONTOLOGICAL TURN" IN ZAPATISTA REVOLUTION, AND ITS EXPANSE

Author(s): Ruiz-Blanch, Ana (Incipit, CSIC)

Presentation Format: Oral

1998, Lacandona jungle. During the Zapatista revolution people began creating autonomous communities. One of these was Taniperla. Coordinated by the artist and researcher of the University of México, "Checo" Valdéz, the inhabitants of the community painted a mural on the main wall of the municipal house where they expressed their identity, As they say, their life and dreams. After it was finished the army destroyed it, imprisoned Checo and expelled the international observers from Mexico. Since then, many replicas of this mural have been handmade in different parts of the world in a participatory manner, in support of Zapatismo as well as for the dissemination of its action. In 2005 Checo was released from prison and the mural repainted in its place of origin. Its "voyage around the world" renewed its symbolic value, being known ever since as "el mural mágico".

Arturo Escobar and Boaventura de Sousa Santos make reference to the Zapatista revolution when theorizing on the "ontological turn" in Latin America. Actions such as the series of replicas of the mural -where emotion, politics and art become a collective and transformational ritual- have served to bring these ideas into experiences. The resulting two levels of understanding have had a great influence on the social movements of the 21st century.

As a case study, the Taniperla mural gives us the opportunity to revisit the "museé éclaté" concept of George-Henri Rivière and Hughes de Varine-Bohan, since both can be seen in a complementary way. One could say that "Southern Epstemologies", by Sousa Santos can help overcome the limits and dangers that Rivière himself saw in the new museology, providing other ways of looking at the past in the present, reflecting possible futures. Concepts such as authenticity, original and copy can occupy a different and dynamic space.

06 "TRUTH IS A MOMENT OF FALSEHOOD": BRINGING REPLICAS TO LIFE

Author(s): Barreiro, David (Institute of Heritage Sciences - Spanish National Research Council)
Presentation Format: Oral

Between 1960 and 1980, some Spanish landscapes, because of their desert condition, functioned as replicas of the epic Far West's landscapes. These landscapes, which could be considered as alienated, constitute a material legacy that, in some cases, have continued to function as a tourist attraction to this day. In other cases, such as the one we want to show, the landscapes have suffered a process of abandonment and ruin. But in our case study (the setting for a mythical movie, built in a natural scenario) the monumentality of the replica made it stand the test of time, until a group of people took up restore the site, achieve its recognition as a Heritage Asset in the official inventory and turn it into a living space, through a micro-patronage project. This leads us to rethink our concept of authenticity, since a "false" materiality has been replaced by a new one, product of the social re-appropriation of space, and, therefore, apparently more "authentic" than the original.

It seems to be the famous sentence of Guy Debord ("In a world that really has been turned on its head, truth is a moment of falsehood") but with some hope, since this investment takes place in a context (the rural and deep Spain) that suffers from a process of decline for centuries, accentuated from the 50s and 60s of the 20th Century. In these spaces, the traditional economy has given ground to cultural tourism, while the population continues to age and migrate to the cities. Thus, we would find ourselves faced with a kind of inverted mirage: in the demographic desert of deep Spain there is still a tough and true social life, which use the remains of a fictional past, an old alienated landscape, for self-realization.

663 ARCHAEOLOGICAL DATA CLINIC. PERSONALISED CONSULTING TO GET THE BEST OF YOUR DATA

Theme: Theories and methods in archaeological sciences
Organisers: Prignano, Luce (University of Barcelona; UBICS - Universitat de Barcelona Institute of Complex Systems) - Romanowska, Iza (BSC - Barcelona Supercomputing Center) - Lozano, Sergi (IPHES - Institut Català de Paleoecologia Humana i Evolució Social) - Fulminante, Francesca (University Roma Tre; Durham University; Cambridge Univeristy) - Witcher, Rob (Durham University) - Brughmans, Tom (Oxford University)
Format: Other - workshop

In the ideal world we would all have enough time to learn statistics, data analysis, R, several foreign and ancient languages and to read the complete works by Foucault. In reality, most researchers artfully walk the thin line between knowing enough and bluffing. The aim of this workshop is to streamline the process by pairing archaeologists with data and computer science specialists.

If you have a dataset and no idea what to do with it...

if you think PCA/least cost paths / network analysis / agent-based modelling is the way forward for your project but you don't know how to get started…

If you need a second opinion to ensure that what you've already done makes sense...

...then this drop-in clinic is for you.

Let us know about your case by submitting an abstract with the following information:

A few sentences project outline;

Type and amount of data;

Research question(s);

What type of analysis you'd like to perform? (if known).

We will set up a meeting with an expert in data analysis / network science / agent-based modelling. They will help you to query and wrangle your data, to analyse and visualise it and to guide you on the next steps. They may help you choose the right software or point you towards a study where similar problems have been solved. In a nutshell, they will save you a lot of time and frustration and make your research go further!

ABSTRACTS

01 ANALYSING TEMPORAL SERIES: FROM AMB OUTCOMES TO THE RADIOCARBON RECORD

Author(s): Cucart-Mora, Carolina (Institut Català de Paleoecologia Humana i Evolució Social)
Presentation Format: Oral

02 ROUTING ANCIENT MARITIME BEHAVIORS. SHORTCOMINGS AND CHALLENGES IN PREDICTIVE MODELLING

Author(s): Ritondale, Manuela (University of Groningen; IMT School for Advanced Studies Lucca)
Presentation Format: Oral

03 POTENTIALITY OF SIMULATIONS TO INVESTIGATE ANCIENT AGRICULTURE AND SETTLEMENT PATTERNS IN NORTHERN ESTONIA

Author(s): Kimber, Andres (University of Tartu)
Presentation Format: Oral

664 MEDITERRANEAN ISLANDS OUT OF THE STREAM: COMPARING ISLANDS ACROSS TIME

Theme: Mediterranean seascapes
Organisers: Cau Ontiveros, Miguel Ángel (Institució Catalana de Recerca i Estudis Avançats - ICREA; Equip de Recerca Arqueològica i Arqueomètrica de la Universitat de Barcelona - ERAAUB) - Van Dommelen, Peter (Joukowsky Institute for Archaeology and the Ancient World, Brown University) - Mas Florit, Catalina (Joukowsky Institute for Archaeology and the Ancient World, Brown University)
Format: Regular session

Island archaeology has grown exponentially as islands are increasingly at the heart of studies of sociocultural transformations and cross-cultural interaction. During the last decades, a growing interest in early seafaring and the first occupation of islands has drawn attention to the particular roles played by islands within the Mediterranean Sea as a whole. As a result, island studies have mostly focused on early prehistory. In this session, we wish to extend the chronological scope well into the historical periods and explore the role of islands in the waxing and waning of Mediterranean connectivity.

The idea of islands as isolated places has been challenged by the postcolonial critique emphasizing connectivity and indigenous involvement within the wider framework of an archaeology of the seas. There nevertheless remains a lingering sense of islands as isolated, remote and exotic places where time passes more slowly than elsewhere.

The aims of this session are accordingly twofold. First, it explores how islands actively contributed to the forging of Mediterranean seascapes, and how particular geographical areas within islands played a fundamental role in connecting them to the mainland. The second aim is to analyze moments of change, with a special interest in periods in which islands deviated from mainstream mainland histories. With this session, we hope to contribute to the general theme of Mediterranean seascapes by providing an explicit island perspective, which could be as much maritime as focused inland. We welcome contributions from all periods and all islands across the Mediterranean.

ABSTRACTS

01 MEDITERRANEAN ISLANDS OUT OF THE STREAM: INTRODUCTION

Author(s): Cau Ontiveros, Miguel Ángel (ICREA; Universitat de Barcelona) - van Dommelen, Peter (Joukowsky Institute for Archaeology and the Ancient World, Brown University) - Mas Florit, Catalina (Equip de Recerca Arqueològica i Arqueomètrica, Universitat de Barcelona - ERAAUB)
Presentation Format: Oral

During the last decades, a growing interest in early seafaring and the first occupation of islands has drawn attention to the particular roles played by islands within the Mediterranean Sea as a whole. Island archaeology has grown exponentially as islands are increasingly at the heart of studies of sociocultural transformations and cross-cultural interaction. The idea of islands as isolated places has been challenged by the postcolonial critique emphasizing connectivity and indigenous involvement within the wider framework of an archaeology of the seas. In this contribution, we wish to explore the role of islands in the waxing and waning of Mediterranean connectivity. There nevertheless remains a lingering sense of islands as isolated, remote and exotic places where time passes more slowly than elsewhere. The aim of this presentation is to offer few introductory remarks for the session with the same name focusing on how islands actively contributed to the forging of Mediterranean seascapes, and how particular geographical areas within islands played a fundamental role in connecting them to the mainland. The introduction will explore also moments of change and

periods in which islands deviated from mainstream mainland histories. We hope to contribute to the general theme of Mediterranean seascapes by providing an explicit island perspective, which could be as much maritime as focused inland.

02 CYPRUS AND SARDINIA AT THE TRANSITION FROM THE BRONZE TO THE IRON AGE: A SACRED LANDSCAPES APPROACH

Author(s): Papantoniou, Giorgos (University of Bonn) - Depalmas, Anna (University of Sassari)
Presentation Format: Oral

Unlocking Sacred Landscapes (UnSaLa) is a research network concerned with the diachronic study of the temporality, spatiality and materiality of Mediterranean sacred space, using a range of interdisciplinary approaches. Particular emphasis is given to the interaction between political and religious structures. In the framework of this project, and taking on a macro-historic sacred landscapes approach, we established a comparative project analysing in parallel the development of sacred landscapes of two mega-islands, i.e. Cyprus and Sardinia, at the transition from the Bronze to the Iron Age.

It is generally accepted that the transition from the Late Bronze to the Early Iron Age is a period that comes after general disorder and movements of people and ideas in the broader Mediterranean. In both Cyprus and Sardinia the period between the 12th and 8th century BC seems to have been a time when re-negotiations of individual, societal, and political identities took place, and this is clearly reflected on the construction of the sacred landscapes of the two islands.

In this paper we first present our 'landscape/macro-historic approach'; we then define the chronological horizon and the socio-historical contexts under discussion for each island, exploring at the same time how the hierarchical arrangement of ritual sites appearing at this transitional phase seems to be related with articulated social order, or linked with shifting relations of power and cultural influence. We conclude addressing the following three questions: 1. What may be the relation between individual insularities and the construction of sacred landscapes on these two mega-islands, in comparison with the nearby evidence from mainland? 2. How can a 'landscape/macro-historic approach' assist us in better formulating microscopic approaches on both islands at the transition from the Bronze to the Iron Age?; and, 3. Is a comparative approach viable?

03 PREHISTORIC LANDSCAPES OF LAMPEDUSA

Author(s): Wexler, Jennifer (British Museum)
Presentation Format: Oral

Prehistoric Landscapes of Lampedusa is designed as a pilot study to document, identify and assess prehistoric sites and features across the island of Lampedusa (Sicily, Italy), the most southern landmass of Europe. The island has always as a 'stepping stone' between Africa and Europe, most notoriously in its recent history of migrations, but despite its advantageous location at the centre of the Mediterranean it has been overlooked in modern archaeological investigations. Informed by previous limited archaeological documentation offering indications of the potential of Lampedusa's archaeology, this study has focused on developing a systematic survey, using a spatio-landscape approach and ground reconnaissance to identify and map sites, targeting the early settlement record of the island (c. 6000-1200 BC) in order to gain a better understanding of later prehistoric dynamics of the central Mediterranean. This paper will address the ideas of connectivity and remoteness as identified in the archaeological record in order to gain a better sense of this island's place in a broader, historical context. This study has great potential implications for our understanding of the prehistoric dynamics of the central Mediterranean. Most importantly, the known archaeological remains of the island show aspects of both Italian and North African influences, providing a unique chance to explore previously un-investigated areas within cross-Mediterranean relationships in later prehistory.

04 AN ISLAND ARCHAEOLOGY OF THE MIDDLE AND LATE BRONZE AGE CYCLADES?

Author(s): Abell, Natalie (University of Michigan)
Presentation Format: Oral

The Cyclades are no stranger to island archaeology. Broodbank's (2000) An Island Archaeology of the Early Cyclades was a watershed, which reshaped discussion around the development of Early Bronze Age Cycladic society, while showcasing the comparative value of island archaeologies centered in the Mediterranean. The temporal end-point of that book coincides with a massive social and political shift in the Aegean—the emergence of the Minoan palaces of Crete in the Middle Bronze Age (MBA). Yet, studies of the Cyclades in that period and the subsequent Late Bronze Age (LBA) rarely frame research questions in terms specific to island archaeology. Rather, research focused on these periods has been bound up primarily in debates around the impact of Aegean palatial cultures on Cycladic communities (i.e., the so-called Minoanization and Mycenaeanization phenomena). This difference in theoretical frameworks is, perhaps, unsurprising. Island archaeology traditionally has been associated especially with problems of initial colonization, as well as interaction and social change amongst communities with similar forms of social complexity. The problem in the MBA and LBA Aegean is the palaces, as well as the differential power dynamics that accompanied them. Thus, colonial and post-colonial theories have formed the primary lenses through which insular, non-palatial societies of these periods are evaluated. Nevertheless, approaches common in island archaeology remain relevant for the MBA and LBA Cyclades and offer opportunities to de-center the palaces as the assumed primary source(s) of power and influence in the region. This paper explores how island archaeological perspectives can enrich narratives of social development and cultural interaction in the Cyclades during the MBA

and LBA, when the islands are marked by shifting, idiosyncratic patterns of engagement with palatial and non-palatial communities, both near and far.

05 LOCAL IDENTITY OF THE EARLY TALAYOTIC ARCHITECTURE IN MENORCA

Author(s): Ramis, Damia (Independent)
Presentation Format: Oral

The Balearic archipelago is a remote territory colonized in the 3rd millennium cal BC by communities with a relatively homogeneous cultural background. This early settlement was followed by a marked isolation which lasted throughout most of the Bronze Age. Consequently, these islands, with a roughly common ancestry, offer the possibility to study the social dynamics in each of them, in terms of cultural homogeneity and diversification, analysing the intensity of the maritime interactions between them. The major change in the prehistory of Mallorca and Menorca is the start of the so-called Talayotic culture by the end of the 2nd millennium cal BC. It is characterized by the appearance and diffusion of monumental towers (talayots), a new kind of architecture with a marked symbolic meaning. But a closer look at these towers shows relevant differences between the two islands. In addition, in Menorca the talayots coexist with a local type of burial monument (naveta), unknown in Mallorca. Differences are not only detected in the shape and types of monuments in each island. From a chronological point of view, the current evidence shows an earlier dating for the Menorcan talayots. In parallel, the abandonment of the settlements of the previous period (i.e. naveta villages) suggests a slightly earlier origin of the Talayotic period in Menorca. Additionally, the materiality recorded in the west talayot of Cornia Nou suggests a higher level of social complexity, and even some signs of inequality. Mallorca lacks this kind of evidence in the early Talayotic. All this suggests the need to study the Talayotic period in both islands separately.

06 RELATIONS BETWEEN SARDINIA, THE GREEK AND THE ITALIC WORLD IN THE EARLY HELLENISTIC PERIOD

Author(s): Tronchetti, Carlo (Retired, formerly National Archaeological Museum of Cagliari)
Presentation Format: Oral

The Punic Sardinia of the Hellenistic age, from about half of the fourth century BC onwards, it is at the center of a network of traffics. Objects and cultural influences from Greece, in particular Athens, from the Centro-Italica area, and partially from southern Italy arrive in the island.

It is possible to identify both common characteristics between the different Sardinian territorial compartments and diriment elements. These are located mainly in Olbia, because of its proximity to the Italian peninsula, which makes it a privileged port of access for the trade managed by Rome.

The comparison with other areas of the Mediterranean, first Carthage, is useful to highlight the Sardinian peculiarities within the Western Punic World. In fact, while the contacts with the Greek world took place through the mediation of Carthage, those with the italic world seem to derive from direct relations, due to the geographic position of the island.

In examining this situation, particular attention is devoted to the imported pottery and to the important phenomenon of "imitations". Both Greek and italic pottery have produced a large number of imitations, and this phenomenon is also found in the early times of Roman political domination, until at least the middle of the 2nd century BC.

07 THE EXCAVATION OF BITHIA BETWEEN ARCHAEOLOGICAL RESEARCH AND ANALYSIS OF THE ANCIENT LANDSCAPE

Author(s): Bassoli, Carlotta (Indipendent researcher) - Minoja, Marco (MIBACT) - Chergia, Valentina (Università di Granata)
Presentation Format: Oral

The archaeological excavation of Bithia starts in 2011. Research has focused particular attention to the analysis of the territory, to its geomorphological characteristics and to the transformations of the environment in which human activity is evident. The territory of the ancient Bithia is part of the wide coastal plain between the hinterland of Nora and the deep inlet of the Gulf of Teulada. The urban settlement appears concentrated on the Chia hill and in particular along its slopes. The immediate hinterland of the promontory is characterized by a fertile alluvial plain located between the southern reaches of the Sulcis massif and occupied in part by the Chia basin. The excavations on the top of the hill have highlighted the presence of a monumental staircase that introduces a series of environments related to each other, from which comes a series of votive objects which identify the sacred destination of the spaces, at least until at the late antiquity, when it began to outline a progressive change of use of the spaces.

The discovery of ancient environments, which show up preserved up to 3.00 m, shows how the original structure of the promontory was profoundly different and continued to evolve over time, parallel to the actions of man on the territory. In fact, it is necessary to imagine that, at a certain time, some rooms are partially filled and adapted even in their dimensions with different functionalities from those carried out in the past; and then again, almost totally disappeared and reused as substructures of the Aragonese tower.

Even the archaeological excavation, as an action of removal, will intervene to change the hilly landscape, helping to restore the ancient aspect of the landscape.

08 SICILY AND CONNECTIVITY THROUGH MEDITERRANEAN SEA IN LATE ANTIQUITY AND EARLY BYZANTINE PERIOD. THE CASE STUDY OF AGRIGENTO

Author(s): Caminneci, Valentina - Parello, Maria Concetta - Rizzo, Maria Serena (Parco Valle dei Templi)
Presentation Format: Oral

In the last decade thanks to the numerous archaeological surveys and systematic field researches carried out in some areas of Sicily, more interesting data are available on Late Antiquity and Early Middle Age. If the concepts of crisis and decadence are nowadays obsolete, the latest studies are concentrated on changing processes and connectivity in Mediterranean area. In this period characterised by increasing political fragmentation, it is very important to understand the signs of an enhanced connectivity thanks to trade/shipping networks and routes.

Our topic focuses on the case study of Agrigento during Late Antiquity and early Byzantine period. The archaeological evidence shows various changes in the urban physionomy. The rich domus of imperial period became smaller and, during the 6th-7th century, some burials occupied the rooms. In the Roman forum nearby, public buildings were abandoned and oblitered by an impressive dump and some workshops. The large necropolis realized in the southern part of the town testifies that the urban area has been significantly reduced. The ceramic assemblages of the archaeological contexts investigated in the city and in the ancient harbour show a close connection with North Africa, and particularly with the ateliers identified along the Gulf of Hammamet, where the pottery mostly comes from.

Furthermore in order to understand the economy of Sicily in Late Antiquity, it is very important the evidence of the countryside, where the combined documentation of the excavation and the intensive field survey provide important data for the same period on the development of rural settlement that was densely populated with farms and villages. Along the Western coast of the Sicily, near the rivers mouth, a network of little harbors, linked by cabote shipping, allowed the circulation of importation goods in the hinterland and the exportation of local products in the Mediterranean.

09 "ISLANDS IN THE STREAM": RE-ASSESSING THE BYZANTINE INSULAR ECONOMY BETWEEN LATE ANTIQUITY AND THE EARLY MIDDLE AGES (CA. 600-C. 800)

Author(s): Zavagno, Luca (Bilkent University)
Presentation Format: Oral

This contribution mainly focuses on the economy and the economic implications of numismatic evidence as yielded in some of the most important islands of the Byzantine eastern (Crete and Cyprus) and western (Sardinia, Sicily and partially the Balearics) Mediterranean in a specific period, that is the passage from Late Antiquity to the Early Middle Ages (i.e. between early seventh to early ninth century); this mainly owing to the fact that historians have used the evidence of coinage to create false perspectives of how Byzantine insular economy changed.

In fact, in this paper I will argue that monetary indicator gives us enough evidence pointing to a certain degree of economic prosperity on the above-mentioned islands during the period under scrutiny as even the more distant (from Constantinople) ones -like Sardinia and the Balearics- continued to play an important role in the political, fiscal, administrative and religious structures of the Byzantine empire.

With this in mind, this paper will also try to show how the analysis of coinage and monetary circulation chimes with other types of material evidence (mainly lead seals, and ceramics) allowing us to point to a relatively higher welfare of the Byzantine insular world compared to the Anatolian plateau, the Aegean region and the Balkans in the passage from Late Antiquity to the early Middle ages; a level of welfare that reflected the uninterrupted, although diminished, role islands played within the Mediterranean shipping routes linking the eastern and western basin of the Great Sea with the Aegean and Constantinople.

10 TECHNOLOGICAL CHANGES IN POTTERY MAKING IN MALLORCA (SPAIN) BETWEEN THE LATE ANTIQUE AND ISLAMIC PERIODS: RECENT ADVANCES FROM ARCHAEOMETRIC ANALYSES

Author(s): Fantuzzi, Leandro (Fitch Laboratory, British School at Athens; Equip de Recerca Arqueològica i Arqueomètrica de la Universitat de Barcelona - ERAAUB) - Mas Florit, Catalina - Tsantini, Evanthia (Equip de Recerca Arqueològica i Arqueomètrica de la Universitat de Barcelona - ERAAUB) - Cau Ontiveros, Miguel Ángel (Equip de Recerca Arqueològica i Arqueomètrica de la Universitat de Barcelona - ERAAUB; Catalan Institution for Research and Advanced Studies - ICREA; Centre Camille Jullian, AixMarseilleUniv, CNRS, MCC, CCJ)
Presentation Format: Oral

Late Antiquity in the Balearic Islands (Spain) was characterized by significant political, social and economic transformations, especially after the conquest by the Vandal Kingdom, first, and the Byzantine Empire, later. Even more significant changes occurred after the Islamic conquest of the islands, in the early 10th century. Cultural transformation implied, among other, changes in the models of pottery production, distribution and consumption, compared with those that had characterized the Late Antique period. This can be inferred from several ceramic assemblages documented in archaeological contexts so far.

In addition to the knowledge provided by the archaeological record and, in rare cases, historical sources, significant information on pottery production technology and on the patterns of distribution and consumption can be obtained through the application of instrumental analytical techniques. This approach has been applied, in the last decades, on an increasing number of Late Antique pottery assemblages in the Balearic Islands, based on a combined petrographic, mineralogical and chemical analysis of the materials.

These included large amounts of pottery produced in the islands, mostly Ebusitan common or utilitarian wares, although a possible Mallorcan production was also identified. Conversely, there is still a significant gap concerning the archaeometric study of Islamic pottery in the islands, for which a first study on utilitarian ceramics dated to the Muslim period found in the ancient city of Pollentia (northeastern Mallorca) has been recently performed. Despite the scarcity of studies for this last period, preliminary archaeometric results reveal important technological changes when comparing Late Antique and Islamic utilitarian ceramics from Mallorca. This contribution aims, on one hand, at summarizing the results obtained so far, and, on the other hand, at presenting the research lines planned for the next years that will enable a better understanding and comparison of pottery traditions in the island for these two historical periods.

665 BRONZE AGE TRANSFORMATION PROCESSES IN EUROPE – CHANGES AND THEIR TRIGGERS IN ARCHAEOLOGICAL AND ECOLOGICAL RECORDS

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Schaefer, Stefanie (Christian-Albrechts-Universität zu Kiel, Institute for Pre- and Protohistroric Archaeology) - Kneisel, Jutta (Christian-Albrechts-Universität zu Kiel, Institute for Pre- and Protohistroric Archaeology) - Sabatini, Serena (University of Gothenburg, Department of Historical Studies)
Format: Regular session

This session deals with transformation processes during the Bronze Age (2200–500 BC) in North, Central and Central Western Europe. In general, two decisive changes can be observed: on the one hand, the transition to the Middle Bronze Age, and, on the other hand, the beginning of the Urnfield period. Far-reaching but different changes in Europe mark these time horizons: 1) The end of the first Bronze Age cultures, among others the northern Únětice Culture with a following settlement gap of 150 years; 2) The beginning of the Late Bronze Age with the start of cremation burials and large urn cemeteries. The introduction of cremation burials not only bears witness to a change in the grave ritual, but also indicates crucial social and ecological changes that are visible, for example, in the diet.

This session focuses on transition phases in the Bronze Age and their social, cultural, ecological and economic aspects. Within this session, we would like to discuss changes in settlement patterns, technology and productive activities, burial construction and rituals, as well as fundamental changes in the material culture (e.g. new weapons and tools, shifts in personal goods). Furthermore, we are interested in the methods which can be used for the localisation of transformation processes (absolute dating, environmental research, genetic analyses, geochemistry, geophysics and quantitative/diachronic analyses). Finally, it will be inquired if it is possible to identify triggers for the processes of transformation (in social, economic, ideological, cultural, and ecologic contexts).

ABSTRACTS

01 SCALES OF TRANSFORMATION – TRANSFORMATION PROCESSES IN THE ARCHAEOLOGICAL RECORD

Author(s): Kneisel, Jutta - Schaefer, Stefanie (Institute of Pre- and Protohistoric Archaeology Univesity Kiel; SFB 1266 Transormation Dimensons)
Presentation Format: Oral

Transformations are reflected in changes that lead to a substantial reorganization of socio-ecological relationships and occur within different temporal and spatial scales. A transformation is connected with the introduction of new social, cultural and/or material attributes and values that change the existing socio-ecological interaction. These changes can be attributed to both social and environmental factors. In the archaeological and environmental record, we can identify changes in different domains of society and the environment, if the transformation had a certain endurance while building a new status quo.

In a transect of Bronze Age sites from northern Germany to Greater Poland, we can detect different time stages and different reflections of transformations.

While the early Bronze Age settlement "Bruszczewo" in Greater Poland and simultaneous settlements in the Brandenburg Havel region experienced a collapse around 1600 B. C., at the same time in Schleswig-Holstein and Mecklenburg-Western Pomerania local continuities up to the pre-Roman Iron Age were evident. In contrast, another drastic phase of transformation around 1200 BC was evident in all regions: the material culture was modified and the practice of burial rites changed from inhumation to cremation. For the study of such changes or turning points as well as collapses within subregions, local processes of change and transformation with regard to social, economic, ecological, cultural and ideological aspects, which are reflected in the material culture and require the socio-ecological interaction, must be identified and compared. Furthermore, regional and supraregional triggers of transformation processes will be evaluated.

For this purpose, it is important to observe how far-reaching transformations affect society. Does a society, for example, reorganise itself in its entirety or are only parts of it transformed? In addition, the question arises as to how quickly transformations have taken place.

02 FROM ISOLATED WORKERS TO STANDARDIZED PRODUCTION: THE EXAMPLE OF TEXTILE CRAFTWORK DURING BRONZE AGE IN BRITTANY (FRANCE)

Author(s): Penisson, Roxane (Université Rennes 2) - Cocoual, Antoine (W3D's)
Presentation Format: Oral

Textile production during Bronze Age in Brittany and more generally in western France, remains a relatively few studied topic within the framework of archaeology with the exception of the last few decades. However, the great majority of textile remains listed in France for this period originate from this specific region.

The use of vegetable fibres (flax in particular) and the absence of animal fibres in the making of textile fabrics induce a situation that in a way contrasts with the rest of Europe where the presence of wool is more generally attested, especially with regard to nothern regions .

Furthermore, recent excavations show a significant increase concerning production volumes between Middle Bronze Age (1650 - 1350 B.C.) and Early Iron Age (800 - 450 B.C.), as well as a complex productive framework that can not only be related to a simple domestic craftwork.

Manufacturing structures evolution, standardization and improvement of weaving tolls not only show an increase of produced volumes and a change concerning weaving practices but also a specialisation of craft workers.

Global and interdisciplinary approach currently offers us a new vision of textile "chaîne opératoire" and of its evolution, regarding the weaving structures conception, the techniques they depend on until final products.

03 COMMUNITY OF PRACTICE AS A TOOL FOR UNDERSTANDING TECHNOLOGICAL CHANGES AND TRANSFORMATIONS: WEAVING IN BRONZE AGE PO PLAIN

Author(s): Sabatini, Serena (University of Gothenburg)
Presentation Format: Oral

The widespread presence of textile tools in the Bronze Age so called terramare settlements of the Po plain has hinted at the general existence of local textile production. A study of the archaeological evidence in the area suggests that at specific locations textile manufacture could have been could have been not only very intense, thus likely aiming at producing goods for export, but also that it might have been focused on specific kinds of production. Textile production is a complex endeavour and requires a long chaîne opératoire from fibre production to fabrics. This paper analyses weaving practices – indeed one of the final stage of the production chain - through the evidence for clay loom weights, suggesting the spread use of vertical warp-weighted looms in the area. Changes in the taxonomic characteristics of the loom weights suggest also that weaving was a dynamic practice and that a continuous development, reasonably in response to what we might call "market-related" factors, took place. This paper argues that the adoption of a community of practice model as a frame of reference is powerful tool not only to understand variations in weaving practices, but also to envision changes and transformation as to patterns of specialisation during the Middle and Recent Bronze in northern Italy.

04 REGIONAL AND SOCIOPOLITICAL CHANGES IN NORTHWESTERN SCANDINAVIA IN THE EARLY BRONZE AGE

Author(s): Austvoll, Knut Ivar (Department of Archaeology, Conservation and History, University of Oslo)
Presentation Format: Oral

The diverse landscape that makes up the northwestern coast of Scandinavia, stretching from Vest-Agder in the south to Troms in the north, would have created natural difficulties for groups trying to obtain large-scale political control. As such, the social organisation along the northwestern coastline was seemingly highly varied, from smaller groups and single households to more specialised societies reminiscing of a chiefdom-like structure. This paper explores changes in the sociopolitical development in northwestern Scandinavia in Early Bronze Age. These changes are shown to have been triggered by multiple factors, which encompass increased use of the seaway, adaptation to the local ecology, as well as interregional developments and incorporation. An extensive archaeological corpus, consisting of settlement and burial patterns, lithics, metal, and rock art, and patterns of diachronic, regional and societal differences is investigated. This allows me to identify a more nuanced picture of how societies along the northwestern coast organised themselves and their connections with concurrent pan-regional processes. Within this system, it is shown that regional societies rise and fall depending on their successful exploitation of local resources, ecology and sociopolitical strategies. However, even though developing societies are to a large extent structured by local conditions, interregional developments have impacted them in several ways. I argue that the development of societies cannot be seen in a unilinear manner, and neither can the development of one socio-historical region be understood in its entirety without the addressing interaction between multiple neighbouring regions as well as pan-regional processes.

05 LIVING AS BEFORE? TRANSFORMING SETTLEMENT PATTERNS FROM THE LATE NEOLITHIC TO THE MIDDLE BRONZE AGE IN THE SOUTH-WEST BALTIC AREA

Author(s): Raese, Hendrik (Institut fuer Ur- und Fruehgeschichte Kiel)
Presentation Format: Oral

The last two decades of archaeological field work in north-eastern Germany and north-western Poland were influenced by extensive linear infrastructure projects (e.g. motorways and pipelines) which made it possible to examine long transects of the landscape. In north-eastern Germany, especially Mecklenburg-Vorpommern and northern Brandenburg, almost 80% of the currently known house structures of the local Dagger Period and Early Bronze Age (2200-1600 BC) were discovered during these infrastructure projects. Additionally, the number of known settlement sites of the Late Bronze Age (1200-550 BC) was also enlarged. Still missing are settlements or house structures of the Middle Bronze Age (1600/1500-1200 BC). Furthermore it is difficult to recognize the mundane material culture (e.g. ceramics) and absolute dates of settlement features of this period are scarce as well. This situation is comparable to the period of the late neolithic Corded Ware Culture (2800-2200 BC) which is especially interesting because in both periods there is, contrary to settlements, a high number of burials, hoards, single finds and even battlefields. It seems therefore that there a two transformation processes, one starting at the beginning of the Late Neolithic and the other one at the end of the Early Bronze Age, encompassing not only the choice of settlement sites but also of the settlement structure. Based on the available presence-absence data and environmental-based information the underlying settlement patterns shall be analysed using point pattern analysis and predictive modelling to define areas where to look for additional sites and where not. The identified transformative patterns will be compared to the well investigated settlement area of the Kościan region in Greater Poland in the light of similar or diverging development lines.

06 TURNING POINTS AND CULTURAL CHANGES IN THE BOHEMIAN BASIN DURING THE BRONZE AGE

Author(s): Jiran, Lubos - Šumberová, Radka (Institute of Archaeology of CAS, Prague)
Presentation Format: Oral

The broader European area underwent several significant transformations in the Bronze Age that were characterised by the extinction of the contemporary cultural environment and the immediate emergence formation of a new cultural milieu.

Even though the mountain circle surrounding the Bohemian Basin seems to have protected this particular area from the direct effects of the processes that gave rise to such cultural changes; the archaeological sources, however, apparently prove that there were several occurrences of cultural discontinuity in the Prehistory.

This contribution aims to analyse the documented cultural transformations that took place during the Bronze Age in the present-day Bohemia territory and their possible compatibility with the processes occurring in the surrounding areas.

Eearlier phase of the Bronze Age is predominantly represented by the Únětice culture, which had continuously evolved from the previous Eneolithic tradition and gradually became the most advanced cultural complex in Central Europe. After about 600 years of its existence, there was a significant cultural transformation that can be directly demonstrated in artefacts, funerary customs, in the settlement structure, as well as in the quality of used raw materials. The current state of research allows us to determine the origin of these new cultural impulses, their direction and the degree of their influence on the genesis of the Tumulus cultural complex dominating the Middle Bronze Age.

Another fundamental change in the cultural environment can be observed at the end of the Middle Bronze Age when ends the formerly monocultural character of the settlement, and a distinct boundary line of two different cultural complexes is constituted there. The archaeologists have at their disposal a relatively large collection of data to describe fairly accurately the genesis of this new cultural milieu. Results of the research acquired at some unique sites allow us to determine the ongoing transformation phenomena thoroughly.

07 TIME OF TRANSITION. BURIAL RITES AND SETTLEMENTS MIDDLE BRONZE AGE MORAVIA

Author(s): Sabatova, Klara (Masaryk university)
Presentation Format: Oral

The objective of this paper is present the situation in Moravia (Czech Republic) in the middle Bronze Age (local 1600/1550 - 1300/1250 BC) in connection to changes of burial rites and settlement. In the first part, we try to answer on the basis of funeral rites and the new C14 data, when the Early Bronze Age ends. Subsequently, how the burial rite changes in several steps, not only in terms of inhumation and the cremation. We present the cremation burial rite prevails for the beginning of the Late Bronze Age and for the start of urn cemeteries. Then we show the structural change in Middle Bronze Age settlement, which is represented in Moravia with dispersed lowland sites, recurring structures of timber framed and post hole houses and the transformation of settlement features. The occurrence of hilltop settlements is still assumed only at the beginning and at the end of the Middle Bronze Age. From this point of view is short time of the Middle Bronze Age a period of significant transition that is conditioned by economic prosperity. We can see changes in crop husbandry and sufficiency of used metal. The question remains whether the increasing number of archaeological traces is related to real population growth or a change in the nature of the living culture.

08 BRONZE AGE TRANSFORMATION PROCESSES IN THE ARCHAEOLOGICAL RECORD OF SCHLESWIG-HOLSTEIN (NORTHERN GERMANY)

Author(s): Schaefer, Stefanie (Christian-Albrechts-Universität zu Kiel, Institute for Pre- and Protohistroric Archaeology, CRC1266)
Presentation Format: Oral

The identification of transformation processes in Bronze Age are evident in this project which is focused on the north of Germany in Schleswig-Holstein. Around 1600 BC the collapses of settlements in Brandenburg and Greater Poland (e. g. Bruszczewo) are in contrast to the territorial continuities in Schleswig-Holstein (e. g. the site Mang de Bargen). 1200 BC there are significant over-regional changes concerning both material culture and the burial rite.

In this contribution, the question arises how transformations in Northern Germany during the Bronze Age manifest themselves. It is important to observe how far-reaching transformations affect society. Does a society reorganise itself in its entirety or are only parts of it transformed? In addition, the question arises as to how quickly transformations have taken place in the field of work. Furthermore, it has to be questioned whether there are any transformations within the selected sub-regions at all, despite the continuity of the local area in Northern Europe.

For Schleswig-Holstein, especially the second phase around 1200 BC can be identified very well. First of all, we can recognize a change in the material culture with more imports, improvements for ceramic, flint and metal production, gold and an appearance of face and house urns. A second transformation in this phase is the transition from the inhumation in grave mounds to cremation in urns. While this transformation the grave construction, grave goods and the rites changed. In a case study from the district Segeberg in Schleswig-Holstein is shown, for example, that this process took ca. 300 years between Period IIb and Period IIIb and that the quantity of cremated individuals in urns are much higher with the cremation-rite.

These kinds of transformations will be analysed in the context of social, economic, ecological, cultural and ideological aspects.

09 MIDDLE BRONZE AGE POPULATION PRESSURE AND RESOURCE PROBLEMS IN THY, NORTHWEST DENMARK

Author(s): Bech, Jens-Henrik (Museum Thy, Denmark)
Presentation Format: Oral

Combining results from settlement research, absolute dating and environmental research this paper focus on population pressure and scarcity of wooden resources in the region of Thy, northwest Denmark during the Middle and the beginning of the Late Bronze Age – a period of 500-600 years at the end of the 2nd and the beginning of the 1st millennium BC. Already during the Neolithic the first major forest clearance took place early in the 3rd millennium BC, during the late Single Grave Culture, but this development increased in the Middle Bronze Age to such an extent that an open, almost treeless landscape was created. This environmental change was caused by the establishing of many new settlements and the building of several thousand burial mounds, demonstrating a population pressure with a peak shortly before 1000 BC. This apparently led to an ecological crisis in the beginning of the Late Bronze Age. From Middle Bronze Age sites at Bjerre Enge, northern Thy use of driftwood from the shores of the North Sea and fossil wood from bogs in house construction is a clear indication of scarcity of wooden resources also illustrated by the use of peat and manure for fuel. From a central position within south Scandinavian Middle Bronze Age society, Thy during the Late Bronze Age became part of the periphery, perhaps triggered by overexploitation and an ecological crisis ?

10 CHALLENGES OF DAILY LIFE IN BRONZE AGE NORTHERN CAUCASUS: COMPARING FRACTURE FREQUENCIES OF PEOPLE FROM EARLY AND MIDDLE BRONZE AGE

Author(s): Gresky, Julia - Reinhold, Sabine (German Archaeological Institute) - Belinski, Andrej (OOO Nasledie) - Berezina, Natalia (Research Institute and Museum of Anthropology, Moscow State University)
Presentation Format: Oral

During the last few years, extensive anthropological research of Early and Middle Bronze Age skeletons of the steppe and piedmont area of the Northern Caucasus has been undertaken. Altogether 167 individuals from 13 different burial sites dating from 4200-2100 BC have been investigated with the use of macroscopic and optical-microscopic techniques as well as plain radiography and tomography.

This contribution focuses on type, state of healing and frequency of fractures in different parts of the skeletons of 90 males, 26 females and 13 individuals of indeterminable sex. 44 of the adolescent and adult skeletons belong to the Early Bronze Age, 85 skeletons to the Middle Bronze Age. People are supposed to have been engaged in animal husbandry.

For the assumed harsh living conditions coming along with early domestication of animals, animal husbandry, and mobile lifestyle, the fracture frequency is surprisingly low. The observed fracture pattern suggests accidents during work, but more frequently interpersonal combat e.g. fist fighting. Age and sex seemed to play an important role in the distribution of fractures. The most frequent fractures already occur in the youngest age group, but accumulate during life. Females had less severe fractures than males.

There is a higher frequency of fractures in people of the Early compared to the Middle Bronze Age, possibly due to a more dangerous lifestyle (domestication of animals, their adaption to wagons, metal processing).

Fractures of the skeleton are an archive of traumatic stress people accumulate during life and can shed light on their occupation

and life style.

11 ANCIENT DNA SHEDS LIGHT INTO THE KINSHIP STRUCTURE OF EARLY 2ND MILLENNIUM BC TRZCINIEC CIRCLE GROUPS FROM EAST-CENTRAL EUROPE

Author(s): Chylenski, Maciej (Institute of Archaeology, Adam Mickiewicz University in Poznań) - Juras, Anna (Institute of Anthropology, Adam Mickiewicz University in Poznań) - Makarowicz, Przemysław (Institute of Archaeology, Adam Mickiewicz University in Poznań) - Pospieszny, Łukasz (Institute of Archaeology and Ethnology, Polish Academy of Sciences) - Szczepanek, Anita (Department of Anatomy, Jagiellonian University in Krakow) - Górski, Jacek (Archaeological Museum of Kraków) - Taras, Halina (Institute of Archaeology, Maria Curie Skłodowska University in Lublin)

Presentation Format: Oral

The early 2nd millennium BC is one of the most dynamic and transformative periods in the development of social structures in East-Central Europe. Major changes in cultural landscape of the period are defined by the rise of a phenomenon, known to the archaeological record as the Trzciniec Cultural Circle (TCC). It is thought that kinship and blood ties played an important role in a long-distance exchange and mobility of TCC people facilitating its spread and permanence. This view is supported by the assumption that individuals buried in collective burials, characteristic for TCC, were related and that burials themselves were meant to present the dead as members of a specific kin group. This hypothesis is based on various data including information supplied by physical anthropology.

One of the main objectives of our project is to test this idea by applying the methods of contemporary archaeology, biology (genetics), anthropology and isotopic geochemistry. Here we present the initial results of ancient DNA (aDNA) study of four collective TCC burials from southern Poland. The data for relatedness estimates were generated using direct high throughput sequencing of genomic libraries, as well as capture based enrichment methods, targeting mitochondrial, Y-chromosome and nuclear markers in order to maximize the number of tested individuals. We tested several computational methods designed with low coverage genomic data in mind, in order to detect and confirm the 1st and 2nd degree kinship among the tested individuals.

In our presentation we will compare the obtained results with the isotopic and anthropological data obtained for the same individuals in an attempt to reconstruct the most probable kinship and social structures of TCC groups. We will also discuss the possible role the proposed social organization could have played in the dissemination and perseverance of TCC in East-Central Europe for more than 600 years.

12 SOCIETAL TRANSFORMATIONS FROM THE EARLY TO THE MIDDLE BRONZE AGE IN THE LECH VALLEY SOUTH OF AUGSBURG

Author(s): Stockhammer, Philipp (LMU Munich; Max Planck Institute for the Science of Human History, Jena) - Knipper, Corina (Curt-Engelhorn-Centre Archaeometry gGmbH, Mannheim) - Massy, Ken (LMU Munich) - Mittnik, Alissa - Krause, Johannes (Max Planck Institute for the Science of Human History, Jena)

Presentation Format: Oral

For a long time, the transition from the Early to the Middle Bronze Age in Southern Germany has been understood as a linear process of transformation with a shift in material culture and burial practices located to the decades around 1550 BC. In order to better understand this process, we have studied more than 300 so-far unpublished burials from the Early and Middle Bronze Age from the Lech valley south of Augsburg and also from the Gäuboden in Niederbayern. Our archaeological analysis is accomplished by a large series of radiocarbon dates for these burials. The new radiocarbon dates force us to rethink the transition from the Early to the Middle Bronze Age. It became clear that both periods overlapped for at least 150 years in Bavaria between the 17th and15th century BC. In order to understand the social interaction between coexisting Early and Middle Bronze Age hamlets in immediate vicinity, we scientifically studied the individuals from these cemeteries. On the basis of palaeogenetic and isotopic analyses, we are not able to trace shifts in individual mobility, diet and biological relatedness within cemeteries. In the end, we propose a model for the societal transformation during this time in our area of focus.

13 THE LATE BRONZE AGE HOARDS AS INDICATORS FOR THE CULTURAL TRANSFORMATION IN THE NORTHERN-EASTERN EUROPE

Author(s): Civilyte, Agne (Lithuanian Institute for History)

Presentation Format: Oral

The topic of the turning points in the Bronze Age was successfully discussed at the EAA meeting in Glasgow in 2015. There I spoke about the periodisation of the Bronze Age in the Eastern Baltic region and gave the historiographical review of turning points and their significance for the cultural and social development. I was exploring how important had been the splitting of the Bronze Age into shorter sub-periods and whether it really enables us to recognize better the change of various cultural processes in the Eastern Baltic region. As we can see in the North, Central and the Central Western Europe, decisive changes can be observed and that is why we have Middle and Late Bronze Age periods. Today I can continue the discussion about the transitions from one period to another and their signifance in the human life. However in my talk I want to stress the Late Bronze Age metal depositions as an essential change in the material culture. Hoards are connected to the metallurgy and to the appearance of local production of metal artifacts.

They are also a part of the fortificated hillforts, because the deposition of metal have increased simultaneously with the building of fortifications. So, the question is what has happened in the Late Bronze Age and what are the reasons for the crucial transformations in the Northern-Eastern part of Europe.

14 RITUALS IN THE TRANSFORMED LANDSCAPE OF LATE BRONZE AGE SOUTHWEST NORWAY

Author(s): Meling, Trond (Museum of Archaeology, University of Stavanger)
Presentation Format: Oral

In the Late Bronze Age and the Pre-Roman Iron Age, Southwest Norway was a highly developed and extensive agricultural landscape with numerous farms, fields and grazing areas. The landscape was the result of massive forest clearance and settlement expansion were former outfield was transformed into domestic landscapes. The process started in the Neolithic, but accelerated throughout the Bronze Age. This human impact of the landscape was also a major contributory factor of substantial Aeolian activity along the coast in the late Pre-Roman Iron Age.

Based on a recently excavated stone cairn the paper will discuss rituals related to these transformation processes. The cairn, which was carefully constructed and had a complex composition, was situated close to a field and nearby several contemporary farms. It was created through a period of at least 200 years during the Late Bronze Age and early Pre-Roman Iron Age. Several of the objects (e.g. seashells, grinding stones, bones of red deer) found in the cairn can be associated with transformations per se, and multiple details in the construction seems to reflect a narrative were the structure itself is a subject of transformation. There is reason to believe that the performed rituals were undertaken in order to maintain a balance in society when the landscape and the settlement went through rapid changes.

15 LAND USE DYNAMICS OF THE CENTRAL AND EAST HESSE UPLANDS (GERMANY) THROUGHOUT THE LATE BRONZE AGE

Author(s): Bringemeier, Lisa - Stobbe, Astrid (Frankfurt University, Archaeological Sciences, Archaeobotany Laboratory)
Presentation Format: Oral

Throughout the Bronze Age extensive occupation and reclamation of land especially suited for agriculture took place, turning landscapes like the basin Wetterau in Hesse, Germany, into remarkable cultural landscapes. At the onset of the Late Bronze Age (Urnfield period) land use intensified significantly and created vast deforested areas in the basins. Simultaneously the surrounding uplands of Central and East Hesse, i.e. the Taunus, Vogelsberg and Rhön, witnessed fundamental changes regarding their forest vegetation, notably a rapid shift from linden- to beech-dominated vegetation.

Those changes are somehow associated with the first occurrence of potentially fortified hilltop sites in the study area and indicate that the low- to mid-mountain ranges were increasingly occupied and utilised. However, the archaeological investigation of those sites is quite challenging since their appearance is rather diverse, they are often situated in largely forested areas or are in a poor state of preservation due to gravel mining. Thus the range of possible interpretations stretches from short-term refuges to major settlements of economical or strategical importance.

Paleoenvironmental research offers a diachronic perspective on the nature and extent of anthropogenic activities in the vicinity of the hilltop sites. High resolution-pollen analysis aims to elucidate the land use dynamics from the first exploitation of the uplands during the Late Bronze Age to their transition to a fully developed cultural landscape at the beginning of the Iron Age. The palynological evidence was obtained from peat bogs, alluvial sediments and subrosion/sinkhole deposits at different altitudes between 250-600 m a.s.l. in Taunus and Rhön. It is complemented by geochemical analyses on selected profiles, e. g. to trace potential mining activities.

16 THE SOCIAL DIMENSION OF AGRICULTURE IN THE ITALIAN FINAL BRONZE AGE. UNDERSTANDING THE TOLFA MOUNTAIN COMMUNITIES THROUGH THEIR RURAL LANDSCAPE

Author(s): Sotgia, Agostino (Sapienza - University of Rome; University of Groningen)
Presentation Format: Oral

Clarke (1952), Higgs (1975) and Earle (2002) stipulated that the subsistence economies of early communities form the basis of the pre-modern economy. However, as Marxist theories have taught, economic production cannot be equated with economic configuration. The latter refers to a complex arrangement of different social and anthropological patterns within community life (Virno 2014). Moreover, if we view ancient agricultural production as the exploitation of common and shared resources (commons), we should conceptualize it in terms of social production (Negri, Hardt 2009).

Spatial analysis of the productive landscapes surrounding the Final Bronze Age settlements in the Tolfa Mountains (Central Italy) may help to arrive at a better understanding of the subsistence economy of these communities and its social implications. To this end I will present a preliminary spatial analysis of the economic resources, using a combination of archaeological and paleoenvironmental data. Combining information from excavations and palynological and archaezoological analyses, I will propose a land use model, based on these primary data, informed by the writings on pre-modern agricultural techniques by agronomists as Columella or Pliny.

My approach aims to test the validity of current territorial-organisation models (micro districts, cantonal or confederal systems, etc.) as brought to the fore in recent studies (Barbaro 2010). While many scholars (di Gennaro 1986) analyzed the spatial organiza-

tion of settlements and made hypotheses on their political organization, few have tested these models in view of demographic and economic sustainability.

This paper will contribute to a better definition of the political and socio-economic background of the "protourban turn" of the 10th-9th c. BCE in South Etruria. Indeed, for this phenomenon - that ultimately led to settlement concentration in the large (proto-)urban centers - many scholars (Peroni 1996, Pacciarelli 2001) theorized a new social organization that became intimately related with changes in the concept of `ownership'.

17 ENERGY EXPENDITURE, COPPER OUTPUT AND DEMAND FOR WOOD – A MAJOR TRANSFORMATION IN BRONZE AGE METALWORKING TECHNOLOGY

Author(s): Brinkmann, Johanna (Institut fuer Ur- und Fruehgeschichte Kiel; CRC 1266 - Scales of Transformation)
Presentation Format: Oral

In Central European Bronze Age (2200-800 BC) a major transformation process concerning the metalworking technology is evident. A series of changes in technology and productive activities are observable in material culture at the end of the Early and the beginning of the Middle Bronze Age (around 1600 BC). This includes an increased copper output in the mining areas as well as a change in metal processing technology, visible in the replacement of the oxidizing smelting process by a smelting technique that runs under reducing conditions. The reducing process allows the production of larger amounts of metal and a greater standardisation, but presupposes a more complex furnace construction, which is indicated by furnace features from the Eastern Alps. In addition, in the later phase of the Early Bronze Age a change in alloying from arsenical copper and copper with a low tin content to tin copper with approximately ten percent of tin occurs. These changes in metalworking technology are accompanied by an increase in energy expenditure required for the production of copper and bronze artefacts and an increased demand for wood resources. The calculation of the energy expenditure – including all production steps – is a rarely applied method. It gives a comparative value for every copper or bronze artefact, which reflects the time and effort required for the production of an object in different periods of the Bronze Age. Moreover, a calculation of the required wood resources illustrates the need for wood as a fuel and the human impact on the environment. The changes visible in the archaeological record (changes in technology, increased copper output) are reflected in the energy expenditure calculations and the estimated demand for wood. Together, all the named factors point towards a major economic transformation at the end of the Early Bronze Age.

667 THE EIGHTH CENTURY BC – A TURNING POINT?

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Pearce, Mark (University of Nottingham, Department of Classics and Archaeology) - Potrebica, Hrvoje (University of Zagreb, Department of Archaeology)
Format: Regular session

The eighth century BC represents a major step change in the European prehistory. For example, in the central Mediterranean, urban centres form in South Etruria and Greek colonisation of the West begins. There are also profound changes in the southeastern Alps and Carpathian Basin, where the Urnfield Cultural Complex is replaced by the Eastern Hallstatt Circle at the advent of the Iron Age. Long range communication networks are rearranged, the social structures of local communities are reinvented, burial mounds appear as universal landscape features and settlements are reorganized or abandoned for new locations in the same areas. Although communities in the Balkan area see a long continuity of development from the Late Bronze Age to the very end of the Iron Age, the 8th century BC shows marked changes in the material culture of burial contexts which probably reflect some sort of rearrangement of social structure.

This session seeks to identify the fundamental changes in society that had their roots at this time and led to the complex societies of the later first millennium BC and asks the question, what was going on? Why do these fundamental changes occur and is their temporal correlation an index of some wider cross-European phenomenon?

ABSTRACTS

01 THE EIGHTH CENTURY BC IN THE CENTRAL MEDITERRANEAN

Author(s): Pearce, Mark (Department of Classics and Archaeology, University of Nottingham)
Presentation Format: Oral

The eighth century BC sees the emergence of cities and the first writing in the central Mediterranean. It also sees the beginning of Greek colonisation in Italy, with the foundation of the emporion of Pithekoussai and the colony of Cumae in the Bay of Naples. Following the demise of Frattesina, a Final Bronze Age – Early Iron Age trading and manufacturing centre at the head of the Adriatic, there is a new territorial organisation in the eastern Po plain, with the foundation of the major centres of Este and Padua and the first steps towards the emergence of a polycentric urbanised polity. To the west, the northern Tyrrhenian sees Etruscan trade northwards doc-

umented at the Chiavari cemetery in Liguria.

What seems to be clear is that many of these transformations do not depend on the deus ex macchina of Greek colonisation, but are the results of local trajectories. Indeed it will be argued that the 'turning point' that led to the complex societies of the later first millennium BC cannot be simply explained as a response to external stimulus, but that its causes must be sought locally. Indeed, it may be that the first Phoenician and Greek traders came precisely because of these changes, rather than causing them.

02 THE 8TH C. BC TURNING POINT IN LATIUM VETUS (CENTRAL ITALY): EXCAVATIONS OF A COMPLEX ARTIFICIAL MOUND AT CRUSTUMERIUM (ROME)

Author(s): Attema, Peter (Groningen Institute of Archaeology / University of Groningen)
Presentation Format: Oral

The 8th c. BC in Latium Vetus was in many ways a turning point for the Iron Age communities south of Rome as can be deduced from the abundant settlement and funerary evidence available for this period when compared with the foregoing centuries. New forms of settlement and funerary architecture arose associated with the so-called orientalising material culture. In this paper the nature and impact of 8th c. BC change is illustrated by the discussion of the on-going excavation of a huge artificial mound at the Iron Age to Archaic Latin settlement of Crustumerium, located on the Tiber, near Rome. It is in the course of the 8th c. BC that the people of Crustumerium began to erect a mound over their earliest tombs that themselves had constituted small burial mounds (tumuletti) erected over shallow fossa graves. New tombs were dug through the now elevated burial complex which, however, respected the early tumuletti. Still later the Crustumini expanded the mound to cover the funerary complex, covering the latter with layers of soil and stone debris to finally erect a series of walls on top. Recent research has shown that beneath the mound the ancient defensive structures are preserved as well. As such the mound represents a key to read the various phases in Crustumerium's biography from its foundation in the mid-9th c. to its abandonment, probably already shortly after 500 BC.

03 THE MIDDLE ADRIATIC AREA IN THE 8TH CENTURY BC

Author(s): Macerola, Fabiana (Dipartimento di Scienze dell'Antichità-Sapienza, Università di Roma)
Presentation Format: Oral

The middle Adriatic area, corresponding approximately to the modern Marche and Northern Abruzzo regions, is affected, through the 10th – 8th centuries BC, by the development and spread of what is traditionally called "Picene culture". Although it is not clear whether, and since when, we can talk about a "Picene culture" in the broadest sense, substantial transformations are recorded, especially from the end of the 9th century BC.

Studies on this topic have traditionally focused on a few classes of artifacts, mainly pertaining to the funerary sphere. However, if we consider all the variables involved (typological, funerary and settlement-related aspects), it is quite clear that the situation is more complex and that many concurrent and multi-level phenomena occur.

First of all, a massive settlement density is attested in the 8th century BC: in the face of a very low settlement continuity between the end of the Final Bronze Age and the beginning of the Early Iron Age (in the course of the 10 – early 9th cent. BC), new sites are recorded in the 9th century BC (mostly surviving into the following phase) and many others are established in the 8th century BC. The same applies for funerary evidence, drastically enhancing in the course of the 8th century BC: an increased wealth among the grave goods, reflected, for example, by a wider presence of amber objects, iron tools and weapons, and the diffusion of burial mound structures, especially in the southern area, are the main features of this phenomenon. To complete the innovative picture, the narrow geographical distributions of many artifacts types and classes highlight, during the 8th century BC, the start of a "regionalization" process, probably connected to the formation of cultural and/or political entities.

04 BURIAL AND SOCIETY IN THE 8TH CENTURY B.C.E. IN ALBANIA

Author(s): Bejko, Lorenc (University of Tirana)
Presentation Format: Oral

If we can discuss the main cultural features of the 8th century B.C.E. in Albania, as elsewhere, it is due to the relatively large number of graves of this period that have been documented. Very limited information comes from systematic exploration of settlements however landscape/survey data is accumulating in the last two decades from systematic surface investigations. This situation makes the current knowledge of the 8th century B.C.E. not only biased, but also heavily dependent on the cemetery data, which will be reflected also in this presentation.

The 8th century B.C.E. represents a series of cultural developments that distinguish it clearly from the preceding Early Iron Age, and give it the status of the turning point from which to understand the major transformations of the following 7th century B.C.E. The wide use of iron, indications for re-establishment of long-distance connections, and the appearance of new mortuary norms that define new identities are some of the characteristics of this period that indicate dynamic social developments within communities that set the stage for later events. In this presentation a regional approach is also taken that shows how different communities responded differently to the new circumstances of the 8th century. Intra- and inter-regional variations underline the fact that there was differential access to connection networks between different communities and this is another important characteristic of the 8th century, which explains, partly at least, why complex societies developed where they did in the following 7th and 6th centuries

B.C.E.

05 FROM EAST TO WEST IN THE 8TH C. BC – DIVERGING VIEWS

Author(s): Metzner-Nebelsick, Carola (Inst fuer Vor- und Fruehgeschichtliche Archaeologie, Provinzialroem Archeologie)
Presentation Format: Oral

From east to west in the 8th c. BC – diverging views

In my paper I will address the question of the "eighth century as a turning point ?" from two different angles. I will contrast the development of the eastern alpine fringes – as part of the eastern Hallstatt world – with that in southern central Europe as part of the Hallstatt west, focusing on Bavaria. Both regions display significant differences as far as the rhythm of settlement occupation is concerned, and also spacial patterns of cemeteries and settlements are diverging. A turning point seems to be more obvious in the Hallstatt west whereas in my view the situation in the Hallstatt east is less clear. The reason for this include the fact that here the use of iron objects does not mark such a clear indicator of 'modern times' as it does in the west.

Memorial culture reflected in graves stands in a sharper contrast to the previous Urnfield period in Bavaria than it does in the eastern Hallstatt zone where new developments started already in the 9th century BC. The paper will also address the question whether our notion of change may be a reflection of the fact that the Hallstatt chronology is still based to a large extend on the Bavarian data base.

06 HA C IN SOUTHWESTERN FRANCE: A GOOD EXAMPLE OF POST-COLLAPSE RECOMPOSITION?

Author(s): Dumas, Antoine (UMR 5607 Ausonius - Bordeaux Montaigne University - LabEx Sciences Archéologiques de Bordeaux)
Presentation Format: Oral

This paper is an attempt to understand the changes that occurred during the 8th and the beginning of the 7th century BC in Southwestern France. We consider the conceptual framework of the collapse studies to be a relevant tool in order to interpret this period, which corresponds to the Ha C.

Important changes, yet of different nature, mark the beginning and the end of the Ha C. First, major discontinuities in settlement strategies are identified between the Late Bronze Age (LBA) and the Ha C. In particular, domestic sites tend to scatter, decrease in size and locate in different areas, while many hilltop settlements are abandoned. In addition, ritual and burial practices evolve drastically, with the almost complete disappearance of metal hoards and the creation of cemeteries. Conversely, some discontinuity is observed, especially regarding the typology of artefacts.

The comparison with the Ha D also reveals discrepancies. Lowland settlements increase in size and density, and hilltops are partially re-occupied. Cemeteries and isolated graves show signs of growing differentiation. A deep renewal is observed in the typology of artefacts.

In this long sequence, the Ha C can thus be seen as an interlude. We suggest that this period is a good example of a post-collapse process of recomposition. This implies that, in spite of appearances, the Ha C should be viewed as a continuation of cultural processes initiated during the LBA, as well as the starting point of new developments.

07 THE BRONZE AGE-IRON AGE TRANSITION: CHANGE AT THE ALPINE CROSSROADS OF AOSTA, NW ITALY

Author(s): Wicks, David (Akhet srl) - Armirotti, Alessandra (Patrimonio Archeologico. Soprintendenza per i Beni e le Attività Culturali della Regione Autonoma Valle d'Aosta)
Presentation Format: Oral

The discovery of a monumental Early Iron Age landscape in recent excavations to the north of Augusta Prætoria has cast new light upon the period of transition between the Bronze and Iron Ages in the mountainous region of the Aosta Valley. Sited at an important alpine cross-roads, Aosta not only dominates two of the main communication routes linking France, Italy and Switzerland, but also controls access to notably rich zones of both the traditional and the new mineral wealth.

The status of Aosta as an important central place, at least in this period, is indicated by the presence of 'exotic' monumental elements imposed upon the Late Bronze Age rural landscape. An enormous stone circle (diameter 135 metres) was constructed towards the end of the Eighth century BC, attracting a large 'satellite' tumulus containing a warrior-burial equipped with a north-alpine Halstatt sword and scabbard of the mid-VII century BC, and also a major contemporary palisaded enclosure.

This important activity represents however only a hiatus in the evolution of a superficially tranquil prehistoric linear field-system, developed in association with persistent yet discontinuous hill-foot settlement over the previous two millennia. The unpredictable impact of nature is illustrated by a series of calamitous landslides partially-obliterating the artificial landscape, with some settlements however already inexplicably in state of abandon, suggesting that other processes are operating, for example climatic change or population movement exemplified by the historical 'celtic' migrations.

The transient nature of power in this 'dangerous' context is revealed, with the momentarily important symbol of power represented by the stone circle rapidly losing its original cultural significance with a return to the more important work of agricultural production; the much-degraded monument incorporated as a simple circular field into a wide-scale, landscape agricultural scheme based upon

a notably complex irrigation system.

08 CONTINUITY, DISCONTINIUTY AND CHANGE: ELITES, SETTLEMENT AND LONG DISTANCE EXCHANGE IN THE EARLY 1ST MILLENNIUM BC IN SE SLOVENIA

Author(s): Mason, Philip (Zavod za varstvo kulturne dediščine Slovenije,)
Presentation Format: Oral

The first quarter of the 1st millennium BC saw radical change in society, settlement and the mortuary record throughout the Eastern Alpine Region and the Head of the Adriatic. The 8th century BC was critical in this period for the change from the flat cremation cemeteries and, open settlements of the Late Bronze Age Ljubljana Urnfield group to the hillforts and barrow cemeteries the succeeding Early Iron Age Dolenjska group, as well as for the appearance of iron technology and local iron production.

Prestige goods in mortuary contexts reflect the changing nature of elite exchange in the area around the Head of the Adriatic, between the Eastern Adriatic and the Eastern Alps on the one hand and the Apennine peninsula on the other. Ornaments and weapons are joined by defensive armour, equestrian equipment and the drinking sets of the new elite (image), which endured to the end of the Early Iron Age in the region. .

The paper explores the role of elite contact and competition in the Late Bronze Age and Early Iron Age societies in South East Slovenia in the transmission of artefacts and technologies in this region and ultimately between the Italian peninsula, the Balkans and Central Europe. It also seeks to examine whether the appearance of more visible and more intensive forms of elite competition, reflected in the settlement and mortuary sphere in the Early Iron Age in South East Slovenia, is as abrupt as it seems, or whether they represent the intensification of existing trends that were already visible in the Late Bronze Age.

09 SOUTH-EASTERN SLOVENIA IN THE EARLY HALLSTATT PERIOD

Author(s): Borut, Križ (Dolenjski muzej)
Presentation Format: Oral

The crucial changes that marked the beginning of the Iron Age in the area of South-Eastern Slovenia happened in the 8th century BC. The turning point was firmly established production of iron from large quantities of easily accessible iron ore which rapidly became the most important sector of economy. This change was also reflected in settlement pattern and dynamics which reflect process of centralisation. All these external processes were strongly interrelated with transformation of inner social structure of local communities which started already in the 9th century. In the 8th century BC the process of transformation was over and the new Iron Age elites were firmly established ready to rule over three centuries of general prosperity. The evidence of that are rich warrior graves that reflect not only large and powerful trade network, especially with Italy, but also acquisition and transformation of Italic taste and fashion. In that time, in Dolenjska the South-Eastern Slovenia, the rite of burial changed from cremation burial in urns, to inhumation burial beneath an earthen barrows. The barrows are interpreted as family or lineage tombs, because they contain a large number of burials of both sexses and all ages. The central part of the barrow was usually chosen for the earliest burial, the founder, the elder of the family group, usualy from the beginning of te Early Iron Age.

10 ADVENT OF THE IRON AGE – EIGHT CENTURY BC IN SOUTHERN CARPATHIAN BASIN

Author(s): Potrebica, Hrvoje (University of Zagreb; Center for Prehistoric Research)
Presentation Format: Oral

The southernmost part of the Carpathian Basin lies on the border of the Eastern Hallstatt Circle and Balkan Iron Age Cultures. It is also place where ancient East-West routes that run along rivers Drava and Sava connected Danubian area and Alps for most of later prehistory. Eight century BC in this area is almost synonym for the beginning of the Iron Age. Although the process of transition from the Late Bronze Age cultures belonging to the Urnfield Culture Complex to the Kaptol Group which is part of the Early Iron Age Hallstatt Complex is still obscured, we know that first burial mound graves of Iron Age elite appear in the eight century BC. Beside different burial ritual and probably significantly different social structure, these graves under tumuli reflect whole new network of long-distance communication as well as more regional and local contacts. Prestigious goods from different Iron Age centres across Europe, from Greece to Alpine region, travelled through this network to find their final points of distribution in this area. Although little is known on settlements from that period in this area, some new results point out an important shift in the landscape use, rather than large changes in population. The impulse for that change was probably some kind of collapse of the Late Bronze Age network which probably can be traced on much larger scale across Europe.

11 THE EIGHTH CENTURY BC IN THE SOUTHERN PART OF MIDDLE DANUBE AREA – CONTINUITY VS. DISCONTINUITY?

Author(s): Ložnjak Dizdar, Daria - Dizdar, Marko (Institute of Archaeology)
Presentation Format: Oral

The southern part of the Middle Danube area is the south-eastern part of the Carpathian Basin. The continuity from the Late Bronze Age to the Early Iron Age is evident in positions and patterns of settlements and cemeteries at the beginning of last millennium BC (in the first fourth centuries). The discontinuity is visible in the personal items (especially female attire) and concepts in mortuary

practices.

Southern part of the Middle Danube is a region at crossroads of the different communication routes, which is particularly evident from distribution maps of different parts of attire in the Late Bronze Age and the Early Iron Age that overlapped in this territory. The question is however, who really met here? Traders, travellers, craftsmen, individuals with high mobility… What caused the changes – disappearance of traditional jewellery types and an innovation in the production of attire types, including the usage of the new materials in the southern Carpathian Basin in the course of the 8th century BC? The female attire also is very important in construction of different regional chronologies in the southern Carpathian Basin. What were the criteria for adoption of new ideas in communities along the one of the most important communication routes (Danube) which had lived in long lasting settlements and buried their deceased in cemeteries with continuity from 11th century BC?

12 EIGHT CENTURY IN NORTHERN AND CENTRAL BALKANS

Author(s): Pravidur, Andrijana (National Museum of Bosnia and Herzegovina)
Presentation Format: Oral

Central cultural feature of the Iron Age in Bosnia and Herzegovina is the Glasinac Group. The Glasinac is a region in the form of a plateau, located in the eastern part of Bosnia and Herzegovina, extending from the Romanija Mountain in the west to the Drina River in the east. It is also a name used to describe the complex of necropolises consisting of tumuli that were built in that area throughout the Bronze and Iron Age. It is actually a core area of much larger cultural complex that at one point stretched over large area of Central Balkans. So far the main characteristic of this group has been continuity of development from beginning of the Late Bronze Age to the Late Iron Age. The burial ritual in the area remained the same for several centuries (stone mounds with multiple burials). Both skeletal and cremation graves were present from the beginning of the group with increase of cremation burials at the late phase of the Iron Age. However, the eight century BC certainly was some kind of turning point, more in content than in form. It marked the advent of the Iron Age with introduction of new metal as well as with change in social structure reflected in appearance of local but powerful elites. Rare elite graves from this period will be presented in larger cultural context. This paper will also present several other finds from the area of Bosnia and Herzegovina that belong to this elusive but extremely important period.

668 FIELD SYSTEMS, CENTURIATIONS AND THE SHAPING OF CULTURAL LANDSCAPES: INTEGRATED AND LONG-TERM ANALYSIS

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Palet, Josep Maria (GIAP. Institut Català d'Arqueologia Clàssica) - Carvalho, Helena Paula (Departamento de Historia. Instituto de Ciencias Sociais, Universidade do Minho) - Ortega Pérez, María Jesús (GIAP. Institut Català d'Arqueologia Clàssica) - Orengo Romeu, Hèctor A. (TwoRains Research Associate, McDonald Institute for Archaeological Research, University of Cambridge)
Format: Regular session

The last decade has seen a revival in the study of Roman centuriation and ancient field systems using archaeomorphology-based approaches. Current work has adopted integrated and multidisciplinary studies, which include geoarchaeology, geophysics, survey, historical documents and paleo-environmental data. These approaches are based on the idea that, through a complex history of occupation, landscapes have become a cultural palimpsest. Current cultural landscapes can be considered as multiphase systems within which, previously existing forms play a key role in determining and shaping the subsequent landscape phases. In this sense, territorial structures display a long-term chronology and become essential in the configuration of long-term settlement patterns and landscape dynamics. In this regard, new approaches are focused on the study of the conservation and possible re-use over time of ancient field systems and territorial structures in modern agrarian landscapes.

Current research shows that ancient field systems and Roman centuriated arrangements seem to be the origin of many Mediterranean cultural landscapes. From these new perspectives and through the comparison of diverse case studies, this session aims to showcase long-term and integrated analyses of ancient field systems and centuriated networks and discuss their meaning in Roman and classical landscapes. Given their strong influence in the shaping of present cultural landscapes together with their lack of visibility and their enormous importance as a cultural resource, papers dealing with the heritagisation of ancient field systems will also be welcomed.

ABSTRACTS

01 ROMAN SURVEYS IN SOUTH-EASTERN BRITANNIA: AN APPLICATION OF ALEXANDRIAN SCIENCE?

Author(s): Peterson, John (University of East Anglia)
Presentation Format: Oral

The standard limitatio grid was often used to plan roads, with orientations defined by rational numbers. This leads to restriction in the range of relative orientations, and to the creation of the three symmetries – translation, reflection and rotation. For the definition

of possible centuriated landscapes, the observation of symmetries provides much more reliable clues than impressions given by topographic analysis or so-called 'landscape stratigraphy'.

In theory, two adjacent systems of limitatio covered south-eastern Britannia. The first (Kent A) was defined by two Roman roads leaving Dover, one showing translational symmetry and the other at 45° (1:1) to it. This leads to a redefinition of Margary's 'centuriation' at Ripe, confirmed by the translational symmetry of its bounding roads. The second (Southern) was proposed in the area between London and the Sussex coast, as a possible cause of the translational symmetry in the northern part of road 14, on the assumption that it was at 1:4 to the grid. Another road, at 3:5, provided confirmation. The two roads are at 1:1 because these three ratios solve an equation of the sort discussed by Diophantus of Alexandria.

Apart from numerous possible landscape traces of the Southern limitatio, its existence is verified by its rational links to other already proposed Roman roads, and to the southernmost part of Road 14. This has another 1:4 relationship, so the two main parts of road 14 are reflected in the axes of the Southern system. This road segment simultaneously has a 1:2 relationship with the Kent A grid, and the above Diophantine equation implies that the two grids are related at 6:7. This is confirmed, to high precision, by the empirically determined value of the difference between their orientations.

02 LEARNING TOPOGRAPHY AND CADASTER FROM THE OLDEST MANUALS EVER KNOWN: CORPUS AGRIMENSORUM ROMANORUM

Author(s): Morintz, Alexandru (Institute of Archaeology)
Presentation Format: Oral

It is above any question that field systems and Roman centuriated areas are at the origin of many cultural landscapes. Having the ancient Egyptians and Greeks as predecessors (the latter especially at the theoretical level), the Romans devised the most performing land measurement procedures ever known in Antiquity. Numerous principles and methods were perpetuated after the dissolution of the Roman Empire, until the 17th century when, with Ramsden's theodolite, the topography stepped into a new era. Reminders over the centuries of the Roman centuriation system can be seen in Europe, but especially in America. There, the European colonists often adopted similar methods of land allocation and cadaster registration.

I think it is of extreme importance to know how were the ancient field systems and centuriated arrangements actually established on the ground. My paper is trying an approach to Corpus Agrimensorum Romanorum not through the eye of the historian of technology but through the eye of a student who knows almost nothing about topography and cadaster and masters only basic knowledge of arithmetic and Euclidean geometry. Bringing together information collected from several texts from Corpus Agrimensorum Romanorum (Frontinus, Hyginus 2, Balbus, Nipsus and others) I will try to draw up a compendium containing all topographic knowledge available in the Roman period.

In the end, relying on this compendium, I will propose a few practical procedures.

03 AMONG VICENZA, PADOVA AND ESTE: FINDING TRACES OF THE ROMAN LANDSCAPE IN A BORDERLAND

Author(s): Matteazzi, Michele (Catalan Institute of Classical Archaeology)
Presentation Format: Oral

The stretch of Venetian plain today comprehended between the cities of Vicenza and Padova and defined by the presence of the Berici Hills to the west and the Euganean Hills to the east and by the passage of the Bacchiglione river and the Bisatto channel, has always been characterized, starting at least from 6th century BC, as an important borderland among the Venetian centers of Vicenza, Padua and Este. A peculiar characterization that will be typical of this territory even during Roman and Medieval times: especially between 12th and 13th centuries, when it will be the focus of a centuries-old border dispute, mainly motivated by the control of the important water resources, between the Comuni of Padova and Vicenza.

Thanks to the archaeomorphological reading of the territory, integrated by new archaeological and geomorphological data, we are now able to recognize in the palimpsest of the current landscape the traces of the ancient Roman landscape, proposing the reconstruction of the main road network that affected the area and suggesting the probable existence of at least three different centurial field systems (most likely pertinent to the municipia of Vicetia and Patavium and to the Augustan colony of Ateste), which also seem to define the possible boundaries of the agri belonging to the three ancient civitates.

The Roman structuring of the landscape has over the time undergone several changes, modifications and erasures, but it remains quite evident how it has profoundly influenced the building and the shaping of the current landscape, contributing not a little to the definition of today boundaries between the provinces of Vicenza and Padova.

04 COLONY OF PRAENESTE: THE CHALLENGE OF A CONTINOUSLY CHANGING LANDSCAPE

Author(s): Pintucci, Alessandro (University of Rome "Sapienza")
Presentation Format: Oral

The system of agrarian division of the colony of Praeneste had already been taken into account in a systematic study in 1993.

A recent doctoral research, however, which had as its object the study of the territory of the city of Palestrina, which succeeded

Praeneste in the modern age, allowed to reconsider the previously collected data: the knowledge of a much greater number of structures, often discovered during preventive and rescue archaeology excavations, together with the in-depth study of historical sources, aerial photographs, multispectral images, historical and modern cartography, as well as the check of hypotheses on the ground through survey, has allowed the development of a new reconstruction proposal of the system of ancient agrarian division, which all sources agree to place in the Sillean era and probably end in the Tiberian era.

In particular, recent excavations along Via Prenestina Nuova (an ancient secondary arm of Via Labicana) have revealed the presence of large field road, interpreted as a decumanus of the ancient colony.

The paper will present the new hypothesis, integrating the data coming from the different sources and trying to explain the archaeological reality also in the light of what the ancient sources have transmitted to us.

05 LANDSCAPE CHANGES, SETTLEMENT AND CENTURIED SYSTEMS IN THE HINTERLAND OF EMPORION-EMPORIAE (NORTH-EASTERN CATALONIA)

Author(s): Palet, Josep Maria (Institut Català d'Arqueologia Clàssica) - Garcia Molsosa, Arnau (McDonald Institute for Archaeological Research. University of Cambridge) - Ejarque Montolio, Ana (Université Clermont Auvergne, CNRS, GEOLAB) - Rodrigo Requena, Esther - Ortega Pérez, María Jesús (Institut Català d'Arqueologia Clàssica) - Orengo Romeu, Hèctor A. (McDonald Institute for Archaeological Research. University of Cambridge) - Riera Mora, Santi (Seminari d'Estudis i Recerques Prehistòriques, Universitat de Barcelona)
Presentation Format: Oral

The Empordà's littoral plain is a highly diverse and dynamic littoral ecosystem subjected to see influence and fluvial flooding contributing to the formation of beach-barriers, marshes and lagoons and, ultimately, the plain in-filling. It constitutes an outstanding area for the long-term study of wetland management (drainage, irrigation), as well as for the analysis of landscape dynamics and land-use relationships in Mediterranean littoral plains. In Antiquity, this area was also characterized by an intensive Iberian and Roman settlement related with the presence of the Greco-Roman town of Emporion-Emporiae (Empúries).

In the context of a Landscape Archaeology research program the centuriated grids systems around the Greco-Roman city of Empúries has been studied in order to characterize their incidence in the anthropisation and shaping of this cultural landscape. Archaeological, historical and archaeomorphological data has been crossed with paleoenvironmental data. GIS has allowed the correlation of paleoecological, archaeological and historical data in a multi-scale and diachronic framework.

The results show the presence of multiple grid centuriated systems in the hinterland of Emporion-Emporiae. The wide array of digital and field methodologies employed has been essential in order to clearly document the centuriated land division traces and their Roman origin. The relationship between these axes and settlement patterns has also been characterized. Paleoecological data shows the remarkable imprint of the Roman occupation in the littoral plain, with the removal of littoral woodlands and the expansion of wet pastures and cultivation lands in an increasingly drained floodplain.

These methods have allowed moving beyond the pure description of the traces and exploring the concepts and ideas behind the making of a centuriated landscape. Finally, the high impact of centuriations on landscape structuration makes them visible in modern land arrangements and defines them as an outstanding evidence of Roman impact in the shaping of present-day cultural landscapes.

06 THE MAKING OF A MEDITERRANEAN LANDSCAPE. THE SHAPING OF THE TERRITORY OF VALENCIA IN ROMAN TIMES AND ITS SYMBOLIC BACKGROUND

Author(s): Ortega, Maria Jesús - Palet, Josep Maria (Catalan Institute of Classical Archaeology) - Orengo, Hèctor A. (McDonald Institute for Archaeological Research. University of Cambridge)
Presentation Format: Oral

Recent works integrated in the Valencia Landscape Project (VaLandPro) have revealed that the origin of present Valencian cultural landscape is the implementation of several centuriated systems during the Roman period.

The characterization of past settlement patterns and land-use through the application of various techniques in GIS has been essential for understanding the human impact in the Valencian plain, whose analysis presents great difficulties due in great part to the intense historical occupation and to the geomorphological processes typical of the Mediterranean alluvial plains. Likewise, a high degree of reliability in the results has been achieved by correlating the archaeomorphological and historical-archaeological analysis in a GIS environment. Also the archaeological and archaeomorphological survey and the analysis of the historical documentation have allowed verifying the hypotheses formulated through the archaeomorphological analysis in GIS.

These works have proved that road and field systems implemented in Valencia during the Roman imperial period have been determinant for the evolution of this landscape morphology and also that settlement location is due to multifactorial purposes, for settlements are linked to roads but also taking into account hydrology and topography.

The great extension of the centuriation linked to the city of Valentia allows us to propose a non-materialist interpretation of these systems and explore the symbolic conception of the Roman landscape and how centuriation was an example of this ideal.

This case study is similar to another Mediterranean territories like that ones' linked to the cities of Tarraco, Emporion and Barcino, where pallinological analysis have proved that the greatest part of the centuriation areas were not linked to agricultural exploitation,

but most of the areas remained forested.

07 THE STRUCTURING OF A ROMAN COUNTRYSIDE: ROAD NETWORK, SETTLEMENT PATTERNS AND ANCIENT LAND-SURVEYING IN THE CONGOST AND MOGENT VALLEYS (BARCELONA)

Author(s): Garcia, Arnau (McDonald Institute for Archaeological Research. University of Cambridge) - Oliver, Jaume (Universitat de Girona) - Flórez, Marta (Institut Català d'Arqueologia Clàssica)

Presentation Format: Oral

The physical and conceptual organization of the countryside is a basic element to understand Roman History and society and, therefore, it has been object of particular attention by archaeologists and historians. Long-term multidisciplinary approaches to Roman agrimensura have provided a deep knowledge in how territory was conceptualized and shaped. At the same time, surveys and archaeological excavations have its focus on the study of rural settlements and resource exploitation. Yet, these two dimensions of the Ancient world imprinted in present day landscapes, often appear as two unconnected realities, concealing the relationships (or its absence) between settlement patterns and ancient land-surveying operations.

This paper will propose a middle-scale approach to the questions of how Roman agrimensura can be identified on ancient settlement organization and how it can be a useful proxy to contextualize a disperse archaeological record. The study case, on the basin of the Congost and Mogent rivers (part of the Vallès region, the immediate hinterland of Barcelona), is an example of a territory were a dense network of rural settlements is documented during the Roman period, but, at the same time, without many elements to understand their articulation with wider territorial structures and historical processes.

Materials used in this study include Early Medieval documents, the critical analysis of the historical archaeological record, results of intensive and extensive surveys and the information about the road network obtained from archaeological data and morphological analysis. The results show evidences of a significant intervention in those territories at the beginning of the Roman Empire, captured in a small scale by the resulting road network and settlement pattern. From that point, this Ancient articulation extended its influence on Early Medieval landscape and towards later periods.

08 AN ARCHAEOMORPHOLOGICAL APPROACH TO THE AGER VALLEY HISTORIC LANDSCAPE. PATTERN CHANGES BETWEEN THE 5TH AND THE 13TH CENTURIES

Author(s): Porcheddu, Antonio (Universitat de Lleida)

Presentation Format: Oral

Characterizing a landscape from its shapes is one of the main methodologies that can be applied in Landscape Archaeology. The visible shapes, a part from its materialisation, can be considered as a product of the human action in the earth's surface. These shapes can be transmitted through time with different materialisation and even with different use, following a complex phenomenon of transmission and hybridisation. The approach we present here consisted of the analysis of the parcel system morphology of the Àger Valley (Spain). We detected some morphological patterns associated to specific archaeological sites of the 5th century and a general reorganisation of the plain area occurred after the seigniorial conquest of the area in the 11th century that was completed during the 13th century. To accomplish this study we used all the available sources, from remoted sensing images to historical aero photographs as well as archaeological prospection and documentary sources. In addition, we performed an automatic calculus of the shapes orientation through a GIS tool in order to identify an eventually planned parcel system. Finally, we compared the results with the hydrographic network, the geomorphology and the road network and we obtained an interpretation of a prevailing landscape pattern that structured the valley.

09 CONFIGURATIONS OF THE CONTEMPORARY LANDSCAPE: BRACARA AUGUSTA AND THE ROMAN CENTURIATION

Author(s): Brito, Sandra (Faculdade de Arquitectura da Universidade do Porto; Laboratório de Paisagens, Património e Território - Universidade do Minho) - Carvalho, Helena Paula (Departamento de História, Instituto de Ciências Sociais - Universidade do Minho; Laboratório de Paisagens, Património e Território - Universidade do Minho) - Labastida Juan, Marta (Escola de Arquitectura da Universidade do Minho; Laboratório de Paisagens, Património e Território - Universidade do Minho) - Pinto da Silva, Madalena (Faculdade de Arquitectura - Universidade do Porto; Centro de Estudos de Arquitectura e Urbanismo - Faculdade de Arquitectura da Universidade do Porto)

Presentation Format: Oral

The centuriation of rural space around the roman city of Bracara Augusta (Braga, Portugal) puts into perspective a series of issues related with the structure of its landscape. The implementation of this system of territorial mapping consolidates a wide road network that encompasses main and secondary roads, as well as a finer web of private and neighbourly paths that interfere with settlement dynamics, favouring the appearance of a network of "places" that provides structure to the landscape.

In this paper we place the observations in the architectural context as part of the project approach. In the move from a historical perspective to a spacial one, we define new hypotheses of investigation that emerge from the point of view of the observer. The focus on formal configurations and the relations between key elements of the landscape is a means of understanding conservation dynamics in territorial structures that are associated with the contemporary centripetal road system.

In this context, we aim to establish some reflections regarding the identity of the territorial framework that surrounds the old city

of Braga. This is achieved through the crystallisation of centuriation axes and a sympathetic approach to topography and old settlements. We try to clarify the "order" inherent to the structure of the landscape so we can approach the dynamics of preservation of the axes of roman centuriation in the contemporary landscape, associated to the retention of some paths and mechanisms of demarcation that maintain limits related to the roman land records. The selective accumulation of materials allows us to consider the permanence of certain demarcation tools, and their current meaning in the context of the landscape. Furthermore, it allows us to think about the possibility of conceiving new compositional relations based on the systems that informed the way this territory was organised.

10 ROMAN ROAD NETWORK AND CENTURIATION AROUND BRACARA AUGUSTA: THE CASE STUDY OF THE VIA XVIII

Author(s): Silva, João - Carvalho, Helena (Universidade do Minho)
Presentation Format: Oral

The present paper aims to provide an analysis of the relation between the roman centuriation system and the road network in the landscape of Bracara Augusta (Braga, Portugal). These aspects of roman territorial management and organization, in addition to influencing subsequent landscape axes, are themselves conditioned by previously existing elements; as such, their study provides an important outlook of the evolution of landscape and territorial morphology. Indeed, although originally implemented in the late 1st century BC/early 1st century AD, the roman road and centuriation systems around Braga continued to play a decisive role in the development of this particular landscape. However, the specific relation between these two elements in the vicinity of Braga is not yet fully understood: this is of particular relevance in the context of the territory around Braga, considering that the construction of the individual roads which make up the whole system did not take place at exactly the same time. The Via XVIII, which connected Bracara Augusta to Asturica Augusta offers, therefore, a singular opportunity to consider different phases of implementation of the roman road system and its relation to landscape morphology and human occupation. A methodology of analysis which considers the archaeological landscape as revealed by the individual archaeological sites in their social, cultural, economical and spatial aspects will be employed.

11 TRACES OF ANCIENT AGRICULTURAL ACTIVITIES RECORDED IN POLISH WOODLANDS

Author(s): Jakubczak, Michal (Institute of Archaeology and Ethnology Polish Academy of Sciences) - Budziszewski, Janusz - Dobiegała, Mateusz (Institute of Archaeology Cardinal Stefan Wyszyński University in Warsaw)
Presentation Format: Oral

The history of research on ancient field systems have almost a century-old tradition in Western Europe. However in Poland the situation was different, no traces of agricultural activities were detected till last decade. Development of airborne laser scanning (ALS) has changed this situation. The ALS technology allows to detect micro relief of terrain covered by forest. It turned out that woodlands preserved numerous ancient field remains of different shapes and sizes. At this moment we can distinguish several types of them visible on ALS data.

We will present a series of ancient field systems which are a permanent element of forested landscape. Each of them is located in various environmental conditions, from the Izera Mountains, through Polish Lowlands, to wetlands in the Białowieża Forest. The fields in each of these regions have its own unique character, differ in terms of size, form of balks and regularity. What all of them have in common is the location in places, that are not very useful from the perspective of modern agriculture. Right now we have a problem with analysis and dating of ancient fields, but single phase complexes from the Izera Mountains and the Białwieża Forest give us a unique opportunity to analysis well preserved landscape.

671 THERE IS MORE THAN MEETS THE EYE: UNVEILING THE HISTORIES OF ARCHAEOLOGICAL COLLECTIONS

Theme: Museums and the challenges of archaeological outreach in the 21st century
Organisers: Coltofean, Laura (Brukenthal National Museum, Sibiu) - Mihajloviná, Vladimir V. (Institute for Balkan Studies SASA, Belgrade) - Gustavsson, Anna (University of Gothenburg)
Format: Regular session

The objects exhibited in archaeological and history museums today are often part of impressive and meticulously created collections whose origins can be traced back to the eighteenth and nineteenth centuries, sometimes even before. In many cases, archival sources, old scientific publications and newspapers offer the opportunity to reconstruct the complex and fascinating histories of these collections, as well as the early curatorial practices related to them. What are the stories behind archaeological collections? How and in what cultural, political and social context were they formed? How did they evolve in time?

This session aims to explore the histories and lives of various archaeological collections in Europe and beyond. We welcome papers that explore themes such as the birth of archaeological collections and the reasons and ideologies behind them; the trajectories of the objects that

constitute these collections, from discovery to their inclusion in collections (whether private or public); and the criteria employed in organising, storing, preserving and displaying collections in the past and now. We would like to encourage discussion on the exhibitions in which archaeological objects were presented, their display and the concepts behind it. Discussions might include correspondence concerning archaeological collections and the networks of scholars, amateurs and common people that formed around them; the role of collections in knowledge production, transfer and exchange; and the scientific interest raised by a specific collection in time (who researched it, why and how).

ABSTRACTS

01 GIFTS OF THE NILE – TRANSNATIONALISM, ARCHAEOLOGY AND COLD WAR POLITICS AT THE VICTORIA MUSEUM IN SWEDEN

Author(s): Berg, Ingrid (Stockholm University)
Presentation Format: Oral

In the 1960s, The Scandinavian Joint Nubia Expedition (SJE), a UNESCO-run salvage project, brought back a large number of objects to enrich the Egyptian collections at Uppsala University. In response to the construction and eventual flooding of the Aswan Dam in the United Arab Republic, Nubia became divided into archaeological zones operated by Western nations and research institutions. "The International Campaign to save the Monuments of Nubia" was promoted by UNESCO as a global obligation. In return for financial and technical aid, the salvage campaigns brought back the system of a "fifty-fifty division of value". Once again, Egyptian artifacts flowed into foreign museum collections. This paper investigates how Nubian antiquities were appropriated as, and discursively transformed into, transnational heritage objects in the spirit of heritage politics during the post-war period. Through analyzing how the objects acquired by the SJE were found, categorized, divided, stored and exhibited, this paper discusses how UNESCO's agenda of a "heritage for all mankind" was staged and performed at one museum in the periphery of academic centers of Egyptology. Using unpublished archival documents, this paper also demonstrates how of Nubian artifacts at the Victoria Museum can be analyzed as materializations of Swedish Cold War politics as well as outcomes of ideals of Nordic post-war collaboration.

02 THE IRON AGE ABROAD: COLLECTIONS FROM THE SITE OF LA TÈNE IN US MUSEUMS

Author(s): Arnold, Bettina - Kubicek, Richard - Hruby, Thomas (University of Wisconsin Milwaukee)
Presentation Format: Oral

The type site for the late Iron Age in Switzerland was discovered and publicized in Europe at a time in the mid-19th /early 20th centuries when museums in the United States had already begun to acquire material from Neolithic and Bronze Age lake dwelling contexts, creating channels of communication between institutions, collectors and scholars that were to be instrumental in the transfer of artifacts from La Tène across the Atlantic. In cases like that of the Logan Museum collection at Beloit College in Wisconsin, there was a direct exchange with the excavator Paul Vouga in 1927, but in other instances a more opaque series of transactions was involved, as in the case of the Field Museum of Chicago's collection, some of which may in fact be from sites other than La Tène and which were acquired through at least two middlemen. Complete inventories of this material have yet to be produced, although a selection of artifacts is usually available in online data bases (though often without source information or photographs). In 2008 two Masters theses completed at the University of Wisconsin-Milwaukee began the process of documenting all artifacts putatively from La Tène at six major US museums. The complete catalog will be published in cooperation with the University of Neuchâtel. This paper will focus on the historiographic utility of such collections for understanding larger socio-political developments in US-European interactions.

03 COLLECTION OF DUCHESS CZARTORYSKA IN PUŁAWY (POLAND) - ITS HISTORY, CONTENT AND IMPACT ON POLISH CULTURE

Author(s): Rekowska, Monika (University of Warsaw, Institute of Archaeology)
Presentation Format: Oral

In the 18th and 19th centuries, the Polish nobles as well as the aristocracy from Northern and Central Europe collected antiquities to embellish their residences. Until the 1830's, nine large collections and about two dozens of minor ones were created. However, due to the turbulent history of Poland, many of them were scattered and looted, and a large part of the artefacts was lost. Nowadays, only the collection records (inventories, catalogues), iconographic testimonies (drawings, prints) as well as the architecture of residences in which these collections were housed allow to restore not only the contents of the collections, but also their background. The collection of Duchess Izabella Czartoryska in Puławy in Poland should also be studied in this context. Assembled at the beginning of the 19th century, it was dominated by ancient artefacts of little material value, rather souvenirs of immense sentimental worth. Duchess Czartoryska compensated for the lack of impressive sculptures and vases with pieces from the territories of Roman provinces, exhibited together with objects connected to pre-Roman cultures of Europe. This trend was not unusual in the period of birth of the identity of modern nations. She devoted a particular attention to the collected artefacts in both - the handwritten and the printed - catalogues. Now, although the collection is mostly dispersed and destroyed, and only few pieces survived, it can be reconstructed through the written and iconographic sources. Even more interesting is the context of the assemblage. The collection was exhibited (from 1809 open to the public) in the pavilion built in garden à l'antique, full of buildings and sculptures alluding in form, style of details to the art of ancient Rome. Thus, Duchess Czartoryska created one of the major venues for enthusiasts of Antiquity

in Poland in the early 19th century.

04 OBJECT HABITS: TRANSCULTURED COLLECTIONS FROM BRITISH EXCAVATIONS IN EGYPT

Author(s): Stevenson, Alice (UCL)
Presentation Format: Oral

From the 1880s until the 1980s British excavations in Egypt benefitted from the principles of partage, by which means a share of the material recovered by archaeologists was allowed to be exported abroad. British-led work was a transnational undertaking, funded by variable interests around Egyptian antiquities fostered in a variety of contexts in Europe and worldwide. A recent project, 'Artefacts of Excavation', has mapped the scale of this endeavour: over the course of a century an estimated 350 institutions across 27 countries in 5 continents materially benefitted. There is simply no other endeavour in world archaeology that is comparable in terms of its scope and material legacy. Attitudes to such artefacts, or 'object habits', are not, however, defined simply by the museum as an institution or archaeology as a discipline, but in the full agency of the world. Therefore, this paper will situate artefact distribution more broadly within wider political, social and cultural attitudes to material culture over time. In so doing, I will argue that the integrity of museum collections can constitute a barometer of how archaeological materials are valued and mediated by society. This will be demonstrated through case studies drawn from Victorian England and Europe through to the fragmentation of the British Empire in the 1950s and in new contexts of collecting in post-colonial Ghana.

05 THE LEGACY OF COURLAND PROVINCE MUSEUM

Author(s): Broka-Lace, Zenta (Institute of Latvian History, University of Latvia)
Presentation Format: Oral

The beginnings of archaeological science in Latvia can be traced back to the early 19th century. One of the main actors in this field were the Literature and Art Society of Courland (Kurländische Gesellschaft für Literatur und Kunst) in Mitau (today: Jelgava), founded by Baltic German intellectuals in 1815. Their goal was to fulfill the ideals of Enlightenment and humanism by developing archaeology, ethnology, natural and other sciences. An important part of their work was to educate the general public. To spread knowledge, the members of the Society established a museum in 1818 – the Courland Province Museum (Kurländische Provinzialmuseum). Among others, there was also an Archaeology Section with an archaeological collection from all around the territory of today's Latvia, as well as some artifacts from other parts of the world. Today, one of the first museums in Latvia no longer exists (in 1944 the building was destroyed), but its legacy and parts of the former archaeological collection are now scattered throughout different archives and museums around the world. Although the Museum itself is now only a legend, there are still plenty of informative materials and traces to research.

This paper aims to reconstruct the history of the archaeological collection of the Courland Province Museum, from its creation to preservation and exhibition. Overall, this paper is a reflection on the history of archaeology and the thoughts constituting it.

06 THE UNWANTED HERITAGE OR THE TASTY BITE? HISTORY OF ARCHAEOLOGICAL COLLECTIONS IN WEST POMERANIA, NW POLAND, AFTER WW2 (UNTIL 1989)

Author(s): Migdalski, Pawel (University of Szczecin)
Presentation Format: Oral

Studies on the history of Polish museology that are based on broad archival research are quite rare. The main reasons for this are: the dispersion of sources, the politicization of museums and also a taboo connected with the stealing and transferring of entire collections from the territory of so-called recovered lands, incorporated into Poland in 1945.

Based on the research of archival sources previously unconsidered in scientific discourse, the main aim of this paper is to present the history of archaeological collections from West Pomerania between 1945 and 1989, as well as the reasons of their sad history. In 1945 the Polish borders were shifted to the west, thus incorporating the eastern parts of pre-war Germany into the country, including Pomerania as well. The part of Pomerania's heritage was lost as a result of war actions or of post-war plundering. The attitude of the new, Polish settlers towards the rescued artifacts was often indifferent or even hostile. Only several people recognized their scientific value. They have started protecting the artifacts, at first mainly by sending entire collections from Pomerania to Central Poland and from provincial museums to the main cities of Pomerania. As a result of these actions, many artifacts never returned to their home institutions. Meanwhile, new collections and museums were created after 1945 in order to support the new, communist ideology. The new government was realizing its own agenda: the legitimization of the Polish claim and the presence in Pomerania through researching the Slavic roots and negating the Germanic settlement.

07 SEXOLOGISTS AS COLLECTORS OF ARCHAEOLOGICAL EROTICA IN THE LATE NINETEENTH AND TWENTIETH CENTURY

Author(s): Grove, Jen (University of Exeter)
Presentation Format: Oral

Growing scholarly attention is being given to the way in the classical past informed new sexological concepts in the West in the late nineteenth and twentieth century. For instance, the publication of Sexual Inversion (1896/1897) by Havelock Ellis and Classical

scholar John Addington Symonds, which drew on ancient Greek practices in order to defend contemporary male same-sex desire. But as well as historical texts, many sexual scientists were significantly interested in material and visual culture from the past. It is well known that Sigmund Freud made use of his substantial collection of Egyptian and other ancient artefacts in his psychoanalytical theory and practice. But other founders of modern sexual science, such as Magnus Hirschfeld and Alfred Kinsey, were also avid collectors of archaeological artefacts, especially with sexual and phallic themes. This paper will consider what role collections of physical evidence of past sexual practices, desires and customs played in the study of sex and the sexological method of comparing past and present cultures. How did displays of archaeological artefacts at sexological clinics, laboratories and other spaces of sexual science relate to sexology's varied aims to research, educate, campaign and treat? And how did sexological debates inform the acquisition of antiquities and artefacts which was still growing the museums of Europe and America in this period? I will consider how the pursuit of archaeological and historical collecting sat alongside the scientist's work of gathering statistical and other types of data and by what mechanisms they sought to maintain scientific authority in the face of acquisitions of being collectors of antique "pornography" or "obscenity". To what extent and how were diverse visual and material representations of sex from the past rationalised within the project of writing the "science" of sexuality?

08 CYCLES OF (S)ELECTION: FROM COLLECTING TO EXHIBITING

Author(s): Cvjeticanin, Tatjana (National Museum in Belgrade) - Babic, Stasa (Faculty of Philosophy, University of Belgrade)
Presentation Format: Oral

Both histories of archaeological collections and narratives of the past presented to the public are defined by moments of selection. The task of museum archaeologists to present past peoples and societies means working with archaeological repositories accumulated in their institutions as a result of both intentionally selected and unintentionally collected samples of the past (excavations, donations, chance finds etc.) These assemblages are structured into collections according to some preconceived criteria, that again include the (s)election and ordering of the archaeological evidence. Finally, just a minimal part of the museum collection is exhibited, with the aim of creating a comprehensive narrative of the past. The question thus arises of the authority that underpins the re-constructed context of the past. The narrative is based firstly upon the already artificial construct of the collection and further constrained by another stage of selection (exhibits), most of the time grounded in the curator's affinities that are dependent upon his/her professional criteria, but also upon the perceived aesthetic value and expected appeal for the audience. Is the resultant narrative the one of authority? Whose authority? Do these cycles of (s)election depend primarily upon the changes in the professional sphere or upon the wider social setting? The points raised will be illustrated by the example of the National Museum, Belgrade, whose permanent exhibition is currently under reconstruction.

09 TWO COLLECTIONS AND TWO GREEK OBSESSIONS

Author(s): Palavestra, Aleksandar (University of Belgrade, Faculty of Philosophy)
Presentation Format: Oral

It has become a truism that museum exhibitions and interpretations are influenced by wider theoretical concepts and the author's personal ideas. Winckelmann's legacy is present in most of the European museums. Sometimes the concepts emphasizing Greece are perpetuated over decades, in spite of the fact that the new archaeological interpretations contradict this neo-Classicist reading. Two examples will be offered to illustrate this situation. The first is the case of the Neolithic site Vinča near Belgrade, excavated during several campaigns from 1908 to 1934 by Miloje Vasić. At the time he started the research on the site, Vasić was the director of the National Museum in Belgrade and professor of archaeology at the University. He argued that Vinča was the settlement of the Aegean colonists and the emanation of the Minoan and Mycenaean Bronze Age spirit. From 1934 on, he even identified Vinča as the Ionian colony of the 6th cent. BC. After the First World War Vasić ceased to be the director of the Museum and focuses on the work at the University. At the same time, his Vinča interpretation was met with severe criticism both in the Serbian and international archaeological community and the site is firmly dated into Neolithic. Faced with the criticism, even from the National Museum, in 1929 Vasić established the University Archaeological Collection, where he placed the material from the post-war excavations at Vinča and continued exhibiting his philhellenic interpretation. The second case to be presented is the so-called princely grave from Novi Pazar, one of the most important finds of the Iron Age in the Central Balkans. From the middle of the 20th century almost to the present day, the thesis is perpetuated about the „Greek-Illyrian treasure", although the new interpretations have clearly shown that both parts of this title are problematic.

10 THE DEVELOPMENT OF ARCHAEOLOGICAL COLLECTIONS IN MALTA IN THE EARLY 1900S - SIR THEMISTOCLES ZAMMIT AND HIS LEGACY

Author(s): Sultana, Sharon (Heritage Malta)
Presentation Format: Oral

Sir Themistocles Zammit, known as the father of Maltese archaeology, was the first appointed Curator of The Museum in 1903.

Amongst his multitude of appointments and achievements especially in the medical field, he was then placed in charge of a collection of antiquities, the origins of which dated back to the first half of the seventeenth century, and which were dispersed throughout the island. As Zammit himself pointed out in the first annual report of The Museum in 1904, the collection, recognised throughout the years for its historic and archaeological importance, had to be re-evaluated. It had to be increased and reorganised in a way to

make it accessible to the public and not just the scholars.

This paper will trace the history of archaeology from 1903 until Zammit passed away in 1935 by then holding the position of Director of the Museums Department. Using Zammit's field notebooks as a departing point of reference, this research will give us an overview of his methodology of recording the numerous sites he visited, excavated or supervised. It will also give us a glimpse of curatorial decisions made; which sites were recorded much more meticulously than others; which featured in the Museum's annual reports; why were some artefacts bought from the land owners and why were others not deemed worth acquiring; his systematic storage techniques and his display methods.

11 SAME COLLECTION, DIFFERENT ATTITUDES: THE SCIENTIFIC INTEREST RAISED BY ZSÓFIA TORMA'S ARCHAEOLOGICAL COLLECTION

Author(s): Coltofean, Laura (Brukenthal National Museum, Sibiu, Romania)
Presentation Format: Oral

In the second half of the nineteenth century, visiting the archaeological collection of Zsófia Torma (1832-1899) was indispensable for any researcher who was interested in the prehistory of Central and Eastern Europe. Zsófia Torma was a pioneering Hungarian archaeologist who had a significant contribution to the development of prehistoric archaeology in Transylvania, especially through her research on the settlement of Turdaș-Luncă, one of the most important archaeological sites in present-day Romania and then in Austria-Hungary. This site was first excavated by Zsófia Torma in 1875, and it is here that she discovered most of the artefacts that allowed her to create an impressive archaeological collection which became a reference point in nineteenth-century European prehistoric archaeology. It was a collection around which she built a strong international academic network, a vast scientific correspondence, as well as controversial theories with political implications. Towards the end of her life, this collection that is now hosted by The National History Museum of Transylvania in Cluj-Napoca, Romania, consisted of more than 10000 objects.

After Zsófia Torma's death, the scientific value of her collection was heavily questioned, partly because of the unclear stratigraphy of the sites where it came from. There were several attempts to organise the collection and compare it with the finds and stratigraphic data resulted from later excavations carried out at Turdaș. With few exceptions, these attempts have been unsuccessful and the collection became a burden for later generations of archaeologists. What were the reasons behind this attitude shift? Who researched this collection after Zsófia Torma passed away, why and how? How did this research influence the current situation and perception of the collection? This paper aims to examine the evolution of the scientific interest raised by Zsófia Torma's archaeological collection after her death, from the beginning of the twentieth century until today.

12 NATIONAL COLLECTIONS AND KNOWLEDGE EXCHANGE BETWEEN SCANDINAVIA AND ITALY IN THE LATE 19TH CENTURY

Author(s): Gustavsson, Anna (Dep of historical studies, Gothenburg University)
Presentation Format: Oral

This paper aims to explore the dynamics and results of scholarly contacts between Italy and Scandinavia, regarding the acquisition of artefacts and the creation of national collections. Personal interests entangled in national agendas, in new nations as Italy well as older nations like Sweden or Denmark, had a great impact on possible artefact exchange and the selection of objects. Did the interchange of ideas automatically lead to an exchange of artefacts? How, by whom, and why were artefacts transferred between Scandinavia and Italy? These questions will be discussed with the starting point in the Scandinavian collection at the National Prehistoric and Ethnographical museum in Rome (Museo Nazionale Preistorico Etnografico Luigi Pigorini). The first museum director, Luigi Pigorini (1842¬–1925), often called "the father of Italian prehistory," was determined to create a national/central museum with comprehensive resources, including a scientific library. He was one of the scholars during the 19th century who wrote the most letters to European colleagues, asking for contributions to "his" museum and library. The presentation will focus on and give examples of the outcome of the contact between Luigi Pigorini and Scandinavian scholars, among them the archaeologist Oscar Montelius (1843–1921) and the orientalist Carlo Landberg (1848–1924), regarding the museum collections.

13 THE GYANTSE MONASTERY BONE APRON: A SACRED JOURNEY FROM TIBET TO A NORFOLK MUSEUM

Author(s): Morrison, Wendelin (Bournemouth University)
Presentation Format: Oral

The journey that objects make from their place of origin to a museum collection often hold unexpected stories, but in the case of sacred objects these journeys are not mere trajectories. By their sacred nature these journey-ways become part of an object's sacred path, whether acknowledged or not, by those who collect, loot or inherit and donate them. In this paper the sacred path will be followed of a Tibetan shanmudra, an apron made from human and animal bone, held in the collections of the Norwich Castle Museum in their 'Treasure, Trade and the Exotic' exhibit. The artefact was donated to the museum by the family of Lt. Arthur Hadow who served in the Norfolk Regiment during the 'Younghusband Expedition' (1903-1904) to Tibet.

Shanmudra are sacred ritual ornaments made in sets including crown, earings, necklaces, armlets and bracelets, belt, apron and anklets which may be worn by Tibetan Buddhist Lamas, siddhas, mahasiddhas (highly realised yogis or yoginis) and chödpas (practitioners of the tantric practice of chöd). As an object sacred to Buddhist practitioners of the past and present, the bone apron appears

to be removed from its hallowed position by being in a museum display which withholds it from sacred practices. In this paper, it is proposed that the sacredness of the bone apron may neither reduced nor limited by its journey to a Norfolk museum display from the Gyantse monastery in Tibet it was 'looted' from. The way it was obtained, its journey, and the meaning it now holds for those who see it, remains part of its sacred path. The potentiality of this proposition for engaging sacred museum collections with communities of religious practitioners, in the cultural translation of Buddhist teachings and for the production, transfer and exchange of knowledge, brings a new perspective to sacred museum collections.

14 THE AGAMEMNON MASK – THE GREAT HISTORY TRANSFORMED TO THE CONTEMPORARY WORLD

Author(s): Dudlik, Katarzyna (Adam Mickiewicz University)
Presentation Format: Oral

The Agamemnon Mask – one of the most famous traces of Mycenaean culture and the genuine masterpiece of Bronze Age art – is the first artifact seen by the visitors as soon as they enter the National Archaeological Museum of Athens. The importance of the mask in the studies on Early Mycenaean society cannot be overestimated, although its significance should not be limited to the scientific meaning.

The aim to raise that topic within the session is to present the current narrations covering the Agamemnon Mask and its socio-political context as a part of the Collection of Prehistoric Antiquities. The first part will be dedicated to the history and state of art of the Mycenae's discovery. Of the particular importance will be the inaccuracy between Heinrich Schliemann diaries and his recognition of Agamemnon remains, and the misinterpretations repeated by the later scholars. Apart from that, the description of unique human representation and craft technique, as well as the accusations about potential forgery, will also be mentioned. It will allow framing the special status of the object, given to it as a result of modern historical narration.

The second part will be dedicated to the special role of the Agamemnon Mask in the history of museology and archaeology – two disciplines involved into political and social discussions during the late 19th and 20th century in Greece. Undoubtedly, the Agamemnon Mask should be interpreted as a symbol – the living proof of the Homeric tradition and magnificence of Greek past. It returned to the modern world as a memory of the greatest mythical hero – the righteous ruler and military chief. That living symbol became a great element, defining the national unity and identity, facing through the Museum gate all of the conflicts, treats and crisis in the name of Greek society.

15 SOLICITATION AND SALES OF CASTED OBJECTS: CASE STUDY OF A LATE-19TH CENTURY CRETAN CIRCULAR FOR ARCHAEOLOGICAL REPLICAS

Author(s): Genova, Aimee (University of Chicago; American School of Classical Studies at Athens)
Presentation Format: Oral

Prior to the establishment of the Cretan State in 1898, Cretans had limited autonomy under the Ottoman Empire. Despite restrictions placed on their ability to manage archaeological affairs, material objects continued to have a defining role in the island's cultural heritage. This paper considers how the Greek Syllogos of Candia —an educational group— balanced its control of local antiquities while simultaneously securing relationships between scientific and academic institutions abroad. Aside from excavations, the Syllogos promoted these relations through the solicitation and sales of casts from objects discovered on the island, and I argue that these advertisements were twofold in their purpose.

First, these advertisements were part of a late-19th century movement to defray conservation expenses for recently excavated antiquities. Second, apart from sales and profits, these advertisements were used to garner transnational support for the scientific achievements of Cretan archaeology and the Syllogos' supervision over the island's antiquities.

Using archive collections from the Archaeological Museum of Iraklio, this paper serves as a case study to uncover the circumstances surrounding the 1 June 1895 circular sent to foreign institutions by Dr. Joseph Hazzidakis [President] and Professor Stephanos Xanthoudides [Secretary], which advertised the casts of a 7th century BCE Daedalic statue in poros lithos discovered at Eleutherna; the Head of Aphrodite from Gortyna; and the Gortyna Legal Code. In addition to this distributed circular, correspondences between Italian archaeologist Federico Halbherr and Joseph Hazzidakis will be discussed to give context to the solicitation and sales of these casts.

The development of artifact collections and the sales of casts characterize a period of Cretan history when archaeology was used as a means to support the island during its transitional period towards complete autonomy from Ottoman control. Therefore, these archival documents speak to the archaeological processes of Cretan archaeology and the politics of the past.

16 FROM THE MUSEUM BACK TO THE COLLECTION: THE EXAMPLE OF THE ANTIQUITIES COLLECTION OF VILLA WOLKONSKY IN ROME

Author(s): Bucolo, Raffaella (Università degli Studi di Roma Sapienza; British School at Rome)
Presentation Format: Oral

Villa Wolkonsky is the official Residence of the British Ambassador to Italy in Rome and it houses in its garden hundreds of Roman antiquities. In 2011, 360 marbles of the collection were restored and for conservation reasons, most of them have been placed in two 19th-century greenhouses, named the "Wolkonsky Greenhouses Museum". However, the Museum of the British Embassy can

tell us a long story rich of events, since the marbles were collected from the beginning of the 19th-century. In fact, the history of the Villa as such began in 1830 when the Russian princess Zinaide Wolkonsky transformed a vineyard on the Esquiline hill into an English garden, where she built a summerhouse and displayed various antiquities in the scenic backdrop of 36 arches of the aqueduct of Nero. At first, the Villa Wolkonsky was a place of leisure then a family residence, but the whole property became a diplomatic seat, first German (1922-1945) and later British (1947-the present). The majority of the antiquities - especially sarcophagi and statues – are still unpublished and represent various periods of ancient art, from the late Roman Republican period to the early Middle Ages. The Wolkonsky collection represents a perfect case study of antiquities collecting and its story takes place during several centuries, among different owners of different nationalities.

This paper aims to retrace the history of the Wolkonsky Collection and the reasons for its realisation from its birth to the current museum exhibition, through photographic and archival documents.

17 WILLIAM THE SECOND EARL OF LONSDALE'S COLLECTION OF ANCIENT SCULPTURE

Author(s): Fadda, Salvatore (Università degli studi di Sassari)
Presentation Format: Oral

From 1842 until his death in 1872, Sir William Lowther, the second Earl of Lonsdale, gathered a remarkable collection of ancient works of art. The collection was displayed in two galleries added for this purpose to his manor in 1866. Of the great assemblage, acquired through the dismemberment of previous British collections, little information has come to our days. It was composed of more than 100 pieces of Egyptian, Etruscan, Greek, and mostly Roman sculpture, whose selection reflected during the Victorian era the spirit of the collections of the Golden Age of Dilettantism.

Mainly due to its dispersion, occurred through a series of sales between 1947 and 1970, the collection of antiquities set up by the Second Earl of Lonsdale at Lowther Castle is one of the least documented and investigated among those formed in 19th century England. The purpose of this contribution is to give an overview of the formation and the dispersion of the collection and try to clarify which cultural factors determined the gathering of that eclectic set of ancient objects.

Starting from primary sources, archival documents, and the scant reports published between the end of the 18th century and the beginning of the 19th century this paper also aim to reconstruct the original display concept of the collection at Lowther Castle, understanding which parts of its original meaning can be extrapolated from its objects, now scattered worldwide in important public and private collections.

18 MECKLENBURG COLLECTION: TO LARGE TO BE CONSIDERED

Author(s): Novakovic, Predrag (University of Ljubljana)
Presentation Format: Oral

In 2006 Gloria Polizzoti Greis (Peabody Museum, Harvard) published a book about the largest European prehistoric collection held in the USA. She also included a short biography of the Duchess of Mecklenburg who created this collection by excavating in Slovenia between 1906 and 1914. The 'Mecklenburg collection' which is kept in the Harvard Peabody Museum since the 1930s contains more than 20,000 objects from more than 20 sites, mostly from the Iron Age period. In spite of a large amount of work invested in cataloging and publicizing it for the auction, only very small parts of the collections were published so far. The personal biography of the Duchess of Mecklenburg, an enthusiast amateur archaeologist, and the circumstances of how she was able to accumulate such a vast collection in a very short period of time are well explained in G. Polizzoti Greis's book, as well as the ways how the collection ended in Harvard. However, in the years following its acquisition by the Peabody Museum, the collection became almost forgotten and known only to archaeologists in Slovenia and a small number of other experts in Iron Age archaeology in Central Europe. The collection's great potential for developing detailed typology and chronology, as well as for studying cultural contacts in SE Central Europe in the first place was lost. Indeed, in Slovenia, it took almost 60 years to accumulate enough new data from the new excavations of the same sites represented in the Mecklenburg collection to create referential typological and chronological frameworks for the Late Bronze and Iron Ages in the SE Alpine region. In our paper we do not want to elaborate in detail different 'what if' scenarios but, by using the peculiar case of the Mecklenburg collection, reflect different ways of building our knowledge in archaeology.

19 A MARITIME COLLECTION SAILING TOWARDS THE FUTURE

Author(s): Heamagi, Christin (Martitime Archaeology Trust; Shipwreck Centre and Maritime Museum)
Presentation Format: Oral

This is the story of a professional diver, passionate collector and a keen historian who in 1978 when he was 29 years old wanted to share his growing collection of items recovered from shipwrecks with the public to ensure that everyone would be as fascinated as he was with the discovery, recovery and conservation of items from lost ships. To reach the public he bought a cottage in a small village and set up his own Shipwreck Centre and Maritime Museum, funded and managed by himself. The museum and the collection grew over the next 28 years and in 2006 the building was deemed too small necessitating a move to a larger facility within a Craft Village which supports a pub, craft shops and a glass museum.

It is also the story of the artefacts that make up this private collection. The museum is filled to the brim with unique, amazing and surprising objects, most brought up from the seafloor and all on display, although few are labelled or catalogued. In early 2017 in a

move towards the long-term safeguarding of the collection the owner decided to pass over the museum to The Maritime Archaeology Trust that is an established organisation researching and managing marine cultural heritage.

As is well known, the history of museums started with private collections in the eighteenth and nineteenth centuries however our story is happening now. While we transform the museum and the collection from a collector's paradise into an accredited museum and modern attraction we need to ask ourselves who we are doing it for? What will get lost if we focus only on the history of the items themselves but forget why they are in there and who collected them. Is this for us, as academics, or the public?

20 UNVEILING THE "CHERNAYA MOGILA" ("BLACK MOUND") COMPLEX: PAST DEVELOPMENTS AND NEW FINDS

Author(s): Murasheva, Veronika - Zozulia, Sergey - Shevtsov, Alexey (State Historical Museum, Moscow) - Yatsishina, Ekaterina (National Research Center «Kurchatov Institute») - Kashkarov, Pavel (National Research Center «Kurchatov Institute»; Moscow Institute of physics and technology) - Tereschenko, Elena (National Research Center «Kurchatov Institute»; FSRC «Crystallography and Photonics» RAS) - Loboda, Anastasiya (National Research Center «Kurchatov Institute»)

Presentation Format: Oral

It would not be an overstatement that the burial mound "Chernaya Mogila" (Black mound) situated in modern-day Chernigov is the most famous 10th c. Old Rus' pagan barrow. Prof. Samokvasov D.Ya. excavated the 10 m high mound in 1872-1873. The complex consisting of rich burial goods was first exhibited at the University of Warsaw where the archaeologist held office. This was the beginning of the collection's journey. In 1874 the finds were exhibited during the 3rd Russian Archaeological Congress in Kiev. The artifacts from the elite burial were then included in the Russian Empire's exposition during the World's Fair in Paris in 1878. Finally, in 1892 Samokvasov donated his collection to the Historical museum in Moscow. Thenceforth the burial goods from the mound "Chernaya Mogila" became the trademark of the museum's medieval collection and have never since left its permanent exposition.

Surprisingly enough the complex's uniqueness and fame led to it remaining virtually untouched by scholars. Over the years comprehensive studies regarded only certain artifacts, such as the silver-adorned rhytons, the idol (a figurine of Thor), the cross-inlaid spearhead, while the whole complex was thoroughly examined only twice: the first time by Samokvasov himself while a second scientific publication occurred in 1949. The latest research of the "Chernaya Mogila" collection using modern scientific methods began in 2017 with the support of the Russian Science Foundation (project 17-18-01399). X-ray tomography of the artifacts revealed that the barbaric restoration of the mid-20th c. tampered with the initial shape of the finds: fragments of different artifacts were assembled and pasted together thus fabricating altered imaginary objects. This paper aims to present the unexpected results of the latest investigations on these artifacts, which put the history, structure, and dating of the "Chernaya Mogila" collection into a completely new perspective.

21 PHOTOGRAPHY AND ARCHAEOLOGICAL COLLECTIONS: DOCUMENTING AND ARCHIVING TREASURES OF THE PAST

Author(s): Cetin, Seyda (Koc University's Research Center for Anatolian Civilizations)

Presentation Format: Oral

Photography is a key component of archaeological documentation since the formalization of the discipline in the mid nineteenth century. Carefully developed documentation of archaeological finds as well as photographic archives of excavations offer the opportunity to provide evidence returning an artefact, or a cultural object to its former life.

In recent years, a great number of investment has been made in digitizing photographic collections and excavation documents through initiatives based in museums, libraries and university archives. These digitizing projects brought about an unprecedented access to and interpretation of information. This paper will present case studies from photographic collections of international archaeological excavation projects in Turkey discussing the collection management from a public engagement perspective. What the excavation photographs tell us about the objects that are preserved in the museum collections? What is the story behind them when those significantly precious objects were first discovered in-situ? How these photographs were produced in the field? How they were catalogued and stored in the archives? How they were remediated in the gallery displays when showcased along with historic objects within permanent or temporary exhibitions in museums? What is the role of the photographic archives in cataloging, storing, preserving and displaying the collections? To investigate the listed questions above, this paper will address examples of photography collections of archaeological fieldwork. It will discuss the challenges and share experiences of the international excavation projects held in archaeological sites in Turkey and the relationships between archaeologists, museums, state agencies, archaeological research centers and heritage management organizations.

22 THE HARLYN BAY COLLECTION: REDISCOVERING CORNWALL'S LARGEST IRON AGE CEMETERY

Author(s): Jordan, Alexis (University of Wisconsin-Milwaukee)

Presentation Format: Oral

This case study explores the excavation, creation, dis/re-assembling, and significance of the Harlyn Bay collection, a British Iron Age cemetery (c. 1st century BCE-1st century CE) excavated between 1900-1906 in the southwestern peninsula of Cornwall. Discovery of the site piqued local interest and regional antiquarian societies and museums funded and staffed an excavation, provided

public tours, and assisted the landowner in founding an onsite museum. The site's slate-lined cist burials came to define the Iron Age South-Western Cist mortuary tradition and the excavation generated one of the largest and best-preserved collections of human remains from prehistoric Cornwall as well as one of the earliest photographic collections of archaeological excavations in the region. Harlyn Bay materials have featured in the permanent exhibitions of multiple southwestern museums over the course of the last century. Despite the site's significance to Cornish archaeology and the early history of these institutions, no site report or inventory of the burials was ever produced and the collection's subsequent history limited the research potential of this important assemblage. Repeated collections splitting, relocation, and rehousing resulted in the loss of the majority of excavation notes, the commingling of skeletal remains from multiple individuals, and the disassociation of the remains from specific records. Biogeochemical and commingled skeletal analyses of the human remains as well as a reexamination of newly discovered site documentation has now revealed a more diverse picture of the mortuary practices at the site than traditionally assumed. A reassessment of Harlyn Bay provides an opportunity to rethink Iron Age burial practices in southwestern Britain more generally.

23 THE GRAVITATE PLATFORM - A NEW WAY TO APPROACH AND STUDY DISPERSED COLLECTIONS OF CULTURAL OBJECTS

Author(s): Polig, Martina (STARC) - Hermon, Sorin - Vassallo, Valentina - Sorrentino, Giusi (STARC, the Cyprus Institute) - Modafferi, Stefano (IT-Innovation)

Presentation Format: Oral

Large archaeological collections are often dispersed across several museums and institutions located in different countries. Moreover, objects belonging to such collections may be fragmented and different parts of the same object stored in various locations. Studying objects from such collections poses considerable challenges in terms of accessibility. GRAVITATE, an ongoing EU funded project, addresses these issues by creating a platform for the Re-unification, Re-association and Re-assembly of fragmented artefacts.

One of GRAVITATE's case studies is the Salamis terracotta collection, an assemblage of over 200 fragments of votive statues from the 7th-6th century BC, unearthed in Cyprus more than a century ago and currently hosted in different museums and private collections across Europe. Since its physical re-unification is not considered, given the current state of heritage policies in Europe, we 3D digitized available fragments and stored the virtual collection in a single repository, following a metadata structure based on CIDOC-CRM. Consequently, a range of digital tools were developed to allow the scientific visualization and analysis of these 3D models in order to study style, production techniques and suggest restoration matchings. Such tools integrate semantic approaches with 3D shape analysis and surface characterisation to facilitate the recovery of similarities in shape, decorative elements and overall production style. GRAVITATE created thus a virtual environment simulating the typical workflow of an archaeologist, where a first generic search, based on semantic considerations, brings a set of 3D models which can be later quantitatively and qualitatively compared. Consequently, each researcher can enrich the semantic descriptions of these objects proposing new attribute characterisation and matching of fragments.

The paper will present the conceptual framework of the GRAVITATE platform and exemplify its functionalities, demonstrating how it can provide scientific support to archaeologists wishing to investigate artefacts distributed among various museums and thus impossible to be physically reunited.

24 GIS AND THE CURATING OF COLLECTIONS ACCESSING KNOWLEDGE AND EXPANDING INTERACTION

Author(s): Villajos, Santiago (Madrid Autonomous University; Alumnus, University College London)

Presentation Format: Oral

This article presents a methodology for researching, analysing, producing and transmitting knowledge in relation to the practices of curating collections. That provides useful means that engage with theoretical accounts on the materiality of objects such as Benjamin's perceptual accounts on the aura and authenticity, Gibson's theory of affordances, Appadurai's biographic approaches to commodification, Hodder's contextual and reconstructing archaeologies and Latour's significant network associations.

The methodology was developed independently in two different stages both via experimental fieldwork and through GIS laboratory work. That produced a georeferenced model of the display with the form of a point-pattern where every point is related to an entry containing relevant information in a database. The perceptual features were expressed by defining an aura or area of influence from their width measurements. This constitutes a useful mean to define interaction between them and viewers at an artefactual scale from material affordances that may drive to further developments of the method.

The technique also provides the basis for integrating biographic and contextual approaches. Firstly, the points referring the objects can be edited and moved to previous locations. By incorporating spatial information from both visual and textual archival records, the shifts produced as a result of a succession of curational decisions can be reconstructed besides the contextual settings the objects had before their entered the collections. As a result, each object's associations potentially produce a series of events which defines a sequence from which a particular narrative can be transmitted to the public.

Finally, this expanded knowledge can be accessed in situ by the public on the screen of their mobile devices when they are visiting the collections, so it is aimed to provide more holistic, didactic, personalised and interactive aesthetic experiences. A basic example of a georeferenced interactive catalogue is presented.

672 CAA @ EAA: COMPUTATIONAL MODELS IN ARCHAEOLOGY

Theme: Theories and methods in archaeological sciences
Organisers: Romanowska, Iza (Barcelona Supercomputing Center) - Prignano, Luce (University of Barcelona) - Coto-Sarmiento, María (Barcelona Supercomputing Center) - Brughmans, Tom (University of Oxford) - Morer, Ignacio (University of Barcelona)
Format: Regular session

Models are pervasive in archaeology. In addition to the high volume of empirical archaeological research, there is a strong and constant interest among archaeologists and historians in questions regarding the nature, mechanisms and particularities of social and socio-natural processes and interactions in the past. However, for the most part these models are constructed using non-formal verbal arguments and conceptual hypothesis building, which makes it difficult to test them against available data or to understand the behaviour of more complex models of past phenomena.

The aim of this session is to discuss the role of formal computational modelling in archaeological theory-building and to showcase applications of the approach. This session will showcase the slowly changing trend in our discipline towards more common use of formal methods.

We invite contributions applying computational and quantitative methods such as GIS, data analysis and management, simulation, network science, ontologies, and others to study past phenomena concerned with societal change, human-environment interactions and various aspects of past systems such as economy, cultural evolution or migration. Methodological and theoretical papers on the benefits and challenges of quantification, the epistemology of formal methods and the use of archaeological material as a proxy for social processes are also welcome.

This session is supported by Computer Applications and Quantitative Techniques in Archaeology (CAA) International: http://caa-international.org

ABSTRACTS

01 IN THE BEGINNING WERE THE RAW DATA

Author(s): Ravotto, Alessandro (ICAC)
Presentation Format: Oral

In archaeology, the most important part of raw data comes from field interventions (excavations, surveys, architectonic studies...). Raw data rest in the lower layer of the process of analysis and subsequent diffusion of results. These data often aren't accessible to other researchers, mainly because they aren't standardized. Even if literature has established a robust method of recording archaeological field data, there are sensible differences between the ways in which archaeologists gather and format those data. This, and the use of different and no archaeological-oriented software (databases, sheets, texts processors...), makes difficult - in the best of cases, a time consuming operation - the comparison between different sets of data.

The contribution proposed here is about a numerical system for collecting, querying, managing, presenting and, to some extents, analyzing archaeological raw data. The system – designed according to the precepts of European literature and to the Catalan field experience - was originally designed as a tool for gathering and organize data of the doctoral thesis of the author, but it demonstrated to be useful in any field intervention.

The system it's composed by three pieces of software:

- a computer program for collecting data from a single intervention, that runs on Linux, Windows and Mac.

- a simplified version that runs on Android mobile devices.

- a third program to manage data from multiple interventions, that runs on Linux, Windows and Mac.

Each program is at at a different stage of development, but all three have been already used in real archaeology. The versatility of the system and the fact that it is partially open source would have to promote the use of a standard in recording archaeological raw data.

02 INTEGRATION OF MODELS AND QUERY FEDERATION FOR HETEROGENEOUS ARCHAEOLOGICAL DATASETS

Author(s): Gonzalez-Perez, Cesar - Martín-Rodilla, Patricia (Incipit CSIC)
Presentation Format: Oral

The MARIOL project had the goal to build the necessary conceptual and software tools to allow organisations in charge of archaeological datasets to organise their information and expose a selected subset to the public so that citizen participation could help these organisations to enhance and validate their data. To achieve this objective, an iOS-based app was developed so that citizens could interact with information from heterogeneous sources in an integrated manner.

Two case studies were selected for the project: the Riotinto mining heritage area, in Huelva, Spain; and the "Camino Primitivo" or Northern branch of the Way of Saint James in Galicia, also Spain. A dataset containing comprehensive documentation of over 170 industrial heritage elements in Riotinto was provided by the Instituto Andaluz del Patrimonio Histórico (IAPH), whereas a second dataset containing descriptions of over 2000 archaeological and ethnographical elements along the "Camino Primitivo" was provided by Incipit CSIC.

These datasets were modelled using the Cultural Heritage Abstract Reference Model (CHARM), thus obtaining two particular instance models expressed in the ConML language, which worked as user-oriented datasets. These models were placed in a server which was accessible to the iOS app over the Internet. By using the app, users were able to carry out searches on both datasets in an integrated manner through abstract categories provided by CHARM, as well as specific categories that were particular to each area.

Some fieldwork was carried out with iPad tablets to test the app and get some information on the public's reactions to using it to locate relevant elements, learn about them, and make comments or suggestions. Although the number of participants in these tests was low, some interesting insights were learned, which will contribute towards improving the modelling technologies in areas such as model extension, refinement and querying.

03 HERITAGE LEGAL DISCOURSE TRENDS: A SEMIAUTOMATIC ANALYSIS FOR SUPPORTING CRITICAL READING

Author(s): Martin-Rodilla, Patricia (Institute of Heritage Sciences) - Barreiro, David (Institute of Heritage Sciences)
Presentation Format: Oral

In recent years, the regional laws on cultural heritage in Spain have experienced considerable changes, repealing and / or modifying previous laws to adapt them, supposedly, with current demands. According with these updates, some authors have made critical analysis of the changes arisen from the comparison between the previous cultural heritage laws and the new ones. Specifically, we have carried out this comparative analysis in Galicia, detecting some trends of change in the ontological and the spatial treatment, as well as in the political and economic dimensions of heritage, which could give us some insights about certain strengthening of a cultural heritage management model more in line with a context of neoliberal governance.

Based on this critical analysis, this paper presents a semiautomatic analysis of the discourse presented in the legal texts on cultural heritage in Galicia (the old one from 1985 repealed and the current law from 2016), with the aim of offering a complementary vision that allows us to detect signs of the change trends previously outlined.

Thus, a methodology has been designed for the annotation of both legislative texts. This annotation was based on a selection of linguistic information considered relevant to the exemplification of the detected trends. Subsequently, each one of these tendencies has been contrasted using natural language processing algorithms, according to the frequency of occurrence of annotated terms and their underlying concepts, the discursive structure extracted automatically (what level of importance receives a term annotated within each legislative text), and according to its semantic polarity (if certain discourse parts have a greater component of positive or negative terms).

The results obtained show the value of these semiautomatic analysis methodologies in order to complement and sustain a critical reading of the heritage discourse reflected in the legal texts.

04 USING GAME ENGINES TO THE FULLEST: IMPLEMENTING CUSTOM SCRIPTS IN ARCHAEOLOGICAL INTERPRETATION

Author(s): Barratt, Robert (Queen's University Belfast)
Presentation Format: Oral

Although gaming software was not originally intended for archaeologists, analysis and interpretation of archaeological sites have much to gain from its implementation. Game engines such as Unity3D are exceptionally flexible, not only simulating real environments and physics but allowing researchers to manipulate them to answer specific questions. Using 3D reconstructions and scripting tools we can create the ideal conditions to test archaeological queries in an easy to control virtual setting. Additionally, thanks to metadata and paradata, these results are replicable and accessible to future researchers.

Despite the potential however, game engines are rarely applied to the analysis of data, often being relegated to simply presenting archaeological sites to the general pulic. This paper aims to showcase examples of custom-written Unity3D scripts used to analyse and interpret sites in Neolithic Malta, demonstrating the advantages and limitations of this approach.

Manipulation of space and lighting within temples and hypogea was an important part of Maltese architecture, yet given the incomplete nature of the archaeological sites our understanding of practices and beliefs is limited. Using Unity3D-based scripts, 3D reconstructions of the Ggantija temple complexes and of the Xaghra Brochtorff Circle hypogea are tested upon, revealing patterns of use. At Ggantija, a solar position script confirms a winter solstice alignment at the site. At the Brochtorff Circle, custom viewshed analysis shows a complex readjustment of interior space to allow for ritualistic 'special effects'.

These results help reanalyse archaeological data and demonstrate current interpretation in Neolithic Malta. The use of custom-written scripts also illustrates the advantages of query driven gaming software analysis, while also showing some of its limitations.

05 A TECHNIQUE TO ENHANCE THE VISIBILITY OF INSCRIPTIONS

Author(s): Ravotto, Alessandro (ICAC)
Presentation Format: Oral

Thanks to a treatment that makes use of algorithms derived from photogrammetry, Geographical Information System and image rendering, it's possible to enhance the visibility of ancient inscriptions.

The technique consists in three main steps. First, the object of study is reconstructed as a high resolution 3D model by photogrammetry; secondary, data are stored as a raster Digital Elevation Model, taking as Cartesian plane the inscribed surface; finally, they are interpolated and filtered as if they were a terrain model, even applying typical hydrological analysis algorithms, in order to obtain the best visualization. The process can be undertaken even with a low-end camera and it makes use entirely of open source and free software, hence it's a rather inexpensive method of analysis. Furthermore, it requires only a medium-level computing power, so that by increasing the processing time, it is an operation that can be undertaken on computers that are fairly old and/or not particularly gifted.

The technique has been tested on eroded and damaged stone. In all case studies it lead to better results than with traditional paper casts, but the greatest difference between the two techniques, in this sense, is perceived when the digital method is applied on coarse supports.

06 ZOOMING INTO THRACE: MODELLING SPATIAL DIVERSITY AND REGIONAL MOBILITY DURING THE SECOND MILLENNIUM BC

Author(s): Nenova, Denitsa (UCL)

Presentation Format: Oral

In a period when complex systems of Bronze Age social life and urban communities were well-established in the Aegean and Anatolia, the southeast corner of the Balkans, commonly known as Thrace, appears to have remained largely unaffected. Nevertheless, the presence of a few similar artifacts between the latter and the first two regions during the 2nd millennium BC has provoked scholars to propose various forms of cultural encounter. This has diverted the research focus in Thrace from a thorough examination of local characteristics and, along with the lack of much systematic study, has limited our understanding of internal social patterns of development.

In this paper, a new, detailed examination of the local ceramics calls into question existing culture-historical constructs such as the 'Plovdiv-Zimnicea' culture and offers a chronologically structured analysis of local pottery sequences. Complementary multivariate spatial analysis of the site distribution reveals settlement patterns with different micro-regional characteristics. An unsupervised clustering technique is applied to identify potential hidden structures within the data, regardless of its categorisation. Thereafter, the distribution of specific site-types is compared to the observed spatial variability of the whole pottery repertoire, constructing a model of regional zoning.

As a result, the study highlights clusters of attributes and cycles of micro-regional interaction and independence at this key location of potential Eurasian articulation. Ultimately, a general pattern of isolation in the final phases of the Bronze Age can be recast by considering a combination of both, persistent vectors of long-range contact, and also a high degree of local cultural diversity and mobility in the midst of the second millennium BC.

07 SPATIAL AND SPATIO-TEMPORAL MODELLING OF CULTURAL CHANGE IN THE IPEĽ/IPOLY RIVER VALLEY REGION (S-SLOVAKIA, N-HUNGARY)

Author(s): Tóth, Peter (Department of Archaeology and Museology, Faculty of Arts, Masaryk University, Brno) - Larsson, Nicklas (Hungarian National Museum, Budapest)

Presentation Format: Oral

Archaeological research in Slovakia and Hungary was until recently mostly conducted only within each of the state's boundary. As a result, the dispersion of archaeological cultures generally corresponds with modern state borders. Lately, this situation has changed thanks to the ISzAP project conducted both theoretical research and non-destructive field work on both sides of river Ipeľ/Ipoly, which marks the state boundary between Slovakia and Hungary. The project aims at examination of prehistoric interregional trade networks and cultural change in the region. Thanks to the joint research efforts an extensive database was gathered ranging from the Neolithic until the New Age. Computational spatial and spatio-temporal modelling is used as a key analytical element. The project is using a broader action research methodology, the model can improve progressively with ongoing extensive field surveys and re-evaluation of new data.

In this paper we are focusing on the components dated to the Neolithic. During mapping of archaeological sites, it was clear that there is ca. 30 km gap between LBK/Želiezovce group and Bükk Culture. So we started a close examination of this finding. After the analysis of key environmental parameters in GIS predictive models for both cultural units were created using fuzzy logic. Methodology of the predictive model calculation will be further discussed in the paper. Results of predictive models show different tendencies of landscape occupation deriving from the environmental conditions. It was suggested that the observed situation could be a result of environmentally induced cultural boundary. In order to see how this boundary developed in the course of the Neolithic, we used spatio-temporal modelling. It was possible to observe shifting of sites probability distribution in particular time clusters. Combination of both modelling methods enabled us to visualize changes in settlement clusters over time and see possible boundaries among cultural units.

08 AGENTS, NETWORKS AND THE QUEST FOR SYSTEM UNDERSTANDING: AN IDIOT-GUIDE TO COMPLEXITY SCIENCE

Author(s): Coto-Sarmiento, Maria (Barcelona Supercomputing Center; Universitat de Barcelona) - Romanowska, Iza (Barcelona Supercomputing Center) - Brughmans, Tom (University of Oxford) - Prignano, Luce - Morer, Ignacio (Universitat de Barcelona)
Presentation Format: Oral

When mathematicians Stan Ulam and John Von Neumann developed a fun game of black and white squares to kill some time at Los Alamos in the midst of the second world war few would have guessed that their invention would be used half a century later by medics to patch up heart tissue in cardiac arrest survivors and by policy makers to nudge the society in their preferred direction. This is how much cellular automata simulation has developed since its 'game' phase prompting some to declare it 'the new kind of science' in the early 2000s.

By now this new kind of science, better known as 'complexity science', has pervaded all branches of scientific enquiry. The main objective of complexity science is to understand the behaviour of systems, in particular complex systems. Complex systems are not necessarily complicated. In many cases systems composed of very simple components and behaving according to simple, deterministic rules produce global patterns that are highly counter-intuitive and would be difficult to predict without the use of heavy computational tools. Human societies, past and present, are a prime example of such phenomena and complexity science offers a tried-and-tested research avenue to gaining a better understanding of their functioning and evolution.

Nevertheless, archaeology is a late and a slow adopter of complexity science. Although as a discipline we have been at a forefront of the theoretical developments in 'systems science', due to the lack of technical know-how and the general user-un-friendliness of 1960s computers, we did not get far. Now that building computer simulation does not require a computer science degree and other disciplines developed the methods, the theory and the software for us, there is little that should keep archaeology from embracing the techniques that allowed other disciplines to make rapid strides forward.

09 NETWORK PATTERNS: A CASE STUDY OF THE UPPER PALEOLITHIC SITES IN THE NORTHERN BLACK SEA REGION

Author(s): Fedorchenko, Olena (Department of archaeology, National University of Kiyv)
Presentation Format: Oral

The region near the Black Sea (northern part) was characterized by specific natural environment and therefore by diversity of primeval lifeways during the Upper Paleolithic period.

Since the middle of the 20th century there have been two main concepts regarding economic and settlement specificity of this area. Some researchers admitted the existence of special economic "steppe region", primeval inhabitants of which had similar subsistence systems and similar toolkit. Meanwhile, an alternative hypothesis about presence of separate locuses in this area is strongly supported in the light of recent research of the Upper Paleolithic group of sites near Kamennaya Balka (Leonova et al, 2006).

Due to the fact that this issue has remained open to date, possible resolution would be found through the implementation of network analysis. Applying network analysis to the archaeological research would enable us to recover interconnections and to evaluate degree of such linkages. Usage of this analysis is productive in the research of settlement systems and geographical distribution of the Upper Paleolithic sites as well as modeling and testing them on the empirical material.

Current research is dedicated to the simulation of two network patterns based on archaeological data from the Upper Paleolithic sites in the Northern Black Sea region. Each of them is characterized by degree of node (in this case, an archaeological site is considered as a node) and the connectivity index. The various simulations of edges configuration in both models provide clusters of nodes, which could be explained by not only topological characteristics, but also by particular subsistence features.

10 FORMALIZED APPROACH TO SPATIAL ARCHAEOLOGY USING ALGORITHMIC MODELLING

Author(s): Demján, Peter (Institute of Archaeology CAS)
Presentation Format: Oral

Regions with environmental conditions favorable to human habitation, such as Central Bohemia, offer an archaeologically interesting but very complex image. As a result of decades of archaeological activity, we often see large areas continuously covered with archaeological finds of different - mostly very broad - dating. They are a palimpsest in which we try to identify settlements of communities existing in a particular time and space in order to analyze them in terms of structure, density, their relation to environment and each other. This paper presents a formalized approach to community areas as defined by the theoretical framework of spatial archaeology. Information about the spatial context of the settlement evidence allows us to reconstruct possible configurations of habitation areas and their adjacent primary production areas (settlement cores). A more detailed phasing transcending the low chronological resolution of the original data was achieved by using mutual spatial exclusion of settlement cores as a chronological marker. The set of reconstructed possible scenarios, large enough to offer a representative sample of all possible scenarios, was produced using algorithmic modeling and analyzed using probabilistic methods. Such formalized approach to spatial archaeology made it possible to leverage the potential of existing rich archaeological settlement evidence, which until now resisted attempts at interpretation. The results can be used to assess the intensity of human impact on the landscape in various periods as well as changes in the structural organization of the settlements.

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11 CONNECTING DOTS ON MAPS: APPLYING SOCIAL NETWORK ANALYSIS TO ROCK ART SITES IN N. W. AUSTRALIA - A PRELIMINARY STUDY.

Author(s): Rainsbury, Michael (Ustinov College, Durham University)

Presentation Format: Oral

The Kimberley of north Western Australia is renowned for its wealth of rock art, this being found in sandstone rock shelters throughout the region. The art is thought to range in age from late Pleistocene to modern, and relative chronologies of art periods based on superimpositions of motifs are now well established. Amidst the analysis of motifs, material culture and relative changes in time, what is missing is an idea of interconnections, how art sites may or may not have been connected to each other, and how these connections may have varied with location and time. Mapping the distribution of art sites reveals aspects of culture but it is worth remembering that this is in fact a manifestation of social relationships. Social Network Analysis offers the opportunity to explore cultural connections between sites, and between river systems, on both a geographical and temporal basis. The analysis treats art sites as nodes and the shared art motifs as the links between them. In my presentation I explore preliminary results from two case studies, one a river system, the other on the northern coast, to investigate further the interconnections revealed through SNA. Data from other Kimberley rivers will allow this analysis to be tentatively expanded.

12 IDENTIFYING LATE CHALCOLITHIC AND EARLY BRONZE AGE METAL COMMUNITIES OF ANATOLIA AND NORTHERN MESOPOTAMIA THROUGH GROUPING AND NETWORK ANALYSES

Author(s): Massimino, Martina - de Gruchy, Michelle (University of Durham) - Radivojevic, Miljana (McDonald Institute for Archaeological Research, University of Cambridge) - Grujic, Jelena (Vrije University Brussels, Artificial Intelligence Lab)

Presentation Format: Oral

There are two broad methodological approaches for identifying distinct communities in the archaeological record: groups and networks. Grouping methods divide objects into categories based on observed similarities, while networks map connections between objects. Archaeologists working in Europe have been advancing methods of both approaches, including Typenspektren to define groups without losing sight of the often fuzzy boundaries between them (Nakoinz 2013) and applying modularity maximization to network analysis (Radivojević and Grujić 2017). This paper applies and compares these new methods from both approaches and correspondence analysis to Late Chalcolithic and Early Bronze Age copper-based objects from Anatolia and Northern Mesopotamia, for which metal compositional analysis are currently available. The resultant spatial clusters have implications for understanding regional and interregional patterns of production and exchange at a time when copper-using complex societies were first emerging in Anatolia and Northern Mesopotamia. The remarkable abundance in Anatolia of poly-metallic ore deposits – including copper, iron, silver and lead - contributed to the early appearance - by the mid-4th millennium BC - of a wide range of copper-based alloys. These have been interpreted as resulting from different regionalised technological traditions (Lehner and Yener 2014), which possibly reflect large-scale interaction networks of production and exchange stretching from the Aegean to Syro-Mesopotamia. Therefore, applying the grouping and network methods to the Anatolian and Northern Mesopotamian data could enable to independently assess this archaeological interpretation and thus enhance our understanding of the socioeconomic structures and relations underlying the production, exchange and use of copper-based objects during the period under examination.

13 DETECTION OF STRATEGIC FUNCTIONS IN OLD KINGDOM EGYPT USING THE INFORMATION THEORY

Author(s): Dulíková, Veronika (Czech Institute of Egyptology, Faculty of Arts, Charles University, Prague) - Mařík, Radek (Faculty of Electrical Enginnering, Czech Technical University in Prague)

Presentation Format: Oral

The sophisticated administration in the age of the pyramid builders offers a remarkable time span for research and a unique opportunity to analyse the dynamics of a complex society. Although scholarly interest in the Old Kingdom administration has always been relevant, the grasping of its complexity and the tracing of the particular processes which led to changes and innovations of the system have been missing. Contrary to traditional approaches relying on statistics, we will present our achievements in the detection of strategic titles and their ties to important state offices using complex network analysis (CNA) and the information theory.

Our research is based on synchronic and diachronic occurrences of titles held by officials of various social status. The occurrence patterns and similarities of the titles and their holders are assessed using the variation of information belonging to information-theoretic metrics. The method used has detected several strategic titles. Their processing in more depth has revealed not only relevant titles tied to important state offices but also a significant connection with a change in the participation in power, for example during the crucial transformation period of the mid-Fifth Dynasty when pervasive changes took place. Since the occurrence of the power change accurately coincides with social changes, these titles seem to have been introduced for high-ranking dignitaries, and some of them even served as honorary markers.

The approaches will be exemplified by selected case studies from the Fourth to Sixth Dynasties.

14 THE IBERIAN PENINSULA'S ROMAN TRANSPORT SYSTEM. MULTI-DISCIPLINARY APPROACHES TO ANALYSE THE TRANSPORT NETWORK CONNECTIVITY.

Author(s): de Soto, Pau (Universidade Nova de Lisboa) - Prignano, Luce - Morer Zapata, Ignacio (Complexity Lab Barcelona. Dept. Física de la Matèria Condensada, University of Barcelona) - Brughmans, Tom (School of Archaeology, University of Oxford)

Presentation Format: Oral

This paper will explore and compare formal approaches for the analysis of past transport networks, illustrated using a new highly accurate dataset of the Roman transport system of the Iberian peninsula developed by the Mercator-e project.

During several centuries Rome conquered and dominated a large territory covering Europe and parts of Africa and Asia. One of the most important elements that helped to maintain its cohesion and facilitated the rule of the different provinces was the creation and maintenance of a huge transport network.

In recent years there has been a growing interest in the development of new methodologies to model and analyse transport in historical periods. The use of GIS, but most importantly, the increase of network science applications, has allowed scholars to deal with the study of transportation networks from different perspectives. This paper by a multi-disciplinary team of archaeologists and physicists focuses on the comparison of different approaches to studying the structure of transport networks in Roman Iberia.

We will explore approaches to transforming digitized transport networks into graphs, as well as methods to characterizing the structure of the network, to study the roles of different cities, and to model the mechanisms leading to the creation of road infrastructures.

This paper will offer the results of these different approaches to the analysis of the transport networks of the Iberian Peninsula in Roman times. In doing so, we will refine our current understanding of the structure of the Iberian peninsula's Roman transport system and the processes that moulded it.

15 EXPLORING LONG-TERM EFFECTS OF AMPHORA REUSE ON THE ROMAN IMPERIAL ECONOMIC SYSTEM

Author(s): Brughmans, Tom (School of Archaeology, University of Oxford)

Presentation Format: Oral

In this presentation I will explore long-term change in Roman amphorae distributions caused by reuse. What kinds of empire-wide distribution patterns of amphorae would we expect to see if we assume amphorae might have been reused as containers to transport different types of goods? Are reuse processes even archaeologically visible: under what conditions do they lead to undeniably different distribution patterns as compared to processes that exclude reuse? A set of increasingly elaborate computational models will be presented to explore these questions. Particular emphasis will be placed on understanding the effects of the Roman transport network and the demand of urban centres on these processes.

This work is part of the larger research agenda of project MERCURY, a multidisciplinary project that will explore the most hotly debated questions about the Roman economy: was the Roman Imperial trade market equally integrated as nowadays? How important were social networks for structuring this flow of information? It will address two methodological issues currently preventing scholars from answering these questions: limited use of archaeological big data and the lack of quantitative comparisons of complex hypotheses. MERCURY will combine recent advances in computational network science and simulation methods with increasingly available archaeological big datasets.

MERCURY website: http://oxrep.classics.ox.ac.uk/affiliated%20projects/mercury/

16 PALAEODEMOGRAPHY AMONG HUNTER-FISHER-GATHERERS: A COMBINED AND EXPERIMENTAL APPROACH TO SOCIAL INEQUALITY

Author(s): Olives Pons, Juana Maria (Max Planck Institute for Social Anthropology- IMPRS ANARCHIE) - Vila-Moreno, Adrià (Universitat de Girona - ARESOCARE research group) - Estévez Escalera, Jordi (Universitat Autònoma de Barcelona, Departament de Prehistòria-ARESOCARE)

Presentation Format: Oral

Multi agent based simulation systems and data modelling offer an alternative approach to research questions on archaeological contexts and, a space for test and verification. They have become an indispensable tool which has broadened the possibilities for interdisciplinary research approaches. Within this methodological frame, the current study aims to contribute to the understanding of social structure among prehistoric hunter-fisher-gatherer societies.

Demographic pressure among foraging societies can lead to a disruption of the carrying capacity of the environment. In order to assure the continuation of the population, a balance with the natural resources is needed. The stability of prehistoric hunter-fisher-gatherer populations has been explained assuming the existence of a natural demographic equilibrium. Simplifying the explanation arguing a high population mortality does not provide a proper understanding of the actual process observed. While existing demographic studies have already indicated variability in demographic rates that cannot be explained only by natural fertility or mortality rates, it is necessary to test the role social norms played to restrict demographic growth. The working hypothesis points to the strong impact social regulations have on human reproduction. This regulation acts on different events of the life history of the individuals. But more importantly, this regulation has a social foundation, which is reinforced through socioeconomic practices,

such is the sexual division of labour.

In order to test the plausibility of this hypothesis, qualitative data and sets of norms from different modern hunter-fisher-gatherer groups are collected from early ethnographic reports. These data are then introduced to a MAS, which performs simulations of demographic processes, allowing the examination and measurement of the impact the different social norms have on reproduction. The statement of the results would be a cautionary advice to promote the search for explanations in the social and ruling spheres of prehistoric hunter-fisher-gatherer societies.

17 GENERATING FALSIFIABLE HYPOTHESES THROUGH AGENT-BASED SIMULATION ON THE POPULATION REPLACEMENT IN AGRICULTURAL SPREAD IN ANCIENT JAPAN

Author(s): Sakahira, Fumihiro (Tokyo Institute of Technology; KOZO KEIKAKU Engineering Inc.) - Terano, Takao (Tokyo Institute of Technology)

Presentation Format: Oral

In this paper, we discuss the strong points of Agent-Based Modeling applied to falsifiable hypothesis generations in ancient history studies. We have developed an agent-based simulation model, then have explained the spread of agriculture to cause the population transition in ancient Japan main land and medieval Okinawa islands. Our simulation model has generated such hypotheses that native people played the major role to spread agricultural cultures when native people were replaced by immigrants. Our simulation results have also demonstrated that the discovery of bone remains of people with native traits, along with artifacts which suggest the existence of an agrarian culture would support this hypothesis. The results of our simulation model have suggested that the past population transitions require the rapid spread of agriculture though native people and the system of such preferential distribution of a trait gene as polygamous marriage. In human history, there are many cases that the spread of agriculture caused the population transition from the state where people with one trait were majority to the state where people with another trait were majority. Especially, in Japan surrounded by the sea on all sides, immigrants introduced agriculture into that place, thereafter, the population transition occurred. This paper will give important hypotheses to uncover the reasons, which could be falsifiable if they would find other historical evidences.

18 A GAME OF... CHAIRS, MUSICAL CHAIRS. A THEORY-BUILDING AGENT-BASED APPROACH TO AGRO-PASTORAL LANDSCAPES IN EURASIA

Author(s): Angourakis, Andreas - Fusaro, Agnese - Martínez, Verònica - Gurt, Josep M. (ERAAUB, Department of History and Archaeology, University of Barcelona)

Presentation Format: Oral

We present the latest development of a seven-year effort in experimenting and generating theory that could help explain different land use patterns around water sources in arid environments. This work was developed within the case study 5, 'oasis construction in Central Asia', of the former SimulPast project. Using Agent-Based simulation models, we progressively put together mechanisms hypothesized to be relevant factors in shaping the balance of farming and herding land use within arid environments. The core mechanism is the intermittent competition between sedentary and mobile stakeholders, which we assume can happen during a part of the annual cycle (e.g., winter). Thus, the analogy with the children game, Musical Chairs. Through versioning models, we can observe the simulated consequences of each mechanism, and their interaction, under a wide variety of conditions.

After a brief overview of the two previous models, Musical Chairs and Nice Musical Chairs, we will present the latest model, Nomad-Frontier. This latter model introduces the effects of (i) spatial relations, (ii) herding territorial marks, and (iii) a multi-level institutional structure, comprising corporate groups and political alliances between them. We review the main implications evidenced by the three models: (a) competition creates a bias favoring farming land use, (b) herding stakeholders tend to consolidate in smaller, more independent, political formations, and (c) the investment in territorial marks in the pastoral landscape is an important strategy for herding stakeholders. Last, we compare the simulation experiments with our assessment of several historical and archaeological case studies in Eurasia.

19 SOWING SEEDS: INVESTIGATING EARLY HORTICULTURE IN NEW ZEALAND USING AGENT-BASED MODELLING

Author(s): Brown, Andrew (Bournemouth University) - Romanowska, Iza (Barcelona Supercomputing Centre)

Presentation Format: Oral

New Zealand was settled from tropical Polynesia around 700 BP. The colonisation involved the translocation of people, crops and animals across many thousands of kilometers of open-ocean. Once there, early colonists were confronted with strikingly different environmental conditions: New Zealand's temperate climate was hostile to tropically adapted crops and the large latitudinal spread and varied topography created clear regional variation in habitat quality. The broadest pattern was the graded decline in horticultural habitats from the optimal north to the southern areas, which supported limited or no horticulture. This large environmental variability in a relatively small space presents interesting possibilities for the investigation of how farming societies go about establishing food production systems. However, in the absence of direct evidence of horticulture in New Zealand, the majority of discussion regarding the early economy has focused on human exploitation of the natural environment. In recent years agent-based modelling (ABM) has

emerged as a useful tool for providing insight into archaeological questions where direct evidence is limited. Thus, in this paper we investigate the potential of ABM to develop productive models of the establishment phase of horticulture in New Zealand, which we believe can contribute to broader questions surrounding human settlement of new environments.

20 RECONSTRUCTING LAETANIAN ROMAN WINE ECONOMY USING AGENT-BASED MODELLING (1ST CENTURY BC-3RD CENTURY AD)

Author(s): Martín i Oliveras, Antoni (Universitat de Barcelona; CEIPAC-Classical Antiquity Studies on Provincial Interdependence Centre; EPNet Project-Production and Distribution of Food during the Roman Empire: Economic and Political Dynamics; Government of Catalonia-Ministry of Culture-Archaeology & Paleontology Service) - Revilla Calvo, Víctor (Universitat de Barcelona; CEIPAC-Classical Antiquity Studies on Provincial Interdependence Centre; EPNet Project-Production and Distribution of Food during the Roman Empire: Economic and Political Dynamics; UBICS-Universitat de Barcelona Institute of Complex Systems) - Romanowska, Iza (BSC-Barcelona Supercomputing Center; EPNet Project-Production and Distribution of Food during the Roman Empire: Economic and Political Dynamics)
Presentation Format: Oral

Viticulture has played an important role in the economy of the Mediterranean coast of Hispania Citerior Tarraconensis between the 1st century BC and the 3rd century AD. The vineyards, wineries and pottery workshops are usually found clustering in specific areas, such as the Laetanian region located in the northeast coast of the Iberian Peninsula. Their spatial and temporal distribution has been previously interpreted as a proof of the existence of intensive and specialized winemaking economy, associated with large-scale production & trading of wine in bulk quantities targeting predominantly to overseas markets such us Gallia, Germania & Rome itself. This fact is further supported by the wide geographical distribution of specific Tarraconensis amphorae forms, which appear in the record of archaeological sites throughout the western part of the Empire. Here we present a explanatory data analysis coupled with an agent-based model simulating economic processes involved in the production, consumption and trade of the Laetanian wine. The model evaluates the strategies that this economic system could adopt in response to the competition from other provinces and the evolution of the wine consumption in the Roman society. We then compare the outcomes of such strategies with two sources of data: the changing dynamics of winemaking ab origine, i.e., in the Laetanian region and the changes in the frequencies of Tarraconensis amphoras ad destinum, that is, in the port of Ostia (Italy).

21 BUILDING ARCHAEOLOGICAL MODELING TOOLKITS

Author(s): Murphy, John (University of Chicago)
Presentation Format: Oral

Computational models must be built to address specific questions, but models as tools have life cycles the often include re-use, expansion, and generalization. One form of this extended life cycle is the construction of modeling toolkits that parse problem domains into different and multiple levels of abstraction. Agent-Based Modeling is particularly amenable to this. This process offers a route from modeling to theory construction, but the practice of developing computational modeling toolkits is more complicated than it may seem, and is fraught with challenges; some of these challenges are technical, but many are theoretical and some are external, as models and modeling are both driven and positioned by a collection of interacting trends. In this brief essay I will present a survey of the ways that constructing archaeological modeling toolkits can be successful and an inventory of the kinds of challenges that they face. Some experiences from the production of generalized modeling toolkits above the level of specific domains, as well as toolkits and models produced in other domains (e.g. agriculture, earth-system models), will be presented, as these may usefully inform the archaeological case. I argue that the creation of modeling toolkits for archaeology will face special challenges, but that addressing these challenges will be key to realizing the potential for archaeological models and modeling within archaeology and especially as applied to the array of problems that archaeology attempts to explore and the potential that archaeology holds for informing decisions in our contemporary world.

22 AN EMERGENT COMMUNITY? AGENT-BASED MODELLERS IN ARCHAEOLOGY

Author(s): Romanowska, Iza (Barcelona Supercomputing Center) - Davies, Benjamin (University of Auckland)
Presentation Format: Oral

Simulation is one of the most common tools of modern science. However, it remains underused in archaeology and humanities at large. The one branch of simulation that is slowly catching up in archaeology is agent-based modelling (ABM). Until recently a tool used predominantly by complexity scientists, it is becoming archaeology favourite technique.

Agent-based modelling (ABM) is a powerful tool for understanding the dynamics of past social systems. A form of computer simulation, ABM is oriented around computational "agents": autonomous entities that have the capacity to interact with each other and/or their environment based on a set of rules. This kind of 'bottom-up' modelling approach has been well received in human-centred sciences like health science, economics, and, social sciences.

The development and promotion of a new methodology depends in part on the shared ideas of a community of practice. And to systematically target issues related to practice, it is helpful to understand what a community of ABM practitioners in archaeology looks like. Here, we characterise the ABM modelling community in archaeology by means of self-reporting in a survey and a citation network analysis.

By providing the first description of agent-based modellers in archaeology and identifying the routes that brought them into this specialism we help to identify the hindering and the facilitating factors that can 'make or break' the current and future archaeological modelling community. By doing so we hope to support a wider transition of our discipline towards more formal modelling practice.

674 ARCHAEOLOGY FOR ALL: SOCIAL IMPACT OF ARCHAEOLOGICAL RESEARCH IN COLLECTIVES WITH SOCIAL AND SPECIAL NEEDS AND NEWCOMERS

Theme: Museums and the challenges of archaeological outreach in the 21st century
Organisers: Masriera-Esquerra, Clara (Universitat Autònoma de Barcelona - UAB) - Gibaja-Bao, Juan Francisco (Institució Milà i Fontanals - CSIC-IMF, Consejo Superior de Investigaciones Científicas Departament d'Arqueologia i Antropologia) - Valenzuela-Lamas, Silvia (Institució Milà i Fontanals - CSIC-IMF, Consejo Superior de Investigaciones Científicas Departament d'Arqueologia i Antropologia) - Nevado-Martínez-delaCasa, Anibal (Universitat Autònoma de Barcelona - UAB) - Bennett, Richard (Breaking Ground Heritage)
Format: Regular session

Archaeology has a great potential to motivate feelings of attachment and belonging. The materiality of remains, which can be seen and felt, creates deep connexions with those people of the past who contributed to create the world in which we live today. This sense of place - which we all need to avoid loneliness and depression -, is even more important to people with social and special needs, as well as newcomers. This includes people with physical or mental disabilities, and the elderly. Recent studies demonstrate the big impact and benefits that engagement with archaeological heritage can have on those sectors of society. With this session, we aim to connect researchers engaged with this social dimension of archaeology, and disseminate case studies in which archaeological heritage helped social inclusion and health".

ABSTRACTS

01 THE ROLE OF ARCHAEOLOGY AND HERITAGE IN THE PROMOTION OF RECOVERY TO COMBAT VETERANS SUFFERING COMPLEX TRAUMAS IN THE UK

Author(s): Bennett, Richard (Breaking Ground Heritage)
Presentation Format: Oral

Breaking Ground Heritage are in their fourth year of utilising archaeology and heritage to support service veterans in the UK, suffering psychological and physical trauma caused predominantly through military operations.

With over 30 projects completed to date, ranging from archaeological excavations, historical research, academic instruction and heritage craft skills, we have been able to gather a corpus of evidence that is starting to show us why these projects are so effective in the promotion of recovery to this demographic.

There have been a number of studies conducted on this demographic, looking at the human borne legacies from the veterans of conflicts such as WW2, Korea, The Falklands Campaign and even Iraq and Afghanistan. All of these studies elude to the benefits derived from a peer network, but this has never been followed up in any capacity until now.

Evidence is now indicating that peer-peer interaction is instrumental in helping beneficiaries reconstruct a narrative that is conducive to their own personal recovery and that the heritage element is a driving force, helping to build upon a social identity that is more than just a label or career description (veteran (vet)/ex-army). Heritage also provides the platform to refocus the soft skill ingrained into this community, during the process of becoming 'military'. Skills such as self-discipline, attention to detail, a desire to succeed and teamwork all highly desirable in any workforce.

What we are now considering is how this peer-peer support this can be built upon in a sustainable way, for the progression of an individual's clinical intervention and how it might be replicated in other social demographics that might not have a commonality, like military a identity.

02 REH-ARK: REHABILITATION THROUGH ARCHAEOLOGY (PILOT PROJECT ON THE PSYCHOLOGICAL EFFECTS OF AMATEUR METAL DETECTING FOR DANISH VETERANS SUFFERING FROM PTSD)

Author(s): Dobat, Andres (Department of Archaeology, Aarhus University)
Presentation Format: Oral

Treatment and rehabilitation of veterans with mental injuries is one of today's pressing social challenges. The ultimate goal of REH-ARK is to investigate the potential of participation in amateur driven metal detecting as an element of a rehabilitation and socialisation program for Danish veterans with PTSD diagnosis.

The program 'REH-ARK: Rehabilitation through archaeology aims at:

- Improving veteran's wellbeing and quality of life as well as supporting and developing personal and work-related skills and competences

- Introducing vulnerable veterans to the reassurance of a social network and facilitating the establishing of lasting mentor-mentee relationships

- Introducing socially marginalised veterans to a new identity and a new (non-military) community and facilitate experience of successes which strengthen their self-confidence

- Investigate and analyse the effect of veteran's participation in the program with respect to symptom reduction, wellbeing and quality of life.

- Explore the potential of archaeology as a contributor to rehabilitation programs and a source of wellbeing

The program's target group, during the pilot study phase, are Danish veterans with diagnosis PTSD and other forms of mental challenges from the Danish Armed Forces, who either are or have been in psychological treatment.

We view archaeological teamwork, and in particular surveying with metal detectors, as a social technology capable of remediating basic psychological, social and cognitive levels of functioning. The program is expected to have a positive effect on participating veterans because of, among other factors, its meditative character, being a clearly structured and highly foreseeable outdoor activity. Furthermore, our hypothesis is based on the similarities between amateur driven metal detecting and the military environment in social, practical, technical, organisational and emotional terms.

03 AN INCLUSIVE AND BARRIER-FREE SCIENCE: SCIENTIFIC DISSEMINATION TO 'FORGOTTEN SOCIAL GROUPS'

Author(s): Gibaja, Juan - Valenzuela, Silvia (CSIC) - Higuera, Santiago (Casal Folch i Torres) - Nieto, Ariadna - González, Araceli - Mozota, Millán (CSIC) - López, Vanessa (Departament d'Educació de la Generalitat de Catalunya)
Presentation Format: Oral

In the Convention on the Rights of Persons with Disabilities, presented in 2006, it is highlighted 'the importance of accessibility to the physical, social, economic and cultural environment, to health and education and to information and communication in enabling persons with disabilities to fully enjoy all human rights and fundamental freedoms'.

In scientific and archaeological dissemination, these statements are not fully met, neither for people with disabilities, nor for other groups such as the elderly or those suffering social exclusion for different reasons. This is the case of a large number of newcomers that just arrived to our cities. The competent institutions (e.g. Museums, local administrations) do not think about bringing science to these groups. This leads everybody to think that science (including archaeology) is not for them.

Since 2013, the Archaeology of Social Dynamics group at the Milà and Fontanals Institution (Spanish National Research Council - CSIC) has developed a series of activities specifically designed for these 'forgotten social groups'. In them, the participants are not passive listeners but become active actors involved in the activity development. This allows exploring other channels for the transmission and acquisition of knowledge through a more sensorial experience.

In this work we will present some of the activities developed in the last few years, and we will discuss the challenges and the benefits for the people involved.

04 FROM RECOVERY TO REHABILITATION TO RESKILLING: SHIFTING THE EMPHASIS

Author(s): Everill, Paul (University of Winchester)
Presentation Format: Oral

The relationship between archaeology and the military has a long and important history in the UK, particularly in terms of previous military training proving beneficial in the organisation of large field projects. About a decade ago a shift in the landscape of UK military charities signalled a changing relationship between service personnel and the civilian population. With a greater awareness of the physical and mental health impact on those returning from deployment, and perhaps a greater awareness of gaps in existing state provision, new charities emerged to bolster the work of established bodies and, with them, new and innovative approaches to the recovery/ rehabilitation process. This included, with the establishment of Op Nightingale in 2012, the use of archaeology. Initially treated as simply providing a guiding framework for outdoor, team-based projects, the quality of the archaeological work quickly became a key consideration. Increasingly, archaeological specialists and professional organisations volunteered their time and expertise in support of these initiatives, helping widen the opportunities and supporting the establishment of new veteran-led organisations. Despite anecdotal evidence of the value of this approach, very few of those benefitting from the application of archaeology as a recovery vehicle pursued it beyond the confines of an excavation season. Indeed, one could argue, that for some the positive experiences it provided were negated by the cliff-edge that the end of the project, and a return to 'normal' life, heralded. In seeking a longer-term solution, the University of Winchester has offered fee-waiver degree studentships through Help for Heroes since 2016. These studentships can support a transition to archaeology as a career, though the primary goal is to open up Higher Education to those who might not otherwise have considered it. Early indications are very positive, and the work at Winchester will be expanded in the future.

05 WHEN IS ARCHAEOLOGY FOR ALL?

Author(s): Facchin, Giulia (University of Roma Tre)
Presentation Format: Oral

The present contribution aims to discuss and hopefully solve a controversial doubt, which arose in several years of practice as a supervisor of academic excavations. Roma Tre University, a public academic institution based in Rome, has been organizing since 2011 yearly fieldwork campaigns intended to train students at the practical side of the profession. Junior and senior students are welcome, as well as students from other Italian and foreign universities. At the end of the process they will get their educational credits and, most of all, they will have acquired some familiarity with the archaeological practice. People with physical and mental disabilities, attending academic courses, as well have been involved. Learning, indeed, is a democratic activity, everybody can attend a university and make the best out of it. The integration between people with different needs is successful and extremely helpful to embody the fundamental element of such an experience: to be collaborative and to work together. The fieldwork campaigns, though, have not only a teaching purpose, but also research goals, which need to respect specific deadline in order to be financed. Also the research is a public activity, financed with public money, which needs to be justified. The unsolved point arises when the second purpose dictates the terms of the entire work, causing misalignments between a collaborative and an economic dimension, far to be untangled.

06 ARCHAEOLOGICAL ARTEFACTS AND INCLUSIVE SEX EDUCATION: EXPLORING GENDER AND SEXUAL DIVERSITY IN SCHOOLS AND BEYOND

Author(s): Grove, Jen (University of Exeter)
Presentation Format: Oral

This paper will present work at the University of Exeter in which academics collaborate with sexual health practitioners, LGBT+ activists, young people and museums in order to make use of archaeological (and other historical) artefacts in activities which improve public health and wellbeing. Our most recent initiative is working with museums and heritage organisations across the UK to focus on increasing awareness of diversity and inclusion through youth curated exhibitions and mainstream school lessons, which answers calls to include LGBT+ in sex education. This capitalises on the crucial work done by many institutions in the UK in 2017 to mark 50 years since the partial decriminalisation of homosexuality, but which used was a wider opportunity to make LGBT+ history visible through their collections and part of the recognition of museums as playing a role in increasing public awareness and acceptance of diversity. Please see here: http://lgbthistory.exeter.ac.uk/

Our work highlights the importance of creating connections with the past by finding historical representations of diverse identities. This has proved to be incredibly valuable for motivating feelings of belonging in young LGBT+ people in particular. However, we also seek to explore whether we do need to necessarily locate affirmative, recognizable ancestors of ourselves in the material of the past in order for it to be empowering in the present and work to challenge prejudice and social exclusion. For instance, we have developed a lesson plan together with the British Museum which has harnessed the ambiguous nature of an archaeological specimen – an 11,000 year old Natufian figurine - in order to critique contemporary heteronormativity. This opens up wider questions about how archaeological material, and public engagement with it, can be made more inclusive.

07 LOCAL MUSEUMS AS OPPORTUNITIES OF INCLUSION AND SOCIAL CHANGE

Author(s): Minuesa, Helena (Museum of Sant Cugat- Ajuntament de Sant Cugat)
Presentation Format: Oral

In few years, many initiatives have shown that cultural heritage is a tool that can potentially fight against inequalities and balance social deficits. This essay aims to fight against the sense of a culture made only for cultured and educated people. It aims to make a way to a culture 'do it yourself', more participative and which generates social value, committed to the transformation of society. Cultural events can be the answer for inequalities in an effective and authentic way, in a creative way. This essay wants to highlight this enormous opportunity of heritage being capable of overcoming prejudices and taboos, bringing worlds together and breaking the social barriers. And we would like to give concrete examples, experiences carried out in the local museum area. Therefore, the ultimate objective of this essay will be: on the one hand, we want to make clear the power of art and culture as elements of cohesion and creation of social peace: culture as a tool –and not as weapon- of massive construction –and not destruction. On the other hand, we will present in more detail some practices carried out in the Museum of Sant Cugat del Valles (Barcelona) in which multiple projects and actions are held towards accessibility and real inclusion.

08 THE TACTILE GAZE. PLAY THE STORY

Author(s): Rius Font, Lluís (Oficina de Patrimoni Cultural, Diputació de Barcelona) - Llop Rigol, Josep Maria (Àrea d'Atenció a les Persones, Diputació de Barcelona) - Bosch Argilagós, Josep (Museu de Gavà) - Comasòlivas Font, Joan (Museu d'Història de Sabadell) - Francès Ferré, Joan (Museu d'Història de Cerdanyola) - Mestres Santacreu, Imma (Centre d'Interpretació i jaciment El Camp de les Lloses) - Ocaña Subirana, Maria (Museu Arqueològic de l'Esquerda) - Tenas Busquets, Montse (Museu Municipal de Montmeló)
Presentation Format: Oral

Since the year 2007, the Office of Cultural Heritage of the Diputació de Barcelona (Provincial Council of Barcelona), carries out

different actions to bring museums and their heritage closer to all citizens through the Local Museums Network. The Tactile Gaze is a program of cultural accessibility to adapt permanent exhibitions and archaeological sites to the whole society. This program focuses on the development of different elements at the museums, the communication channels specific to each group, with the aim of becoming museums and sites a cultural space designed for everyone. We start from a tactile reality for reinforce the speech of the visit. Of course, this action should include scripts of the visitor in Spanish, Catalan and English, in braille and macroscale print, and images in relief of those "non-tactile" elements that can reinforce a greater understanding of the various exhibition contents and meanings. In addition, for the deaf community we have a channel on youtube www.youtube.com/user/LaMiradaTactil, providing all contents in sign language, subtitled for the oral deaf community and voice in Catalan to offer a more universal use. Thus, touch becomes the most universal source of knowledge: that which can be can be take is understood much better and is more attractive because it involves a direct and emotional personal experience.

In this article we want to present specific actions in the museums of archaeological themes and actions in open air sites, as well as an assessment of their impact on the public with disabilities.

09 MULTICULTURAL SCHOOLS AND LOCAL HERITAGE: SHARING LIFE, CONSTRUCTING COMMON HERITAGES

Author(s): Masriera-Esquerra, Clara (Universitat Autónoma de Barcelona) - Feliu-Torruella, Maria (Unversitat de Barcelona)
Presentation Format: Oral

Actually, a recurring characteristic of many European schools, especially public schools in urban contexts, is the diversity of cultural references of their students.Therefore, the cultural context of origin of a large part of the students differs, often significantly, from the cultural context in which their school life develops. This cultural distance tends to be more pronounced in relation to the construction of collective historical references and the notion of what is considered as our own cultural heritage.However, in this paper we intend to show how a multifacetic approach to the idea of history and cultural heritage allows us to develop strategies of cohesion and place attachement.

Therefore, we will complement the concept of cultural heritage as the creator of collective identities of origin, with the concept of experiential heritage as a result of concrete life stories. This conceptual framework converts the heritage of proximity, the close and daily tangible and intangible environment, into a shared lived context for students from diverse geographical and cultural backgrounds.

Stemming from this approach, we want to present different best practices examples which apply different strategies, using local heritage as a tool, to build more cohesive communities in schools with kids from diverse cultural origins.

10 ROYAL MONASTERY OF SANTA MARIA DE PEDRALBES, HOW TO MAKE INCLUSION POSSIBLE

Author(s): Urgell, Ferran (Municipal Institute for People with Disabilities - Barcelona City Council) - Bonet, Gemma (Royal Monastery of Santa Maria de Pedralbes - Barcelona City Council) - Anguita, Yolanda (Municipal Institute for People with Disabilities - Barcelona City Council) - Castellano, Anna (Royal Monastery of Santa Maria de Pedralbes - Barcelona City Council)
Presentation Format: Oral

Founded in 1327 and practically inhabited until today, the Royal Monastery of Santa Maria de Pedralbes is an exceptional cultural and historical testimony of Barcelona and Catalonia. In 1983, the Pedralbes Museum-Monastery was inaugurated and has since become a museum of reference for the city. The will of the museum to become a space open to all audiences, and especially to people with disabilities, has led to launch several initiatives to make the monastery a real inclusion space. In this way, in a gradual process, starting with the educational project "Pedralbes, a walk of perceptions", the museum has worked to adapt both space and activities to all kinds of needs. This work has enabled to pass to the current stage, with a direct participation of the people with special needs in various fields of the operation and management of the museum itself. In this sense, with the collaboration of the Municipal Institute for People with Disabilities, the museum represents a leading experience in the real inclusion of people with disabilities in cultural and heritage facilities. This presentation includes the different actions and phases that have led to the current situation, all with the added difficulty of having to work in a heritage space where accessibility actions must be especially sensitive to the preservation of heritage.

11 VULNERABILITY, PARTICIPATION AND CITIZENSHIP: A RESEARCH PROJECT WHICH CONSIDERS NEIGHBORHOODS OF THE REGION OF MADRID AND THEIR CULTURAL HERITAGE

Author(s): Castillo, Alicia - Dominguez, Marta (Society, Environment and Territory Research Team. Complutense University of Madrid)
Presentation Format: Oral

Since 2016 we have been working on a transdisciplinary project which combines groups of cultural heritage experts, sociologists and architects to study vulnerable areas in the towns of Madrid. The main objective is to discover new indicators to better detect these such districts and to offer new solutions to improve them. We consider participation one of the keys for it.

This paper will show how we have applied Cultural Heritage management strategies in these contexts. We try to interpret "new pasts" of the local communities or to connect the "official past" with them. We will show a combination of methodologies, from documented studies, contemporary archaeology or heritization processes. We combine them with urban regeneration proposals or

participatory actions. The experiences will question the human and material resources that one needs to implement good participatory processes in these areas and how it is very difficult to offer continuity in these initiatives. We think that only long-term projects could be effective in these districts, but we have to continue with this kind of analysis and study.

All of this could improve social conditions in these deprived districts in which several generations of "newcomers" are the main inhabitants. Cultural heritage could become a mainspring of social change in these urban contexts.

12 KNOWING OUR PUBLICS, LEARNING INCLUSION. THE STUDY CASE OF LA ROCA DELS BOUS (NEANDERTHAL SITE)

Author(s): Nevado, Aníbal (Universitat Autònoma de Barcelona - UAB; Associació Recerca i Difusió del Patrimoni Històric) - Masriera, Clara (Universitat Autònoma de Barcelona - UAB)

Presentation Format: Oral

Museums and archaeological sites have traditionally excluded many social sectors to be potential public of these places. Among these sectors, physical and mental disabled individuals and groups. This exclusion is highly increased in archaeological sites where they have the handicap of the difficult access to the site. A part from this, texts, images and objects, as well as activities are not being designed for a universal access, taking into account the diversity of the society (gender, social and cultural groups, disabilities, age, etc...)

In this paper, we would like to explain a study case based on inclusion of cognitive disorder groups to visit and learn in the archaeological site of La Roca dels Bous, a temporary site of Neanderthal groups located in the prepyrenees area. The aim is to design and develop inclusive actions and activities (discourses and pedagogical resources). We will also present some evaluative results of these actions and activities developed with these groups of people.

These groups of people are from a local special school in Balaguer, the main city near by the archaeological site. One group is formed by adults from 18 to 64 years old with mental disorder, such as autism. The main challenge is to work with time and space concepts and to include new concepts and ways of living with a simple language.

676 LAND USE IN AFRICA: NEW METHODS, PERSPECTIVES, AND DATA CHALLENGES

Theme: Theories and methods in archaeological sciences
Organisers: Kay, Andrea (University of Lausanne) - Biagetti, Stefano (Universitat Pompeu Fabra)
Format: Discussion session

The study of Land Use and Land Cover (LULC) in Holocene Africa has been geographically and temporally unbalanced, particularly with regard to the integration of archaeological data into the reconstruction of past land use. Past African dynamics have often worked on a very large scale, and changes in LULC are extremely significant to the study of the development of cultural trajectories on a truly continental perspective. In this session we will gather experts from different regions of Africa with the aim of discussing possible directions for research on LULC in Africa, with a special focus on the regions that have not yet been the subject of land use studies. This session will also explore the viability of integrating new methods, perspectives on the relevance and future application of these studies, and the many data challenges present in the archaeological record.

ABSTRACTS

01 ARCHAEOLOGICAL CHARCOAL AS A METHOD FOR ASSESSING PAST LAND USE AND LAND COVER IN WEST AFRICA: PERSPECTIVES AND DATA CHALLENGES

Author(s): Höhn, Alexa (Goethe University)

Presentation Format: Oral

A multitude of different archives contain information on past land cover - on various scales and complementing each other in the reconstruction of past landscapes. In the West African savanna, archaeological charcoal assemblages are one such archive, containing valuable information on the environement of past settlements for several reasons:

Woody vegetation is and was an essential part of the West African environment. With agroforestry as the typical form of land-use practice, even the fields contain trees that are spared for different reasons during site clearing. Differences in land use lead to specific tree compositions in the resulting farmed parklands. Additionally, fallows are an integral part of land-use practices with different fallow cycles leading not only to different degrees of canopy openness but also to different species compositions. The type and the intensity of land use thus determine the woody vegetation around the settlements. Being the main resource for fuelwood collection, these parklands are well reflected in the archaeological charcoal. Land cover outside these areas remains mostly invisible. Pollen, phytoliths, soil (micro-)morphology and other archives, covering different spatial scales and different processes related to land use and land cover, supplement the charcoal information. In spite of the important information contained, and char-

coal routinely being recovered at archaeological excavations, charcoal remains unanalyzed for a large number of sites and regions in West Africa. We intend to change this.

02 ARCHAEOLOGY AND SPACE: REVISITING THE SETTLEMENT PATTERN OF LATE IRON AGE SITES IN SOUTHERN AFRICA USING SPATIAL TECHNOLOGY

Author(s): Siteleki, Mncedisi (University of Oslo)

Presentation Format: Oral

Late Iron Age farming communities dating to AD 1300-1840 in southern Africa left traces that, when studied, can provide meaningful glimpses into the past to help reconstruct their history. However, the challenge remains to understand the spatial relationships between the various ruins or traces and their surroundings and the wider landscape. This project therefore attempts to understand the socio-political significance of the spatial organization of Late Iron Age sites in southern Africa (i.e. interior of South Africa and south-eastern Botswana) by comparing different settlements at different scales using GIS and statistics. As such, my PhD research will be driven by two overarching questions: (1) To what extent may we separate between stone-walling used as main courts (kgotla), and thereby being more public spaces or arenas, and stone-walling used for more domestic purposes? and (2) Is there socio-political significance to marginality between different settlements? Carefully considering the underlying culture-historical and methodological implications of these questions, my research will investigate these questions with a new set of methods to tap into the minds of the farmers through the landscape in-order to understand the decision-making, underlying processes and fundamental variables that guided the lay-out and setting of the southern Africa farmer settlements. Spatial technologies together with statistical techniques will be employed, and these include: GIS tools, Point Pattern Analysis, Ripley Rasson and Ripley K statistical techniques. Taking into account the different analytical scales, these tools and techniques will be combined to produce statistically based spatial patterns of the Late Iron Age settlements, as well as help to determine the statistical significance of the spatial patterning of the southern African Iron Age landscape.

03 PASTORALISM AND LAND USE IN THE TANZANIAN RIFT VALLEY AND HIGHLANDS: CURRENT AND PROSPECTIVE RESEARCH

Author(s): Prendergast, Mary (Saint Louis University) - Grillo, Katherine (University of Wisconsin - La Crosse) - Contreras, Daniel (University of Maryland) - Gidna, Agness (National Museums of Tanzania) - Goldstein, Steven (Max Planck Institute for the Science of Human History) - Mabulla, Audax (National Museums of Tanzania) - Storozum, Michael (Earth Observatory of Singapore, Nanyang Technological University)

Presentation Format: Oral

Mobile pastoralism is a highly flexible economic and social system that has enabled food production in areas where potential for farming is marginal. In East Africa, early livestock herding is associated with the Pastoral Neolithic (PN) era, c. 5000-1200 BP. While the PN is relatively well understood in Kenya, contemporaneous sites are rare and minimally investigated in Tanzania. However, surveys since 2012 have identified numerous Holocene pre-Iron Age sites in the north-central Tanzanian Rift Valley and its surrounding highlands. These demonstrate that pastoralism may have been much more widespread in East Africa than traditionally thought, and highlight the need for land use and land cover studies in East Africa to consider late Holocene human-environment interactions. This will, we suggest, require long-term combined programs of paleoecological and archaeological research to investigate the settings and social dynamics of the spread of early food production.

The surprising discovery of Luxmanda – the largest PN site yet identified – in an area that is otherwise terra incognita for paleoecology and archaeology, has prompted a new program of research. The RAPT (Research on the Archaeology of Pastoralism in Tanzania) Project aims at elucidating both the environmental shifts that may have enabled the site's specialized pastoralist community to thrive, and the durable, long-term impacts that herders and their livestock may have had upon local ecologies, particularly via dung deposition. In this paper, we present ongoing archaeological, geoarchaeological, and paleoecological research at Luxmanda. We use this site-based approach as a starting point to map out a broader research agenda, addressing land use and land cover across larger parts of northern Tanzania. We briefly review what is known from prior research, discuss data challenges, and highlight potentially fruitful areas for combined archaeological and paleoecological studies.

04 THE COMPLEX RELATIONSHIP BETWEEN IRON PRODUCTION AND FOREST RESOURCES IN EAST AFRICA

Author(s): Iles, Louise (University of Sheffield)

Presentation Format: Oral

Industrial-scale iron production has long been associated with forest degradation. This association is generally based on two factors: (1) that a significant supply of charcoal is needed to support intensive smelting and smithing industries, and (2) that a healthy iron production industry often accompanies a context of increasing agriculture and thus forest clearance, which would have created a growing demand for iron tools. However, a direct causal link between iron production and forest degradation is difficult to detect in the archaeological record.

Previous research in northern Tanzania sought to examine the environmental impact of iron production technologies in the specific

forested montane environment of North Pare, utilising archaeometallurgical reconstructions of the technical parameters of iron production specific to this region alongside environmental and geoarchaeological data. However, how can such data at the site-scale be expanded to explore technological impacts on forest cover on a broader scale?

The new research discussed here explores how we might look at regional-scale environmental impacts of iron production, by merging archaeometallurgical, chronological and environmental datasets, and considers the challenges and limitations contained within such methods. It is hoped that this will provide a new perspective for our understanding of the impacts of past pyrotechnologies on local and regional environments.

05 TOWARD A LAND USE MAP OF THE SAHARA

Author(s): Biagetti, Stefano (Universitat Pompeu Fabra; University of the Witwatersrand) - Zerboni, Andrea (University of Milan) - Merlo, Stefania (University of the Witwatersrand) - Madella, Marco (Universitat Pompeu Fabra; ICREA)
Presentation Format: Oral

Due to its current erratic vegetation, the Sahara is generally represented as an empty expanse in the maps of African land cover. Equally, maps of current land use in the Sahara are extremely rare, with the exception of the ones at very large scale. From the archaeological point of view, our knowledge of past cultural trajectories in this vast region is still patchy and unbalanced between better-known spots and almost unexplored areas. As a result, no maps portraying past land use(s) in the Sahara are available, and ancient regional land use reconstructions are lacking. Our contribution to the roundtable aims at presenting a set of preliminary maps of present and past land use in the Saharan belt, which use the few best documented studies in the area to model regional patterns, with the support of remotely sensed data. To develop these maps we use the hierarchical categories adopted within the LandUse6k/LandCover6k initiative, an international and interdisciplinary research group dedicated to reconstructing human land use over the past 10,000 years. The contribution will focus on methodological concerns and expected outcomes, with reference to selected Holocene time slices. We will ultimately discuss the peculiar issues related to past and present land use reconstructions in the Sahara.

677 COMMUNITIES, ENVIRONMENT AND RESOURCES: THE STRUCTURATION OF CULTURAL LANDSCAPES IN PREHISTORIC SICILY AND THE CENTRAL MEDITERRANEAN BASIN

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Speciale, Claudia (Istituto Nazionale di Geofisica e Vulcanologia, Napoli) - Giannitrapani, Enrico (Arkeos S.C. - Servizi Integrati per i Beni Culturali) - Ayala, Gianna (Department of Archaeology, University of Sheffield)
Format: Regular session

This session will discuss the complex relationship between human communities and the rich natural landscape of Sicily and the central Mediterranean basin during the prehistoric and proto-historic periods (from the Palaeolithic to the Bronze age). Traditionally, the prehistory of this area has been studied almost exclusively from a chrono-typological point of view. This approach has left little room for discussion about other perspectives. In this respect, over the last decade, research focussing on the analysis and the study of the tight relationship developed between human groups and the rich environmental landscape, is redefining our understanding of the prehistoric framework of the central Mediterranean basin.

In the session, therefore, we would like to discuss the aspects of the transformation of the natural environment into varied and complex cultural landscapes and to understand what were the cultural and technological mechanisms and the modes of production used by prehistoric communities. The primary focus of the session would be the main island, but we are also interested to debate with specialists working in the many islands surrounding Sicily, as well as in the neighbouring regions (e.g., southern Italy, Sardinia, north Africa).

For this purpose, we welcome papers from our international colleagues that cover, though not exclusively, the following themes:

- Bioarchaeological, geophysical and archaeometric analyses
- Exploitation of raw materials and natural resources
- Spatial and GIS analyses, settlement patterns and distribution of sites
- Empowerment of ritual and funerary landscapes
- Processes of unequal access to landscape
- Social meaning of cultural landscape

ABSTRACTS

01 THE FIRST PEOPLING OF SICILY: DISCUSSING A NEW CHRONOLOGY

Author(s): di Maida, Gianpiero (Graduate School Human Development in Landscapes, Christian-Albrechts Universität zu Kiel) - Mannino, Marcello (Department of Archaeology and Heritage Studies, School of Culture and Society, Aarhus University; Department of Human

Evolution, Max Planck Institute for Evolutionary Anthropology) - Talamo, Sahra (Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology)
Presentation Format: Oral

Sicily is the largest island of the Mediterranean. But, due to its proximity to the firm land and the presence of a land bridge during the LGM, its nature has also been effectively described as "quasi-insular" (Leppard 2014). This condition reflected on the development of the environment during the alternation of climate phases throughout the Pleistocene (Masini et al. 2008). But more interestingly, it also had an impact on the history of studies: such a proximity to the continental landmasses, was seen by the scholars as an a priori guarantee of an early peopling, whose proves were only to be searched and found. Eventually, this attitude brought to the well-known discussions about the presence of a Lower Palaeolithic in Sicily. But while these claims have been since long, definitely archived as wishful thinking, a credible chronology of the first peopling of Sicily remains an open issue.

By using the environmental data present in the literature, the island archaeology conclusions on the sea-crossing / seafaring activities in the Mediterranean during the Pleistocene, the available absolute dates, and finally our recent research on the site of Fontana Nuova (di Maida et al. in preparation), a possible new chronology of the first peopling of the island will be presented and discussed.

Di Maida, G., M.A. Mannino, B. Krause-Kyora, & S. Talamo. in preparation. "Radiocarbon dating and isotope analysis on the purported Aurignacian human remains from Fontana Nuova (Ragusa, Italy)."

Leppard, T. 2014. "Modelling the Impacts of Mediterranean Island Colonization by Archaic Hominins: The Likelihood of an Insular Lower Palaeolithic." Journal of Mediterranean Archaeology 27 (2):231-54.

Masini, F., D. Petruso, L. Bonfiglio, & G. Mangano. 2008. "Origination and extinction patterns of mammals in three central Western Mediterranean islands from the Late Miocene to Quaternary." Quaternary International 182 (1):63-79.

02 THREE MOMENTS IN THE POLITICAL PREHISTORY OF A MEDITERRANEAN LANDSCAPE

Author(s): Robb, John (University of Cambridge) - Chesson, Meredith (University of Notre Dame) - Foxhall, Lin (University of Liverpool) - Michelaki, Kostalena (Arizona State University) - Yoon, David (American Numismatic Society)
Presentation Format: Oral

This paper describes prehistoric settlement on the southern slopes of Aspromonte, Calabria, Italy. Southern Calabria contradicts the stereotypes of settlement history based on areas such as Puglia, the Maternao, or Eastern Sicily. The landscape is eroded and damaged, and difficult to study. Nevertheless, through field survey and integration of varied archaeological information, we identify three periods in the Holocene settlement history, corresponding to three political logics. In contrast to better-known areas of Southern Italy, Neolithic settlement was based upon scattered, very small settlements with short histories, with an apparent logic of avoiding aggregation into villages; this may have been a strategy for preserving household autonomy. In the earlier Bronze Age, settlements begin to form clusters or neighbourhoods in environmentally favourable settings. This may perhaps evidence increased political relatedness among household groups. Later Bronze Age and early Iron Age settlements reveal a more direct politicisation of the landscape, with aggregation into larger sites, a new preference for living on very steep, defensible slopes, and an attraction to areas with access to coasts. In contrast to better-known areas, however, the settlement pattern remained inland rather than coastal and there is little evidence that people were interested in integration with long-distance Bronze Age trade systems. Instead, the priority seems to have been maintaining an egalitarian local political organisation.

03 A GEOARCHAEOLOGICAL HISTORY OF LANDSCAPE CHANGE IN SOUTHWEST SICILY

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

Identifying and recording the diversity of human-environmental interactions over time provides opportunities to learn about the past from the past. A case study from later prehistory and early history in southwestern Sicily, part of the Prospecting Boundaries project, employs concepts from geoarchaeology, historical ecology, and landscape history to document environmental and anthropogenic changes to the landscape. Evidence of changing climate, land use, economics, and resource availability is compared and contrasted in light of the relative resilience displayed in both ecosystem and human culture. Results indicate changes in both human land use and regional climate, resulting in changes to three fundamental qualities: hydrology, soil cover, and human settlement patterns. Comparison of palaeoenvironmental and geoarchaeological data suggests that ancient land use may have been a source of considerable stress in upland areas along the Mazaro river, although the impact to our study area remains speculative. Despite this stress, both human communities and the landscape were resilient over the long term. We propose that modern land use practices, in particular the large-scale transformation of rocky surfaces into arable land, are not sustainable on dry upland areas, and in fact are degrading the landscape at an astounding rate, with concomitant negative impact on archaeological and environmental resources. This process is exacerbated by ongoing desertification of the region. However, historic land use strategies may remain sustainable on the valley slopes.

04 GEOARCHAEOLOGICAL AND GEOPHYSICAL ANALYSES AT THE COPPER/BRONZE AGE SETTLEMENT OF CASE BASTIONE (VILLAROSA) AND THE PREHISTORIC LANDSCAPE OF CENTRAL SICILY

Author(s): Iannì, Filippo - Giannitrapani, Enrico (Arkeos - Servizi integrati per i Beni Culturali, Enna) - Dolfini, Andrea - Shillito, Lisa Marie (School of History, Classics and Archaeology, University of Newcastle) - Anguilano, Lorna (Experimental Techniques Centre, Brunel University, London) - Di Mattia, Paolo (Geologist, indipendent researcher, Enna)

Presentation Format: Oral

Case Bastione is a large prehistoric settlement (ca. 2 ha) located along the Morello river (central Sicily), a major tributary of the Imera meridionale river. The site is located within a landscape marked by sandstone and clay conglomerates of the Terravecchia geological formation and by the typical elements of the Evaporitic series of the Messinian. The settlement, investigated since 2007, was inhabited from the Late Neolithic to the Early/Middle Bronze Age (5th-2nd millennium BC). The excavations have brought to light complex domestic and productive structures dating to the Late Copper Age and Early Bronze Age (ca. 2600-1600 BC), as well as diagnostic pottery and stone tools. The paper presents the site focusing in particular on the scientific analyses carried out by the multidisciplinary research team on the structural remains and portable material culture to identify the prehistoric production/craft processes, which seem to have centred on the use of shallow, clay-lined pits; the geological survey and analyses carried out both on site and in the surrounding landscape in order to map out the geological raw materials (e.g. salt, sulphur, granite, and flint), which may have been sourced, used, and exchanged in the 3rd and 2nd millennia BC; and complementary investigations including geophysical prospections and coring, which aimed to reconstruct the layout of the prehistoric settlement, its stratigraphy, and its soil morphology.

05 PROTOHISTORIC LANDSCAPES IN SARDINIA (ITALY): TERRITORIAL CONTROL AND EXPLOITATION OF NATURAL RESOURCES IN THE MIDDLE AND LATE BRONZE AGE

Author(s): Cicilloni, Riccardo (University of Cagliari) - Cabras, Marco (Doctorado en Historia y Artes – Arquelogía y Cultura Material, Universidad de Granada)

Presentation Format: Oral

During the Bronze Age, in many areas of the Western Mediterranean (Spain, France, Italian peninsula, islands), we can observe the development of a series of fortified centers and structures, often on high places, aimed to the defense of strategic locations and resources. These fortifications, which began to be built from the Copper Age, are the answer to a need for possession and control of the territory linked to a greater degree of social complexity of populations, with an ever-increasing hierarchy and the rise to power of persons or groups linked to the possession of weapons and then to warlike activities.

On the island of Sardinia, in the western Mediterranean, during the proto-historic period, the Nuragic phenomenon developed; an extraordinary civilization, from the Middle Bronze Age to the end of the Iron Age (XXIII-VIII cent. BC), characterized by the building of great monuments. This civilization stands out particularly for the construction of more than 8,000 nuraghi, cyclopean-type constructions similar to towers. These great buildings have multiple functions, but in particular to surveil the whole island territory. We have mainly carried out different GIS analyzes on different sample areas with the aim to reading the visual-perceptive aspects and to try to investigate the relationship between settlements and landscape and the mobility systems across different territories through the applying of the least-cost path analysis. In order to reconstruct the Archaeological Landscape of proto-historic age, we propose some cases of important settlement systems pertinent to the Nuragic civilization. GIS-based analysis shown as these territorial control systems consisting of several nuraghi and settlements, were intended to control the more considerable natural and economic resources and transit routes.

06 PALAEOENVIRONMENTAL DYNAMICS AND THE LATE BRONZE AGE/IRON AGE OCCUPATION (1300-600 CAL BC) OF THE EREI UPLANDS (CENTRAL SICILY)

Author(s): Valbruzzi, Francesca (Soprintendenza BB.CC.AA. - Enna)

Presentation Format: Oral

The Erei uplands is a hilly area located in the innermost part of Sicily, recently the focus of intense archaeological research, producing a large amount of new data concerning the settlement patterns, the material culture, and the social structures of the communities which occupied the area from the Neolithic to the Iron Age. This geographical space is marked by the constant interplay of rolling clay hills, with sudden and sharp limestone and sandstone ridges. The area is also crossed by long and slow-flowing rivers, heading eastwards towards the Ionian coast. In the central part of the region, close to Enna, is the Lago di Pergusa, an endorheic basin of tectonic origin. Palaeoenvironmental analyses carried out on the lake sediments allowed a detailed reconstruction of past vegetation and climatic history, covering the entire Holocene. These environmental data are used as a basis for a new narrative related to the long-lasting social dynamics that have led to the development of a complex proto-urban settlement system. After a crisis during the Middle Bronze Age, a large number of new hills-top settlements started to develop since the late Bronze Age. These had a proto-urban and then urban development during the Iron Age, concentrated in particular in the Pergusa area and along the Torcicoda and Morello river valleys. This new phase of settlement expansion is also accompanied by significant cultual community practices, clearly evidenced at Cozzo Matrice, and by a process of monumentalization of death, represented by the vast Iron Age rock-cut cemeteries, documented at Pergusa and in the territory of Calascibetta. This process ended during the 5th century BC, possibly because a synecism process in favour of the new founded polis of Enna, started both for defence reasons and to respond to the cultural competition with the colonial city-states of the coastal areas.

07 THE CHERT FORMATIONS OF SICILY AND THEIR RELATIONSHIP WITH THE NEOLITHIC CHERT ARTEFACTS OF MALTA

Author(s): Chatzimpaloglou, Petros - French, Charles - Stoddart, Simon (University of Cambridge) - Pedley, Martyn (University of Hull)
Presentation Format: Oral

Malta is a small group of islands in the central Mediterranean basin and only 90 Km from Sicily (south). The human presence has been recorded on these islands during the Neolithic period and it is under investigation. Currently, FRAGSUS project is investigating the extent to which these islands were laboratories of human activity and, in particular, their degree of connectivity with neighbouring areas. The project focuses on the Stone Temples on Malta (between 4th and 3rd millennia BC) and identifies the circumstances under which these unique monuments were built.

The archaeological research has found an important amount of chert assemblages in these prehistoric sites. The origin of these findings is important for the project, as it could contribute on understanding the relationship between human and landscape. Also it would provide useful information on the prehistoric trade/exchange network of the central Mediterranean Sea. Although these stone artefacts have been studied in the past, the research on their sources has been inconclusive. There are indications of exotic cherts in the assemblages but, the claim that Sicily was the supplier is based only on the proximity of the islands. Therefore, it is clear that a comprehensive and scientifically based research is necessary to distinguish if indeed such material from Sicily was imported to Malta.

This presentation will focus on the petrological and geochemical research conducted on the main chert formations of Sicily. It will display the results of the investigation and suggest how they should be processed in order to obtain the necessary and useful information for such type of research. Finally, a comparison will be made between these information and those of the Maltese chert assemblages and an assessment to what extend the Sicilian cherts were sources of the prehistoric chert assemblages of Malta.

08 THE USE AND DISTRIBUTION OF LIPARI OBSIDIAN IN PREHISTORIC SICILY AND THE CENTRAL MEDITERRANEAN

Author(s): Tykot, Robert - Vianello, Andrea (University of South Florida) - Freund, Kyle (Indian River State College)
Presentation Format: Oral

Obsidian from the Aeolian Island of Lipari was widely used in the Early Neolithic thru Bronze Age (6000-1500 BC). In the Central Mediterranean, however, there also are other obsidian sources used on a regular basis, especially in western Sicily, Malta, and peninsular Italy. The ability to identify the specific geological source and even sub-source of obsidian artifacts provides endpoints of the chaîne opératoire of raw material acquisition, production, distribution, usage, and disposal context, and significant data for addressing our hypotheses about cultural and technological mechanisms and modes of production used in prehistoric societies.

Starting in 2012, lithic studies have been conducted on more than 7500 obsidian artifacts in many museums and storage facilities in Sicily, southern and central Italy. Elemental analysis was conducted using a non-destructive Bruker portable X-ray fluorescence spectrometer to determine their specific geological source. This instrument provides secure discrimination between all of the possible sources (Lipari, Palmarola, Pantelleria, Sardinia, Melos, Carpathians) and most subsources (Gabellotto, Canneto Dentro on Lipari; Balata dei Turchi, Lago di Venere on Pantelleria; four on Monte Arci, Sardinia). Twenty-five or more artifacts from 70 sites were tested, enabling statistical comparisons based on location, lithic typology, and time period.

Among the most significant discoveries are the relative consistency over time in the proportion of Lipari to Pantelleria obsidian on Ustica, which is quite different from the closest Sicily site of Uzzo. Another is the stark difference between nearby Gozo and Malta, with the burial site of Xaghra dominated by Pantelleria obsidian and the partly contemporary site of Skorba dominated by Lipari obsidian. For both cases, direct maritime travel is suggested, rather than through intermediate connections on Sicily. Overall, integration of obsidian data allow us to better understand the socioeconomic nature of trade and contact in the Neolithic and Bronze Ages of the central Mediterranean.

09 SETTLEMENT PATTERNS IN THE CENTRAL AND SOUTHEASTERN AREA OF IBERIAN PENINSULA: A LANDSCAPE APPROACH IN A EVOLUTIONARY FRAMEWORK

Author(s): Escribá Ruiz, Mª Pilar - Jiménez-Puerto, Joaquín R. - Bernabeu Aubán, Joan - Orozco-Köhler, Teresa (Universitat de València)
Presentation Format: Oral

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

This phenomenon is not exclusive of early stages of Neolithic. During the third millennium BC, several so-called 'complex' societies emerged along the Iberian Peninsula. Such societies presented some features like: Strong demographic growth and large population aggregations, monumental construction, extension of ideo-technic elements and specialized crafts, starting with the impreso-cardial and finishing in posterior chronologies with the bell-beaker, both showing parallels with the ones in the Italic peninsula and Sicily. We can't forget either the presence of exotic raw materials like ivory from Syria (which will probably arrive Iberia through Sicily) and amber (some coming from Sicily itself, pointing to long-range exchange networks and potential parallels between both regions). Nevertheless, by the end of that millennium, the cultural landscape looks like fragmented and regionalized, all together with a eco-

nomical and spatial re-organization, setting the basis for the Bronze Age. All this information suggests that there are hints of cycles of significant growth and dispersal beginning with the earliest Neolithic societies.

In this paper, we study the settlement patterns and the exchange of raw materials from a diachronic perspective from Neolithic to Bronze Age, in the central and southeastern area of the Iberian Peninsula, in order to better understand the evolution and the social meaning of cultural behaviour of this communities and their relationships with the landscape and resources.

10 SALT, SULPHUR, METAL ORES: THE PLATANI VALLEY AS A CORE AREA FOR PRODUCTION, TRADE AND CULTURAL CONTACTS WITH THE MEDITERRANEAN

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

The Platani river valley, placed west of Agrigento, shows peculiar geomorphological features, mainly consisting in the outcrops of evaporitic rocks of the chalky-sulphur series, which contain important deposits of sulphur, rock salt and bitumen. These elements, whose use has been documented since the prehistory, are easily found directly on the surface, allowing them to be procured in large quantities without resorting to mine extraction. The concentration of long-lasting settlements is particularly diffused near the sulphur mines, from Eraclea Minoa, where the Platani flows in the Mediterranean, to moving gradually inland, where there are large and important sites like Monte Sara, Monte della Giudecca, and Sant'Angelo Muxaro. These natural resources can possibly explain the Aegean presences along the Agrigento coast, from Monte Grande to Cannatello, steps of a systematic East-West route active since the Early Bronze Age, that constitute the bases for further inland occupation along the Platani valley, known also as "the route of salt and sulphur". In fact, in the area are easily recognizable the evidence of cultural traits strongly permeated with Aegean elements in various aspects of material culture, but particularly evident in the diffusion of tholos tombs in the area. Worthy of note are also limited metal resources, especially iron ore, such as pyrite, hematite and marcasite, which seem to be concentrated in the area of the middle Platani valley, between Sant'Angelo Muxaro and Casteltermini. The evidence of their local exploitation is provided by the huge amount of bloom or iron foam found in a vast area at Monte Roveto di Casteltermini, and from a hoard where, together with bronze and iron objects dating between the 10th to the 6th century BC, there was a large amount of semi-finished waste products of the metallurgical process that originally used the iron minerals present in the area.

11 ACROSS THE STRAIT. NEW EVIDENCE ABOUT CULTURAL INTERCONNECTIONS AND EXCHANGE BETWEEN CALABRIA AND SICILY DURING THE EARLY BRONZE AGE

Author(s): marino, sara (Sapienza University of Rome)
Presentation Format: Oral

Recent developments in the archaeological research carried out in Calabria in last decades have considerably extended our knowledge about the Early Bronze Age (ca. 2200-1700 BCE). The scenario has been expanded and its knowledge deepened thanks to a series of territorial surveys carried out in the Region, especially important in the definition of local settlement dynamics. However, mostly recent stratigraphic excavations conducted in the southern area of Calabria (e.g. : Piani della Corona, Petti di Portigliola, Punta di Zambrone) have provided new data about the aspects/characters of intra-site inhabited areas, through the discovery of a variety of functional structures.

This has allowed to deepen not only the chrono-typological classification and absolute dating through 14C analysis (left in background in this contribution), but above all to study the modes of interaction and assimilation within the areas encircling the lower Tyrrhenian area (Aeolian Islands, Strait of Sicily). In addition, recent archaeometric analyses realized in some Calabrian, Aeolian and Sicilian contexts, on different classes of materials and at different levels of depth, make it possible to better outline the complex relationships of contact and exchange inside this area during the Early Bronze Age, already generically assumed by the chrono-typological study of ceramics.

Another element that has contributed to the construction of a renewed framework lies in the increasing evidence of the funerary ritual of inurned cremation (again from Piani della Corona), whose development and diffusion in the Mediterranean area finds comparisons in the important contemporary contexts of Diana in Lipari (Aeolian Islands) and Tarxien Cemetery in Malta. It is possible to link this ideological/religious shared behavior to other ideological and symbolic markers, such as exemplified in peculiar pottery decorations, like swastikas, shared in this phase between Calabria, Pantelleria and Western Greece (Olympia).

12 OF POTS, PEOPLE AND CULTURAL LANDSCAPES: SICILY IN THE EARLY BRONZE AGE

Author(s): Piccione, Paola (Independent researcher) - Copat, Valentina (Independent researcher) - Costa, Annalisa (Dipartimento di Lettere e Filosofia, Università di Trento)
Presentation Format: Oral

According to the World Heritage Centre, the multifaceted concept of 'cultural landscapes' embraces not just the way landscapes are shaped by human communities, but also the 'long and intimate relationship between peoples and their natural environment'. Because of its long time span (2300-1500 BC) and its diffusion over a large and environmentally diverse territory, the cultural horizon of Castelluccio is a challenging case study to investigate the relationship between the Early Bronze Age Sicilian communities and the areas in which they lived.

For a few years now, we have been studying the decoration of Castelluccio ceramics in the belief that style is a powerful indicator of how information and/or objects were exchanged. We evidenced a possible pattern of circulation of stylistic traits that partly contrasts with the traditional idea of the existence of well defined style-based territorial groups. Therefore, it seems that the way these communities interacted with each other, moved through the landscape and built their perception of the surrounding territory is more complex than what scholars thought in the past.

This presentation aims to contribute to the reconstruction of the cultural landscapes of Early Bronze Age Sicily by discussing the results of our past work within a broader framework. By focusing in particular on the Hyblean area, we will try to understand how the distribution of stylistic traits intertwines, within this area and between it and other regions, with other indicators. Thus, we will consider all the available data on subsistence practices and raw material procurement, and explore the role that in the mobility patterns, information exchange network and cultural landscape must have been played by those outstanding features that surely had a place in the cognitive map of the ancient communities: flint mines, funerary sites and natural features.

13 PALYNOLOGY FROM MEDITERRANEAN ARCHAEOLOGICAL SITES FOR CULTURAL LANDSCAPE RECONSTRUCTION

Author(s): Mercuri, Anna Maria - Florenzano, Assunta - Torri, Paola - Montecchi, Maria Chiara - Rattighieri, Eleonora - Mazzanti, Marta (Università di Modena e Reggio Emilia)

Presentation Format: Oral

Palynology is probably the best biological approach to investigate relationships between humans and the environment in the past. The genesis and evolution of cultural landscapes of the Mediterranean sites is more and more explored by palaeoecologists and archaeobotanists with analyses of on-site and off-site contexts that invariably contain signs of human presence and activities carried out during millennia of civilizations. The presentation will report in particular on pollen analyses from archaeological sites located in southern Italy. The case studies are selected among interdisciplinary research analyses, with examples of sites from Basilicata (e.g. Pantanello, from the 7th BC) and Sicily (e.g. San Vincenzo di Stromboli, Bronze Age). High number of sediment samples, pollen extraction with concentration methods and microscopical analyses at high magnification allow the collection of environmental data in a deep detail, while the comparison between the sites allow regional reconstructions. In general, pollen data suggest that landscape was fairly treeless in the settlement areas. In Basilicata, pastoralism emerges as a key economic strategy during most of the Middle and Late Holocene. In Sicily, the classical role of major producers of cereal foodstuffs giving the importance of economic growth during historical (Late Antiquity) is confirmed by the combination of pollen and archaeological results. Our data testify the continuous land exploitation that, since prehistoric times, transformed the natural environment into the agrarian landscapes of the central Mediterranean basin.

14 NEW PERSPECTIVES ON THE PREHISTORY OF THE GULF OF PALERMO: THE NECROPOLEIS OF COZZO SAN PIETRO AND VIALE VENERE

Author(s): Battaglia, Giuseppina (Soprintendenza BB.CC.AA. di Palermo) - Miccichè, Roberto - Sineo, Luca - Valenti, Pietro (Università degli Studi di Palermo) - Mannino, Marcello (Aarhus University)

Presentation Format: Oral

The activity of the Palermo Soprintendenza (Sicily) is increasingly linked to the preservation of archaeological heritage, carried out mainly through constant monitoring of rescue excavations linked to railway, sewerage, electrical network and other public works, while the activity of independent research is now very limited. However, with the chair of Anthropology at the University of Palermo, an investigation has been conducted at the Zubbio (cave) of Cozzo San Pietro (Bagheria), so far known only from a speleological point of view. This preliminary research which has shown that the cave was used for burial purposes during the Copper and Bronze ages and has highlighted the potential of the site for the study of the protohistory of western Sicily. This research has allowed us to outline an initial paleo-environmental reconstruction of the area, providing us with useful clues on the territories of the human group that occupied the Zubbio of Cozzo San Pietro, as well as other previously investigated caves in the surroundings of Palermo.

In addition, by carrying out archaeological monitoring during the installation of the electricity grid in the Mondello area (Palermo), a transect was excavated across a protohistoric necropolis in Viale Venere. The excavations intercepted three oven-shaped tombs, which contained deposits that accumulated in multiple episodes and the remains from which are in a poor state of preservation. The study of the funerary structures and of the artefacts recovered in them, allows us to hypothesize the existence of an extensive necropolis dating back to the early Copper Age.

These new discoveries open up new interesting perspectives on the interpretation of the relationship between humans and their environment in the territory of Palermo during the 'Metal Ages'.

15 SOCIO-POLITICAL COMPLEXITY IN SICILIAN EARLY BRONZE AGE: THE CASE STUDY OF CASTELLUCCIO

Author(s): Crispino, Anita (Museo Archeologico Regionale Paolo Orsi Siracusa)

Presentation Format: Oral

Castelluccio (Noto, Siracusa) is the eponymous for the most important Sicilian Early Bronze Age culture group. At the end of the 3rd

and the beginning of the 2nd millennium BCE the material culture of the Castelluccio group testifies intense contacts with the eastern Mediterranean, as is proven by a whole series of incised bone plaques found in southeastern Sicily as well as in Greece (Lerna) and at Troy. The site of Castelluccio has the highest quantity of this enigmatic artefact type known from a single site. In addition, Castelluccio yielded pottery of Cetina type linking Sicily to the eastern Adriatic and western Greece. A new series of 14C-dates date the settlement to the end of the 3rd millennium BC, which confirms the synchronisms with Early Bronze Age III Greece and Troy that are based on typological parallels between painted motifs on the pottery from Castelluccio Hut 2 and incised motifs on decorated bone plaques from Castelluccio, Greece and Troy. A pithos storage inside Hut 8 demonstrate the earliest adoption in the central Mediterranean of a storage system that used pithoi. The first organic residue analyses on one pithos suggest that these vessels were indeed used for oil storage. This is further supported by the latest anthracological results indicating a very high percentage of olive wood.

These archaeobotanic as well as the archaeozoological results add the necessary data for analyzing the subsistence economy of the Castelluccio inhabitants. This paper will examine the latest obtained data.

16 THE PREHISTORIC VILLAGE OF CASE BASTIONE (CENTRAL SICILY): PALAEOENVIRONMENTAL AND PALAEOECONOMIC DATA FROM CENTRAL SICILY BETWEEN COPPER AND BRONZE AGE

Author(s): Giannitrapani, Enrico - Iannì, Filippo (Arkeos - Servizi integrati per i Beni Culturali, Enna) - Speciale, Claudia (Istituto Nazionale di Geofisica e Vulcanologia, Napoli) - Combourieu-Nebout, Nathalie (UMR 7194 HNHP, CNRS - Muséum National d'Histoire Naturelle, Paris) - Di Sansebastiano, Gian Pietro (DISTeBA, Università del Salento, Lecce) - Chilardi, Salvatore (Archeo Natura Sicilia, Siracusa)
Presentation Format: Oral

Recent multidisciplinary researches carried out at the prehistoric settlement of Case Bastione (central Sicily), located along the Morello river, are allowing to collect large amount of new palaeoenvironmental data. These are a key element useful to understand the tight relationship between the human community which inhabited the site since the Late Neolithic up to the Bronze Age, with the surrounding environment. Archaeozoological analyses highlighted the reliance mainly on pastoralism (sheep/goats and pigs), particularly between Late Copper Age and Early Bronze Age (2600-1600 BC), but at the same time also underlining the importance of the hunting of wild animals (red deer). In a similar manner, new archaeobotanical analyses already started to reveal the broad spectrum of vegetal resources involved in the daily activities carried out in the settlement for its subsistence system. Furthermore, palynological analyses are being performed, thanks to a core recently obtained by the nearby Lago Stelo (less than 300 m from the site). This is an endorheic basin reclaimed in the 1930's: these analyses together with the other lacustrine sequences currently available in this inner part of the island (Pergusa, Urio Quattrocchi), could contribute in the comprehension of past and present dynamics of climatic and environmental changes in the region. All these data will also contribute to investigate the palaeoeconomic structures and the complex modes of production carried out in this key site for the prehistory of Sicily

17 BEYOND CHRONO-TYPOLOGY: THE ROLE OF CERAMIC ANALYSES IN SHAPING OUR UNDERSTANDING OF THE CULTURAL LANDSCAPES OF PREHISTORIC SICILY.

Author(s): Mentesana, Roberta (University of Sheffield) - Fragnoli, Pamela (Austrian Archaeological Institute - OeAI)
Presentation Format: Oral

Being the most ubiquitous archaeological material, ceramics have always been used to construct chronologies and cultural classifications. Prehistoric Sicily makes no exception, and the rich and complex ceramics found in the island have been used to define multiple facies. By coupling traditional typology with archaeometric analyses, more recent investigations attempted to also inquire pottery craft organization and exchange networks. However, this approach has been mainly achieved on a single-site basis and still struggles to form a more comprehensive picture. The potential of Sicilian prehistoric ceramic and its archaeometric evidence to reveal ancient cultural landscapes has not been sufficiently exploited.

This paper reviews materials mainly studied by the two authors attempting to reconstruct the Bronze Age cultural landscape of north-eastern Sicily from the perspective of ceramic production. In particular, we aim at tracing a diachronic reconstruction of the choices made by potters and ancient communities in relation to the landscape resources present in Sicily and to the different wares produced at each site. We will tackle the question of natural resources going beyond the traditional concept of "raw materials" by also considering some more overlooked resources in ceramic studies (i.e. water and fuel). By doing so, we intend to shed light on the web of knowledge created by potters and their role in shaping the cultural landscape of Bronze Age Sicily. We hope to make a first step toward a more integrative study of ancient ceramic production and natural resources for Bronze Age Sicily, trying to go beyond a chrono-typological approach.

678 EXPLORING FUTURE METHODS FOR UNDERSTANDING THE PAST WITHIN LARGE SCALE INFRASTRUCTURE PROJECTS

Theme: Theories and methods in archaeological sciences
Organisers: Wass, Helen (High Speed Two Limited) - Swan, Ronan (Transport Infrastructure Ireland)
Format: Regular session

Large Scale infrastructure projects such as High Speed Rail 2 in the UK, present a significant opportunity to advance our understanding of the past across both significant spatial scales and a significant depth of time. Such projects lend themselves to broad themes of population mobility, adaptation to natural environments, economic and social change, and allow the identification of regional trends through comparative analysis at large scales. Opportunities are, therefore, created for methodological innovation both in the application of scientific techniques, strategies for fieldwork, and for the dynamic revision of our understanding of the past to feed into future work.

HS2 Ltd, through broad and ongoing collaboration, is exploring innovations which have the potential to transform our understanding of past populations and contribute to the development of future methods for both heritage practice, knowledge creation and scientific study.

Themes within the session will include:

- The application of scientific techniques and recording methods for the study of remains over a 1000 year history from medieval and post medieval burial grounds;

- Mechanisms for the ongoing review of the large scale archaeological resource, developing narratives, understanding research context and research objectives;

- Developing specific research objectives for route wide themes; and

- Advancing large scale landscape studies and our understanding of environmental change.

ABSTRACTS

01 QUESTION LED APPROACHES TO THE ARCHAEOLOGY OF LARGE SCALE INFRASTRUCTURE: THE HS2 HISTORIC ENVIRONMENT RESEARCH AND DELIVERY STRATEGY, UK

Author(s): Halsted, John (High Speed Two Limited)
Presentation Format: Oral

Phase One of High Speed 2 rail represents the single biggest historic environment project undertaken in The UK. The scheme presents a generational opportunity for significant knowledge creation and the testing of differing interpretative concepts and methodological techniques. In order to maximise the value and public benefit of the archaeological programme, a question led approach has been adopted. This establishes priorities for investigation and knowledge creation, forms a framework for decision making at all stages of the investigation process. The approach does not include and allowance for recording for recordings sake. Such an approach has the potential to change and challenge existing narratives of the past through investigations across a significant transect of the landscape.

This paper will explore how such an approach can be defined and implemented in advance of such large scale infrastructure project. The paper will discuss how relevant research questions can be formulated, through a clear baseline of existing knowledge and how to achieve comparative data across the scheme at both landscape and site specific scales. Mechanisms for collaboration, consultation and engagement with regulatory bodies, academic and communities are also key to the success of a question led approach. These aspects will be discussed in the context of the ongoing heritage programme and emerging results.

02 THE FORGOTTEN GRAVEYARD: EXCAVATIONS AT RANELAGH, CO. ROSCOMMON AND THE RANELAGH OSTEOARCHAEOLOGY PROJECT

Author(s): Delaney, Shane (IAC Ltd) - Murphy, Eileen (QUB)
Presentation Format: Oral

As part of a comprehensive archaeological mitigation programme, a large and previously unknown multi-enclosure site with associated burials was excavated at Ranelagh townland, Co. Roscommon, Ireland. This work, undertaken by Irish Archaeological Consultancy Ltd (IAC) on behalf of Roscommon County Council and Transport Infrastructure Ireland (TII), was in advance of a road realignment scheme and resulted in a 54-week excavation and the exhumation of over 800 burials. Post excavation is ongoing, however preliminary analysis of the artefacts recovered from the site suggest a 6th–11th century AD date range for primary activity at Ranelagh.

The human skeletal remains are being analysed under the Ranelagh Osteoarchaeology Project based in Queen's University Belfast (QUB). Post-excavation analysis has focused on a detailed osteoarchaeological examination of all human skeletal remains alongside a comprehensive programme of radiocarbon dating that will facilitate a thorough understanding of the development and life span of the burial ground. A targeted programme of ancient DNA analysis, in collaboration with Professor Dan Bradley (Trinity College Dublin), is determining the genetic composition of particular individuals and investigating issues of familial relatedness, disease and

the potential presence of non-local people in the cemetery. The collaboration also involves a substantial element of stable isotope research undertaken by Dr Julia Beaumont (University of Bradford); this is exploring issues related to diet and migration as well as maternal and infant health. The involvement of the University sector in the project has the added benefits of enabling smaller spin off research projects to be developed and a number of students are also undertaking dissertation projects on aspects of the remains involving aDNA analysis of soil samples, palaeopathology and funerary practices.

03 GO EAST! LARGE SCALE INFRASTRUCTURE PROJECTS - AN EASTERN PERSPECTIVE. HIGHWAY D4R7 IN SLOVAKIA

Author(s): Zitnan, Andrej (Private Company VIA MAGNA, ltd)
Presentation Format: Oral

Even if economic power of Western Europe to renew its infrastructure makes it a perfect example of advances in archaeological methodology and understanding of past, we should bear in mind that in recent years, through Central and Eastern Europe, Balkans and post-Soviet republics gigantic investments in infrastructure renewal resulted in archaeological projects even larger as those of western counterparts.

Plagued with general misunderstanding of the archaeologist's role, preconception of authorities that archaeology means delays, poor negotiating position of archaeologists with investors, and very low level of cultural awareness means situation in Eastern Europe is tough. For small but centrally placed country like Slovakia, laying on the crossroads of transcontinental trade routes, existence of archaeological remains can be easily expected, however, process of securing their protection is rather complicated, often with questionable results. I see crucial problem in strictly market conditions for archaeological research, thus hindering implementation of novel methods and methodologies and dissipation of results to general and professional public.

During 2016-2018 started large highway project D4R7, creating circular bypass of capital Bratislava and our company took larger part of excavations for this project. Practical results include excavation of 13 out of 17 sites, identification of 6 new sites. Excavation of Avar Khaganate Period cemetery from 8th ct. with 485 inhumation graves. Identification and excavation of princely seat from late Roman Age and trenching along the whole length of future highway (approx. 60 km).

We would like to share our experience considering work organisation and importance of international cooperation and involvement of local communities. Lastly, we would like to speak openly about problems, including time pressure, post-processing, data evaluation, publication and general financing, as well as methodological weaknesses of these projects. Understanding Europe-wide nature of this problem we would like to suggest regulations in forms of international agreements and commitments.

04 WAR, DISEASE AND INDUSTRY

Author(s): Dennehy, Emer (Transport Infrastructure Ireland)
Presentation Format: Oral

Luas Cross City, which opened in December 2017, entailed the construction of a 5.6km light rail system, linking and extending Dublin's existing Red and Green Lines. The route was located to the east of the city's medieval core, traversing Georgian streets and a railway cutting abandoned in the 1960s. Construction spanned 4.5 years and the works were split into four contracts; each with individual archaeological requirements and archaeological teams.

So the question stands, is it possible to have a research agenda for an infrastructure route designed to meet the needs of living and future populations? When you are reacting to archaeological discoveries during on-street construction works? When you are getting occasional glimpses into events rather than the full picture?

The on-going approach for a meaningful interpretation of Luas Cross City's archaeological results is based on a change of narrative. It involves stepping back and exploring the value that small pieces of stratigraphy can offer towards our understanding of the archaeology of a living city. This changed narrative is now providing new insights into the city's eighteenth century Georgian transformation and nineteenth century tenement demise; its response to pandemics and industrialisation and the lasting impact of war on the fabric of its built environment and cultural heritage

05 DEFINING THE PALAEOENVIRONMENTAL RESOURCE AND ASSESSING OPPORTUNITIES FOR INVESTIGATION DURING MAJOR INFRASTRUCTURE PROJECTS: THE APPROACH TAKEN BY HS2

Author(s): Howard, Andrew (Landscape Research & Management) - Hopla, Emma-Jayne - Halsted, John (HS2 Ltd) - Williams, Jim (Historic England)
Presentation Format: Oral

Palaeoenvironmental remains such as peats and organic silts and clays, and the proxy indicators preserved within them, are an important part of the archaeological record. They are critical for reconstructing histories of palaeoclimate, palaeovegetation and land-use; therefore, they are essential for understanding human interaction with the natural environment.

For the maximum value to be obtained from these organic-rich remains (which can be preserved in a variety of depositional environments from river valleys and peat bogs to former glaciated terrains), the potential for the preservation of these deposits should be identified, or at least anticipated on the basis of empirical evidence. The assessment of the known resource and modelling of exist-

ing data during project pre-planning provides an opportunity to develop research questions around major themes and to consider the value of palaeoenvironmental remains, rather than simply reacting to chance finds in a piece-meal fashion.

The route of HS2 Phase 1 represents a 230km linear transect across southern and midland Britain, which crosses a variety of depositional terrains and environments where organic-rich remains may be preserved. To ensure that the known and potential palaeoenvironmental record was fully assessed prior to the commencement of fieldwork, HS2 Ltd developed a methodological approach focused around a detailed desk-based assessment, which underpinned an Access database linked to the HS2 Historic Environment Research and Delivery Strategy (HERDS), in turn providing information suitable for analysis and display via any project GIS.

This paper outlines the value of this methodological approach and considers its wider generic potential.

06 RESEARCH PERSPECTIVES ON DATA FROM INFRASTRUCTURAL SCHEMES IN IRELAND

Author(s): Becker, Katharina (Department of Archaeology, University College Cork) - Eogan, James (TII) - McClatchie, Meriel (University College Dublin) - Ltd., TVAS (TVAS Ltd) - Hegarty, Susan (Dublin City University)
Presentation Format: Oral

Few periods of Irish archaeology have benefitted from the programmes of excavation carried out as part of large infrastructural schemes as much as Later Prehistory, in particular the Iron Age. This paper reviews how archaeological and associated data from road and pipeline schemes has fundamentally changed our knowledge of the Iron Age and has in turn opened up new avenues and directions of research. However, given the sheer scale and scope of excavation and post-excavation analyses carried out as part of such infrastructural projects, there are inevitable difficulties utilising archive datasets to address certain research questions. This situation is highlighted, for example, by difficulties encountered in the application of analytical approaches such as Bayesian modelling, that has transformed the knowledge of archaeological chronologies elsewhere, to the dataset. Also other questions cannot be usefully asked based on the available data. The paper will draw on the results of the recent Heritage Council INSTAR funded project 'Seeing Beyond the Site', to outline the potential as well as the limitations of the available dataset. It will be argued that integrated, explicit research-potential focused strategies (vs research agendas) are necessary to shape methodology and best- practice in order to maximise the significant investment in the archaeological resource as part of future infrastructural schemes in Ireland.

679 MEDIEVAL NON-PLACES: SITES OF TRANSIENCE IN THE MEDIEVAL WORLD

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Jervis, Ben (Cardiff University) - Tys, Dries (Vrije Universiteit Brussel)
Format: Regular session

Much archaeological work focusses on processes of places-making, but what of places of transience, marginalisation and exclusion? 'Non-places' have been the focus of study in the contemporary World and are typically seen as characteristic of 'supermodernity'. But, is the concept of the 'non-place' helpful in thinking about medieval spaces? Might it allow us to move away from a focus on institutional, religious and regulated spaces to engage with spaces of disruption, transience and marginalisation, and allow us to explore those living outside of spaces and regimes of regularity, authority and normativity? Examples of contemporary non-places, existing at the margins include airports and service stations, but also those with more exclusionary functions; slums, detention centres and temporary settlements.

Approaches to medieval place-making have been characterised by a concern with order. By thinking about places at the margins, can we begin to think about medieval space in new ways, to reveal further the complexity of medieval society and to think about the implications of processes such as commercial expansion in creating spaces of transience and dispossession? Papers are invited which explore these questions, for example by:

- Exploring the archaeology of transient and temporary spaces, (e.g. military encampments, fairs, places of temporary refuge).

- Considering the implications of processes such as commercial expansion in the creation of marginalised spaces, (e.g. in docklands and townscapes), and exploring the relations between formalised, regulated space and the emergence of more 'feral' spaces.

- Discussing the relationship between spaces of transience and structures of authority.

01 MODELLING MEDIEVAL LANDSCAPES IN HIGH MOUNTAIN AREAS: HERDER SETTLEMENTS IN CENTRAL PYRENEES

Author(s): Garcia Casas, David - Gassiot, Ermengol (Universitat Autònoma de Barcelona. Departament de Prehistòria) - Nunes, Joan (Universitat Autònoma de Barcelona. Departament de Geografia.) - Salvador, Guillem (Universitat Autònoma de Barcelona. Departament de Prehistòria)

Presentation Format: Oral

In the last 15-20 years, new archaeological data, coming from archaeological surveys, stratigraphically test pits and open area excavations, at high altitude in the western Catalan Pyrenees since 2001, challenged our previous understanding on human occupations of this area. Now, this new archaeological record provides a large and quite continuous sequence of human occupation in the National Park of Aiguestortes i Estany de Sant Maurici, from the Mesolithic to the 20th century. In this communication we want to show the evidences of the human settlement and economic exploitation of this area during the Middle Age. Specifically, we will focus on a type of seasonal settlement linked herding with many architectural structures. It is a type of temporary settlement that rise between the fourth and sixth centuries AD and disappears in the 14th century. This kind of sites display's strong architectural differences with modern and contemporary transhumant settlements, both in the size and in the number of enclosures and cabins. GIS assisted modelling the distribution of these sites suggests that their ubication has a strong relation to the communication routes between permanent villages. At the same time, it shows important differences in settlement patterns in relation with modern transhumant sites. According to the architectural and spatial analysis of medieval sites sites, we will discuss the role of livestock at the mountain spaces in the articulation of feudal societies in the Catalan Western Pyrenees.

02 MEDIEVAL EUROPEAN MONASTERIES AS NON-PLACES

Author(s): Goodson, Caroline (Cambridge University)

Presentation Format: Oral

Enormous scholarly energies have been devoted to demonstrating that medieval monasteries in Europe were central places, channelling resources on regional and super-regional scales, redistributing them according to new networks, and supporting significant production and artisanal activity. In Italy, a few major monastic centres such as Montecassino and San Vincenzo al Volturno have fostered interpretative models showing that monasteries operated as quasi-urban or courtly centres, commanding economies over their entire region and consuming luxury goods. Through well-preserved archives from such places historians have charted the roles played by monasteries in the rise of seigneurial lordship from the tenth century. Historians and archaeologists, as well as medieval monks, have been committed to the idea of monasteries as central places transcending the rural residences. As more and more European monasteries are excavated, the material realities of these places are revealed to be less and less central. Most medieval monasteries were rural settlements with only limited connections to wider networks. While some enjoyed significant high-status patronage at certain moments in their development, to rebuild a church for instance, the day-to-day material culture and networks of consumption (including of food resources) were very local indeed. This paper will explore the tensions between monasteries as central and non-places.

03 ABOUT THE SEARCH FOR THE FORMER PLACES OF EXECUTION IN SILESIA – THE FIRST YEAR OF THE PROJECT (POLAND)

Author(s): Majorek, Magdalena (Institute of Archaeology, NCU in Toruń) - Wojtucki, Daniel (Faculty of Historical and Pedagogical Sciences; University of Wrocław)

Presentation Format: Oral

There, where the animals were equal to humans. The former places of execution in Silesia in an interdisciplinary approach is a five-year project financed by the National Science Center (Poland), whose implementation began in May 2017. The intention of an interdisciplinary team of researchers in the field of history, archivistics, archeology, anthropology will be the presentation of the appearance and way of functioning of former places of execution, with towering on them brick gibbets (on the example of several Silesian cities).

The research focused on the types of execution and issue of the treatment of corpses executed criminals, their public presentation and the specificity of places used for burials suicide, condemned criminals and carrion. The archaeological data obtained from non-invasive and survey research and the results of anthropological analyzes will be compared with the written ones (eg criminal records, law files, city chronicles), acquired as part of an extensive archival and library inquiry in the country and abroad.

During the first year of the project, more than 50 gallows were pre-located. Three selected sites were verified using geophysical methods and than survey trenches were carried out on that sites. The full excavation of one of the sites was completed two weeks ago.

04 THE ARCHAEOLOGY OF PUBLIC SPACE FROM THE GROUND UP: THE CASE OF SONGO MNARA, TANZANIA

Author(s): Fleisher, Jeffrey (Rice University)
Presentation Format: Oral

Archaeological research on the public spaces at the medieval Swahili site of Songo Mnara, Tanzania has revealed a complex set of features that include both planned and unplanned elements within and beyond the urban environment. The World Heritage Site of Songo Mnara, built and occupied for a short period during the late 14th to early 16th centuries, offers an ideal site to examine public space. A program of geophysical surveys, shovel test pits, geochemical testing, and large exposure excavations has revealed a variety of public spaces and the activities that defined them.

This paper will explore the relationship between these elements to examine how the iterative activities of people likely served to define and create public spaces within more centrally planned areas. The creation of spaces within public spaces by less powerful residents may have allowed them to shape the way people moved and lived within the town. In particular, the paper will examine the site's coastal entrance zone, which contained both formal elements such as a series of coral built mosques as well as non-elite housing, areas of production, and a protected public space. This area will be compared to more formally organized spaces, such as the central cemetery, which were sites of ongoing, public commemoration.

05 MEDIEVAL MARKETS AND ASSEMBLY PLACES AS NON-PLACE?

Author(s): Tys, Dries (Vrije Universiteit Brussel) - Wouters, Barbora (Urbnet, Aarhus University; Brussels Free University)
Presentation Format: Oral

The 'medieval' Market Places with their characteristic guildhalls and ancient cobbles are undoubtedly considered to be the most iconic places and vistas of many historic towns in the Low Countries. The least one can say is that the landmark-character of the glorious market places, including their town halls, belfries and so on can be regarded as a reframing of the representation of the medieval economic success of these towns. The historic market places were positioned as unaltered and even timeless places. As such the formation of town squares, which is situated broadly in the 13th century, is considered to be the true start of the (late) medieval urban form, whatever the older origins of both towns and squares. As any landscape though, townscapes are ever changing and dynamic social places, or arguably at a certain moment even non-places. Micromorphological research of several urban markets reveals that they are often preceeded by a complex of depositions related to intensive activities in situ before the pavement of the town squares. The accumulation of assembly and crafts related "dirt" resulted in organic deposits that represented several ages of 'urban' trade & assembly before that the town squares received there prestigious make over. It also appears that before 1300, traders and craftsmen produced and exchanged goods and materials on open terrains with a wet and marginal character at the edge of urban and/or feudal agglomerations. One can raise the question if these were indeed places of transience, between early-medieval assembly-places and late medieval monumental markets.

06 COPENHAGEN HARBOUR; MARGINAL AREA, ZONE OF HIERARCHICAL CONTROLLED EXPANSION OR AREA OF MERCANTILE COMMERCIAL LED GROWTH?

Author(s): Whatley, Stuart (Museum of Copenhagen)
Presentation Format: Oral

The harbour of Copenhagen has always been central to Copenhagen. The settlement probably began as a local and a regional port in the 11th Century according to recent excavations and may have been the place named Havn documented in historical records. By 1200 it was either known as Havn or Købmannahavn, meaning Merchant's harbour. The name of the settlement suggests the importance of trade and the harbour to the city, and the name continues until this day in the present spelling Copenhagen (København in Danish). By the 1400s the town had developed and become the capital of Copenhagen and the royal court moved to the city, thus making the harbour not only the capital city harbour, but also the royal harbour. But how did the harbour develop and how did it link with the town? Who was in charge of the harbour area? Was it a marginal area located at the southern boundary of Copenhagen or was it a tightly controlled border zone as the fortified landward sides of Copenhagen?

The talk aims to use the recent excavations at Gammel Strand, historical records and natural science evidence to examine the southern boundary of Copenhagen in the medieval period. It will focus on how, when and why did the harbour change and whether this was associated with the different phases of the town's expansion. It will discuss who lived at the harbour regions and whether or not they affected the harbour zone, and finally, consider how did the development of the Copenhagen harbour fit into a general European trend?

07 „EMPTY SPACES" IN MEDIEVAL TOWNS - PLACES OF EXCLUSION OR PROGRESS?

Author(s): Cembrzynski, Pawel (Institute of Archaeology and Ethnology, Polish Academy of Sciences)
Presentation Format: Oral

The commonly invoked picture of a medieval town consists of a walled area tightly packed with houses and narrow streets. But many of these towns included areas I call "empty spaces": peripheral, less valuable, less prestigious, yet dynamic. They could be literally empty, or socially "empty" as a place of exclusion.

There are several questions concerning „empty spaces" in Central-European towns: Can "empty spaces" be traced in historical sources? How were these spaces formed? Which functions they performed and how did these functions evolve? How did burghers perceive "empty spaces"?

To answer these questions I will compare written records with archaeological data form several towns in Central Europe, with special a reference to Wrocław (Poland) and Prague New Town (Czech Republic). As large centres they have rich documentary records along with many available archaeological data. "Empty spaces" appeared there in two cases: during the chartering process or due to calamities or abandonment. In the first case they served as space reservoirs for further development. The most peripheral parts of such areas had low value, but large plots and scattered buildings made them perfect for space-demanding, burdensome crafts (i.e. blacksmiths). Peripheral "empty spaces" were inhabited by people excluded economically (pauperized, lower classes) or socially (Jewish communities). I will try to demonstrate, that "empty spaces" could be considered not only as areas of exclusion, but also as constantly changing hubs of new possibilities.

08 ADVENTURES IN SMOOTH SPACE: SPACES OF DECAY IN MEDIEVAL TOWNS

Author(s): Jervis, Ben (Cardiff University, School of History, Archaeology and Religion)
Presentation Format: Oral

Debates over the decline of medieval towns in the 14th and 15th centuries have often discussed the decay of urban fabrics as a critical theme. Whilst the simplistic equation of emptiness to declining fortunes has been critiqued, particularly by Keith Lilley (2015), less attention has been paid to the productive potential of these ambiguous features in the urban landscape (although see Smith 2008).

Here I use the concept of non-place to think through these spalces and what we might learn from them. Through decay spaces become empty, they loose their 'place-ness'. Yet, as Marc Augé (1995, 79) discusses, 'place and non-place are rather like opposed polarities: the first is never completely erased, the second never totally completed'. Empty spaces, the non-places of the medieval town, are always defined by the lingering presence of the past. Here I follow Ian Buchanan (2005) in using the Deleuze-Guattarian concepts of smooth space and re-territorialisation to think about urban space as process, and to explore the ways in which emptiness is assembled through the performance of urban life; to think about empty spaces not as negative features of a landscape, but as spaces of potential, of places in the making. In order to explore these points I draw upon research undertaken into later medieval urban decay in southern England, focussing on ports and smaller towns.

References

Augé, M. 1995, Non-Places. Introduction to the Anthropology of Super-Modernity, Verso.

Buchanan, I. 2005, Space in the age of non-place, in I. Buchanan and G. Lambert (eds), Deleuze and Space, Edinburgh University Press, 16-35

Lilley, K. 2015, Urban planning after the Black Death, Urban History 42(1), 22-42

Smith, M. 2008, Urban empty spaces. Contentious spaces for consensus building, Archaeological Dialogues 15(2), 216-31

684 AT THE INTERFACE: INVESTIGATING COUPLED HUMAN AND NATURAL SYSTEM FROM NATURAL SCIENTIFIC AND ARCHAEOLOGICAL PERSPECTIVE. CHALLENGES AND OPPORTUNITIES

Theme: Theories and methods in archaeological sciences
Organisers: Hinz, Martin (CRC 1266, Institute for Pre- and Protohistoric Archaeology, Kiel University) - Solheim, Steinar (Museum of Cultural History University of Oslo)
Format: Regular session

It is clear that during the Holocene period both the trajectories of environmental and human history were influenced by marked changes. These changes occurred on smaller or larger scales in time and space. It must be assumed that the developments are influenced by each other, even if this happened in asynchronous intensity. It is precisely this asynchronousness, which research has often tempted to see the human in this equation as a passive element, especially in contrast to the present situation of the Anthropocene. The question of causality often arises, which cannot be answered directly from the data.

In recent years, however, it has also become clear that in order to write a meaningful history of the development of human societies in their environment, it is necessary to combine both humanities and natural sciences in close cooperation. It is not enough to bring together the results of separate teams in the end. The nature of Coupled human-environment systems also necessitates a closely interlinked investigation of these systems.

In our session we want to approach this topic. We hope for contributions that make clear how such a coupled investigation can look like in practice. We would also be pleased to receive contributions that focus on the causal interdependencies in human-environment relationships. What tools can be used to prove causality?

In particular, the session will focus on the relationship between human societies and local or global climate change, but case studies highlighting the collaboration between archaeology and other natural sciences are also welcome.

ABSTRACTS

01 AT THE INTERFACE: AN INTRODUCTION TO THE SESSION

Author(s): Solheim, Steinar (Museum of Cultural History University of Oslo) - Hinz, Martin (Institute for Pre- and Protohistoric Archaeology, Kiel University)

Presentation Format: Oral

During the Holocene period, the trajectories of both environmental and human history were influenced by marked changes. These changes emerged on different spatial and temporal dimensions. It can be assumed that the developments were mutually influencing each other, even if this happened in asynchronous intensity. It is precisely this asynchronousness, that has often caused research to see the human in this equation as a passive element, especially in contrast to the present situation of the Anthropocene. On the other hand, we can also observe concomitant changes in environmental and human history at different spatial and temporal scales. The reasons for this cannot always be identified directly from the data.

In recent years it has become clear that in order to write a meaningful history of the development of human societies in their environment, it is necessary to combine both humanities and natural sciences in increasingly close cooperation. It is not enough merge the results of individual disciplines at the end of the research process. The nature of coupled human-environment systems also necessitates a closely interlinked investigation of these systems.

In this paper, we will give a short introduction to the session and a brief overview of a few cases where the causal interdependencies in human-environment relationships are in focus.

02 CARRYING CAPACITY: A SUPERSEDED CONCEPT OR A WINDOW OF OPPORTUNITIES?

Author(s): Daems, Dries - Cleymans, Sam - Vandam, Ralf - Broothaerts, Nils (University of Leuven)

Presentation Format: Oral

Historians and archaeologists have traditionally adopted the concept of carrying capacity and its corresponding methodologies from the field of ecology to deduce the number of people that could survive in a given city, region or empire. Yet, the adopted ecological formulae have significant shortcomings as only energy caption needs via a fixed and (overly) simplified diet are assumed. The newly created research network SuRP+ (Sustainability and Resilience in Past & Present Populations) brings together young scholars from the humanities, environmental, biological and social sciences to develop new methodologies to understand human-environment interactions in past human populations. To this end, SuRP+ seeks to re-assess current usage of carrying capacity, social-ecological systems and resilience thinking by comparing and linking it with the concept of social metabolism. This concept entails the entirety of flows of matter and energy between society and nature. The social metabolism framework should serve as a stepping stone to develop new methodologies to assess human-environment interaction holistically by taking into account recent observations in environmental and social studies on for instance foodways, dietary habits, production output, heating infrastructure, caloric needs, or agricultural and extraction technologies. As a case study, this paper will discuss the human-environment interactions, carrying capacity and land use on datasets generated by interdisciplinary research – combining archaeological, ecological and geomorphological evidence – by the Sagalassos Project (University of Leuven) in the study region of the ancient site of Sagalassos (SW Turkey).

03 THE ROLE OF ENVIRONMENT IN THE SOCIO-CULTURAL CHANGES ALONG THE HISTORICAL SILK ROAD IN CENTRAL ASIA

Author(s): Yang, Liang (Graduate School "Human Development in Landscapes", Christian-Albrecht-Univeristät Kiel)

Presentation Format: Oral

The Silk Road is a modern concept for an ancient network of trade routes that for centuries facilitated and intensified processes of cultural interaction and goods exchange between West China, Central Asia, the Middle East, and the Mediterranean. There is increasing discussion that climate and environmental factors may also have played a role in fostering economic and socio-cultural changes along the Silk Road and in a broader area. Coherent patterns and synchronous events in history suggest possible links between social upheaval and climate/environment forces in specific periods and regions in Central Asia; in some cases, environmental factors have been claimed as multipliers that accelerated socio-cultural changes. This study re-analyzes the climate and environment disasters, the historical water and agriculture systems, and the maintenance of local livelihoods in the broad Tianshan-Pamir mountain areas in Central Asia. It further investigates both perspectives of the socio-environmental interactions, such as that climate change provide better hydrological resources for the golden era of Silk Road trade, and water withdraw for human activities resulted in dramatic landscape changes including the near and complete desiccation of large lakes in the arid western part of today's China Xinjiang. Preliminary results indicate that local communities was able to reinforce their resilience through simple but effective initiatives, such as investing infrastructures, sharing responsibilities, diversifying livelihoods, networking recoveries. The findings further highlight the importance of understanding how human society maintains living under environment stresses in

a long historical period.

04 ARIDIFICATION AND SOCIO-ECONOMIC RECONFIGURATION AS THE CAUSE OF TRANSFORMED HUMAN-ENVIRONMENTAL RELATIONSHIPS. THE CRISIS OF THE CALCOLITHIC-BRONZE AGE SOUTHERN IBERIAN PENINSULA

Author(s): Hinz, Martin (Institut für Ur- und Frühgeschichte CAU Kiel) - Schirrmacher, Julien (Institut für Geowissenschaften CAU Kiel) - Kneisel, Jutta (Institut für Ur- und Frühgeschichte CAU Kiel) - Weinelt, Mara (Graduiertenschule Human Development in Landscapes CAU Kiel)

Presentation Format: Oral

Archaeologically the turn from the 3rd to the 2nd millennium BCE is characterized by the transition from the Copper Age to the Bronze Age social and economic configuration (not only) on the Iberian peninsula. This goes hand in hand with a social restructuring from a society that is to some extent characterized by increasing complexity and hierarchy to a society that clearly shows a social stratification and unequal access to resources.

This transition is accompanied climatologically by the 4.2 ky BP event, an aridification event likely to last from the 24th to the 22nd century BCE and which, in its effect on past cultural developments, is considered to be one of the most severe of the Holocene. Today, Mediterranean coastal regions are characterised by a dry to semiarid climate, with some regions receiving less than 200 mm of precipitation per year. The southern Iberian Peninsula in particular is vulnerable to desertification and droughts, and the climate has a strong impact on local society and economies.

Based on combined archaeological and climatological investigations we can show how climate change has affected the population development of this period and how settlement foci and preferences have changed in the course of two successive droughts. As a result of the aridification, the Copper Age societies were forced to develop strategies of evasion and resilience, which in turn enabled them to locate and colonize places that had hitherto been unfavourable for settlement. These new strategies in turn led to a significant transformation of the Mediterranean region of the southern Iberian Peninsula through human impact (deforestation, El Argar).

We present this development as an early example of a trajectory in which the reciprocal influence of man and the environment intertwined has had a lasting influence on the further development of both spheres.

05 THE FIMBULWINTER OF AD 536-538: CRISIS, ADAPTATION OR DECLINE?

Author(s): Gundersen, Ingar (Museum of Cultural History, University of Oslo) - Bostic, Joshua Neilson (Department of Geosciences, The Faculty of Mathematics and Natural Sciences, University of Oslo)

Presentation Format: Oral

How was Scandinavian Iron Age society affected by the climate crisis of the middle 6th century AD? An increasing amount of climate proxies point in the direction of a dramatic cooling of the northern hemisphere in the years 536-538. Further evidence indicates long-lasting climate deterioration until c. 660, nicknamed the Late Antiquity Little Ice Age (LALIA). Several scholars have suggested agricultural failure, societal crisis, plague and even depopulation. There is substantial archaeological evidence that suggest major societal changes throughout this period, but few comprehensive studies have been carried out to analyze the actual impact of this climate deterioration on society.

This study seeks to combine long-term seasonal climate reconstructions covering the entire Iron Age with archaeological evidence of concurrent changes in agricultural and settlement development in two areas of eastern Norway, the Gudbrandsdalen valley and the lake Mjøsa region, to elucidate the impact of the LALIA on Scandinavian society.

Archaeological evidence of altered societal development will be determined from the number and character of excavated sites, related radiocarbon dates and artefact density throughout the Iron Age, while seasonal climate reconstructions will be derived from existing climate models combined with high-resolution carbon and oxygen stable isotope analysis in tree rings, which provides estimates of seasonal differences in temperature and precipitation within individual years. To what degree do the different categories display similar patterns, which can display significant differences between the different context types and regions? Are major peaks and valleys in the compiled C14-record caused by cultural and habitual patterns, or do they reflect actual demographical variations? Can major demographical changes in the archaeological data be detected, and, if so, to what degree do major breaks in the archaeological record correlate with seasonal climatic perturbations during this period?

06 SOLAR ENERGY, BIODIVERSITY AND HUMAN POPULATION STABILITY DURING THE HOLOCENE

Author(s): Robinson, Erick (University of Wyoming) - Freeman, Jacob - Bird, Darcy (Department of Sociology, Social Work, and Anthropology, Utah State University) - Baggio, Jacopo (Department of Environment and Society, Utah State University) - Byers, David (Department of Sociology, Social Work, and Anthropology, Utah State University) - Gayo, Eugenia (Center for Climate and Resilience Research - CR2) - Finley, Judson Byrd (Department of Sociology, Social Work, and Anthropology, Utah State University) - Meyer, Jack (Far Western

Archaeological Research Group, Inc.) - Kelly, Robert L. (Department of Anthropology, University of Wyoming) - Anderies, John M. (School of Evolution and Social Change, Arizona State University)
Presentation Format: Oral

Among many species changes in the attributes of populations are coincident over space and time—a pervasive ecological phenomenon known as synchrony. Recent research indicates that prehistoric human societies displayed synchronous changes in population attributes over the last 10,000 years and over four different continents. The causes of this synchrony likely include 1) common responses to oscillations in the availability of solar energy, and 2) similar pathways of cultural evolution toward more complex political economies. Although prehistoric societies display synchronous changes at a global scale, local ecological and cultural factors may affect the amplitudes or stability of human populations, independent of each other, over the long-term. In this paper we investigate the effects of ecological factors on the stability (amplitudes of variation) in the radiocarbon records of four different continents. Specifically, we test the predictions that biodiversity makes populations more stable over time while pathogen stress decreases the stability of human populations by comparing the relative changes in radiocarbon frequencies in a global sample of cases against the Holocene sunspot record. By documenting and proposing hypotheses that explain stability of human populations, we contribute to developing more refined understanding of the interplay between biodiversity, pathogens and the long-term population ecology of Homo sapiens.

686 SILVER, STATUS AND SOCIETY - TRANSITION FROM LATE ROMAN TO EARLY MEDIEVAL EUROPE

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Goldberg, Martin (National Museums Scotland) - Rau, Andreas (Stiftung Schleswig-Holsteinische Landesmuseen Schloss Gottorf)
Format: Regular session

Power and prestige in the first millennium AD is predominately expressed in two portable materials: silver and gold. There are fundamental differences in their use: in parts of post-Roman Europe, for instance in Scotland, silver was the single most important precious material; elsewhere it was used alongside gold. In Scotland, silver first arrived with the Roman army and rapidly became adopted for local power symbols. Understanding the access, use and attitudes towards this new material are vital in understanding the transition from late Roman Iron Age to Early Medieval society. New directions and priorities for the study of silver in first millennium AD Britain have emerged in the last few years. Work on Scottish late–post Roman silver hoards has highlighted in particular the need to connect with those working on comparable material elsewhere in northern Europe. This session will review findings of a UK Arts & Humanities Research Council-funded network that was founded in 2016 to create connections between scholars working on silver across northern Europe in the first millennium AD. This session will focus particularly on the role of silver in the transition from late Roman to early medieval Europe.

ABSTRACTS

01 THE FATE OF ROMAN AND SASANIAN SILVER PLATE IN LATE ANTIQUITY

Author(s): Hobbs, Richard (The British Museum)
Presentation Format: Oral

Both decorated and undecorated silver plate was a crucial element of elite relations in the Roman/Byzantine imperial courts and the court of the 'king of kings' in Sasanian Persia. Vessels were used as containers for imperial gifts (such as imperial largitio), to commemorate imperial anniversaries and to distribute imperial propaganda (e.g. plates with enthronement and hunting scenes), to promulgate the idea of paideia (knowledge of the Classical world and Graeco-Roman tradition), and provide fine vessels and utensils for dining and bathing. All these diverse ways in which silver plate were used reinforced the position of the elites in both Rome and Sasanian Persia at the pinnacle of their respective social structures.

But what happened to silver plate when the Roman and Sasanian Empires started to collapse and the influence of their respective elites started to wane? This paper will examine how silver plate was turned into bullion by the creation of Hacksilber, why this process took place and where the material ended up. It will also look at how silver plate was used for trade with merchants from central Asia to China and as diplomatic gifts with 'barbarian' peoples in central Europe as far as the Russian Steppes. What do these processes tell us about the erosion of the power of these great Empires to control the production and use of silver plate? What does the fate of silver plate tell us about changes in the politics, culture and economy of the world of late Antiquity?

02 THE ROLE OF SILVER COINS IN THE TRANSITION PERIOD

Author(s): Bursche, Aleksander - Dymowski, Arkadiusz - Myzgin, Kyrylo - Więcek, Tomasz (University of Warsaw)
Presentation Format: Oral

Roman denarii dated to late 1st - early 3rd century were in use in the east-central and northern Barbaricum until the Migration Period. This fact is confirmed by their archaeological contexts dating from the late-4th to the 6th centuries: graves, settlement layers, water deposits or hoards, sometimes with cut-up silver Late Roman and early Byzantine vessels (Hacksilber), ornaments and dress accessories. Thousands of barbarian imitations and copies of Roman denarii made in different workshops and technologies, struck or cast, from silver, tin, zinc, and their alloys, also silver plated, appeared between Ukraine, middle Danube and southern Scandinavia. They are dated to the Late Roman and early Migration Period. The largest concentration of their finds suggests that most probably they were previously produced on the territory of the Cherniakhiv culture, in connection with the so-call Gothic horizon. Roman denarii and their imitations occur together with 4th-5th century Roman silver coins in Germanic elite hoards in the West after the fall of the Western Roman Empire, and in North Gaul the Franks initiated their own silver coinage imitating Late Roman types. The mint of Sirmium (now Sremska Mitrovica in Serbia), the first Germanic mint that has been localised, most probably Ostrogothic, struck coins in silver and silver alloys. The question is what the role of the Roman silver coins, their Late Roman/Migration Period Germanic imitations and copies was in the creation of early Medieval European coinage systems?

03 PRE-VIKING AGE HACKSILBER HOARDS IN SCANDINAVIA - A VALUING OF INTERPRETATIONS

Author(s): Rau, Andreas (Centre for Baltic and Scandinavian Archaeology)
Presentation Format: Oral

As one of the fastest-growing find groups in Migration Period Scandinavia, esp. in Denmark, assemblages of hacked silver items have attracted more and more interest during the last decade. Unfortunately, almost none of the larger assemblages have been published with the necessary attention of details, so that the prevailing summarizing interpretations of the find group have to be regarded as rather quick-shot. This applies both to the discussion of the act of accumulation of silver as well as to the reasons for deposition. Even the term Hacksilber hoards is unsatisfying since some hoards consist in their majority of locally produced ingots or cut-offs of ingots, which indicate that transformation of silver played a crucial role.

The assemblages offer a variety of possibilities to discuss object biographies as well as to analyze economic, social and technological aspects of silver during the 4th to 6th centuries in Northern Europe: Quite obviously the accumulation and deposition of "old" silver items and their transformative products (ingots) contrasts spatially with those areas in which silver items are deposited in both male in female burials. This may also reflect different perception of precious metals in its relation to the human being and its social values.

The paper aims to shortly demonstrate the prospects of scrutinizing this find group in detail and of putting it into the theoretical framework of concepts of value.

04 SILVER, STATUS AND SOCIETY IN THE TRANSITION FROM LATE ROMAN TO EARLY MEDIEVAL NORTHERN BRITAIN

Author(s): Goldberg, Martin (National Museums Scotland)
Presentation Format: Oral

In 2013, the discovery of what was at that point Europe's northernmost post-Roman hacksilver hoard at Gaulcross in Aberdeenshire stimulated the current phase of the Glenmorangie research project at National Museums Scotland, which has culminated in an exhibition and book 'Scotland's Early Silver' [https://www.nms.ac.uk/national-museum-of-scotland/whats-on/scotlands-early-silver/]. The research program has focused on silver as a potent material through which the impact of Late Roman power and the transition to the Early Medieval kingdoms of Scotland can be explored. These kingdoms have too often been seen as peripheral to developments in Early Medieval Britain largely because of the dependence on historical comment from neighboring societies in Ireland and England, and especially the lack of historical sources from the Picts. However, silver provides a different lens through which we can examine the self-portrayal and personal display of elites in Northern Britain. Unusually, silver was more important than gold for these societies. In parallel with this research program, NMS has been leading an an AHRC-funded International network project called Silver, Status and Society: the transition from Late Roman to Early Medieval Europe [http://gtr.rcuk.ac.uk/projects?ref=AH%2F-P003575%2F1] to bring together scholars from across Europe who are studying Late Roman and Early Medieval silver across what has traditionally been seen as an important historical transition. This paper will summarize some of the results and the developing relationship between both of these projects.

05 RETHINKING SCEATTA'S AND THE ECONOMY OF NORTHWESTERN EUROPE IN THE 8TH CENTURY

Author(s): Theuws, Frans (Leiden University)
Presentation Format: Oral

The economy of Northwestern Europe in the 8th century is difficult to evaluate. The 8th century is an age of transition especially its first half, between the Merovingian and Carolingian worlds and their respective economies. However, it is exactly the period in which one of the most enigmatic coinages in European history has been produced: the sceattas. The coinage differs radically in

many respects of that preceding it (the period of tremisses) and that following it (the period of controlled production of denarii). It is an anonymous coinage with a very complicated iconography. Recent research by Anna Gannon shows that this iconography includes more Christian messages than has been suggested before. Although a lack of mint places and names of officials on the coins hampers a straightforward assignment to the places and regions where sceattas were produced, numismatists suggest that the general framework of sceatta production is by now known.

Is has been suggested that the bulk of the coins (series D and E) were produced in the Netherlands and that they were massively exported to England in exchange for among others wool.

I will argue that this reconstruction of coin production and circulation is not correct and based on presuppositions not supported by the evidence and that sceattas are in essence an English production. This re-interpretation has far reaching consequences in evaluating the economy of northwestern Europe in this age of transition.

06 THE FLOW OF SILVER IN THE EARLY MEDIEVAL BALTIC REGION — PROVENANCE DETERMINATION OF DIRHAMS, PERM'/GLAZOV AND DUESMINDE RINGS

Author(s): Hrnjic, Mahir (Centre for Urban Network Evolutions - UrbNet)
Presentation Format: Oral

The Viking Age concurrently begins with the deposition of silver hoards throughout Scandinavia. Vikings engaged in long-distance trading networks with the communities and political entities in the East, resulting in vast amounts of silver pouring into Northern Europe. Through such trade, a supra-regional communication network was established that supported social-ties and strong economic interactions between actors involved. Objects found in hoards, provide a valuable foundation for studying communication and trade networks in the Early Middle Ages. One of the most intriguing group of silver objects are Perm'/Glazov and Duesminde neck- and arm-rings. They are evidence of strong socioeconomic ties between communities in Scandinavia and Eastern Europe. Alongside rings, an important indicator of dynamic long-distance relationship are the vast number of silver coins (dirhams) found in hoards. Most of dirhams can be put in direct relation with the historical regions in which they were minted; however, they lack information about where was the silver mined. The origin and the form of silver that reached Northern Europe varied depending on political, economic and other changes that occurred during the Viking Age. Through application of techniques used for geochemical and archaeometallurgical study, it is possible to develop an insight in the origins of silver used for producing rings and coins, as well as changes through time. The analytical methods, such as the lead isotope analysis done by MC-ICP-MS and trace elements identification obtained by μXRF, have been applied with a high degree of success in determining the origin of different silvers. The aim of the research is to understand the development of long-distance communication and networks between Northern Europe and Eurasia, by understanding the provenance of 8th and 9th century silver found in Scandinavia.

07 SILVER FROM HOARDS OF VI-VII CC FROM EUROPEAN RUSSIA: THE RESULTS OF PB-PB ISOTOPE ANALYSIS

Author(s): Saprykina, Irina (Institute of Archaeology Russian Academy of Sciences)
Presentation Format: Oral

It has been generally thought that silver was imported from the Ancient and Roman mining regions and, according to the archaeological data, this import ceased about the second third of IV AD (Saprykina, Gunchina, 2017). Silver of the late Roman period is commonly found in hoards (as for example the hoard from Bolshoy Kamenets, which has some analogies in Traprain Law Treasure; Matzoulévitch, 1934; Curle, 1923, tabl. V). In the V-VII centuries there had been an exploding growth of hoard's quantity in Central Russia (Kurskaya, Tulskaya, Ryazanskaya regions and etc) and later on, in VII-VIII AD, in the Urals area. Commonly, geographical location where silver hoard was found is linked with one of the traditional mining areas: samples from Central Russia are correlated with the Carpatho-Balkan province, while Uralian samples with Asia Minor.

During the last 20 years a significant number of silver hoards of VI-VII AD was found in Central Russia. Among the samples from these hoards, silver imports from Sogdiana and Caucasian Byzantine provinces were present which indicates the process of silver sources replacement during the late Roman period (Saprykina et al., 2017). Currently Pb-Pb isotope analysis of silver for samples from Kurskaya and Tulskaya regions is being performed; the first results indicate replacement of old silver sources by new ones, as well as high speed of silver income and of its concealment in hoards. Moreover, now we can speak of more important role of silver in the late Roman – early Medieval societies in the European Russia and Urals, than it previously was thought.

687 REVAMPING VALUE(S): ON THE DESTRUCTION OF VALUE DURING THE BRONZE AND IRON AGE IN EUROPE AND THE MEDITERRANEAN

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Poigt, Thibaud (Toulouse Jean Jaurès University - UMR 5608 TRACES; Bordeaux Montaigne University - UMR 5607 Ausonius; Casa de Velázquez) - Melheim, Lene (Museum of Cultural History, Oslo) - Gorgues, Alexis (Bordeaux Montaigne University - UMR 5607 Ausonius)
Format: Regular session

The Maastricht 2017 session "The Value of all Things" approached the many facets of value assessment in the Ancient World. At the EAA in Barcelona 2018, we would like to take this discussion a step further, and investigate the whys and hows of value destruction.

Indeed, one of the most noticeable archaeological phenomena in European and Mediterranean late prehistoric societies is the deliberate withdrawal of values from circulation: hoards that were never retrieved, depositions in wetlands, grave goods – sometimes ritually mutilated – and offerings made in sanctuaries. In other words, value – at least in its material form – was destroyed or alienated, as these artefacts could no longer be used, possessed, given away, exchanged or displayed.

Such behaviour can be explained in the context of power: performative artefact destruction, for instance, may be intended to emphasize the wealth and power of an individual; or a ritual offering may be aimed at obtaining the goodwill of the gods. We would like, however, in this session to consider an alternative approach, that artefact withdrawal, more than being a destruction of value, was a way of converting value: the conversion of a material value that could be measured, evaluated and negotiated, into a symbolic and incommensurable value.

We would like to invite papers based on specific case studies (whether at a local, regional or inter-regional scale) as well as more theoretical contributions, in order to encourage a comparative approach to the many seemingly contradictive aspects of the curation of valuables.

ABSTRACTS

01 INTRODUCTION: ON THE DESTRUCTION OF VALUE DURING THE BRONZE AND IRON AGE IN EUROPE AND THE MEDITERRANEAN

Author(s): Poigt, Thibaud (Bordeaux Montaigne University – UMR 5607 Ausonius; Toulouse Jean Jaurès University - UMR 5608 TRACES) - Gorgues, Alexis (Bordeaux Montaigne University – UMR 5607 Ausonius) - Melheim, Lene (Museum of Cultural History, Oslo)
Presentation Format: Oral

This session comes in continuity of "The Value of all Things", which took place at Maastricht in 2017. We wanted to approach the many facets of value assessment in the Ancient World. This year, we would like to take this discussion a step further, and investigate the whys and hows of value destruction.

Nowadays, value –expressed in a monetary form- can be capitalized. It can be given. It can be confiscated. But only on rare occasions is it destroyed, and almost never voluntarily: financial crisis is one of main "opportunities" for virtually burning virtual money, but only few people will actually burn real banknotes, or bury them. By "value destruction" we mean the phenomena, observable in all European and Mediterranean late prehistoric societies, consisting of a deliberate withdrawal of values from circulation: hoards that were never retrieved, depositions in wetlands, grave goods – sometimes ritually mutilated – and offerings made in sanctuaries. In other words, value – at least in its material form – was destroyed or alienated, as these artefacts could no longer be used, possessed, given away, exchanged or displayed. But we would like, in this session, to consider an additional possibility: artefact destruction, more than a destruction of value, was a conversion. The conversion of an actual value, which can be measured, evaluated, negotiated, discussed, into a symbolic, incommensurable, one.

02 EXAGGERATED ORNAMENTATION: THE DEPOSITION OF VALUABLE BEADS IN EBA I GRAVES AT BAŞUR HÖYÜK, TURKEY

Author(s): Baysal, Emma (Trakya University) - Sağlamtimur, Haluk (Ege University)
Presentation Format: Oral

A number of EBA I graves at the site of Başur Höyük in southeast Turkey contain huge quantities (in terms of number and weight) of beads made by specialists from a small variety of raw materials. The amounts are too great to have been worn by the interred individuals at the time of burial and there is no trace of use wear consistent with prior use. A small number of items composed of beads were clearly associated with the bodies and thought to be worn at point of burial, the remainder were not directly associated with the bodies. The consistent production of standardized products from difficult to work stone material and their subsequent deposition suggests the deliberate performative removal of the artefacts from the world of the living as part of the burial rituals. We consider what the relationship was between display of wealth and status, how that status and its display continued beyond death and the need to manufacture beads for possibly ritual deposition as part of ceremonies relating to the transition between the social group of the living and the dead. Was mass production of certain items related to the value associated with their removal from circulation as part of social ritual practice?

03 CUT INTO PIECES... FOR THE GODS? ALTERATIONS OF OBJECTS IN THE BRONZE AGE HOARDS IN THE REGION OF SALINS-LES-BAINS (FRANCE)

Author(s): Gauthier, Estelle (University of Franche-Comté; UMR CNRS 6249 Chrono-Environnement) - Piningre, Jean-François (UMR CNRS 6298 ARTeHIS)

Presentation Format: Oral

Systematic field survey campaigns conducted since the early 2000s in the area of the fortified hilltop settlement of the Camp du Château at Salins-les-Bains (Jura, France) have revealed about fifty Bronze Age metal hoards, with particular characteristics: modest composition, pieces frequently found at shallow depth and scattered over a few square meters, particular topographical contexts in relation to natural elements easily identifiable in the landscape. These characteristics lead us to the supposition that these hoards are neither stocks for recycling nor temporary hidings but are rather the results of symbolic and probably religious acts. The objects confined in the soil had undergone various treatments to make them unusable : they are distorted, bent, perforated, interlocked, squashed, etc. Such as in the so-called "foundry" hoards, the fragmentation in the assemblages dating from the turn of the Middle to Late Bronze Age is recurrent. Do these practices aim to standardize the size of pieces or to consecrate them through a transformation that changes their value? It is also possible to consider an alternative interpretation: that of the pars pro toto. We propose here to examine the various treatments undergone by the objects and also to try to identify rules or standards in their fragmentation.

04 THE BURIED SKILL. TOOL HOARDING IN THE WESTERN EUROPEAN LATE PREHISTORY

Author(s): Gorgues, Alexis (University of Bordeaux Montaigne; UMR 5607 Ausonius)

Presentation Format: Oral

The aim of this paper is to discuss the meaning of symbolic practices implying the removal of tools from the sphere of the « living ». Tools are highly valuable objects: the conceptions of these artefacts may have required complex skills, and are probably made by their original user. But they also carried a memory and were intimately linked with their successive owners and users. They could be improved, and transmitted from one generation to another, along with technical skill and knowledge. In such conditions, it is not surprising that such objects are rare within Late Prehistoric hoards and tombs. Yet, in some rare instances, they are actually removed from the living world and probably acquired a new function with their deposition within hoards or as funerary goods. The Génelard hoard (France) is a good example of such rare, but spectacular, practice. Through a comparative approach that will sometimes lead us far away from the Late Prehistory, we will discuss the possible meaning of such behavior, and defend the idea that the ritual deposit of tools was linked with their own biography. We will then discuss the possibility that the much more frequent phenomenon of the hoarding of bronze axe-heads belong indeed, at least in some regions, to the same kind of practices.

05 ON TEMPORALITY AND THE WITHDRAWAL OF INALIENABLE VALUABLES: THE VESTBY HOARD REVISITED

Author(s): Melheim, Lene (Museum of Cultural History University of Oslo) - Lund, Julie (Dept. of Archaeology, Conservation and History, University of Oslo)

Presentation Format: Oral

Time depth has been an often understated aspect of past ritual behaviour. Lately, however, a new interest is seen in studies of the past in the past. This paper addresses the temporality of the 6th century BCE hoard find from Vestby in Oppland, southeastern Norway. The Vestby hoard consists of an outstanding collection of metal valuables, heirlooms and sacra with clear cosmological significance. The deposition occurred during the final part of the Nordic Bronze Age, the 500s BCE, archaeologically defined as a transitionary period. At the time of their deposition, some of the objects were more than 200 years old. The deposited artefacts had gone through a series of amendments and repairs, either aimed at prolonging their use-life or aimed at altering/adapting their religious and symbolical significance, as in the case of the two unique animal figurines. The temporal aspect of one object – a bead necklace with calendric functions – is apparent. However, we argue that the histories of one and each object through their various chains of production, use-lives, repairs and exchanges served as key factors in making these objects inalienable. While inalienable possessions may shift hands a number of times, they are seldom withdrawn permanently from circulation, or exchanged permanently out of the community. While inalienable possessions act as stabilizing forces against change by authenticating cosmological origins and kinship, they may also become destabilizing, when people use them to identify themselves with the past. Through their deposition, the asynchronous temporalities of the Vestby objects became synchronized into what may be described as 'folded time'.

06 COMPOSING AND RECOMPOSING VALUES OF THE GALLIC HELMETS

Author(s): Bertaud, Alexandre (Ausonius Laboratory; University Bordeaux Montaigne)

Presentation Format: Oral

During the second half of the first millennium BC, the Gallic people were producing metallic helmets. Their chaînes opératoires involve specific know-how and knowledge of the different metal used during the process. The precious decorations doesn't seem to play a protecting role during the battle, their presences on helmets have to be associated with other considerations, social practices. During the last centuries BC, we observe some modifications: the precious metals becoming less frequent, and the decorations

appearing on fewer examples. The evolution of the metallic helmets production show us some modifications of the values of these helmets and their places within the society.

To go further to the understanding of such artefacts, we need to approach the moment when the objects cease to play a role by their use to get a major impact through their destructions. This phase can be understood through the archaeological context. Beside the funerary contexts, which are not the most frequent for productions from IIIrd to IInd c. BC, the depositions in ritual areas indicate a redirection of values dedicated to these objects. The new values accorded to the metallic helmets within sanctuaries can be understood through the temporality of the gestures: in most of the cases, the helmets were produced a long time before their deposition.

This paper will deal with the values associated to the metallic helmets, theirs changes during the lifetime of the objects as well as on the long time. It will be possible to understand the military élites of the Gallic societies and their ways to create and consolidate their status. This paper will also approach the modifications of the military Gallic élites during the last four centuries BC which were marked by the appearance of the oppida civilization and then the dominance of Rome.

07 INTRINSIC, FACE AND METROLOGICAL VALUE: ASYMMETRIC REVAMPING OF WEIGHTS VALUE

Author(s): Poigt, Thibaud (Univ. Toulouse Jean Jaurès - UMR TRACES; Univ. Bordeaux Montaigne - UMR Ausonius) - Delanaye, Lysiane (Univ. catholique de Louvain - INCAL)

Presentation Format: Oral

During the Metal Ages some weighing tools are deposited in hoards or funerary burials in all Europe, generally associated to prestigious items, confirming they are markers of a high social status. On the contrary, very few seem to be lost or forgotten, with the exception of those found in catastrophic contexts.

Sometimes, the prestige of these objects could even exceed their metrological value as in the Iberian Peninsula around the 3rd c. BC where weights are voluntary modified rather than abandoned or recycled. These transformations can be quite radical and diverse with consequences more or less important on the object mass. The purpose of these operations can be metrological of course: weights could have been adjusted in order to be deliberately falsified or to match different metrological systems, in particular to match the epichoric system with the roman one. If, in some cases, we can suppose a need of metrological adaptation, some of the weights present multiples modifications that left the mass of the object unchanged. As a consequence, we cannot limit our analysis to purely metrological considerations. These observations lead to the identification of at least three values of the object:

- an intrinsic value, directly linked to the scale weight itself

- a metrological value, sometimes revamped sometimes not

- a face value, systematically destroyed by morphological changes

The aim of this paper is to investigate the purpose of these transformations and their relation to ancient and new practices at a moment of fundamental social changes. An in-depth investigation could shed light on the possible Roman influence on the local weighing system, thus contributing to highlight the process of Romanization undergone by those regions. More generally, such analysis provides information about the place of traditional weighing tools and their value(s) in a context of political and economic changes.

08 DEPOSITION, TRANSFORMATION, RETRIEVAL: THE VALUE OF OBJECTS FROM REOPENED GRAVES

Author(s): van Haperen, Martine (Leiden University)

Presentation Format: Oral

In the Merovingian period, rural communities often buried their dead with lavish grave goods. To the surprise and frequent dismay of archaeologists, the graves were often reopened and a selection of these items were taken out. This participants dug a hole in the grave, breaking open the coffin lid if it was still intact, and accessed the deceased's remains and the grave goods. This often took place within one generation after the funeral, or at least while the cemetery was still in use.

These grave reopenings are traditionally interpreted as grave robbery, a purely materialistic criminal practice aimed at regaining the wealth deposited in the graves. This hypothesis has been nuanced and to some extent discredited by recent research. New interpretations attempt to place grave reopenings in the context of early medieval society and worldviews. Reopenings occurred so frequently that they were probably a socially accepted practice, which may have been carried out by the burial community itself. In my PhD thesis I have suggested that objects from graves may have functioned as ancestral relics, sharing characteristics with saints' relics.

In this session I would like to contribute to the discussion about conversion of value through deposition. Grave goods were fundamentally transformed through their stay in the grave, both in a physical and cosmological sense. In a way, objects were 'destroyed' by deposition. They became corroded and could often no longer be used for their original purposes if they were retrieved. This paper will focus on the meaning of Merovingian grave good deposition, the transformation value that took place in the grave, and the implications of the choice to reopen a burial or to leave it closed.

688 "THE HEAD AND THE HAND": SKILLS, LEARNING AND KNOWLEDGE IN PREHISTORIC PRODUCTIONS

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Forte, Vanessa (McDonald Institute for Archaeological Research, Cambridge University) - Zupancich, Andrea (DANTE Laboratory, Department of Oral and Maxillo Facial Sciences, Sapienza University)
Format: Regular session

Richard Sennett describes the craftsman as "a balanced union of manual and mental skills connected in a continuous dialogue". If, on the one hand, this model does not properly explain the variety of behaviours characterising ancient producers, at the same time it makes clear how the production of objects is not just a mechanical sequence of practical gestures.

Recently, the study of skills and learning processes in archaeology availed of sociology, psychology and neuroscience based theories providing a complex framework of biological and psychological variables affecting the development of practical skills and knowledge in artefacts production.

Learning theories suggest how routine plays a key role in the embodiment of gestures and technical sequence and how the knowledge, partly acquired by experience, is the aspect leading to produce not just a functional object but a high-quality product.

Currently, the application of multidisciplinary approaches to the analysis of material culture permits defining the whole sequence of production from raw material procurement to its processing in a final product. With these premises the proposed session aims to discuss the concept of skills and its patterns of identification in the archaeological record through representative case studies from the Palaeolithic to the Iron Age.

A comparison of different points of view concerning this issue will lead to trace a scenario in which to compare figures of producers characterised by different level of skills and discuss behavioural patterns according to the archaeological evidences and interpretative models for a better understanding of these aspects of material culture.

ABSTRACTS

01 THE CULTURAL TRANSMISSION OF STONE TOOL TECHNOLOGY AS A WINDOW TO PALAEOLITHIC COGNITION

Author(s): Stade, Cory (University of Southampton)
Presentation Format: Oral

Four recent studies have simulated the social learning of different stone tool technologies within an experimental context (Morgan et al 2015, Schillinger et al 2015, Lombao et al 2017, Stade 2017). Along with some earlier experiments exploring verbal and non-verbal teaching of stone tools (Ohnuma et al 1997, Putt et al 2014), these constitute a growing interest in the cultural transmission of early stone tools and how these simulated social learning experiments inform us of the cognitive abilities of ancient tool-makers and -learners. In addition to aiding archaeologists in recognising different social learning techniques at the assemblage level, this presentation examines how these studies have linked teaching and learning of early stone tool technologies to cognitive, behavioural and linguistic abilities. This includes how complex forms of social learning require theory of mind (Stade 2017), an important cognitive Rubicon that contains myriad behavioural and developmental implications (self-awareness, joint attention, etc.). Theory of mind is also highly correlated with specific linguistic structures (Stade 2017), meaning the type of social transmission identified in stone tool technologies can indicate Palaeolithic language ability. This review will highlight and contextualise the importance of simulated social learning experiments to understanding the evolution of human cognition, and the future, more empirical direction that evolutionary cognitive archaeology is taking.

02 IDENTIFYING THE IDENTITY

Author(s): Baysal, Adnan (Trakya University)
Presentation Format: Oral

Production is an action. It has a beginning and an end. Between these two points the desired item is shaped from the material being worked on. This form is related to the quality, size, time and experience of the producer and their chosen material. In addition, it relates to the personal characteristics of the producer. The producer might be very talented, careful, painstaking, and attentive to detail. The opposite might also be true. In the end the production will take place. There may be variations in quality and quantity. When talking about the product it is difficult to say who produced it and under what conditions. The producer might be in possession of specialized knowledge, and all mental and physical properties, and the ability to use them. Despite this, it is not possible to reach the identity of this person from the manufactured objects or, from thousands of similar objects, to say, 'this was made by A'. Using examples of Palaeolithic hand axes and the blades produced from bullet cores, although the identification of the produced and producers in question in archaeological data is extremely difficult, work to develop a perspective or method on this subject remains theoretical. In this sense the producer's identity is erased when identity identification work is reduced to technology and typology. So the main question with which we are faced is: how can we transcend the boundaries in the subject of individual identity identifi-

cation in technology and typology?

03 BIFACIAL SKILLS: WHICH KIND OF KNOWLEDGE IS NEEDED?

Author(s): Castañeda, Nuria - Torres, Concepción (Universidad Autonoma de Madrid; Experimental Archaeology Laboratory - LAEX)
Presentation Format: Oral

The analysis of knapping apprenticeship offers a deeper understanding of the complexity that involves standardized lithic production. To obtain such a complex product in which some features in size and form are required, it is possible to define and discriminate different levels of skill. Through these different levels it is possible to make visible different individuals, some of them maybe children or youth.

Considering bifacial standardise lithic productions, the challenge of making them is the need of being symmetrical in three axes. This aspect is critical to obtain a calibrated tool. But is perfection a requirement of the production or is it the craftsman's proud? Are the apprentice's products useful or they are only pedagogic trials?

To assess these questions in this work we analyse and compare archaeological examples from two to different bifacial productions: Solutrean arrowheads from El Higueral-Guardia Cave (Spain) and Neolithic axes from Jablines (France).

Although both productions are bifacial standardized productions, they represent two substantially different historical frameworks. Nevertheless, the analyses of the learning process to make them allow us to understand common aspects that arise.

In both cases, the main difficulty for novices is to reach symmetry in longitudinal and cross section, but it seems easier to reach a symmetrical silhouette. Also, deficiency in blank selection is another common apprentice issue.

This approach has brought to light that craft specialized productions weren't available to the hole group. The examples examined demonstrate that the apprentices were selected, and they need to have a previous basic technical knowledge.

04 PERFECTION IN LITHIC PRODUCTION: EXAMPLE OF NEOLITHIC GOUGES (CENTRAL SUDAN)

Author(s): Kapustka, Katarína (AU - Institute of Archaeology of the Academy of Sciences of the Czech Republic)
Presentation Format: Oral

Complex „chaines operatoires" in lithic production are often a good examples of professional craft. It is necessary to balance manual and mental skills. One must have an idea what is his objective and also have precise functional gestures to obtain it. Objective is usually shaped by local tradition. Gestures must be precised by routine and are limited by skills of producer. Thanks to this attributes of the lithic production we are able to detect possible spread of style or connexion between regions.

One of good examples of professional lithic production is gouge production, which held a place in central Sudan during early Neolithic period (5500–5000 BC). This type of artifacts is bifacially shaped in specific way. Many aspects of specialized craft are visible during production process. There is clear preference of one specific raw material with determined source in area of diameter at least 100 kms. For this paper gouges from different sites were studied.

Near sources of this raw material intensive production was identified. Professional level of production varies a lot. Some pieces are done in very precise way, where it can be easily seen, how was craftsman step by step coming to his objective. But there are also pieces which were retaken by someone not so experienced/handy and there could be seen how regular production starts to be just a chaotic attempt.

According to the comparison of the collections from different sites this paper should be presentation of proposed distribution model of the rhyolites from the Sabaloka hills using example of the gouges. This type of artifacts was chosen because objectives of the creator can be traced and it is present and described at many different sites.

05 MATTER-DISCOURSE-MOVEMENT: MAKING, SHARING, AND LOCATING MEANING IN PREHISTORY

Author(s): Govier, Eloise (University of Wales Trinity Saint David)
Presentation Format: Oral

There are many nuances in the New Materialisms discourse, particularly in-terms of how the relationships between humans and things are conceptualised (see DeLanda 2006, Barad 2007, 2012, Bennett 2010). These differences have a direct impact on the way archaeologists explore and understand Prehistoric making. Philosopher and Physicist Karen Barad (2003, 2007, 2012) has brought a new understanding of causality and agency to the academic discourse (agential realism). Her ontological re-configuration of the 'between' has brought into focus how human and material 'matterings' interrupt the causal milieu (Barad 2007). In this paper I focus on the 'between' humans and materials during 'making events'. By outlining the idiosyncrasies between the hylonoetic field (Malafouris 2013), the hylomorphic model, and morphogenetic approach (Ingold 2013), I indicate how a Baradian approach offers something that is not encapsulated in these concepts, which I frame as the hylo-logos-kinesis model (matter-discourse-movement). Pivoting between theory, method and practice, I consider the residues of Neolithic creative practices and how matter informs and reveals unique modes of being (cf. Conneller 2011). The material culture found at Çatalhöyük reveals the traces of highly creative and materially-engaged individuals and communities, who routinely made and re-made things, such as sun-baked clay figurines, basketry, and beads. The residues of material events offer a rich dataset to explore how the analysis of matter-discourse-movement can help locate meaning in Prehistory.

06 MORE THAN A POT SHERD: NEOLITHIC ÇATALHÖYÜK

Author(s): Tarkan, Duygu (Koç University - Research Center for Anatolian Civilizations - ANAMED)
Presentation Format: Oral

Pottery is an archaeological information tool that contains sensitive indicators for human decision-making and their interaction with materials. Understanding the nature of pottery production is essential to comprehend the knowledge, skills, traditions, and identity of the potter.

Neolithic Çatalhöyük (Central Anatolia) demonstrates some of the earliest examples of pottery production in the world. Indeed, such evidence is present at every level of occupation since the site's first inhabitation, 7100 BC, to its end, 6000 BC. The Çatalhöyük potters showed their skill by making vessels with standardized shapes in a range of sizes from large to miniature. Recently, there has been an emphasis on the understanding of the pottery chaîne opératoire. With that, three main points of change in the pottery production based on function, raw materials, and technology have been identified. Accordingly, it is now possible to argue that there were different professional groups of people producing pottery. These producers interpreted unique ways of forming the pottery, evidenced in production techniques and the use of tools and methods in surface treatments, while the end product remains a standardized-style pottery.

This paper examines the behavioral reasons in the community that produces these three main change. It will also ask how we can identify these professional groups of potters, how the potters developed such new production techniques and how the technical knowledge was transferred.

07 BEYOND MOTOR-SKILL: CONSIDERING SKILL AS KNOWLEDGE OF LANDSCAPE, RHYTHM, AND PROCESS

Author(s): Michelaki, Kostalena (Arizona State University) - Braun, Gregory V. (University of Toronto) - Hancock, Ronald G.V. (McMaster University)
Presentation Format: Oral

This paper will focus on ceramic materials from two Early-Middle Neolithic sites in SW Calabria, Italy: Umbro Neolithic and Penitenzeria, and present results of an intensive raw materials survey, replicative experiments in the field, as well as a variety of physico-chemical and mineralogical analyses in the laboratory (re-firing texts, X-Ray Diffraction, petrographic analysis of thin sections, as well as Instrumental Neutron Activation Analysis). By examining the complete production sequence, from the acquisition of raw materials, to the final firing of these ceramics, we will show two major 'ways of doing' that separated the production of the majority of ceramics -known typologically as Stentinello, Impressed, and Undecorated- from that of a small percentage of ceramics -known as Buff, or figulina. We will demonstrate that, although all these different kinds of ceramics were locally made, their 'ways of doing' required different movements in the local landscape, different rhythms of production, different knowledge of material affordances, different tools, and different firing conditions. We will argue that both 'ways of doing' were skillful in terms of motor-skills, and push for a broader consideration of skill that encompasses knowledge of landscape, rhythm, and process. This may be a fruitful way of thinking about skill in contexts where being 'a potter' was not a matter of economic specialization, and/or when 'potter' may have not been a fixed identity.

08 THE HAND, THE SIGHT, AND THE HEAD. TOWARDS AN ARCHAEOLOGY OF VISUAL COGNITION

Author(s): Criado-Boado, Felipe (Institute of Heritage Sciences - Incipit, CSIC) - Martínez, Luis (Institute of Neurosciences - IN, CSIC)
Presentation Format: Oral

Material constructions (either material culture or landscape) reliy on the concept of space ingrained in each socio-cultural formation. This has been substantially proven by years of research on landscape archaeology and material culture studies. However, is there any other effective way of studying "space" beyond symbolic, cognitive, or emotional archaeologies? This paper explores how materializations of human practices relate to cognition and to socio-cultural contexts. By combining evidence on the relationship between material culture and perceptual reactions, its aim is to contribute towards our understanding of the engagement between the mind, objects, and the world. A perceptual study of different prehistoric ceramic styles conducted by eye-tracking, underpins the material engagement of the mind, by showing that the visual world has fostered this engagement between doing, seeing, and designing throughout history. It will provide new insights into the material culture, contribute to the understanding of the relationship between mind and the material world, and account for the transitive engagement between the way of thinking, seeing and making things. Thus, the paper approaches the topic proposed in this session by introducing the sight between the head and the hand. By doing so, it contributes to understand the material forces driving perception and thought.

09 THE CRAFT OF PREHISTORIC COLOURS. WHITE AND RED ON EARLY ENEOLITHIC POTTERY FROM SOUTHERN ROMANIA

Author(s): Opris, Vasile (Bucharest Municipality Museum) - Simion, Corina - Mirea, Dragos - Cozac, Mihaela - Ilie, Maria Valentina (Horia Hulubei National Institute for Physics and Nuclear Engineering)
Presentation Format: Oral

One of the defining characteristics of the Early Eneolithic pottery from the Lower Danube area is the inlaying of white pigments in

excisions made on the outer surface of the vessels. In the later phases there was a more frequent use of the red pigments applied on different areas of the vessels. In the past few years, several attempts have been made to determine the composition of the prehistoric pigments from pottery from Southern Romania using archaeometric methods (XRF, PIXE and EDAX for chemical composition, FT-Raman and FT-Infrared techniques for mineralogical phases and SEM for microstructures). New results about the composition of red and white pigments applied on pottery from three Early Eneolithic sites from Southern Romania were recently obtained with the aid of archaeometric analyses (XRF, PIXE, FT-Raman) performed by the authors of this presentation.

The aim of our paper is to resume the discussion about composition and production sequence of red and white pigments applied on Early Eneolithic pottery from Southeastern Romania. The compositional results of white pigments are indicative of various technologies and skills as there were at least three different raw materials (calcite, kaolinite and bones) processed to obtain the same colour. The red pigment was obtained from mineral raw materials based on iron oxides. However, the identified adjacent compounds indicate different sources or deliberate mixtures. The hypotheses about the production and application techniques of the pigments were tested in several experiments.

10 SPECIALIZED CRAFT SKILLS AND VARIABILITY OF FINISHED PRODUCTS: A CONUNDRUM FOR EXPLAINING SOUTHERN LEVANT CHALCOLITHIC WHEEL SHAPED BOWLS

Author(s): Roux, Valentine (Maison de l'Archeologie et de l'Ethnologie) - Haruch, Ortal (Hebrew University of Jerusalem)
Presentation Format: Oral

In the southern Levant, wheel shaped bowls appear by the second half of the 5th millennium BC. Their manufacture implies specialized craft skills. Given their numbers on each site, their local production as well as the skills involved in their making, the hypothesis has been that they were made by a few craft specialists. However, a recent 3D analysis of wheel shaped bowls at the site of Megiddo shows that, contrary to all expectations, their morpho-metric variability (measured by comparing the profiles of the walls) is high. This variability has been observed as well on other sites. This contradicts the hypothesis that only a few craftspeople were in charge of the wheel shaped bowls production. Indeed, if it was the case, we could expect a high standardized production as in Mesopotamia, on the site of Feres (Syria, first half of the 4th mill. BC), where the first wheel shaped bowls present a CV lower than 3%. How then to reconcile such a variability with specialized craft skills? How to reconcile low-quality products with specialized production? This paper debates the concept of craft skills and craft specialized products. The conclusion is that the latter may have been made in two main stages and by different hands.

11 CRAFT IDENTITIES IN COPPER AGE COMMUNITIES: RESULTS FROM A MULTIDISCIPLINARY APPROACH TO THE POTTERY PRODUCTION OF CENTRAL ITALY

Author(s): Forte, Vanessa (McDonald Institute for Archaeological Research, University of Cambridge)
Presentation Format: Oral

This contribution focuses on the Copper Age pottery production of central Italy and its social inferences. The observations about practical skills and technical knowledge subject of this contribution emerge from a research project focusing on craft specialisation having as case study prehistoric settlements and funerary contexts of the current Rome area (4th-3rd millennium BCE).

Data collected through traceological analyses, focusing on manufacturing traces and use wear, compositional analyses of ceramic pastes (petrographic, chemical and mineralogical analyses) and experimental archaeology (reproduction of pottery modelling sequences and ceramic use activities) are combined. This allowed to identify and define traces left by individual human gestures that reflect distinct potters' skills, revealing patterns of repeated and specialised behaviours. The comparison with domestic and funerary pottery productions provided evident diversifications in raw materials used, manufacturing techniques and accuracy of the final product. Moreover, the study of gestures through traces analysis and experimental archaeology revealed variations not only in practical experience but also in tools chosen and used by some potters. Such empirical results, according to other archaeological case studies and etnoarchaeological documentation, suggest specific behaviours patterns in pottery production and use, connected to coexistent degrees of technical experience and technological knowledge acquired and transmitted by restricted groups among the communities.

These observations lead to ask if the producers of a good always coincide with the consumers in contexts, as in case of the Rome area, in which social inequality is perceived as incipient as showed by funerary contexts.

12 SIGNATURE STYLES OF THE EURASIAN STEPPE LATE BRONZE AGE GOLDSMITHS: 'LIFE STORY' OF SILVER SPEARHEADS FROM THE BORODINO HOARD

Author(s): Shishlina, Natalia Ivanova (Archaeological Department) - Loboda, Anastasiya (Reseracher)
Presentation Format: Oral

The Borodino hoard dated back to 1800–1700 BC was found on the Black Sea steppes. It consists of 17 items, i.e. two silver spearheads, spearhead socket, a dagger, a gold pin, four jade battle-axes, three stone mace heads, two fragments of a stone axe, two bronze plates and two fragments of a clay pot. Out of all artifacts referred to the eastern component, the most valuable are the silver spearheads. They were cast in bivalve molds and then polished. A salient feature of these items are decorative patterns made on thin gold plates affixed onto the socket bases. The reconstruction of the 'chaîne operatoire' carried out by a goldsmith(s) post-cast-

ing to decorate the spearheads can provide information that will be used in future to demarcate the region where the workshops and goldsmiths who applied ornamental techniques in question were located.

The technological study of the spearheads revealed three types of traces, i.e. use-wear, casting and goldsmiths' crafting traces and imprints. The experimental research carried out to produce a decorative pattern similar to that on the original artifacts on silver sheets with the use of a jeweler's regular toolset and the comparison of the resulting traces and the imprints on the original and experimental items helped identify production techniques, decorative elements and types of tools used by goldsmith(s) as well as their signature styles. The spearheads share some basic decorative features such a gold plate affixed onto the silver socket base and additional decorative patterns on the socket and the gold plate. However, variations in the tools used and the technical repertoire – chasing, punching, and cutting – demonstrate that the spearheads were decorated by different goldsmiths, each exhibiting his signature style. The study provides the 'life story' of each of the examined spearheads. This work was supported by the RSF.

13 PITHOI ON THE WHEEL: THE SHARE OF A NEW TECHNOLOGY IN LBA CENTRAL MEDITERRANEAN

Author(s): Porta, Francesca (La Sapienza-Università di Roma; Ghent University)
Presentation Format: Oral

Long distance networks involve not only clearly visible goods but also the exchange of technology and immaterial ideas across different areas. The introduction of the potter's wheel in some of the indigenous contexts of the Italian peninsula since the 14th century B.C., follows exactly this pattern. Its appearance is related to the growth in contacts between Italy, the Aegean area, Cyprus (and maybe beyond), started during the Mediterranean Late Bronze Age. The use of the wheel in southern Italy marks the beginning of the production of three new wheel-made pottery classes, basically different from local indigenous impasto: the so-called Italo-mycenaean, the grey ware and the levigated clay pithoi.

This paper will focus, in particular, on the learning phases and apprenticeship steps in the production of wheel-coiled pithoi, as the products are better labeled. The production of pithoi, due to their dimensions, is technologically very demanding and requires highly skilled and expert artisans. Ethnoarchaeological research in modern pithoi-producing workshops helps to highlight the peculiarities of the production process and the organization of the workshop's labor. According to stylistics and typological similarities, the paper will compare the Italian pithoi with the Aegean and Cypriot samples from which they are assumed to be derived, and therefore trace more precisely the transfer between these areas and the hints to differential skills.

The main questions are i) if the manufacturing sequence used to produce pithoi is a totally borrowed technological package or not; ii) what kind of contact between artisans, belonging to different potting tradition and different level of skills (Italian vs Aegean) was necessary to develop this highly specialized production.

14 EVERY POT HAS ITS POTTER – PERSONAL STYLE IN ANTIQUITY

Author(s): Harush, Ortal (The Hebrew University of Jerusalem)
Presentation Format: Oral

Every person has his own signature, a stylistic fingerprint reflecting his identity. Personal style can be identified in all forms of art and may even become a trademark that distinguishes one artist from the rest. More than that, Individuals are always somewhat different from one another in their motor habits or motor performance, the artifacts they make will exhibit slight stylistic differences in execution or use-wear. We can use these differences to identify the works of different individuals.

This paper examines new parameters for a better detection of ancient potters and their personal style, as part of an integrated experimental archaeological study. Ceramic students were instructed to produce the same part of a storage jar repeatedly for several days, following a strict protocol of producing one and only prototype, using the same technique, and working in the same workspace. All of the produced items were 3D scanned in order to extract accurate geometric parameters for classification. Various statistical methods were used to analyze the work of each student and to compare between them.

The paper focus on three main trajectories: the variability within a ceramic formal 'type', the potters' learning curve and the individual potter's style. Results shows that it's possible to quantify a personal style and it already established in early stages of learning. Furthermore, relative comparison between the experimental data to archaeological record provide important information regarding the degree of variability within an assemblage.

15 A SERIES OF REFLECTIONS ON NOMADIC LEATHER AND TEXTILE PRODUCTIONS IN THE 1ST MILLENNIUM BC

Author(s): Busova, Varvara (Institute for the History of Material Culture, RAS)
Presentation Format: Oral

In the present report, the data used to compile information are based on leather and textile items from barrows excavated by Tuvinian Archaeological Expedition of Institute for the History of Material Culture (RAS) in 1960s – 2010s. The authors of excavations were Mandelshtam A.M., Stambulnik E.U., Kilunovskaya M.E., Semenov VI.A.

Today there is a wide possibility to use methods of natural-science in archaeological research. Our first study was about an identification of fur from kurgans of Scythian period in the central area of Tuva. The studies were conducted using SEM. The sample of the fur coat from the grave Saryg-Bulun was identified as the fur of jerboa. It means, that this coat was sewn from small pieces of

jerboas. Is this something unusual? I think yes. We can wonder about: from which place was this coat? The majority of the jerboas population lived in Northen Mongolia— it was about 400 km from buried place. Did our furs came to Tuva (as clean raw materials)? [Chernova, Busova, 2016: 52-61]. Also now we have some results of the study of textile materials (fragments made of textile fabrics) discovered on excavations in 2012s-2014s (Tuva, Eerbek). As a result we found some trends in the development of textile manufacturing. And the last case was a story about unpublished collection of burial ground Aymyrlig (excavations of 1960s-1970s, left bank of Yenisey river). All leather items were good preserved and demonstrated some special styles of decoration and special types of fixing which we can compare with completely different styles discovered on right bank of Yenisey river (120 km from). At the moment the results of these studies give us more questions than answers. But we can outline a range of problems and questions arising in connection with the theme being developed.

16 GESTURES OF CHANGE: CULTURAL TRANSMISSION AND THE MESOLITHIC-NEOLITHIC TRANSITION IN THE BALKANS

Author(s): Cristiani, Emanuela (University of Rome La Sapienza) - Boric, Dusan (Columbia University)
Presentation Format: Oral

The impact of practice theory destabilized outmoded ideas about archaeological cultures as "collective minds," and instead constellations or ensembles of undiscursive learnt gestures are seen as central to defining material culture traditions. What becomes foregrounded here is the schematization of practical action, which in order to be effective often remains under the radar of conscious understanding (Descola 2013), and can directly be linked to ingrained techno-functional gestures used in material culture production (Lemmonier 2012). Social learning theories suggest different ways for the transmission of cultural information and knowledge: between generations (vertical transmission), between older, non-parent community members and younger generations (oblique transmission) and between generational peers (horizontal transmission). Yet, ethnographic cases show that vertical and to lesser extent oblique transmission of knowledge play key roles in learning processes, and such processes can significantly be affected by what happens to a biological population. In addition, the effect of isochrestic (enculturation) learning through the unconscious absorption of new styles can account for the adoption of similar styles across a wide region.

In this paper, we will work through these theoretical concerns by examining a case study from the Danube Gorges region of the central Balkans in the transition from the Mesolithic to the Neolithic. We were able to precisely identify both forager and farmer material culture traditions in different media of production. Aided by the available genetic and isotope evidence, we provide a historically grounded interpretation of culture changes that transformed the world of indigenous Mesolithic foragers.

689 THE ARCHAEOLOGY AND HERITAGE OF SALTSCAPES: THE SYNERGY OF ENVIRONMENT AND CULTURE

Theme: Archaeology and the European Year of Cultural Heritage
Organisers: Kavruk, Valerii (The Alexandru Ioan Cuza University, Iași; The Museum of Eastern Carpathians, Sfântu Gheorghe) - Hueso Kortekaas, Katia (ICAI School of Engineering – Comillas Pontifical University in Madrid; IPAISAL - Institute of Saltscapes and Salt Heritage)
Format: Regular session

Saltscapes are hybrid landscapes of which determinant factors are or have been the presence of salt and salt related activities. Saltscapes are the results of synergistic interaction of nature and culture. The human impact on the saltscapes is far from being limited just to the elements of material and immaterial culture. Often human activities have triggered natural processes that have severely affected the evolution of the geomorphology, fauna and flora within the saltscapes. Besides the cognitive potential concerning the past of human societies and cultures, saltscapes provide a huge cognitive potential concerning the history of nature. Hence, the study of the archaeology and heritage of saltscapes should include, besides the evidence of anthropogenic nature, the whole spectrum of paleo-environmental and the present-day environmental evidence.

The saltscapes have rarely been acknowledged as valuable landscapes from the point of view of their combined natural and cultural heritage. Some have been protected by law, but little effect has been found on site. Rather, what seems to work as an efficient protection mechanism is the sustainable use of these landscapes, via local socioeconomic development strategies based on the products and services they can offer (wellness and health, eco-cultural tourism, gastronomy, education, etc.).

The session is addressed to scholars and heritage managers interested in a holistic approach to the landscape and the safeguarding and sustainable use of the cultural, historical and natural values of saltscapes.

01 ROMAN SALT LANDSCAPES IN NORTHWEST IBERIA: THE "MAR DE SAL" PROJECT

Author(s): Currás, Brais X. (Universidade de Coimbra)
Presentation Format: Oral

Throughout the last two decades the study of Roman salt production has undergone an enormous development in Northwest Iberia. In this paper we present the first results of the research carried out on the southwest coast of Galicia, between Oia and A Guarda. The field surveys carried out up until now have documented several saltworks pavements, as well as multiple small salt pans excavated in the rock.

The "Mar de Sal" project seeks the valorization and promotion of the cultural landscapes of salt, taking heritage as a means for socio-economic sustainable development. This program involves several researchers and two local councils. Here we will present the strategies designed for the promotion of tourism as an element for local economic growth, as well as for cultural progress.

02 ARTISANAL SALT MAKING BY SOLAR EVAPORATION – A KEY TO THE PRESERVATION OF NATURAL AND CULTURAL HERITAGE OF SALTSCAPES

Author(s): Hueso Kortekaas, Katia (IPAISAL; Universidad Pontificia de Comillas - ICAI)
Presentation Format: Oral

Artisanal salt making, as opposed to industrial salt production, is an activity that is based on ancient techniques that are orally transmitted and practised mainly by hand, across the world. In addition, salt making by solar evaporation -one of the two main methods that allows an artisanal scale of production, aside from forced evaporation- needs a deep knowledge of the ecological and climatic conditions of the site. The biota naturally present in the salinas are a key protagonist in the salt making process, able to accelerate the evaporation process and increase the quality of the salt crystals. Salt makers are aware of this and protect the natural ecosystem in a clear case of synergic benefit for both: humans and nature. Therefore, the sustainable production of a natural resource like salt needs to be done in accordance with the ecological balance of the living community of microorganisms in the water, bearing in mind the trophic relations in the different ponds, the composition of the soil and soil organisms in the bottom of the ponds and the dykes that separate them, as well as the meteorological conditions of the site. This vernacular knowledge for the construction, maintenance and operation of a salina has been obtained empirically and orally transmitted from one generation of salt makers to the next. Hence, artisanal solar evaporation can be considered an activity that preserves both natural and cultural values of saltscapes, which are uniquely embedded with each other and mutually dependent. The synergic effect of artisanal salt making and the care of the natural and cultural values of saltscapes is a key issue in the long-term preservation of this valuable heritage.

03 DISCOVERING THE ORIGINAL PURPOSE ENGINEERED QANAT SALT LEACHING SYSTEM COMPARED TO THE POST ISLAMIC DOMESTIC SWEETWATER AGRICULTURAL 'SPATE' IRRIGATION

Author(s): Bloch, David (Salt Archive M.R.Bloch)
Presentation Format: Oral

Academic estimates cite the principle use of Qanat water to have been for domestic irrigation purposes however the human engineering motivation required for building these ancient systems was far greater.The surface crust of an inland Sabkha basin typically is made up of layers of different salts that have re-crystalized and settled or precipitated during the evaporation process of controlled QANAT system flood waters. Leached Salts dissolve quickly in a desert endorheic basin, and the process can produce purer and more concentrated, layered playa salt cakes. The various dissolved salts leached and crystalised out of the underlying layers were the original ancient engineered design of the Qanat to control basin flooding without destroying the basin salt mirror playa or causing erosion.

Although the many descriptions and references to mining are vague, the existing huge quantity of ancient Qanat systems and their very long tunnels up to 50km for watering the Sabkha salt playa deposits indicate another type of mining. The water was primarily needed to extract salt, rather than for simple domestic irrigation. They were built and operated during certain periods when coastal salt evaporation pans were globally inundated, and salt was catastrophically in short supply. With the relatively sudden taking over of the Qanat systems with a new management in the 6th century by the Jafari sect of Islam, the control of salt supplies to the [Silk Road] trade, became a 'fait accompli' . With the advent of industrial coal fueled salt production, the Qanat salt leaching technology now fully owned by the Jafari, became obsolete and forgotten. Today the Qanat systems are inefficient and even wrongly used in some of the main Shiia communities such as in Teheran as sewage systems and in others for spate irrigation resulting in a lack of water for the growing populations.

04 THE LANDSCAPE OF PREHISTORIC SALT EXPLOITATIONS IN THE MOLDAVIAN SUBCARPATHIANS (ROMANIA)

Author(s): Nicola, Ciprian - Diaconu, Vasile (Complexul Muzeal Judetean Neamt)
Presentation Format: Oral

The sub-Carpathian Moldavia is rich in brine springs. Close to some of them rich evidence for ancient salt production have been found. The most intense of them date from the Neolithic (7th-6th millennia BC) and Eneolithic (5th-4th millennia BC). At the same time in some of them the evidence of the Bronze Age, Iron Age and medieval period are present. Some of these sites were more or less fully excavated. In parallel, the comprehensive ethnographical researches have been carried out concerning the traditional salt exploitation.

In some of the sites (Lunca, Tolici and Oglinzi) various interdisciplinary studies have been experienced: chemical analyzes of brine, the anthracological, sedimentological and palinological analyzes, the physical and chemical studies of pottery, the geomagnetic scans, as well as the 14C dating. These studies reveal the important environmental dimension of the salt production sites.

Unfortunately, most of the salt production sites and brine springs exploited by traditional means do not benefit of proper protection. The first step in ensuring the protection of these sites and springs should be their official recognition as parts of cultural and natural heritage. This is why a multidisciplinary research should bring their importance to light, envisioning the necessary strategy to follow for their proper approach.

05 TOWARDS THE SAFEGUARDING OF THE SALTSCAPES IN TRANSYLVANIA AND MARAMUREȘ

Author(s): Kavruk, Valerii (The National Museum of Eastern Carpathians; The Alexandru Ioan Cuza University)
Presentation Format: Oral

The Inner-Carpathian areas of Romania and Ukraine are rich in saltscapes. Some of them are included in official lists of heritage, whether as natural or cultural sites, monuments, or protected areas. Although many of them are component parts of wider landscapes that include both natural and cultural features, they are treated as some distinct, isolated, narrowly bordered bodies, and are fitted either in natural or cultural category of heritage.

The official status of the saltscapes as protected properties, the law provisions and the governmental bodies aimed to ensure the integrity of sites does not produce the expected effects. Too many of the saltscapes are severely damaged and too many of them are under the permanent threat of imminent destruction. One of the main causes of this state of the things comes from the fundamental contradiction between economic and heritage interests. Since the money and real power is in the hands of the developers and local governmental bodies, nobody can stop the economic activities that affect the heritage.

What should we do in this condition? First, we have to exclude the fight against governments, developers and communities as part of heritage safeguarding strategy. We inevitably will be defeated in such a fight, even though here and there we will win some small battles. We have to collaborate with them. Second, we have to redefine the saline sites, mainly by their integration in wider landscapes made of the network of sites, routes, habits, memories, identities etc. We have to change our approach to the research of saltscapes. It must be gentle, holistic, trans-disciplinary, pragmatic, and heritage focused. Third, the saltscapes should be managed by parks and/or open air museums tightly connected with local communities, governments and economic agents. On European scale, the specialized monitoring of satscapes would be highly recommended.

06 TOPONYMY AND SALTSCAPES IN ROMANIA

Author(s): Asandulesei, Mihaela (Interdisciplinary Research Department - Field Science, "Alexandru Ioan Cuza" University of Iași)
Presentation Format: Oral

Salt, as a diverse element, has been part of each dimension of the human existence since Prehistory, as continuously proved by archaeological researches or current human behaviour, determined by the natural resource. The intensive continuity of salt exploitation in a traditional ways influenced the proximal landscapes. For Romania, the impact of salt is highlighted also by the topical names related to this commodity, as early as the Antiquity. The evolution of the halotoponyms from simple appellatives up to micro-toponyms and even further to official toponyms certify the validity of the saltscapes.

This paper aims to highlight the role of the micro-toponymy of salt, stressed by the cartographic supports and, not least, by the ethnographic investigation. An edifying example is the archaeological site from Tolici–Hălăbutoaia, important for the world archaeological literature, identified by the ethnographic investigations, focused on the toponymic headings.

In this respect, we can affirm that the salt sources played a central role in the constitution and development of human communities, likewise essential in their organisation and spatial orientation, being the cardinal element for generating the names of most of the nearby geographical elements. Therefore, it is clear that the toponymic studies offer the possibility to identify salt exploitation sites of highest importance.

07 ETHNOMEDICINAL PARAMETERS IN THE FRAMEWORK OF ETHNOARCHAEOLOGICAL RESEARCH ON SALT IN ROMANIA

Author(s): Asandulesei, Mihaela (Interdisciplinary Research Department-Field Science, "Alexandru Ioan Cuza" University of Iasi)
Presentation Format: Oral

It is known that saltscapes are determined by the presence of salt and its related activities. The intensity of non-industrial salt exploitation can be considered a marker for understanding the connections between rural communities, in general, and the natural resource. Traditional practices of using salt for therapeutic purposes are an example by which it is validated the opinion that these landscapes are also a result of a synergistic interaction of nature and culture.

Salt leaves no or few archaeological evidences. In Romania, most archaeological sites with traces of salt exploitation reveal traditional techniques used since Prehistory. The analogies about salt use are established by ethnological investigation and an intense bibliographical documentation. In what concerns halotherapy, the first salt treatments were mentioned in the works of ancient Greek and Latin writers. The ethnoarchaeological research on salt in Romania has revealed that the halotherapeutic practices have not changed much since Antiquity. However, traditional medicine based on salt has a high degree of intensity, especially in rural societies. Furthermore, the importance of halotherapy can be seen in the interest in treatment system through saline halochambers, natural or man-made, which currently witnesses growth. This is due to the fact that salt has beneficial effects in treating various disorders, such as rheumatological, dermatological, otorhinolaryngological, dental, angina, etc.

The present paper aims to highlight the human and animal traditional halotherapy as part of Romanian intangible heritage, by means of ethnological approach, thus also revealing the transmission of halotherapeutic knowledge from one generation to the next. In this respect, the goal is for saltscapes to become valuable assets in development strategies, either as suppliers (salt and derived products) or from the value it can bring into gastronomy, health, etc.

08 SALTSCAPE: AN OPENED AND DYNAMIC BIOTOPE GOVERNED BY SALT. TRACING MARKERS RELATED TO ANTHROPIC ACTIVITIES

Author(s): Asandulesei, Andrei - Tencariu, Felix-Adrian - Caliniuc, Stefan (Interdisciplinary Research Department - Field Science, "Alexandru Ioan Cuza" University from Iași)
Presentation Format: Oral

Salt resources have been "building" and shaping the nearby natural landscape since prehistoric times, prompting a specific cultural behavior of the human communities located around them. An intense and dynamic cultural space development, complying though in a definite pattern, can be observed in case of salt springs and outcrops occurrences.

Using remote sensing techniques, specifically low-altitude aerial photography (classic, oblique or vertical and thermal) and geophysical prospections (vertical gradient or total field magnetometry), particular instances (time-freezing), have been documented for a number of sites. Vibrant images with ethno-archaeological meanings comprising geomorphological parameters on a detailed scale, different types of capture systems, exploitation moments or animal ethological instants have been recorded. In connection, using magnetic measurements, the planimetric images for archaeological sites were obtained, revealing a number of possible anthropic features (dwellings, fortification or delineation works, ritualic enclosures). Structures have been analyzed alongside topographic and cartographic support in order to extract insights associated with ethnographical, ethnohistorical, ecological or archaeological processes from everyday life experiences.

Considering the fact that human activities have changed significantly the natural landscapes, documenting such salt shaped environment, essentially a dynamic biotope, through this methodology, can facilitate the structure and development of some necessary management plans in which these kinds of landscapes are to be included.

09 THE NORTH PONTIC SALTSCAPES

Author(s): Kavruk, Valerii (The National Museum of Eastern Carpathians; The Alexandru Ion Cuza University) - Ivanova, Svetlana (The Institute of Archaeology of the National Academy of Ukraine) - Alexianu, Marius-Tiberiu (The Alexandru Ion Cuza University)
Presentation Format: Oral

A considerable number of salt lakes and limans are spread along the Black Sea coast. Their number, size and salinity varied greatly during the Holocene due to the regressions and transgressions of the sea level. These phenomena gave rise to the vast solonchaks in the area, rich in halophytes.

Written sources witness a substantial salt production in the North-Pontic area, as well as long-distance salt trade, starting in the Greco-Roman period through the beginning of the 20th century. Ethnography reveals an intense exploitation of the solonchaks for herding. Although there is no explicit archaeological evidence for salt production in this area, some scholars, on the basis of historical analogies and circumstantial archaeological data, suggest that saline lakes, limans and solonchaks have been extensively exploited as early as since the 5th Millennium BC.

The current state of North-Pontic saltscapes is precarious. Most of them are severely affected and do not benefit of effective protection and management.

To obtain reliable evidence of the dynamics of the saltscapes in the Northern Black Sea region and of their ancient exploitation, a

trans-disciplinary holistic study of their taphonomy is necessary. In addition to purely cognitive results, such studies will contribute to a better understanding of the nature of these landscapes as objects of natural and / or natural-cultural heritage.

In order to ensure the effective safeguarding of the North-Pontic saltscapes, actions should be taken in two main directions. First, they should be legally recognised as part the protected natural and / or cultural heritage. The second direction should be the integration of this heritage within closely monitored tourism services.

10 SAFEGUARDING THE INTANGIBLE HERITAGE OF SALT: THE CONCEPT OF A VIRTUAL MUSEUM OF HALOTHERAPY

Author(s): Curca, Roxana-Gabriela (Alexandru Ioan Cuza University of Iasi, Romania)
Presentation Format: Oral

Romania is one of the few European countries in which traditional uses of salt in its various forms (rock salt, brine, salty mud, aerosols) for therapeutic purposes still occurs at a notable intensity. The Virtual Museum of Halotherapy (VMH) will promote the traditional as well as the modern halotherapeutic practices from Romania, in a holistic approach. The motivation for creating the VMH springs from the necessity to capitalize and safeguard this intangible heritage, which has never been emphasized from a systematic interdisciplinary standpoint. The project benefits from the ethnographic inquiries, archaeological research, and chemical analyses carried out around a series of salt springs. Near some of these salt springs, modern spa resorts have developed (e.g., Băltățești, Băile Figa, Turda, Praid, etc.). The VMH proposes to present these halotherapeutic practices (with of audio and video records) and to explain their validity from the medical point of view, as well as the list of the most representative salts springs and salt mountains in this respect. The main goal of this innovative museum project is to raise awareness about the importance of the curative role of salt, and to promote the halotherapeutic tourism. The VMH is a pilot project that can be tested in Romania and implemented worldwide.

690 WOODLAND ARCHAEOLOGY: APPROACHES, METHODS, CURRENT PROBLEMS AND FUTURE PERSPECTIVES

Theme: Theories and methods in archaeological sciences
Organisers: Niedziólka, Kamil (Institute of Archaeology, Cardinal Wyszynski University, Warsaw) - Vařeka, Pavel (Department of Archaeology, Faculty of Philosophy and Arts, University of West Bohemia) - Konczewski, Paweł (Department of Anthropology, Wroclaw University of Environmental and Life Sciences)
Format: Regular session

A vast part of Europe is covered with forests (esp. Central, Eastern and Northern Europe), however, systematic field research within woodlands has often been neglected by field archaeologists. The application of standard archaeological techniques in forested environments such as surface, topographic and geophysical survey in dense vegetation, and the use of GPS or ALS data can certainly encounter a number of problems. On the other hand many wooded areas offer a unique opportunity to investigate well-preserved remains of former human activities, whose traces have not been erased or transformed by modern agriculture, industrialisation or urbanisation. In some historical periods it is possible in some regions to reveal complete segments of deserted cultural landscapes due to the process of forest succession. This session will focus on recent theoretical approaches and methodologies in woodland archaeology. We will address topics ranging from the formation processes of the archaeological record within forested environments, the use of non-invasive methods and targeted excavations, the classification and interpretation of anthropogenic features, as well as the potential threats to archaeological features and landscapes posed by modern forest management techniques.

ABSTRACTS

01 OFF-SITE ARCHAEOLOGY IN THE FOREST ZONE: APPROACHES TO DELINEATING THE AREAS OF SWIDDEN CULTIVATION

Author(s): Ponomarenko, Elena (Kazan Federal University; University of Ottawa) - Ershova, Ekaterina (Moscow State Lomonossov University; Kazan Federal University) - Vyazov, Leonid (Kazan Federal University) - Blinnikov, Mikhail (St Cloud State University)
Presentation Format: Oral

It's believed that the slash-and-burn cultivation (SABC) was practiced at least since the Bronze Age, with the extent of the areas affected by SABC increasing drastically in the Iron Age. Numerous archaeological cultures were associated with the SABC subsistence based on the evidence for plant cultivation in the absence of agricultural implements and frequent changes in the location of dwelling sites. Given the extent of the SABC, its traces in the modern forested landscapes must be ubiquitous, but its diagnostic features in the soil are unknown. Due to the elusiveness of the archaeological evidence, the visibility of SABC was inferred mainly from the palynological analysis of lake and bog sediments that did not allow for a site-oriented reconstruction.

Our multi-proxy analysis of forest soils affected by SABC in 19th century revealed several common features that were attributed to

the swidden agriculture:

- Thin (5 to 12cm) dark-colored humus layers with a characteristic scalloped lower boundary, formed by numerous round spots, 1 to 1.5cm in diameter;

- High concentration of dispersed charcoal fragments with the median length of 4-5mm;

- Low proportion or absence of charred bark in the charcoal assemblage, presence of charred foliage (e.g. needles, cones, buds);

- A rounded/pebbly shape of charcoal fragments with the average width to length ratio ~0.7;

- Extensive silt coating on the surface of charcoal fragments;

- Noticeably higher proportion of silt in the pyrogenic layers compared to the below-bedded layers due to the input of phytoliths;

- A high percentage of arboreal taxa with a proportion of fire-dependant taxa, such as Onagraceae pollen and Marshantia spores in the soil pollen spectra.

The diagnostic features were applied to delineate areas of SABC in modern and buried soils in the vicinity from the Early Iron Age archaeological sites of the Bolgar-Svyazhsk area, Tatarstan, Russia.

02 THE NON-INVASIVE PROSPECTION OF FORESTED AREA ON THE EXAMPLE OF SETTLEMENT COMPLEX AT STRUŻYNA (NORTH-EASTERN POLAND)

Author(s): Rutyna, Magdalena - Solecki, Rafał - Rabiega, Kamil (Institute of Archaeology, Cardinal Stefan Wyszyński University in Warsaw)

Presentation Format: Oral

The discussed topic concerns a comprehensive non-invasive prospection of a settlement area around Strużyna. Archaeological research under the project "Catalogue of Warmia and Mazury Strongholds", funded by the National Programme for the Development of Humanities were a contribution to further research on this area. These research focused on the fortified settlements and allowed to set their chronology at the turn of Halstatt D and La Tène A (Strużyna, site 24) and La Tène C/D (Strużyna, site 21). Younger cultural phases, that can be dated to the Middle Ages, has been confirmed at both sites. The analysis of the area around the fortified settlements has shown numerous burial mounds and traces of agrarian activities. A significant number of these sites have not been described in literature so far or even classified under the Polish Archaeological Record (AZP).

Recognition of the area around the Strużyna hillforts was first based on the Digital Terrain Model (DTM) created on the basis of ALS data with mapping of all potential sites in the Geographic Information System. The selected points were then verified in the field. Therefore, a number of burial mounds and also old agrarian structures, such as land divisions or ridge and furrow activity, were classified. In few cases, the accurate DTM let even to determine, only on the basis of a digital image, whether the burial mound was robbed in the past.

Information obtained during the prospection allowed to reconstruct development of the settlement from the early Iron Age to the modern times. It was possible due to the relatively good condition of the sites. In spite of the quite complicated stratigraphy of the surveyed landscape, the fact that for long periods it was overgrown with forest caused that the negative impact of erosive factors as well as destructive human activity were minimized.

03 INTO THE WOODS! ARCHAEOLOGICAL RESEARCH IN BAGICZ WOODLAND - RESULTS, PROBLEMS AND PERSPECTIVES

Author(s): Chmiel-Chrzanowska, Marta (University of Szczecin)

Presentation Format: Oral

Archaeological reconnaissance research in woodlands is extremely difficult due the obvious factors resulting from the specificity of their location. Nevertheless, since LIDAR technology has been used in archaeological research more and more sites with their own terrain form has been discovered on areas covered by dense vegetation.

Following paper presents research in a woodland area of Bagicz in NW Poland. In 2017 a set of maps based on LIDAR technology was prepared for Kołobrzeg area. On one of the sheets several objects have been noticed, which very likely might have been barrows. The size of the site was estimated for 5 hectares. Since that, small-scale excavation project took place on the cemetery and it appears that it represent the Wielbark Culture. Nevertheless, during research a number of other sites dated for Neolithic, Bronze Age and Early Iron Age was reported by local people and discovered on LIDAR-based maps in the same area. In this paper I would like to present not only results of our research but also methodical problems that we are dealing with in case of this specific area. For now we know that we have discovered few sites with a huge potential of information. However, it is very difficult to coordinate archaeological surveys and excavation in an area covered by forrest and swamps.

04 MAGNETIC SURVEYING IN A DEEP FOREST: DISCOVERING IRON SMELTING SITES IN WESTERN SIBERIAN TAIGA

Author(s): Zaitceva, Olga - Vodyasov, Evgeny - Pushkarev, Andrey (Tomsk State University)

Presentation Format: Oral

At Shaitan site (c. 1000-1700 AD), the biggest medieval iron smelting center in Western Siberia, more than 100 archaeometallurgical objects have been revealed through magnetic prospecting. Slag blocks and clay furnaces represent nearly ideal objects for magnetic prospecting because they produce strong magnetic anomalies of several hundred nanotesla. However, the main difficulty with in the Siberian taiga is associated with the inability to conduct measurements on a regular grid. To investigate such a big area in a deep forest and reveal as many archaeometallurgical objects as possible, a special methodology has been developed combining the use of a total station and a magnetometer. More specifically, –a glass prism from the total station was attached to the magnetometer sensor rod. The measurements then were carried out synchronously by means of the total station and the magnetometer. Thus, each measurement of the magnetometer had its three-dimensional geographic coordinates. The operator moved through the forest between the trees with -small steps of no more than half a meter each. Magnetic surveys proved to be a very effective field method for finding the remains of archaeological evidence relating to all stages of iron production: from the roasting of bog iron ore to iron extraction and treatment. They helped to reveal those objects that could not be seen on the surface. Importantly, the conclusions made on the basis of the magnetic survey were subsequently confirmed by test excavations.

05 NON-INVASIVE APPROACH TO WOODLAND ARCHAEOLOGY. CASE STUDY OF MT. CHEŁMO MEDIEVAL HILL-FORT (CENTRAL POLAND)

Author(s): Wroniecki, Piotr (independent researcher) - Sikora, Jerzy (Institute of Archaeology, University of Lodz) - Kittel, Piotr (Department of Geomorphology and Palaeogeography, Faculty of Geographical Sciences, University of Lodz)

Presentation Format: Oral

The hill-fort situated on the top of Mt. Chełmo (323 m a.s.l.) is an outstanding terrain feature in the relatively flat area of Central Poland. Covered by woodland, it is now a natural reserve with restrictions placed on excavations. It is also the largest early medieval hill-fort in the region (about 12 ha) yet still poorly recognised as historical sources and previous small scale archaeological excavations from the 1950's are non-definitive. This was the reason for undertaking non-invasive surveys in 2013 and 2014. It was aimed at identifying the spatial structure of the fortifications, interior features, communication infrastructure and determination of the fortification's function which in archaeological literature was supposed to be connected with pre-Christian ritual activity. Research was based on a vast set of methods including ALS LiDAR derived DEM analysis, geophysics (magnetic and earth resistance), geomorphological hand auger sampling and geochemical phosphorus survey. These experiences allowed us to test and develop a non-invasive workflow for protected woodland areas. Our study resulted in the detection of previously unknown lines of moats and ramparts, revealed construction details of the fortifications which can be used as comparative material to archival (1950's) rescue excavation data. Geochemical analysis clearly showed the existence of zones of high or extremely high phosphorus content in an area closed within the rampart system. It can be understood as a geochemical record of burial activity but in this case more likely as a sign of intense past settlement. Together with geomorphological data the results of our research have put into question older suppositions about the religious role of the hill-fort.

Non-invasive survey of Chełmo hill-fort was conducted by The Scientific Society of Polish Archaeologists (Lodz branch) and The Institute of Archaeology of The University of Lodz, financed by the Ministry of Culture and National Heritage.

06 ARCHAEOLOGICAL SURVEYS IN JURA MOUNTAIN WOODLANDS: METHODOLOGY AND FIRST RESULTS

Author(s): Chevassu, Valentin - Bichet, Vincent - Richard, Hervé - Thivet, Matthieu (UMR 6249 Chrono-Environnement / Universite de Bourgogne-Franche-Comte)

Presentation Format: Oral

Jura mountains are characterized by a landscape of plateaux and high valleys between 600 and 1700 m high, on the French/Swiss border. This region is nowadays mainly covered by pastures and wooded areas.

Facing the lack of archaeological data on Jura high chain, a survey program has been launched on this area since 2015 by Chrono-Environnement Laboratory. This program is based upon the analysis of LiDAR data and seeks to bring chronological data about the spotted archaeological structures, often located in mountain spruce forests. We will present in this paper the main difficulties encountered with this vegetation cover, the different approaches that were used, and finally some of the first results of the program.

For the moment, apart from several roman itineraries and protohistorical or early medieval fortified sites, the main results are concerning the numerous remains of medieval and modern forest exploitation (such as tar kilns, chalk furnaces and charcoal-making platforms) and pastoral activities (modern deserted hamlets and dairy huts, drystone field boundaries), that were never studied or surveyed before. Military structures linked to the 19th and 20th century wars also appear to be very common in this border area.

Several field approaches have been tried to characterize as well as possible these different types of sites, from pedestrial surveys to test pits. While pedestrial and geophysical surveys are quickly limited because of vegetation cover, the use of metal detectors appears to be really useful on some selected areas, as well as small test pits and drillings followed by 14C dating. A GIS approach bring about sites distribution and land-use evolution some first results that may then be compared to several paleoenvironmental

analyses.

07 CHALLENGES AND OPPORTUNITIES – RESEARCH IN BIAŁOWIEŻA PRIMEVAL FOREST

Author(s): Jakubczak, Michal (Institute of Archaeology and Ethnology Polish Academy of Sciences; Institute of Archaeology Cardinal Stefan Wyszyński University in Warsaw) - Wawrzeniuk, Joanna - Budziszewski, Janusz (Institute of Archaeology Cardinal Stefan Wyszyński University in Warsaw) - Krasnodębski, Dariusz (Institute of Archaeology and Ethnology Polish Academy of Sciences) - Niedziółka, Kamil - Rutyna, Magdalena - Szubski, Michał - Szlązak, Roman (Institute of Archaeology Cardinal Stefan Wyszyński University in Warsaw) - Urbańczyk, Przemysław (Institute of Archaeology Cardinal Stefan Wyszyński University in Warsaw; Institute of Archaeology and Ethnology Polish Academy of Sciences)

Presentation Format: Oral

The Białowieża Forest is one of the largest forested areas in Poland, it occupies nearly 1 500 km2 of which 42% is in Poland and the rest is located in Belarus. Significant part of this area is covered by various types of protected zones including strict reserve in the the Bialowieża National Park. Survey in the Białowieża Forest was always very difficult because dense vegetation and lack of agricultural activities what makes aerial archaeology useless. However, this situation creates great preservation conditions for older settlement remnants. They are now accessible by the new technology development - e.g. airborne laser scanning (ALS) or high accuracy GPS. Project "Cultural and natural heritage of the Białowieża Forest" launched at in January 2017 aims at comprehensive, interdisciplinary examination of the archaeological resources of the forest with the help of nature sciences. The goal is to map traces of anthropogenic and natural sites of its own form using ALS, their field verification combined with geophysical surveys and test excavations. All data obtained will be collated in a GIS data base. Already the first season of research provided extremely interesting examples of well-preserved cultural landscapes. Particularly noteworthy are examples of old arable fields of undefined chronology. The most interesting, however, are complexes that include settlement, arable fields and accompanying sepulchral features, usually in the form of barrows. A very large number of features from the Stone Age to the Modern Times (e.g. traces of forest resources exploitation like: charcoal piles, wood-distillings, military constructions, etc.), create a unique landscape of primeval forest, periodically occupied by human communities.

We will discuss the results of our ALS analysis, field-walk surveys, and second season of excavations. Apart from the results of the prospecting and excavations, it will be discussed also the issue of research within strictly protected areas.

08 WINTERS HAVE COME AND WOODS STAYED: NEW METHODOLOGICAL APPROACH OF THE BERCÉ FOREST MASSIF (PAYS DE LA LOIRE, FRANCE).

Author(s): Choplin, Morgan (University Rennes 2)

Presentation Format: Oral

Bercé is a state-owned forest with an area of 5337 ha shared among eleven towns. The current vegetation is essentially made of oak-beech forest (a famous sessile oak of Iberian origin). It is mixed with ancient forest stands and modern reforestation parts whose are comprised of resinous woods.

Several studies were focused on this forest over the past few years. Thanks to the complementarity and multidisciplinarity of these studies it is possible to obtain some coherent informations concerning the evolution and the exploitation process of this forest massif. The studies of the Bercé forest are based on traditional methods mostly like the study of ancient sources and fieldwalking, but also on new technologies (LIDAR, paleoenvironmental surveys, archeometry).

These different studies allowd to highlight the presence of hundreds archaeological sites dated from Protohistory to the present day. These are mostly enclosures, traces of administrative fragmentations, extractions and reductions of iron ore and old communication routes.

The researches on these different sites aim to establish a chronology of occupations and help to find if some sites could be contemporaneously working together. Some scientific approaches such as archeobotanic also help to visualize a natural environment during ancient times and to identify the evolution of forest boundaries. The study of the ancient metallurgy introduces the problematic of technological evolutions over the time and of produced quantities.

Studies made on the forest of Bercé constitute a first way to understand the archeological remains, and allow us to see Bercé with fresh eyes. Today a new non invasive and pluridisciplinary approach has allowed us to create a new methodology well adapted for modern forest management and archeological sites preservation.

09 FORMS OF FOREST EXPLOITATION IN THE CENTRAL EUROPEAN LOWLANDS. EXAMPLES FROM THE LOWER SILESIAN WILDERNESS (POLAND)

Author(s): Konczewski, Pawel (Wrocław University of Environmental and Life Science, Department of Anthropology) - Konczewska, Magdalena (University of Wrocław, Institute of Archaeology)

Presentation Format: Oral

Forests of the Central European Lowlands whose origins reach the end of the Pleistocene create a specific living conditions for humans. Their inhabitants because of environmental aspects based most of their economy on the exploitation of the surrounding area and its resources. Some of the forms of these activities are still visible in the surrounding landscapes and ecosystems.

The Lower Silesian Wilderness consists many representative examples of discussed issues. It is located in south-western Poland and it is the largest continuous forest of the country, and one of the largest in Central Europe. The archaeological research shows that the area was inhabited with a different intensity since the Mesolithic period until today. This can be pointed out as the main reason of tremendous changes visible in the natural environment.

Archaeological and environmental surveys conducted in recent years allow now to create a more extensive description of many traces of anthropopressure. To mention only a few: deforestation, manmade forest stands and also processing of wood and other resources found in forest's biotopes.

During the presentation authors will portray mentioned issues from the perspective of examples of forest economies discovered at sites from Late Roman period, Late Middle Ages and Early modern period. Authors will address also methodological problems regarding the integrated research of a natural-cultural heritage of forests.

10 WOODLANDS VS. SETTLEMENTS: RELICTS OF RUSSIAN LATE MEDIEVAL LANDSCAPE

Author(s): Kutakov, Sergey (State Academic University for the Humanities; Staritsa Museum of Local History)
Presentation Format: Oral

The research is supported by Russian Foundation for Basic Research – project # 17-31-01074 «Historical geography of feudal land tenure in Tver uyezd of Moscow State in the XVI century».

The research is devoted to the studying of the cultural landscape of the historical territory of Tver uyezd (district) of Moscow State of the XVI century. For today, a significant part of this territory is covered with the woods. There are many archaeological sites could be found in the wooded area. The ratio of the territories occupied with settlements, arable lands, forests, etc. were constantly changing. For now at our disposal there are late medieval cadastral sources (census books) containing information on land tenures and settlements, wastelands etc. that land tenures consisted of, as well as data on the amount of arable lands, hayfields and woodlands related to that land tenures. Many of the cadastral objects correlate with cartographic materials of the late XVIII–XIX centuries. Using of the medieval censuses, cartographic materials of subsequent centuries and contemporary satellite images and open geodata allow exploring the development of the landscape from the XVI to the XXI century. Generalizing all of these materials in GIS allows correlating data on medieval landscapes with the location of known medieval archaeological sites. Reconstruction of both settling and landowning structures of the XVI century in GIS allows to discover the areas that have been used in the Late Middle Ages, but were excluded from the economic turnover in the subsequent time. These areas could retain the least damaged monuments of medieval archeology. Studying these sites have a great importance for disclosure of the chronology of the formation of the settlement system and for researches of the material culture of various feudal property.

11 URBAN ARCHEOLOGY IN TAIGA SIBERIA: PROBLEMS OF SEARCH AND LOCALIZATION

Author(s): Chernaya, Mariya - Barsukov, Evgeniy (National Research Tomsk State Unversity; Institute of Archaeology and Ethnography of the Siberian Branch of the Russian Academy of Sciences) - Chernaya, Lyudmila (National Research Tomsk State Unversity)
Presentation Format: Oral

The Slavic tradition of development of forest regions from Moravia and Odra through Novgorod with some influence of Viking experience continued in founding of Russian towns and lesser settlements during colonization of Siberia. Settlements are known from written sources and old maps, where locations are quite vague, and may be only guidelines for topographical binding. For example, early towns Narym and Ketsk changed their location several times over the XVII century, and none has been found. Tomsk' initial place remains unknown though it was a major city and seemingly well documented. Application of geophysical methods is much reduced in densely forested and often swampy taiga as well as in detecting early cultural strata of modern cities due to high anthropogenic pressure. So landscape analysis is a highly effective method, because founders of any new settlement primary reckoned geomorphological characteristics of the land such as well suitable high river terraces. Of particular importance is the visual observation of relief, vegetation and outcrops of soils along river banks, ravines and uplands. However it faces such challenges as changing riverbeds, area and shape of bogs and lakes, which requires the involvement of geologists. Some discovered archaeological sites such as villages and short-term little fortresses and trade settlements of the period are difficult to identify with the ones in written and picture sources. The search and localization of olden settlements in the changed cultivated landscape or in the taiga is the most promising when using a multi-type sources' complex and an interdisciplinary approach. It allows determining the most likely areas of objects' occurrence for subsequent excavations. The principles of historical objects' localization worked out for Siberian Russian cities are methodologically applicable to the search for archaeological monuments of various epochs in forest zones in other territories, including Europe.

This research is supported by "The Tomsk State University competitiveness improvement programme" grant (No 8.1.41.2018)

12 ARCHAEOLOGICAL RESEARCH OF KAMPINOS FOREST – FIRST CONCLUSION

Author(s): Paczkowski, Michal (State Archaeological Museum in Warsaw)
Presentation Format: Oral

Kampinos Forest is located in central part of Poland in the valley of Vistula river. Sand dunes, swamps and peatbogs with relatively young (up to 200 years) pine forest is a typical landscape in the area. Such terrains were potentially highly attractive for hunter-gath-

ers societies. At the same time, agricultural and pastoral societies would settle on Vistula's banks in the east and north or in Łowicko-Błońska plain on the south.

After World War I the forest was almost completely cut out. In the 1930s the first forest reserves were opened and in 1959 the Kampinos National Park was created. In January 2000 the area was added to UNESCO's list of biosphere reserves. Only a few findings were known until the 1980s, when regular archaeological research was carried out around the Kampinos Forest, which allowed to register several thousands of sites. The Forrest areas themselves are however still inaccessible for archaeologist. The widespread use of airborne laser scanning technology (ALS, LIDAR) allow to change this situation.

The main goal of a project started in autumn 2017 is examination of the archaeological resources of Kampinos National Park. We plan to achieve this using ALS technology in order to: find new sites and their further field verification; analyze surroundings of already known sites; perform regular archaeological surveys specially on selected points in the landscape, which are potentially attractive for settlements. We also aim to make test trenches or drills.

Our project assumes also elaboration of findings already existing in museum collections (results of previous researches). We have already selected and verified anthropogenic structures, a number of potentially prehistoric ones, usually in the form of barrows. Most of them constitute however remains of cold war or WWII fortifications or closed railways, abandoned villages which makes the picture of prehistoric settlement less clear.

13 LIVING MONUMENTS OF THE SECOND WORLD WAR: TERRESTRIAL LASER SCANNING AND TREES WITH CARVINGS

Author(s): Kobialka, Dawid (Institute of Archaeology and Ethnology PAN)
Presentation Format: Oral

There is a number of examples of tree carvings in Polish forests. One site with carvings is located near Chycina and it has been the subject of my and mine colleagues' interest for a few years. In 2017 a new research took place. It relied on terrestrial laser scanning of the trees with carvings. Although terrestrial laser scanning is already a popular method of 3D documentation of archaeological artefacts and structures, the application of method to scan trees with carvings was the first such research in Polish archaeology.

In my paper I will discuss and contextualize the results of terrestrial laser scanning of the common beeches (Fagus sylvatica) covered in carvings dated to 1944 around Chycina. All in all, the bark of 11 beeches was scanned. In order to increase the quality and naturalistic color of documented trees, it was decided to combine the method with close range photogrammetry.

The beeches are a unique example of living monuments of the recent past and heritage of the Second World War in the Polish woodland. It will be argued that archaeologies of the recent past in the woodlands maybe come one of the dominant branches of archaeological research in the near future.

a. NON-INVASIVE ARCHAEOLOGICAL RESEARCH OF THE MANOR HOUSES IN WOODLANDS OF THE NORTHERN MAZOVIA

Author(s): Zdeb, Katarzyna (Institute of Archaeology Cardinal Stefan Wyszynski University im Warsaw)
Presentation Format: Poster

The majority of the nineteenth-century manor houses in northern Mazovia are currently located in wooded areas. These buildings became ruins after the second world war and they are now almost invisible in the landscape. However, these type of sites can be identified by means of the non-invasive research methods. Fieldwalking have made it possible to find ruins of mansion houses and accompanying buildings. To locate the alleged cemetery near one of the manor houses a geophysical survey was also conducted. Hand GPS device was used to locate and map artefacts and foundations of the manor buildings. As a result of the non-invasive archaeological research, foundations of the manor house at Poniatów were found. Moreover, remains of a bridge from the early twentieth century were found in the same forest. In another area of the alleged manor house, at Dąbkowizna, foundations of farm buildings and fragments of modern pottery were found. Unfortunately, traces of detectorists' excavations were found in both places. Therefore, the non-invasive documentation is extremely important to obtain information about these archaeological sites. The non-invasive methods in archaeology allow to verify historical information. They are also perfect complementation to the knowledge on material culture of the Masovian nobility. These studies allow to get valuable information without damaging interference in nature

b. THIRTY YEAR´S WAR IN THE FOREST. CASE STUDY FROM WEST BOHEMIA (CZECH REPUBLIC)

Author(s): Preusz, Michal (Department of Archaeology, Faculty of Philosophy and Arts, University of West Bohemia in Pilsen)
Presentation Format: Poster

A testimony of the horrors of the Thirty Years' War between 1618 and 1648 is often hidden in the forest environment. The destruction and depopulation of settlements and entire areas has changed the Renaissance and Mannerist "land use" in Central Europe to the extent that human nature has begun to reign over nature. The war in Bohemia helped to return the forest, which still covers a certain battlefield, damaged settlements and productive areas. Thanks to the introduction of modern archaeological methods, many new components can be found. In particular, the study of aerial photos, satellite and lidar data, whose verifiable value is directly verified by field prospection in the landscape, is of great benefit. With modern databases and GIS, a large amount of data can be analyzed. The discovery of specific war relics combined with the study of written sources contributes to the understanding of the

strategic landscape of the first half of the 17th century, in which specific war events took place. The poster presents examples of archaeological components preserved in the forest environment, which are directly related to the events of the Thirty Years' War in West Bohemia.

On the example of the selected region are presented the possibilities of research of archaeological components in the forest environment, which are relevant to the category of archeology of the conflict.

692 CULTURAL HERITAGE IN MODERN CONFLICTS

Theme: Archaeology and the future of cities and urban landscapes
Organisers: Sabrine, Isber (CSIC; Heritage For Peace) - Cunliffe, Emma (Durham University; Newcastle University) - José Ibáñez, Juan (CSIC)
Format: Regular session

The last decades have seen increased awareness of the place of cultural heritage as a victim during modern conflicts. Many countries have suffered from damage to historical monuments and archaeological sites, looting of museums and important archaeological sites. This large-scale loss – by resulting from the actions of many different actors - has led both to international outcry and the development of initiatives and programs by governments, international organizations and non-governmental organizations.

In addition, as the conflicts have continued, reporting and investigations into this topic have also increased, particularly when ISIS started to profile their destruction of archaeological sites like Palmyra in Syria, and Nimrud in Iraq. Many actions were taken both nationally and internationally to help protect heritage. Unfortunately, these conflicts have demonstrated new challenges that people were - and perhaps still are - unprepared for, and some say that the policies for the protection of cultural heritage have failed.

This session will invite papers that address how and why modern conflicts have affected cultural heritage directly. We seek discussions on: the role of international and local communities; the challenges they face in protecting cultural heritage in these situations; and we want to develop discussions on the needed measures to protect cultural heritage during modern conflicts. This session aims to include not only papers that touch on the situation in the Middle East, but also encompasses a broader range of perspectives to inform a fuller discussion on heritage in conflict, now and in the future.

ABSTRACTS

01 REACTIVATING THE 1954 HAGUE CONVENTION: CULTURAL PROPERTY PROTECTION 70 YEARS ON

Author(s): Cunliffe, Emma - Fox, Paul (Newcastle University; Blue Shield International)
Presentation Format: Oral

The conflicts witnessed across the world since the start of the 20th century have decimated the cultural heritage of local communities, nations, and the collective heritage of humanity. The numbers of sites damaged and destroyed is in the tens of thousands, and their destruction is linked not only to deliberate and collateral military damage, but to propaganda, and to human rights violations and genocide. In the years following World War II, new legislation – the 1954 Hague Convention for the Protection of Cultural Property in the Event of Armed Conflict (1954HC) - was drafted to attempt to regulate the conduct of war and offer cultural heritage levels of protection in line with its value. However, 70 years later this legislation has largely failed to make an impact on either the heritage or military communities, many of whom now refer to it as "moribund" or even "dead".

This paper will begin with an overview of the changes to the field of cultural property protection, highlighting legal improvements and military recommendations in the last decade. It will then present the work of the Blue Shield network – an NGO born out of the 1954HC and its Protocols and dedicated to protecting cultural property in armed conflict. In particular, it will focus on our work reinterpreting and reactivating the 1954HC and its two Protocols in light of the recent military reports released recommending cultural property protection. Founded on the framework provided by the Laws of Armed Conflict, our work offers ways for the heritage community to reconceptualise how they discuss and deal with armed conflicts and cultural heritage destruction, and offers suggestions for work still to be done.

02 : LOCAL AND INTERNATIONAL NGOS WORKING TO PROTECT SYRIA'S CULTURAL HERITAGE

Author(s): Sabrine, Isber (Heritage For Peace; Spanish National Research Council - CSIC)
Presentation Format: Oral

The large-scale destruction of historical buildings, museum collections, and archaeological sites by different actors during the Syrian conflict has led to both international outcry and the development of initiatives and programs by International Organizations (IOs) and Non-Governmental Organizations (NGOs). The work of many international organizations focuses on the Syrian Directorate General of Antiquities and Museums (DGAM) (the governmental institution for cultural heritage management) while many sites are not – or were not - under the control of the government, in areas where DGAM staff cannot go.

Despite efforts by international organizations and international projects, many issues remain, such as the ongoing need for damage assessment and data collection which suffer from a lack of standardization and a high duplication rate. The legal and practical changes suggested by international legislation are rarely implemented: its impact on limiting destruction and looting inside Syria is difficult to properly assess, but overall is likely very limited.

Recognizing that solutions must come from within Syria, many initiatives in Syria aimed to address these problems by working with all Syrians to raise awareness, to safeguard collections, monuments and archaeological sites, to document and monitor the damages, and to stop the looting, and illicit trafficking of Syria's heritage. After giving an overview of the international actions taken towards heritage protection in Syria, this paper will show how Syria's civil society is participating and even leading this effort during the conflict. It will introduce the work of different Syrian NGOs who have been carrying out activities inside and outside Syria to empower local communities whilst developing sustainable program for heritage protection. It will then conclude by distilling lessons that can be applied to wider conflict scenarios for heritage management in conflict.

03 CONFLICT AND HERITAGE IN SOUTHERN ARABIA: DEVELOPING A HERITAGE MANAGEMENT PLATFORM FOR YEMEN

Author(s): Fradley, Michael (University of Oxford)

Presentation Format: Oral

The complex conflict in Yemen, which has been in a state of open warfare since early 2015, has seriously threated the preservation of a range of major heritage sites across the country. However, in comparison with other conflict-damaged regions of the Middle East, the situation in Yemen and its impact on its diverse heritage assets has received significantly less attention from the international community. The extensive problems created by the ongoing conflict have further exacerbated long-term resource issues for the national authority, the General Office of Antiquities and Museums (GOAM). This includes the lack of a functioning national digital heritage dataset, severely hampering the ability of national and international organisations to respond to the impact of conflict on heritage sites and landscapes.

This paper will present the development of the Yemeni Heritage Management Platform (YHMP) as a dynamic resource for the GOAM, building on the model of the Endangered Archaeology in the Middle East and North Africa (EAMENA) project database. This development project represents a partnership between GOAM, UNESCO, the EAMENA project and members from the international archaeological missions to Yemen. In addition to discussing the YHMP, the paper will also cover the use of a remote-sensing methodology as a means of assessing the current condition of heritage sites and to provide a systematic coverage of areas that have previous been subject to only limited ground survey in the past.

04 THE SHIRĪN INITIATIVE: PAST, PRESENT AND FUTURE

Author(s): Pucci, Marina (Università degli studi di Firenze) - Nieuwenhuijse, Olivier (Universiteit Leiden) - Jamieson, Andrew (University of Melbourne) - Novàk, Mirko (Universität Bern)

Presentation Format: Oral

SHIRĪN (Syrian Heritage in Danger: an International Research Initiative and Network) was created at the International Congress on the Archaeology of the Ancient Near East (ICAANE9) in Basel in 2014 in response to the war in Syria. SHIRĪN brings together a significant proportion of those international research groups that were working in Syria prior to 2011, with the purpose of making their expertise available to wider heritage protection efforts. Accordingly, SHIRĪN's international committee includes the directors of several long-term international research programs, and others who share their strong commitment to the effective protection of the heritage of Syria. Since the creation of SHIRIN, the executive board have focused on raising awareness about the existence of the initiative, particularly via the website and through the development of National Committees. The executive board members have communicated SHIRIN's aims and activities at meetings, congresses and conferences, and in publications, letters and exhibitions. One important SHIRĪN objective is to aid our Syrian archaeological colleagues; several examples demonstrate support and opportunities in this area. Whilst the development of SHIRIN and the creation of National Committees were promising first steps at the 2016 statutory meeting, the full potential of the SHIRIN initiative is yet to be fully reached or realized. This paper provides a critical overview of the past activities, present projects and future plans of the SHIRĪN initiative.

05 THE ARCHAEOLOGICAL VALUE OF CONFLICT DAMAGED SITES: LEBANON AS A CASE STUDY

Author(s): Newson, Paul (American University of Beirut) - Young, Ruth (University of Leicester)

Presentation Format: Oral

Conflict is impacting the lives of many millions of people, and the archaeology and heritage of many nations. All conflict-damaged archaeology and heritage can play a vital role as resources to help re-build damaged communities and offer hope of employment and reintegration to those impacted by war. Being able to offer ways of thinking of how to deal with damaged sites, gain as much information from them, and consider them a valuable resource rather than an inevitable casualty of war is critical to moving forward, and regaining control over land and identity.

With reference to the sites in Lebanon, particularly the site of Hosn Niha in the Bekaa Valley, we will show that with the right methods and questions, it is possible to obtain a great deal of original and important information from sites that have suffered badly through

conflict. Hosn Niha, along with many other sites in Lebanon was severely damaged as a consequence of decades of civil war and the associated unruliness and accelerated looting that went with this. Sites that have been badly damaged by various causes may be disregarded by professionals who consider that their archaeological or heritage potential has been too badly affected to warrant any investigation. Instead, as demonstrated by the Hosn Niha project, the opposite should become automatic: archaeologists should view conflict-damaged sites as opportunities to gain information and explore sites and regions with new agendas.

06 HERITAGE AT RISK. DESTRUCTION, CONSTRUCTION AND DECONSTRUCTION

Author(s): Teijgeler, Rene (Culture in Development)
Presentation Format: Oral

Deconstructing the Heritage at Risk framework shows that the fear of loss lies at the heart of heritage. Hence, the key role the framework plays in the Authorised Heritage Discourse. Risk is defined by experts over local forms of knowledge. However, the risk categories have never been properly defined or quantified. The framework stresses the materiality and permanence of heritage yet fails to take the locally informed heritage constructs into consideration. During catastrophic 'events' people are witnessing loss, both of the material and immaterial qualities of heritage. Both from a substantive technical and critical science point of view decay is inextricably bound up with materiality and immateriality of 'things.' But in 'risk society' decay is 'dirty' or even taboo, and needs to be avoided at all costs. Conservation today seems to aim at an arrest of materiality in time and place. This static basic assumption completely overlooks dynamic practices that reflect different understandings of destruction, decay and impermanence.

Many heritage experts miss out on the 'different voices.' Still, there is ample anthropological evidence that demonstrates how communities value integrity, authenticity, replacibility, threat and risk differently from prevailing expert notions. By the same token construction of new forms of heritage during a disaster are not recognized or acknowledged. The 'preferred past' might change in the course of violence as might the 'social character' of a particular locale.

The statement that local knowledge is indispensable in the protection of cultural heritage fully corresponds with the absolute requisite for delivering emergency aid i.e. to work with local communities. To observe the humanitarian charter and minimum standards in emergency aid will assist us to realize our goals. After all, heritage emergency aid is not only about heritage it is also about emergency and aid.

07 A (NEW) METHOD FOR STUDYING HERITAGE DESTRUCTION?

Author(s): González Zarandona, José (Alfred Deakin Institute for Citizenship and Globalisation)
Presentation Format: Oral

Caught between the intellectual work that explains heritage destruction as an aesthetic response and the ethical measures implemented to prevent heritage destruction, the study, analysis and interpretation of heritage destruction is a relatively new field of study in Archaeology and Heritage Studies. Two main sections form the proposed paper. In the first part, the paper will provide an overview of the methods and analytical frameworks (iconoclasm, vandalism, cultural genocide, collateral damage, terrorism) that have been used to date to study and explain the destruction of cultural heritage as a result of conflict. The paper will select a handful of case studies to show how the methods and frameworks are connected to specific conflicts.

In the second part, the paper will outline a new method to study heritage destruction taking into account the different actors that played a role in the most recent destruction of cultural heritage in the Middle East. Likewise, the paper will highlight the challenges and limitations that researchers face when studying these unfortunate cases of heritage destruction.

The paper will conclude by showing new methodologies, originally applied to the analysis of state violence against minority groups, and their application in studying and analysing heritage destruction. The conclusion will provide new avenues of research regarding the destruction of cultural heritage.

694 PREVENTIVE CONSERVATION AND VALORIZATION OF ARCHAEOLOGICAL HERITAGE: OPEN ISSUES AND BEST PRACTICES

Theme: Archaeology and the European Year of Cultural Heritage
Organisers: López Prat, Mònica (University of Barcelona; Dept. Conservation and restoration; Polytechnic University of Valencia; Dept. Conservation and restoration) - Mantellini, Simone (University of Bologna) - Font Pagès, Lídia (History Museum of Barcelona)
Format: Regular session

Excavation and conservation of archaeological sites are two sides of the same coin: a) creating new knowledge through scientific "disclosure", b) preserving the created knowledge through its "conservation" and its later valorization. Archaeological excavation is, for its intrinsic nature, a destructive operation that must be necessarily followed by an adequate conservation plan. Unfortunately, this systemic view is often forgotten and rarely archaeological investigations include a proper strategy for preventive conservation. This session will present examples of cooperation among archaeologists and conservators for the preventive conservation of sites of different periods, countries and types. The final aim is to highlight good practices and common open issues in order to discuss a roadmap for further research developments in preventive

conservation. For this reason, a particular focus will be dedicated to the discussion of incentives and mechanisms of mutual learning between archaeologists and conservators.

The session is open to archaeologists and conservators interested in preventive conservation of archaeological sites, but also encourages the participation of representatives of international public/private funding agencies interested in the debate around the preventive conservation of archaeological sites and the definition of future models/programme for funding archaeological sites investigation, conservation and their valorization.

ABSTRACTS

01 CONSERVING THE CITY UNDER THE CITY: ARCHAEOLOGICAL SITE OF PLAÇA DEL REI IN BARCELONA

Author(s): Pagès, Lídia - Puerto, Carla - Lázaro, Anna - Beltran de Heredia, Julia (Barcelona History Museum)
Presentation Format: Oral

The Barcelona History Museum has taken care the conservation of the archaeological site of Plaça del Rei for 75 years. This site runs through the subsoil of the city under various buildings, streets and squares, and therefore presents the problems of these underground areas with leaks of water and high relative humidity, among others.

The time elapsed since the excavation and the opening to the public has highlighted how necessary is the preventive conservation and the advantages of collaboration with the archaeologist responsible for the site. This is what has been sought since the 1990s when the study on the state of conservation is carried out and measures to combat the detected problems are determined, many of which need the collaboration not only of the archaeologist but of all staff. Starting from here, the maintenance protocol to be followed is established and, day by day, studies are promoted to deepen the knowledge of the environment and the constituent materials.

The archaeologist-conservator collaboration is also essential in the revision and updating of the interpretation of archaeological remains. In our case, the careful cleaning task, based on the joint and well-coordinated work between archaeologist and restorer, has revealed evidences that allow establishing the constructive phases of the site. Consequently, demonstrates how important it is that the conservator knows the archaeological methodology and the evolution of the study of the site so as not to erase any data. At the same time, the archaeologist needs to develop his work according to the guidelines that ensure the conservation and, therefore, following the instructions of the restorer. As a result of this understanding, the new archaeological planimetry has been generated from which a breakthrough in research has been made.

02 THE JOINT WORK OF ARCHAEOLOGISTS AND CONSERVATORS AT ELBORNCCM ARCHAEOLOGICAL SITE IN BARCELONA: AN EXAMPLE OF COOPERATION OVER TIME

Author(s): Fernandez Espinosa, Antoni (Freelance Archaeologist) - Bort Tena, Eugènia (El Born CCM. Ajuntament de Barcelona)
Presentation Format: Oral

The archaeological remains at the Born Center of Culture and Memory (Born CCM) were discovered in 2001, when the Born Market was being converted into the provincial public library of Barcelona. When the subsoil was opened, archaeologists uncovered the remains of an urban sector of Barcelona made up of 63 houses along 9 streets. The site dated from the end of the 13th century to the year 1717, when at least 1,000 houses were demolished (17% of the city) for the construction of a military fortress.

The findings changed the scope of the construction project, as city planners decided to preserve and appraise the archeological remains in situ.

From the very beginning archeologists and restorers worked together in order to restore and spread the heritage. Along the excavations, restorers were part of the team recovering delicate materials and consolidating precarious structures. Such interventions were always provisional.

When the site was declarated a protected heritage area (BCIN), started the architectural design to musealize it. At the same time, archaeologists and restorers set out the necessary treatments. Even interventions that respond to an aesthetic criterion, a consolidation or to a public presentation are carried out.

At the present, El Born CCM is a place where cultural events, heritage spreading and archaeological research come together from the ArqueoBorn program, which contemplates further archeological excavations, and it is made up of professional archaeologists and conservators, and students from local universities. Restorers are very present at the Born CCM, prioritizing the maintenance and preventive conservation tasks.

In this presentation, we will explain the joint work that we carried out in 2016 on a part of the site known as the “Corrales” house.

03 THE CONSERVATION OF ARCHEOLOGICAL REMAINS UNDER THE REFORM OF SANT ANTONI MARKET OF BARCELONA

Author(s): Gamarra, Agustín (Archaeological conservation-restoration) - Hinojo, Emiliano (Archeologist)
Presentation Format: Oral

The site occupied by the Sant Antoni Market has been the subject of various archaeological excavation campaigns from the time when the first surveys were carried out in the months of March and May 2007, up until its reopening in 2018. These excavations have resulted in the discovery of extensive archaeological remains, giving us a more complete picture of a part of the area that was just outside the city walls, particularly in terms of the road network and defensive systems. Archaeological discoveries have led to modifications in the Sant Antoni Market restoration project. In this way it has been possible to preserve many of the structures documented.

Throughout the construction processes - in particular those of structural reinforcement or the shoring up of the Roman remains and defensive structures from modern times - the joint tasks of archaeological supervision and preventive conservation have made possible the conservation of these great structures and archaeological spaces within the new market. Daily monitoring by technicians, the archaeologist and the curator of archaeology, working alongside the various teams of professionals involved in the project, together with the complex engineering operations that the project entailed, were of vital importance in achieving objectives, as was devising creative solutions to problems as they came up at different stages as the work developed.

04 URBAN ARCHAEOLOGY - A LITTLE CHAPEL AND THE TRAMWAY IN LUXEMBOURG-CITY

Author(s): Colling, Cynthia (CNRA - Centre National de Recherche Archeologique)
Presentation Format: Oral

In April 2016, the remains of the very first "Glacis-chapel" have been discovered in the center of Luxembourg-city during extensive road works in preparation of the new tramway crossing the capital of Luxembourg. Although its approximate location was already known thanks to historical documents, the discovery came as a surprise as the remains were thought to be entirely demolished by road works in 1913.

The excavations operated during the first half of 2016 aroused a wide interest on the part of the press, the Church and the population, not only because of the strong symbolism coming from the chapel's history but also because of the link to the construction of the tramway which caused quite a few debates in the forefront of the project.

In this paper, I will present the results of the excavation as well as the impact the discovery had on the urban development by modifying the original plans for the area in relation to the new tramway. The aim is to integrate the symbolic chapel into the urban surroundings by materializing its walls and remarkable elements on the ground and creating a didactic space around it. The planned stop for the new tramway will be adapted to this discovery by getting a new name related to the history of the monument.

The present paper will also focus on the long way to get to this specific materialization in regard to all the actors involved (the company building the tram, the city, the archaeologists, etc.) and the discussions that kind of conjunction of different administrations involves. It will also (briefly) show other projects related to the tramway and its implication on archaeological sites as the planned line will cross several of them and especially the well-known remains of the fortress of Luxembourg city.

05 STUMBLING IN THE UPSIDE DOWN. EXPERIENCES OF MUSEALIZATION AND ENHANCEMENT OF ARCHAEOLOGICAL ITALIAN METRO STATIONS

Author(s): D'Eredità, Astrid (High Institute for Conservation and Restoration - ISCR MiBACT)
Presentation Format: Oral

The construction of an underground metro line represents an opportunity for increasing knowledge of the urban fabric of large cities: it's a chance for archaeologists to make excavations otherwise impossible; it also might be a good occasion for passengers to travel through the archaeological layers.

Over the last few years, thanks to developments in the Italian law on Preventive Archaeology, the construction works of metro lines are now conducted following preventive investigations and maintaining a continuous archaeological surveillance on site. It's a quite different scenario from 1889, when the Cumana railway was inaugurated in Naples. And it's opening up a whole new world from the most recent constructions in Rome (the B Line was finished in 1955) and in Milan (Line 1 opened in 1964).

But what is the fate of structures and artefacts found during these excavations? Is it possible to carry out a sustainable development project of an in situ museum, as taught by the Athens and Thessaloniki Metro projects experience?

The contribution aims to provide an extensive review of Italian case studies composed of inhomogeneous attempts in Rome, Milan and Naples with very different outcomes in functional and aesthetic terms.

Moreover there will be a focus on the new Line C in Rome which is hopefully about to be completed, although in a very different way from the original project. On paper there was an idea of precise musealization of finds and structures in "museum stations" inspired by the Athenian ones, allowing some demolition, in a sort of compensation, in order to complete the works according to the original design of the most important areas. Currently, there will be two "archaeological stations": "San Giovanni", packed with hundreds of ancient artefacts displayed in softly-lit glass-fronted panels, and "Amba Aradam", displaying the remains of a Praetorian Guard

barracks

06 ARCHAEOLOGISTS AND CONSERVATOR-RESTORERS, A NECESSARY COLLABORATION. TWO EXAMPLES FROM CATALONIA

Author(s): Bertral, Anna (Institut Català d'Arqueologia Clàssica)
Presentation Format: Oral

In this communication we want to highlight the importance and necessity of a real collaboration between archaeologists and conservator-restorers in the fieldwork. In order to exemplify how the work of conservators-restorers can contribute and should form part of the tasks of research, we will present the work carried out in two sites in which restorers have been working together with teams of archaeologists of Catalan Institute of Classical Archaeology (ICAC) and University of Barcelona (UB).

One of the examples is the Iberian site of Coll del Moro (Gandesa, Tarragona), included in the project "El primer mil·lenni AC als territoris del curs inferior de l'Ebre: la formació, desenvolupament i dissolució de la cultura ibèrica 2014-2017" (UB). The second example is the Roman site of Costa de la Serra (La Secuita, Tarragona), within the project "Formes d'ocupació del territori i evolució del poblament a la Cessetània occidental durant la protohistòria (Ier mil·lenni aC)" (ICAC).

Presenting the work carried out in these two sites should serve to give a general but clear idea of the difficulties that arise in each case, showing the usefulness and the need of conservation works and restoration in the excavations. From these examples, we intend to generate debate between archaeologists and conservator-restoreres, and to discuss the nature, problems and needs of this joint work in of study and preservation of our heritage.

07 THE ROLE OF SERVICE OF ARCHAEOLOGY AND PALEONTOLOGY ABOUT PREVENTIVE CONSERVATION AND VALORIZATION OF ARCHAEOLOGICAL HERITAGE IN CATALONIA

Author(s): Miró Alaix, Maria Teresa (Servei d'Arqueologia i Paleontologia, Generalitat de Catalunya)
Presentation Format: Oral

The Government of Catalonia has a great interest in preventive conservation and valorization of archaeological heritage. Some of the most important functions attributed to General Direction of Cultural Heritage are to preserve the heritage for future generations and to put this at the disposal of the public.

About preventive conservation, the Service of Archaeology and Paleontology works in different ways:

- Concerning archaeological research, the Government of Catalonia approved the "Plan of Research of Catalan Archaeology and Paleontology" in the year 2014. This plan forced research agents to put in his project actions about protection and conservation of sites.

- Concerning preventive archaeology, the Service takes care of archaeological heritage promoting actuations of consolidation of sites, controlling the final state of the remains in the course of preventive interventions and giving advice and grants to town councils to manage archaeological sites.

About valorization of archaeological heritage, the General Direction of Cultural Heritage has elaborated the "Plan of Actuation in archaeological and paleontological sites (2015-2022)". The objective of plan is to make accessible this heritage to citizenship. The selection of sites answer to criteria relating heritage value, reading understandable of the remains, adequacy, signaling, infrastructure of reception and potential expectation of visitors.

08 ARCHAEOLOGICAL SITES BETWEEN CONSERVATION AND OPPORTUNITY FOR LOCAL DEVELOPMENT: KAFIR KALA IN THE SAMARKAND REGION (UZBEKISTAN)

Author(s): Mantellini, Simone (University of Bologna) - Pipan, Tommaso (University College London UCL) - Berdimuradov, Amriddin (Institute of Archaeology, Academy of Sciences of Uzbekistan)
Presentation Format: Oral

The Samarkand region is historically a major economic, cultural, religious, linguistic and ethnic crossroad of Uzbekistan and Central Asia. Since 2001, the Uzbek-Italian Archaeological Program UIAP "Samarkand and Its Territory" (University of Bologna, ITA, and the Institute of Archaeology of the Uzbek Academy of Sciences) works in this territory with the aim of discovering, preserving and valorizing such a unique cultural heritage made of thousands of archaeological sites, monuments and historical places. During the last years, major efforts were addressed to the Early Medieval-Islamic fortress of Kafir Kala, located ca. 12 km from Samarkand. This is a ca. 20 ha large compound entirely built with mud bricks and typical Central Asian pakhsa (adobe). One of the most important archaeological issue concerns the need to preserve the architectural evidence after the seasonal excavations, possibly with traditional technique and materials. A second, but crucial, matter concerns the possibility to include Kafir Kala within the touristic programs that increased widely during the last years in the Samarkand region. This, however, is limited to the main monuments of the historical city inscribed within the UNESCO list since 2001. The UIAP intends to include less famous sites of the Samarkand hinterland within the touristic travels. In particular, the UIAP intends to open Kafir Kala to the public, supporting its visit with appropriate infrastructures and adequate logistics. This would represent a unique opportunity not only to spread the archaeological results among the scientific community, but also to provide the opportunity of economic development for the local people, authorities and touristic agencies.

09 CONSERVATION AND RESTORATION IN ABASSEYA B SITE (KARIMA, SUDAN)

Author(s): Domínguez, Margarita - Alcobe, Margarita - Bermejo, Eva (conservador restaurador)
Presentation Format: Oral

The study of the historic remains excavated in a particular site following an archaeological methodology, must be directly linked to a conservation project of the mentioned site and, whenever possible, to the exhibition of the results obtained. That is the case of the Abasseya site. This site is located in an urban area of the town of Karima, specifically in one of the public squares of the Abasseya neighborhood, outside the current limits of the archaeological zone of Jebel Barkal. Historically, the site would have been part of the same religious area, being one of the temples that would form part of what is called a Meroitic ceremonial complex. In addition to the main temple substructure, during the excavations, numerous outstanding elements have been found, being the most representative several remains of polychrome columns. Wahat Projects team, under the direction of Ph.D Montserrat Díaz de Cerio, has been carrying out restoration and conservation tasks in parallel to the archaeological work at the Abasseya site. We present here some of the results of the studies performed to the material samples and the actions carried out in the site each season. These actions consist of restoring the original plaster as well as recovering some degraded areas with the intention of conditioning the site for exhibition. The exhibition project includes the adequacy of the space with a peripheral ramp and the protection of the site with a permanent fence. Finally, we will also describe the reconstruction of one of the colored columns, which was placed within the Barkal Museum, and its significance as a unique example of the Meroitic architecture.

10 PROJECT LA BASTIDA (TOTANA, MURCIA). EFFICIENT DRAINAGE AS A PREVENTIVE CONSERVATION STRATEGY IN STEEP SLOPE ARCHAEOLOGICAL SITES

Author(s): Escanilla, Nicolau (Universitat Autònoma de Barcelona-ASOME) - Escalas-Vallespir, Maria Magdalena (Independant Curator)
Presentation Format: Oral

During the Early Bronze Age of the south eastern Iberian Peninsula, the El Argar society (2200-1550 cal BCE) founded its most prominent settlements on steep hills with natural defences. The La Bastida settlement (Totana, Spain) rises along a hill that reaches 481 m above sea level. The 5 hectares of occupied surface make it one of the largest known argaric sites. The whole area seems to have been occupied by tight web of complex dwellings and different public buildings, some of which are preserved several meters in high. These structures were organized into terraces built on steep slopes.

Currently, the climate of this region is defined as semi-arid warm, with very little annual rainfall, sometimes concentrated in violent rains of more than 200 l/m2 in 24 hours. This type of rainfall, together with the steep slope, means that rainwater poses a serious risk to the conservation of archaeological structures.

The excavation and conservation work carried out by the La Bastida Project (Autonomous University of Barcelona) has focused mainly on the foothill area, where architectural structures have been strongly affected by storm run-off and colluvial deposits.

To prevent damage to archaeological structures, a preventive conservation strategy has been implemented to ensure efficient drainage of torrential waters. The different technical solutions used and their response to torrential events will be presented. Each type of solution has been adapted to the characteristics of the natural terrain and the requirements of the archaeological structures. These conservation and restoration strategies have allowed to preserve the first Bronze Age urban centre excavated extensively in Western Europe and make it accessible to the general public.

12 CONSERVATION OF EARTHEN ARCHAEOLOGICAL SITES WITH DECORATED SURFACES

Author(s): López Prat, Mònica (University of Barcelona; Dept. Conservation and restoration; Polytechnic University of Valencia; Dept. Conservation and restoration)
Presentation Format: Oral

Among the many types of archaeological sites, earthen archaeological sites are particularly vulnerable to deterioration. The transition from burial to exposure can wreak major destruction in a very short time if this transition is not carefully controlled. Rapid drying of earthen materials is particularly problematic, as the component clays shrink, the earthen materials crack, and the weak chemical and mechanical bonds are broken (Oliver 2008). Therefore, conservation of earthen archaeological sites is often a combination of techniques for lengthening the preservation after the exposure of the excavation, such as temporary and permanent shelters, drainage systems, wall caps, reassembly and reconstruction, the use of consolidants, water repellents and modified earthen materials for repair, re-burial, and in many cases, removal and relocation.

However, these techniques are, in most cases, applied as emergency or temporary solution. The lack of planning can be particularly problematic if we consider the extreme fragility of earthen archaeological architecture with decorated surfaces (such paintings, sculptures or different kinds of reliefs). In these cases, a preventive conservation strategy before starting to excavate is indisputably the necessary option.

This paper aims at highlighting the importance of collaboration for a preventive conservation plan between archaeologists and conservators through a series of case studies and selection of worldwide practices related with the conservation of earthen archaeological sites with decorated surfaces. It will be shown the positive effects of this collaboration, as well as the disastrous consequences when this collaboration has not existed.

696 RE-THINKING "INTERACTION" IN IRON AGE EUROPE: COMPARING RESEARCH TRADITIONS TO EXPLORE ALTERNATIVE WAYS TO INTERPRET ARCHAEOLOGICAL DATA

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Saccoccio, Fabio (University of Nottingham, Department of Classics and Archaeology) - Bernard, Loup (Université de Strasbourg CNRS UMR 7044 ArcHiMedE) - Danielisova, Alzbeta (Institute of Archaeology CAS, Prague) - Fogliazza, Silvia (Université Paris Nanterre, Ecole Doctorale "Milieux, cultures et sociétés du passé et du présent") - Vecchi, Elisa (University of Nottingham, Department of Classics and Archaeology) - Zamboni, Lorenzo (University of Pavia, Department of Humanities)

Format: Regular session

The Iron Age in Europe is a crucial period characterised by an increase in social complexity, urbanisation processes, importance of long-distance trading networks and the appearance of written sources. Intensive interaction between socio-cultural groups seems to be a fundamental component of these processes.

"Interaction" is here seen in its broadest sense involving phenomena such as migration, trade, spreading of technologies, religious and funerary practice, art, inter-cultural encounters or conflict, in order to grasp, as far as possible, the full range of socio-cultural implications of interaction between individual social groups.

The session aims to challenge the traditional perception of evidence for interaction, generally driven by traditional, 'national' approaches or specific research schools. Nevertheless, it is precisely the diversity of European archaeological approaches that can act as a stimulus for the evaluation and interpretation of the wide diversity of evidence relating to past interaction.

The session particularly welcomes contributions dealing with archaeological approaches to interaction from European Iron Age contexts. We encourage papers dealing either with theoretical concepts of interaction of various sorts, or methodological studies focused on, for example, mobility, analysis of provenance, socio-economic networks, etc. This will allow us to compare and discuss different traditions of study and methodological approaches, so as to explore alternative ways of interpreting the archaeological data. The aim is also to stimulate cooperation between researchers encouraging networking and knowledge sharing.

ABSTRACTS

01 THINKING ABOUT INTERACTION: TRADE, COLONISATION AND SOCIAL CHANGE

Author(s): Pearce, Mark (Department of Classics and Archaeology, University of Nottingham)

Presentation Format: Oral

In this paper I shall highlight the main themes of the session, starting with a specific case study. Much thinking about Iron Age interaction in Mediterranean Europe has been couched in terms of encounters between societies at different levels of social complexity, specifically in terms of colonisation by Phoenicians or Greeks or the expansion of the Roman Empire. While traditionally archaeologists emphasised the impact of urban societies on 'indigenous' groups, not least because of the accounts of the ancient sources, and a pervasive view of the cultural superiority of the Greeks and later the Romans, more recently the emphasis has changed, and more attention has been dedicated to the agency of those colonised in their manipulation of material culture.

In this paper I shall concentrate on the precolonisation phase of contact, looking specifically at the cemetery of Chiavari (Liguria, north-west Italy), which dates to the last quarter of the eighth century - end of the seventh century BC and seemingly documents trade north from Etruria, but which has strong links with the Golasecca culture group of the western Po plain. Although colonisation is clearly an important phenomenon, I shall argue that concentrating on precolonial phases allows us to escape the colonisation paradigm and therefore to reflect more freely on the nature of interaction.

02 FROM THE BALTIC TO THE MEDITERRANEAN: ANCIENT LIGURIA AND THE AMBER EXCHANGE NETWORK

Author(s): Vecchi, Elisa (University of Nottingham)

Presentation Format: Oral

Amber has long been used to investigate long-distance connections and exchange networks across Europe during the late prehistory. As far as the Italian peninsula is concerned, much attention has focused on the role played by the eastern Alps and by the upper Adriatic as the key areas for the re-distribution of Baltic amber towards the rest of the peninsula and the Mediterranean.

Despite the hypothesis that a 'western route' connected central Europe and Italy via the upper Rhone valley and the San Bernardino Pass (Negroni Catacchio et al. 2016, following de Navarro 1925), until now little attention has been paid to the presence of amber in north-western Italy, which is usually not considered within the wider Mediterranean system of amber distribution.

In this paper I shall discuss the distribution of amber artefacts in the area of ancient Liguria, which stretched from southern France to the Tuscan-Emilian Apennines in Italy, with the aim of investigating the amber exchange network. In order to overcome the traditional approach based on chronology, typology and distribution, which usually treats amber finds as 'dots on a map', I will consider the artefacts within their context and in connection with their symbolic and functional meanings. Finally, I will investigate the role of

the Ligurians as possible intermediaries between central Europe and the Tyrrhenian area.

de Navarro, J.M. 1925. Prehistoric Routes between Northern Europe and Italy Defined by the Amber Trade. Geographical Journal 66(6): p.481–503.

Negroni Catacchio, N., & Gallo, V. 2016. L'ambra in Italia. Le vie di pentrazione e la diffusione durante la protostoria. In P. L. Cellarosi, R. Chellini, F. Martini, A. C. Montanaro, & L. Sarti (eds) The amber roads. The ancient cultural and commercial communication between the peoples, 313–336. Roma: CNR

03 PAINT IT BLACK (AND RED)! RETHINKING IRON AGE INTERACTION BETWEEN THE CENTRAL PO PLAIN AND THE EASTERN ADRIATIC COAST

Author(s): Saccoccio, Fabio (University of Nottingham, Department of Classics and Archaeology) - Zamboni, Lorenzo (University of Pavia, Department of Humanities)

Presentation Format: Oral

In this paper we shall critically examine the distribution of Iron Age Red and Black painted ware inside and outside the present Veneto region (north-eastern Italy). This specific pottery class appears at the end of the 7th c. BC in the context of the Este Culture, traditionally assigned to the Veneti, a people named in the ancient sources.

However, at least from the beginning of the 6th c. BC Red and Black ware is widely distributed outside the Veneto region, embracing an area from the central Po Plain to the eastern side of the Adriatic Sea. This pattern was sometimes considered in culture-historical and diffusionist terms as evidence for movement of Venetic people outside the Veneto.

Through an in-depth analysis of the distribution and stylistic variability of the Red and Black ware from both the Veneto and the surrounding areas, we shall attempt to critically re-evaluate this pattern. Our aim is also to question the (ab)use of ethnic labels in Iron Age Italy, and consider alternative ways of explaining this evidence in terms of interaction: not only movement of people but also trade in goods, exchange of know-how, etc.

Archaeological evidence will be set against the reconstructed chronological background and the intrinsic local variability of the assemblage in order to outline interaction vectors through time and space (rivers, sea, Alps), stressing the possible existence of a wider network (koiné?) covering a broad region, from the Central Po Plain to the eastern side of the Adriatic Sea.

04 CERAMICS IN IRON AGE THRACE: AN OVERVIEW OF TRADITIONAL AND INNOVATIVE APPROACHES IN INTERACTION STUDIES

Author(s): Hart, Ashlee (University at Buffalo, SUNY)

Presentation Format: Oral

The identification and interpretation of cross-cultural interactions in the archaeological record has long been an important and debated component of archaeological studies around the world. In the region of modern Bulgaria, ancient Thrace, "interaction" has been subject to various approaches ranging from traditional theories about migration and acculturation to theories of colonialism and cultural privilege of outsiders. However, modern archaeological practices are moving beyond the limited agendas practiced in the past to incorporate postcolonial interpretations among other novel theoretical concepts into the interpretation of the material record. This paper will briefly address some of the major traditional interpretations of interaction and the impact of these viewpoints before presenting a new multiscalar approach. The new approach utilizes an understudied material from Iron Age Thrace (c. 1,200 - 200 B.C.E.), the locally made ceramics, to establish provenance of changes in material culture, which can be systematically linked to cross-cultural interaction through a combination of methodological and theoretical approaches. The approach includes macroscopic visual inspection and microscopic archaeometric testing to reveal changes or consistencies in the manufacturing and consumption of ceramics. The changes or consistencies are then interpreted through several theoretical lenses to infer the reaction and impact of interaction on local peoples. (200)

05 THRACIAN-GREEK INTERACTIONS: POST-COLONIAL PERSPECTIVES ON AEGEAN IMPORTS IN THE BALKANS

Author(s): Dimova, Bela (University of Cambridge)

Presentation Format: Oral

Ancient Thrace, located in the south-east Balkans, is a crossroads between temperate Europe, the Aegean, Anatolia, and the Black Sea. Many of the social changes and historical shifts in Thrace during the first millennium BC are linked to the interactions between local communities and people from neighbouring regions. These interactions took a variety of forms, including trade, migration, conflict, technological transfer, and elite contacts among others. The evidence for them includes archaeological and historical sources, each bringing its own methodological challenges. This paper examines how we can identify and interpret the movement of people, goods, practices, technologies, and ideas from one society to another, using the example of Greek imports in Iron Age Thrace. It does so by applying insights from post-colonial theory to traditional archaeological data, such as catalogues of coins and pottery, distribution maps, etc. The central concern in this approach is to investigate how and why indigenous communities adopted foreign objects, technologies, and practices and how these imports fitted in or transformed existing ways of living. The paper also addresses some of the challenges and limitations of asking questions about nuanced social practices when working with low resolution

legacy archaeological data and historical sources written by Classical authors.

06 BLURRED LINES: TRIBAL IDENTITIES AND MATERIAL INTERACTIONS BETWEEN NORTHERN THRACIANS AND SCYTHIANS

Author(s): Crystal, Donald (Cardiff University)
Presentation Format: Oral

Traditionally, ethnic groups within archaeological scholarship have been defined as entities with obvious material boundaries. However, using northern Thracian and Scythian grave goods (600-300 BC) as an example, I shall demonstrate that the reality is very different.

From the work of the socio-anthropologist Fredrik Barth (1969), ethnic identities and cultural groups are characterised by the presence of distinct material boundaries. These boundaries are formed, re-formed, and reinstated against the boundaries of an ethnic 'other'. However, when testing Barth's (1969) theory, especially in archaeology, the answer is never as simple as 'identifying boundaries'. This is especially the case when it comes to the interactions between the northern Thracian and Scythian tribes. Historically speaking the two cultures are very distinct, particularly for modern-day nationalist archaeologies. From the perspective of local archaeologists, Thracians are by definition Bulgarian, and Scythians are Russo-Ukrainian. However, when the archaeology is analysed, the two 'ethnic' groups are very much connected and materially intertwined. I will argue, therefore, that contrary to nationalist archaeologies, these boundaries are never as clear as we would otherwise want them to be. Using the funerary assemblages of the northern Thracians and Scythians as an example, I will argue that ethnicity, through the point of view of material interaction, offers archaeologists a new insight into the ways in which tribal identities manifested during the Iron Age around the Black Sea Coast. More broadly speaking, using the archaeology I will show how versatile Iron Age identities may have been and how we should rethink concepts like ethnicity from the point of view of material interaction.

07 CHANGES OF MORTUARY PRACTICES IN THE IRON AGE OF THE CENTRAL BALKAN REGION

Author(s): Kuzmanovic, Zorica (Faculty of Philosophy, Department of Archaeology)
Presentation Format: Oral

Archaeological knowledge and conclusions regarding the Iron Age of the Central Balkan region has been mostly based on an investigation of mortuary remains and way of burying during this period, since the identified settlements have not been systematically investigated yet. The observed changes in mortuary practice throughout the period have been predominantly interpreted as a reflection of a process of social differentiation and appearance of a new kind of social authority and organization, so-called chiefdom. It has been assumed that similarly to the rest of Europe in the Iron Age an intensification of regional contacts and exchange resulted in formation of redistributive trade centers and consequently, the increasing social stratification. While today some archaeologists put into question a crucial role of redistributive trade in the process of social stratification and suggest other kind of exchange between Iron Age communities, nevertheless the changes in the mortuary rituals continue to be mostly interpreted as a reflection of changes in social structure and a kind of social complexity.

Without denying manifold indicators of social transformation during the period, the aim of my paper is to suggest also possible changes in the realm of religious and ideological conceptions that could be assumed on the basis of changes of mortuary practices. More precisely, I question whether the introduction of cremation to the region where inhumation was practiced as almost exclusive way of burying for centuries, could be interpreted as the result of religious and ideological changes and if it might be connected with the intensification of regional contacts and interactions throughout this period. A case study that will serve to illustrate all above mentioned will be mortuary rituals identified within Iron Age necropolises in the area of so-called Glasinac culture.

08 WER BIN ICH? UND WENN JA, WIE VIELE?

Author(s): Scheffler, Sarah (University of Leicester)
Presentation Format: Oral

"Wer bin ich? Und wenn ja, wie viele?" – Who am I? And if so, how many? This title of a popular German introduction into the meaning of life could well be the title of almost every research project towards its end. The study of past identities relies primarily on two sources – the archaeological and historical record, and the cultural and academic background of the researcher – who am I? With my contribution I would like to demonstrate how Zeitgeist has impacted and still influences the way we think about the Roman conquest of north-west Italy and the interplay between 'Celts', 'Gauls' and 'Romans'.

The Lomellina (PV) is part of Lombardy and bordered by the rivers Ticino and Po. The analysis of individual material categories and burial rituals highlights a network of communities sharing an Iron Age culture that was partly influenced by the transalpine La Tène culture, partly preserved its own characteristics and partook in the wider Mediterranean exchange. The increasing Romano-Italic influence on material culture following the Roman conquest left its mark also on the Lomellina – leading to an extraordinary amount of glass vessels and the unusual incorporation of funerary beds in local burial customs.

The material culture of the late Iron Age and early Imperial Lomellina allows us to understand cultural change and changing identities; it allowed me to write a British PhD thesis about an Italian archaeological landscape based on my German academic background – because our understanding of who they were is fundamentally influenced by who we are – and how many academic identities impact

our work.

09 PATHOLOGIES DURING THE IRON AGE - A COMPARATIVE STUDY OF HUMAN REMAINS FROM SWITZERLAND

Author(s): Moghaddam, Negahnaz (Unit of Forensic imaging and Anthropology, University Center of Legal Medicine - CURML, University Hospitals Lausanne-Geneva; Department of Physical Anthropology, Institute of Forensic Medicine, University of Bern) - Arenz, Gabriele (Department of Physical Anthropology, Institute of Forensic Medicine, University of Bern) - Müller, Felix - Hafner, Albert (Department of Prehistory, Institute of Archaeological Sciences, University of Bern) - Lösch, Sandra (Department of Physical Anthropology, Institute of Forensic Medicine, University of Bern)

Presentation Format: Oral

The large amount of Late Iron Age burial sites in Switzerland (450 to 15 BC) represents an important source for bioarchaeological studies. This research focused on anthropological and paleopathological data to gain insights into living conditions, social structures, and socio-economic differences in Iron Age Switzerland. In total, 179 individuals from six regions were included. Sex and age at death were estimated and pathological alterations such as dental diseases, non-specific stress markers (cribra orbitalia), and trauma were investigated. Additionally, comparative analyses to other sites and time periods were conducted. The data showed an overall low frequency of infants, while the poor preservation of small infant remains should be taken into account. For Iron Age Switzerland, a caries frequency of 38% was observed with no significant differences in the caries intensity between males and females. In Münsingen, however, the higher caries intensity in females (6%) compared to males (4%) might reflect a different diet, also supported by isotopic studies. Research on diachronic changes of caries intensities, from the Neolithic to the Modern period, showed an increase over time due to rising amounts of carbohydrates and sucrose in the diet. In total, 17% of all individuals with at least one observable orbit showed signs of cribra orbitalia indicating that Iron Age populations suffered from multiple stress-factors. Skull lesions, representing an intentional blow, were mostly observed in males (5/6). Sex differences in skull injuries could be indicative of interpersonal violence. From archaeological records and written sources, it is known that violent combats were part of the everyday life during the Late Iron Age.

10 BELT PLATES AND DAGGERS. SIGNS OF INTERACTION IN THE EARLY IRON AGE COMMUNITY OF THE MAGDALENENBERG NEAR THE BLACK FOREST

Author(s): Koch, Julia Katharina (Kiel University)

Presentation Format: Oral

The rise of the West Hallstatt societies is unthinkable without interaction between the people of the Mediterranean, the Alps and the north-alpine regions. That´s why discussion and reconstruction of early iron age cultural contacts and trade routes have a long research history. Unchallenged is the meaning of the members of the highest status group for every kind of interaction in this period. One well known example is the lady of Vix in Burgundy with her huge crater. But what about members of other social groups of Early Iron Age communities? How close would it be possible to reconstruct the roles and identities of individual contact supporters? Archaeometrical methods like isotope analysis allow us to pick up foreign (i.e. non-local) people out of the communities. Are they really the supporters of active interaction and cultural contact? How can such supporters be recognized and defined by grave goods and anthropological data? And what would we expect with our modern knowledge and research context? Those questions will be discussed with examples from the burial mound Magdalenenberg at the eastern edge of Black Forest (Germany). This tumulus was built up around 616 BC and afterwards used nearly 70 years as cemetery for more than 120 burials. The analysis of the burial inventory is part of a project about individual mobility in sedentary societies in Central Europe.

11 BETWEEN WEAPON EXCHANGES AND SOCIAL PRACTICES, THE STUDY OF WARFARE INTERACTIONS IN WESTERN EUROPE DURING THE LAST CENTURIES BC

Author(s): Bertaud, Alexandre (University Bordeaux Montaigne; Ausonius Laboratory)

Presentation Format: Oral

The analysis of warfare interactions involves a lot of different approaches. The discovery contexts are central to understand the place of weaponry in ancient societies. They allow us to apprehend the use of weapons within the societies to create or to consolidate a particular status.

The artefact analysis is also important to approach the particularity of the weaponry. As all tools, the weapons were made to be used in a specific way. To approach this, we must analyze the typologies and the morphological aspects of the weapons to understand the way to use them. To do so, we can focus on the morphology itself but we also need to fill the gasps of the loss part, as the perishable materials or the oxidation associated with rust. The 3D tools allow us to work on recreation and to analyze the models in different ways. This approach appear to be significant to understand the gestures and the fighting technics even for artefacts morphologically distant.

This paper will deal with the methodologies associated to warfare interaction analyzes through a study of the Western Europe area during the last centuries BC. The complementarity of the approaches of warfare interactions, will give us the possibility to understand the modifications of the Gallic societies and their integration within the latenian Koine. This paper will also apprehend the

exchanges of latenian weapons to the north Iberian area, their adoptions and recreations by the Iberians and then the Celtiberians. It will be important to integrate the impact of Mediterranean power of Rome to understand the changes and modifications of long range interactions between late prehistorical societies, as well as the adoption of the Gladius Hispaniensis by the roman soldiers.

12 HOW THE CELTS OF SOUTHERN FRANCE CHANGED AFTER THE FOUNDATION OF MARSEILLES

Author(s): Loup, Bernard (Université de Strasbourg; CNRS UMR 7044 Archimede)
Presentation Format: Oral

The excellent state of art in Celtic studies around Marseilles gives the possibility to study reactions from a group of "natives" to an external stimulus. The paper will discuss different aspects, from history of research to interpretational paradigms and some open questions.

The history of research shows the importance of Mediterranean wares as chronological markers and explains the bad knowledge of settlements before the first Mediterranean trade in the Golfe du Lion (VII th century BC). This difference in how we date our Iron age sites in comparison to most Celtic studies –with the importations and not with the metallic artefacts-, and the difficulties to analyze the period prior to Marseilles due to low resolution markers and open settlements makes our understanding of the pre-Greek time complicated.

At the opposite, the urbanization phase that follows the foundation (around 550 BC) is characterized by a "synoecism" that archaeologists can read in the emergence of hillforts –with excellent preservation of archaeological remains. This change from wooden houses with oval shape to stone-earth architecture in fortified settlement will be emphasized, but also the changes that reflects in the society with the sudden disappearing of graves until the Roman period (118 BC).

Most of the other indicators, from weapons to ornament or ritual practices show that the "Gaulois du Midi" are part of the Celtic world, even if they're at his fringe, and that they choose to use some Greek techniques, wheel pottery or mud bricks for example, but are far from being hellenized.

13 CHANGING LANDSCAPES AND CHANGING PLACES IN SOUTH-EASTERN SLOVENIA IN THE FIRST MILLENNIUM BC

Author(s): Mason, Philip (Zavod za varstvo kulturne dediščine Slovenije)
Presentation Format: Oral

The paper seeks to examine and compare cultural historical and post-processual models for the interpretation of the archaeological evidence for changing land use and settlement patterns in the Late Bronze Age (LBA), Early Iron Age (EIA) and Late Iron Age (LIA) in South-eastern Slovenia. This region lies astride the main routes between the head of the Adriatic and the Eastern Alpine region, which were avenues for exchange of differing intensity and orientation throughout the period under discussion. It is characterised by the Late Bronze Age settlement pattern of large open settlements in river valleys and small upland settlements. These are replaced in the transition to the Early Iron Age by larger defended settlements on upland edges, as well as on isolated hills and river meanders in the lowlands. The majority of these settlements seem remain in use up to the end of the Late Iron Age, but there are changes in the settlement layout.

The mortuary record changes the Late Bronze Age flat cremation cemeteries being replaced by highly visible mortuary zones - barrow cemeteries in the Early Iron Age. These contain heterogeneous material with abundant evidence of interaction through long distance prestige exchange and hierarchization. The transition to the Late Iron Age is visible a discontinuity in the mortuary record and a return to the use of flat cremation cemeteries.

The evidence for these changes will be examined in the light of new data that is now available from large scale interventions in space. How far are these changes in the settlement and mortuary spheres reflected in changes in land use? Is there a shift in the nature and intensity of agricultural and industrial exploitation, resulting in landscape change?

14 NEW METHODS IN RE-THINKING THE IRON AGE: ARE WE THERE YET? A NETWORK-EXAMPLE OF LATE IRON AGE OPPIDA

Author(s): Schneider, Agnes (Philipps-Universität Marburg)
Presentation Format: Oral

Social hierarchy and socio-cultural interaction in Iron Age Europe reflect an increase in complexity. How can we understand, access and assess this complexity of information? How does the "traditional" research approach deal with big amounts of data? (How) Can data-driven methods ease the handling of archaeological big data? How can we translate archaeo-sociological data for quantitative methods to be used effectively? Can we get a clearer – (more) objective view on the output (and input) data? Can quantitative methods give the answers we seek? Can new methods at least show or point us in direction(s)/paths we should or shouldn´t look or take?

Answers to these questions should deliver a network-analysis of Late Iron Age sites, those classified as Oppida and the known open settlements, as a case-study of quantitative- data-driven methods. Network-analysis can be a powerful tool to shed light on the various layers of connectivity.

As basic data input the open-source data of 'oppida.org' was used and extended by information from other resources, all mainly

open-source. Different open-source network-analytic software is used (Visone, Gephi, 'vistorian.net') to generate the networks and to investigate the relations between these Late Iron Age Sites on behalf of certain statistical parameters and algorithms on the basis of the input information.

a. ANALYSIS OF WETLAND DEPOSITION IN IRON AGE WALES AND SCOTLAND

Author(s): Treadway, Tiffany (Cardiff University, SHARE)
Presentation Format: Poster

Studies on wetland artefacts are usually type or site specific (i.e. Earwood 1993, Mowat 1996, and Garrow et al 2010; the exception Martin 2003). These finds are commonly classed as votive offerings (ex. Green 2001, Fitzpatrick 1984, Van de Noort 2000, Grant 1989), a theory that has yet to be revisited in sixty or seventy years. In the past fifteen years, however, focused attempts to revisit votive theories has been conducted on specific object types, or small scale regional or singular site locations. While there is evidence of unique objects and sites, these appear to dominate the literature instead of focusing on domestic patterns of production, use, and disposal of artefacts on a mass scale for a specified period, region, and environment. Therefore, this project aims at collecting all available records of wetland artefacts dating to the Iron Age in Wales and Scotland. I will reanalyse deposition patterns and challenge existing theories of ritual, archaeological methods, and establish a comprehensive dataset to be the baseline for catalogues that pertain to wetland environments. The project further serves to provide a larger narrative and comparison of Iron Age Wales and Scotland from depositional patterns. My hope in highlighting the significance wetlands serve, not only for environmental benefits but historical preservation, is to further legislation and awareness in Britain for the protection of this rapidly depleting landscape and the archaeology it contains.

698 JUST ADD WATER AND MIX: HERITAGE AND CLIMATE CHANGE - CHALLENGES AND NOVEL APPROACHES

Theme: Theories and methods in archaeological sciences
Organisers: Dawson, Tom (University of St Andrews; SCAPE) - Corns, Anthony (The Discovery Programme; CHERISH) - Ostrich, Stephanie (CITiZAN; MOLA) - Driver, Toby (RCAHMW; CHERISH)
Format: Regular session

Although some dispute the causes of climate change, most agree that changes are taking place now. Successive reports have presented projections that, over time, have been shown to be correct, and there is every indication that significant change will continue into the future. There has been increasing awareness of the vulnerability of heritage sites to climate change, and it is likely that places besides or below water will be some of the most affected in the short term. Rising sea levels, flash floods, increased melt water, more powerful storms and warming oceans and lakes can all affect heritage sites, resulting in catastrophic damage. We are already seeing increased rates of erosion, inundation, chemical change and organic decay, and it is probable that damage will accelerate.

In order to start planning for the future, we all need to come together to develop solutions, similar to the way that the Rescue movement galvanised action in previous decades. Although the scale of the problem may make us despondent, the threats also pose new opportunities, with novel approaches to recording being developed and greater involvement of communities in heritage management and recording. We welcome papers that outline current problems or courses of action to mitigate the growing threat to sites besides or below water, together with discussions exploring what can be learned from past extremes. We hope that the papers presented will be of use to all as we start to tackle the threat that climate change poses to our shared archaeological heritage.

ABSTRACTS

01 LOSING THE EDGE - GAINING GROUND. MAPPING CLIMATE CHANGE AND COASTAL CLIFF LOSS AT HERITAGE SITES IN WALES

Author(s): Driver, Toby (Royal Commission; CHERISH Project)
Presentation Format: Oral

The remote western coastlines of Wales are home to many hundreds of protected heritage sites, among them some of the most iconic prehistoric coastal promontory forts in western Britain. These cliff-top or coastal prehistoric settlements are battered by waves and storms and scoured by salt-spray. Increasing storminess, the threat of sea level rise and higher wave-overtopping through climate change increases their vulnerability to erosion and collapse, and the loss of archaeological stratigraphy without record.

Accurate geomatic data, including modern mapping or LiDAR better than 1m resolution, is vital to monitoring long term change yet in remote western Wales this can be entirely lacking. The 5 year EU-funded CHERISH project is looking to reinstate precision data for long term monitoring of its Welsh coastal study sites. New remote sensing data, including 25cm airborne LiDAR for six principal Welsh islands coupled with aerial and drone-based photogrammetry of coastal cliff sites and promontories, allows accurate base-

lines for long-term monitoring to be established. On the ground dGPS surveys are used to fix eroding coast edges. A century of change can be mapped against recent datasets using georeferenced nineteenth-century mapping and orthorectified historic aerial photographs.

CHERISH will leave a legacy of securely archived high resolution coastal datasets allowing the impacts of future erosion and climate change to be more precisely monitored and understood.

02 ARCHAEOLOGICAL SITES AFFECTED BY SEA EROSION IN ASTURIAS, SPAIN

Author(s): Alonso Rodríguez, Nicolás (Arqueobañugues)
Presentation Format: Oral

Erosion has shaped the coastline over the centuries; and currently, is affecting several archaeological sites on the coast of Asturias. These interactions between sea and land have led to the discovery of new archaeological sites in the area in recent years.

These discoveries led to the formation of a new research project "Arqueobañugues" - which has expanded our knowledge about the maritime landscapes of Bañugues Cove. We have used Bañugues as a laboratory, and have documented in detail the erosion processes at two archaeological sites, using archive documents and actual observations to document changes to the coastline over the last forty years. In parallel, at Cabu Peñes, we have discovered new archaeological sites that have been exposed by the erosive action of the sea. Sites range from the remains of port infrastructure to archaeological material of varying chronology.

In this paper, we will discuss a range of sites, including the chapel of Nuestra Señora de las Nieves and its port at Llumeres Bay; sites on the peninsula of El Gayo in Lluanco; and the shipyard of El Dique in Aramar. We will demonstrate that there is much that can be learned from eroding archaeological sites, and it is imperative that we work on them before the evidence is destroyed.

03 ASSESSING NATURAL HAZARD RISK FROM WATER ON THE HISTORIC ENVIRONMENT SCOTLAND ESTATE

Author(s): Davies, Mairi - Harkin, David (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 contribute to climate change mitigation and adaptation, and to act sustainably. The UK Climate Change Risk Assessment 2012 identified a range of risks and opportunities that climate change may present. Many of these have the potential to impact on the historic environment. HES is key to the delivery of Climate Ready Scotland: Scottish Climate Change Adaptation Programme.

The Schemes of Delegation from Ministers require us to put in place principles, standards and procedures to ensure that the properties in care are conserved and maintained to a high standard. Our Conservation Principles commit us to assessing the vulnerability of our assets and considering climate change as one of the criteria in our resource management plans.

These formal obligations are reflected in our Corporate Plan (2016) and Asset Management Plan and Investment Plan (both 2018). Our approach to identifying 'at risk' sites has been shaped by working in partnership with other organisations, including the British Geological Survey and the Scottish Environment Protection Agency. We have collated datasets detailing current risk from natural hazards such as flooding and coastal erosion and used these as indicators of susceptibility to climate change. This is assisting HES in shaping and prioritising on-going conservation and maintenance. Our 336 historic properties can help us advance and demonstrate our current understanding of climate change impacts, as well as develop innovative methods of adapting to future climate change risk.

The results of this initial assessment are already informing our conservation strategies, including how future trends may impact on emergency planning and preventive conservation programmes. We are thus increasing the inherent resilience of our estate to cope with the changing climate, helping to safeguard it for future generations.

04 CLIMATE CHANGE, FLOODS AND HERITAGE SITES. THE RELEVANCE OF PALEOFLOOD RESEARCH FOR HERITAGE MANAGEMENT IN ALPINE AND BETIC BASINS

Author(s): Schulte, Lothar - Sánchez-García, Carlos - Carvalho, Filipe (Department of Geography, University of Barcelona) - Gómez-Bolea, Antonio (Faculty of Biology, University of Barcelona) - Burrull-Gimeno, Rosa (Department of Geography, University of Barcelona) - Peña, Juan Carlos (Meteorological Service of Catalonia)
Presentation Format: Oral

During the last years, the concerns regarding the vulnerability of heritage sites to extreme floods under the effect of Climate Change increased. However, extrapolation of these effects on hydrological systems and landscapes includes important uncertainties, because controlling factors on processes and the system sensibility (e.g. erosion, aggradation) are different. Whereas flood damage on historical sites in cities such as Cologne, Praha and Basel are well recorded, the local risk assessment in ungauged catchments in rural or mountain regions is difficult due to the lack of hydrological and historical data. Therefore, robust multi-archive flood records reconstructed by flood plain sediments and geomorphology, lakes, tree-rings, lichens, etc. are valuable for the conservation of many heritage sites and they are particularly relevant for the protection of millennia-old structures.

We present examples from different rural areas located in the humid Bernese Alps and arid Betic basins, where paleoflood records

were compiled. In the Alpine valleys the construction and location of traditional farmhouses since the 15th century (recognized as worth protecting), has been influenced by the time-space pattern of floods interacting with local communities. The century-long experience and handed down knowledge is mirrored in an efficient passive flood mitigation strategy, when compared to buildings erected during the last half century. Based on 3000-year long flood records, the effect of Climate Change on the flood risk of historical buildings can be assessed.

In the lower reach of the Antas River (Betics), the 2012 flood damaged most of the historical irrigation infrastructure. These severe damage results from synergetic processes: large peak discharge, exceptional land-use changes and abandonment of traditional irrigation techniques. However, other heritage sites on higher ground such as the El-Argar site were not affected by erosion.

Both case studies show that the novel multi-archive paleoflood approach represents an efficient tool to contribute to heritage management.

05 BUOYANT FOUNDATION RETROFITS AS A CLIMATE ADAPTATION AND FLOOD MITIGATION SOLUTION FOR HERITAGE SITES

Author(s): English, Elizabeth (University of Waterloo) - Wiser, Jeana (Buoyant Foundation Project)
Presentation Format: Oral

The Buoyant Foundation Project (BFP) provides innovative, sustainable, low-impact and low-cost flood mitigation strategies that enhance community and heritage resilience in the face of flooding and climate change, focusing on retrofits of existing housing for vulnerable populations and communities. BFP specializes in a specific type of amphibious construction -- retrofits to existing pier-and-beam structures that enable them to stay in place until the event of a flood, when they are capable of rising, floating on the surface of the water, then returning to their original positions on their original foundations as the floodwaters recede. In environmentally sensitive locations (often historic, as well), buoyant foundation retrofits offer a tool to sit lightly on the land and live WITH flooding, temporarily, when it occurs. This strategy works in synchrony with natural cycles of flooding, allowing water to flow where it will rather than attempting to control it.

Today, many historic coastal and riverine communities are faced with increasing flood risk, often combined with sea level rise and/or land erosion. Until now, the options available to owners of culturally significant heritage properties have been limited. The buoyant foundation retrofit tool offers communities hope and provides a viable alternative to under-resourced communities to fight buy-outs, teardowns, and "displacement by climate change." This tool will not solve all challenges related to the increased impacts of climate change on culturally significant places and sites, but will offer a strong alternative to communities that have longstanding unbreakable relationships to place and home.

The implementation and testing of this tool is increasing. Currently, we are working in the following communities, with growing opportunities in other climate-impacted communities throughout the United States and internationally: Wharton, TX; Princeville, NC; Canada's First Nations; Isle De Jean Charles tribal community in coastal Louisiana; Vietnam; Nova Scotia; and Jamaica.

06 CITIZAN SCIENCE: COMMUNITY-LED SURVEYING ON THE COAST

Author(s): Ostrich, Stephanie (CITiZAN - Coastal and Intertidal Zone Archaeological Network; MOLA - Museum of London Archaeology)
Presentation Format: Oral

England's coastal and intertidal archaeology is increasingly at risk from winds, waves, rising sea levels and increasingly ferocious winter storms exacerbated by climate change effects. Our island nation's heritage be revealed suddenly and disappear just as suddenly before it is recoded. CITiZAN (the Coastal and Intertidal Zone Archaeological Network) is a community archaeology and citizen science project set up in direct response to these threats which raises awareness of at-risk archaeology across England. CITiZAN runs training sessions, teaching local volunteers to identify, survey and monitor the long-term fate of their local coastal sites. This paper will discuss the digital methods on which CITiZAN rely to not only engage with but also to mobilise wider audiences, including 3D photogrammetry of intertidal sites, an open-access interactive website and free smart phone app. These tools allow those who cannot physically access the demanding environment of the foreshore to still interact with, interrogate and interpret intertidal heritage. The smart phone app is a rapid recording tool which allows not only trained CITiZAN volunteers but also any coastal user with a keen eye and a smart phone to record fragile coastal and intertidal heritage and monitor changes brought about by erosion and storm damage. CITiZAN volunteers are empowered to be not just data collectors but true citizen scientists, and are encouraged to discuss their findings and provide preliminary analysis on our blog and at our annual national conference. This enables the public to champion the archaeology in their local areas, giving them a sense of pride and ownership over their heritage while they make real contributions to the archaeological field.

07 'FORTUITOUS ARRANGEMENTS OF BOULDERS' – THE CHALLENGES OF IDENTIFICATION AND INTERPRETATION OF COASTAL ARCHAEOLOGY

Author(s): Kearns, Therese - Hutchinson, Oliver (CITiZAN, Museum of London Archaeology)
Presentation Format: Oral

In Paul Ashbee's 1978 report 'Excavations at Bar Point, St. Mary's, Isles of Scilly', he suggested that three features which had previously been identified (by Charles Thomas, 1975) as prehistoric roundhouses, were in fact merely, 'fortuitous arrangements of

boulders'. These different interpretations of the same features epitomises one of the key challenges intertidal archaeologists face when dealing with often ambiguous coastal contexts. Many of the coastal landscapes that we encounter have been affected by morphological processes associated with climate change such as erosion, tidal scour and the movement of sand and beach boulders for example. Furthermore, where some sites have obviously always been coastal by design, many were once terrestrial and bring with them new challenges in our ability to accurately identify and interpret their form and function in an alien landscape. The effects of these processes can seriously distort the archaeological context and often force a reconsidered approach to the types of data collected and the order in which we collect them from coastal sites, thus hindering our ability to accurately identify and interpret particular features. This paper will discuss these challenges and the different approaches that can be taken to overcome them with particular reference to the Isles of Scilly and Mersea Island, Essex.

08 CLIMATE CHANGE AND CHALLENGE TO HERITAGE IN MAJULI, ASSAM, INDIA

Author(s): Kumar, M. Satish (Queen's University Belfast SNBE; Director for Internationalisation) - Megarry, William (Queen's University Belfast - SNBE)

Presentation Format: Oral

Majuli, Assam is the largest inhabited river island in the world. Home to over 160,000 people living in 243 villages, the island is a living testimony to both the impact of ecosystem and landscape change on communities and their incredible ability to adapt their existence to changing landscape dynamics. Situated in the Brahmaputra River, the island is seasonally flooded during monsoon season when erosional and depositional processes alter the rivers course and banks. It is thought that increasing meltwater caused by global warming has resulted in more severe flooding during the last century. Some reports suggest that as much as 60% of the island has been lost over the last 100 years. This rapid change threatens Majuli's rich cultural heritage.

The island is home to a unique and continuous 16th century Neo-Vaishnavite religious and cultural traditional tradition based in over 30 Sattras (religious monastic institutions) situated across the island. It is also home to a wealth of intangible cultural heritage associated with tribal communities often resident in critical areas along the banks of the river. Cultural heritage coupled with a rich natural heritage led to the island's placement on the Indian Tentative World Heritage List in 2004. A recently started interdisciplinary project is exploring how local communities in Majuli have adapted to (and continue to adapt to) rapid landscape change and how these adaptations might be applied elsewhere to respond to climate change. It will also explore how cultural heritage (both tangible and intangible) can be preserved as the pace of landscape change increases. Preliminary results from this project will be presented in this paper, as will a framework for future study on the impact of, and adaptation to, climate change.

09 SCHEDULED DANISH MONUMENTS AT RISK OF COASTAL EROSION – MAPPING AND ACTIONS

Author(s): Frederiksen, Pernille (Danish Agency for Culture and Palaces)

Presentation Format: Oral

For the first time ever, the official government heritage agency in Denmark, The Danish Agency for Culture and Palaces, has mapped all national scheduled monuments in threat of coastal erosion.

Denmark is a lowland country with a coastline of more than 7000 km, and has about 32.000 scheduled ancient monuments. No location in the country is further from the coast than 52 km. Prognoses made by the Danish coastal authority show that rising sea levels and extreme weather conditions in the future will result in a great risk of severe coastal erosion. The prognoses urgently call for new strategies in terms of monitoring the effects of climate inflicted damages on tangible cultural heritage. In order to monitor the decay, The Danish Agency for Culture and Palaces just finished mapping all scheduled monuments in threat of coastal erosion. The national mapping shows that 711 scheduled monuments are in risk of coastal erosion, and that 92 of these monuments already are decaying due to erosion damages. Most of the scheduled monuments affected are Bronze Age barrows, megalithic graves from Stone Age, castle mounds and churches from Middle Ages, and fortifications from the seventeenth to nineteenth centuries. The completed mapping helps the national heritage administration to understand when and where future actions need to take place. Previous actions have taken place sporadically, and without an overall strategy. These actions have ranged from: 1) "Letting nature take its course", 2) Ongoing monitoring and field inspections, 3) Archaeological excavation or registration 4) Moving or restoring monuments, 5) Coastal protection. Future actions need to be applied according to a national strategy in order to prevent a loss of valuable knowledge.

10 THE HOUSES ARE ALL GONE UNDER THE SEA: COASTAL HERITAGE IN NORTH ALASKA

Author(s): Jensen, Anne (University of Alaska Fairbanks; Bryn Mawr College)

Presentation Format: Oral

Coastal North Alaskan archaeological sites, especially those with excellent organic preservation, are important sources of data on past human behaviour, and as valuable resources for paleoenvironmental reconstruction. Just as new methods increase our ability to access information from these sites, accelerating climate change poses a dire threat. Erosion rates have increased tremendously, due to warming permafrost, sea ice retreat and longer ice-free seasons. Hundreds of miles of coastline are nearly devoid of all but post-contact sites.

I will illustrate the problems arising from this situation with examples from sites in the Utqiaġvik area, especially Nuvuk and Walakpa.

I will also discuss various approaches that have been tried to deal with the problem.

Nuvuk was thought to be a post-contact site, and was ignored by archaeologists. Not until almost all of the houses had eroded and human remains began appearing did it get attention. We were able to obtain funding and conducted a multi-year program working with crews largely composed of local high school student interns. It turned out to have the earliest and farthest north Ipiutak occupation known, as well as apparently continuous occupation from Early Thule until final abandonment in the 1940s. Measured coastal erosion at Nuvuk has more than doubled since the mid-20th century.

Walakpa is an iconic Arctic site with spectacular preservation. Sadly, the once stable site began eroding rapidly in 2013, with annual retreat up to 11 meters. Ongoing erosion is outpacing attempts to obtain traditional funding for excavation. The loss of cultural heritage led to growing international volunteer efforts, starting in 2015, with support from the landowner (an Alaska Native village corporation) and many individuals. I will discuss both the success and challenges of this type of project.

11 JUST ADD PEOPLE: WATER, HERITAGE AND CLIMATE CHANGE

Author(s): Dawson, Tom (University of St Andrews) - Hambly, Joanna (The SCAPE Trust; University of St Andrews; The SCAPE Trust) - Graham, Elinor (The SCAPE Trust; University of St Andrews)

Presentation Format: Oral

The impact of climatic processes is fast becoming the largest natural threat to archaeological sites. Heritage managers are rising to the challenge – and there are an increasing number of initiatives across the globe, with national heritage agencies producing strategies and assessments (for example, NPS Cultural Resources Climate Change Strategy; HES Climate Change Risk Assessment) and new groups and task forces being formed (including the new EAA Committee - Climate Change and Heritage). It is also time to reach out to society more widely, promoting a desire to act and an increase in the resources available to undertake meaningful action. Promoting heritage at risk can be done in a number of ways, from involvement in related, non-heritage projects, to the presentation of the problem in novel ways.

Raising awareness of the immediacy of the threat is key. Involving communities and undertaking grass-roots action at sites that would otherwise be destroyed without notice is one important course of action. By recognising public value and local desire, and investing resources in a range of sites, heritage is kept relevant. Local projects cascade knowledge through communities and increase public interest. Often, these projects attract media attention, leading to increased publicity. We need to inform the public in interesting and dynamic ways, working with TV and broadcast companies; and creating our own resources, producing our own films, embracing developing technologies and using the internet to tell these important stories before it is too late.

This paper will present examples of how to promote work at vulnerable heritage sites. It will focus on community projects, and will discuss the use of video, broadcast media, digital technology and interactive websites to engage the public with this global challenge.

12 LIQUID HISTORY: ARCHAEOLOGY, CLIMATE CHANGE AND EROSION ON THE TIDAL THAMES

Author(s): Frost, Josh - Johnston, Helen (Thames Discovery Programme; MOLA)

Presentation Format: Oral

Historically and culturally the River Thames plays a crucial role in the life of both London and Britain as a whole. This is reflected in the archaeology of the Thames foreshore as well, with sites that reveal the industry, trade and recreation that has defined the Thames for centuries. As a tidal river, the Thames is affected by climate change through both increased rainfall and the impact of storm surges up the estuary. This means that many archaeological sites and three of London's four World Heritage Sites are vulnerable to climate change. For the past 10 years the Thames Discovery Programme (TDP) has worked with local communities to monitor and record the unique archaeology of the Thames foreshore. In this time we have trained over 650 volunteers as part of our Foreshore Recording and Observation Group (FROG) who carry out fieldwork on sites along the Thames. In doing so the project and it's volunteers have added to the understanding of the archaeology of the Thames foreshore. This paper will examine the vital work of the TDP in monitoring the rapid erosion of the Thames foreshore and the threat that this poses to both the archaeology of the foreshore and major heritage sites in London.

13 HERITAGE MONITORING SCOUTS (HMS FLORIDA) AND INCREASING OCEAN LITERACY IN FLORIDA

Author(s): Miller, Sarah - Ayers-Rigsby, Sara - Moates, Jeffrey (Florida Public Archaeology Network)

Presentation Format: Oral

Along Florida's 8,000 miles of shoreline, nearly 4,000 archaeological sites and over 600 recorded historic cemeteries are at risk from coastal erosion and rising sea levels. The matter remains complex in Florida where despite the 20 percent higher rate of sea level rise compared to the global average, "climate change" remains politically taboo. In spite of this, local governments have been eager to take action to adapt, and have implemented policy to address the impact of sea level rise on heritage. This paper will outline ongoing efforts to engage the public in site stewardship through the creation of the Heritage Monitoring Scout (HMS Florida) by the Florida Public Archaeology Network and discuss results from the first two years. HMS Florida also focuses on basic climate literacy in order to motivate the public to document these resources as they disappear before us. The program encourages volunteers to interact with archaeologists, climate scientists, indigenous cultures and other stakeholders through an annual conference, Tidally United,

hosted by Flagler College in St. Augustine in 2016, by the Seminole Tribe of Florida in 2017, and University of South Florida in 2018. The project underwent a formal assessment of the public engagement component and found the program to be mutually beneficial to the monitoring volunteers. As volunteer Gayle Sheets summarized: "I feel I'm contributing in a small way to a very rational endevor."

14 A PREHISTORIC ROCK SHELTER IN THE MIDDLE OF THE CHANNEL (BRITTANY, FRANCE): MARITIME THREATS AND ARCHAEOLOGICAL SOLUTIONS

Author(s): Marchand, Gregor (UMR 6566 du CNRS – CREAAH - Laboratoire Archéosciences -) - Olmos Benlloch, Pau (ICAC Tarragona) - Bernard, Yann (Virtual-Archeo) - Hamon, Caroline (CNRS) - Laforge, Marine (EVEHA) - Martin, Chloë (Rennes University) - Onfray, Marylise - Quesnel, Laurent - Ravon, Anne-Lyse (CNRS) - Roué, Daniel (Santec)

Presentation Format: Oral

Marine erosion and intense anthropogenic pressure on the coastal strip combine their effects to permanently damage the tenuous remains left by prehistoric human groups. In the absence of the "destroyer - payer" link that has allowed the development-led archaeology in France since the 1990s, the preservation of this "diffuse" heritage on the coasts is often the sole responsibility of amateur archaeologists. Specific monitoring programmes, such as ALERT (director: M. -Y. Daire), also amplify these collaborative works. Discovered by D. Roué and J.-C. Le Goff, then explorated as part of the Alert project under the responsibility of two of us (GM and POB) in 2015-2016, the Roc'h Santec Leton rock shelter (Santec, Morbihan, France) benefited from these heritage and scientific practices.

The rocky island of Roc'h Santec Leton is almost two kilometres from the mainland; The access on foot is only possible a few days a year or by boat. The excavation revealed a very rare stratigraphic sequence in the region : three levels of Middle Palaeolithic, a very damaged Azilian layer and a single layer with diverse dwellings of the Holocene (Early and Late second Mesolithic, Early Neolithic and Iron Age). These multiple cultural components underline the interest of human populations in this rock shelter, now isolated on a tiny island in the middle of the sea.

This archaeological operation, which was carried out under difficult logistical and climatic conditions, allowed us to test and validate the principles of intervention, which we believe to have a strong heuristic interest.

15 AMBIGUOUS LANGUAGE AND DIFFICULT DECISIONS: FACING UP TO THE COASTAL FUTURE

Author(s): MacLeod Rivett, Mary (HES Historic Environment Scotland)

Presentation Format: Oral

For archaeologists managing fragile coastlines around Western Europe, the early warning signs of sea level rise, and the impacts of increasing storminess have been visible for nearly three decades. During this time, we have accumulated more and more research evidence about the impact of these changes on the historic environment, and moved towards incorporating this evidence into our projections for the future, and into the management decisions we make about the coastal historic environment.

Working from this background, and using case studies from the Outer Hebrides in Scotland, this paper argues that the language we have used to assess the impacts of climate change is having an effect on both public and professional expectations of outcomes for the sites, and therefore upon our management decisions. In using language of 'risk', we hold out the possibility that it may be possible to mitigate risk, and save sites. We thus avoid difficult discussions about how to make decisions about the futures of the sites, and have delayed in seriously addressing the inevitable loss of important archaeological evidence. As time progresses, resources for this work will become much more constrained. Some alternative approaches are proposed, to address the difficult and unavoidable decisions we must make.

16 FACING THE TEMPEST: UNDERSTANDING PATTERNS OF COASTAL CHANGE

Author(s): Momber, Garry (Maritime Archaeology Trust; University of York; Maritime Archaeology Ltd) - Satchell, Julie (Maritime Archaeology Trust; Maritime Archaeology Ltd) - Mason, Brandon (Maritime Archaeology Ltd; Maritime Archaeology Trust)

Presentation Format: Oral

Coastal archaeology is under threat from coastal change. This can be caused by the changing climate, sea level rise or human activity. There is a need to understand this change if we are to mitigate its effects and minimise damage to the submerged and coastal heritage. However, it is not just ancient buildings and isolated archaeological sites that are under threat, it is also coastal communities (including their cultural heritage) that are now at the forefront of the 'battle' against the sea. The response of the coastal engineer is often to deal with the immediate problem by building bigger and stronger defences. Unfortunately, this can destroy cultural heritage within its footprint, while unforeseen impacts to adjacent intertidal and marine seascapes can have negative consequences where developments are not in harmony with long-term patterns of coastal change. When managers do contemplate past change, this is invariably within a historical perspective being from the time when 'records began'. This is where the coastal and maritime cultural heritage can help. It should not just be seen as an asset that needs to be protected but viewed in the broader context as an archive of data that can be used to provide long term insights into past change whereby helping coastal mangers better understand the processes and the impacts of previous climatic scenarios. This paper will present the work of the Maritime Archaeology Trust on archaeological, paleo-environmental as well as historical resources that can be used to interpret patterns of change. If policy makers were better informed when responding to immediate threats, they could make decisions that would ensure the long-term sustainability of economic as well as heritage assets along the coastline. If society recognises this added significance of the cultural resource, it

will then have a better chance of attracting added protection.

17 ABOVE & BELOW: EVALUATING THE VISIBLE AND HIDDEN EFFECTS OF CLIMATE CHANGE IN THE COASTAL AND MARINE HISTORIC ENVIRONMENT

Author(s): Corns, Anthony - Shaw, Robert - Devlin, Gary - Henry, Sandra - Pollard, Edward (The Discovery Programme/CHERISH) - Driver, Toby - Barker, Louise - Hunt, Daniel (RCAHMW/CHERISH) - Davies, Sarah (Aberystwyth University/CHERISH) - Barry, James (Geological Survey Ireland/CHERISH)

Presentation Format: Oral

Ireland has a coastline of approximately 7400 km, comprised of a combination of rock-dominated coasts (SW, W, N) and soft sediment dominated coasts (E &SE). Many archaeological and historical sites along this coastline are at risk of being damaged or destroyed by the present and future effects of climate change. Changes in sea level in combination with projected increase in the severity of coastal storms which is expected to intensify coastal erosion risk, with wetlands and soft sedimentary systems amongst the first in Europe to respond to storm-led sea level rise impacts. In addition, areas currently at risk of flooding will be at greater risk while areas previously not considered at risk may be at increased risk.

The EU funded CHERISH Project (Climate, Heritage and Environments of Reefs, Islands and Headlands) of the Irish and Welsh regional seas is researching these threats and brings together a cross-disciplinary, cross-border team of specialists in the development of a field toolkit which will combine multiple complimentary approaches and methods to evaluate current and future risk.

This paper focuses on several CHERISH toolkit methods, which are currently being developed and employed within the project in both the terrestrial and marine environments (laser scanning, photogrammetry, geophysics, marine ecology). Critical evaluation of their approach, results and applicability to longer term monitoring will be explored including:

- The ability for field methods to detect coastal change of the historic environment within the duration of the project.

- The development of proxy methods in the detection of climate change on marine archaeology.

- The evaluation of cost effective metric recording against costly high-end methods in relation to detecting coastal and marine change.

- Identifying the full extent of hidden subsurface archaeology features at monuments and archaeological sites, which are at risk from potential coastal erosion and coastal flooding.

699 CAN WE DEVELOP A EUROPEAN NETWORK OF LINKED RESEARCH AGENDAS?

Theme: Archaeology and the European Year of Cultural Heritage
Organisers: Miles, Daniel (Historic England) - van der Jagt, Inge (The Cultural Heritage Agency of the Netherlands) - O'Riordan, Emma Jane (Society of Antiquaries of Scotland) - Lee, Edmund (Historic England)
Format: Discussion session

Making choices is part and parcel of our daily lives as human beings. The best decisions are made through a transparent and participatory process, collecting and considering the evidence, identifying needs and opportunities. Archaeological research agendas have existed for many years in a plethora of formats and scope, used to coordinate our research effort in different cultural periods or geographical locations. Since the Valetta Convention and the huge rise in commercial or planning-led archaeological investigations, the need to develop research agendas to prioritise interventions and research has increased greatly.

A number of research agendas are now online providing opportunities to link agendas. However, the majority of these are confined by political and territorial boundaries irrespective of the archaeological record. Are we missing an opportunity to look outside our own countries? Do we know what other archaeologists are researching and why? Should we start linking things up? Is this an opportunity to develop a European archaeological research agenda?

This session will look at how different countries have approached the development of research agendas as cultural heritage tools within their own political and legislative frameworks. Does the public have a voice in these agendas? We will then ask the question should we consider crossing boundaries and linking our agendas – whether digitally or conceptually, and how can we begin to move forward sharing ideas, approaches and even agendas.

ABSTRACTS

01 HOW ARE DEVELOPMENT-LED RESEARCH DECISIONS MADE ACROSS EUROPE

Author(s): Miles, Daniel (HE - Historic England) - González, Matilde (Independant)

Presentation Format: Oral

This presentation will introduce the session - Can we develop a European network of linked research agendas? It will review how

research, in particular development or planning-led investigations, is coordinated and prioritised by different European countries within their own political and legislative frameworks. These frameworks differ across Europe with various models employed to coordinate the research effort, for example through the involvement of national agencies or devolved regional structures.

The presentation will bring together research currently being undertaken looking at the different models and systems employed across Europe. It will focus in particular on how choices and decisions are made on what will be investigated as part of development led interventions. Various questions will be addressed, for example: How does each country coordinate or prioritise the research effort?; What frameworks are in place (national, regional or local) to assist in the assessment of significance, to identify gaps in knowledge and develop research questions? It will also look at countries which do not have formalised frameworks in place to identify how research choices are made.

This will set the scene for the session, enabling us to discuss the potential to link different research agendas across Europe, identify any issues (practical and political) and opportunities so that we can begin to broaden our research questions outside of our own national boundaries.

02 ANSWERS TO QUESTIONS. THE NEW NATIONAL ARCHAEOLOGICAL RESEARCH AGENDA OF THE NETHERLANDS

Author(s): van der Jagt, Inge (Cultural Heritage Agency of the Netherlands)
Presentation Format: Oral

Research requires focus. Most archaeologists would agree. More than ten years after publication of the first edition, the new version of the Dutch National Archaeological Research Agenda (NOaA 2.0) was launched in April 2016. The National Archaeological Research Agenda 2.0, like its predecessor, is a joint product of the entire archaeological community in the Netherlands, and is designed to feed and guide development-led archaeology, providing topical and relevant research questions. In this paper I'll explore the background to and creation of this updated, user-friendly digital edition of the Dutch National Archaeological Research Agenda. The NOaA 2.0 centers on 134 specific research questions that highlight the most pressing issues of the day. Only archaeological (cultural historical) questions have been included. The questions are not accompanied with a detailed description of the current state of knowledge. Instead a short explanation of the question is added and every question is supplied with practical guidance for use in the field. Specialisms relevant to archaeology play an instrumental role, and thus relate largely to the operationalisation of the cultural historical research questions. The idea is that this will firmly associate such input with good-quality archaeological fieldwork, making it less easy to omit it for budgetary or other reasons.

03 PRIORITIES, RESEARCH AGENDAS AND PLANNING-LED INVESTIGATIONS IN CZECH ARCHAEOLOGY

Author(s): Marik, Jan (AU - Institute of Archaeology of the Academy of Sciences of the Czech Republic)
Presentation Format: Oral

The Czech system of archaeological heritage management is mostly based on outdated legislation from 1980s. The authors of the law could not predict the major political and economic transformations that occurred in the Czech Republic after 1989. Thus, paradoxically, a law created in the conditions of a totalitarian state suppressing all private civil and business activities is still in force, after almost thirty years of democratic government and market economy.

We can say that there is no effective system of setting priorities in development-led archaeology in the Czech Republic.

The decision what and how to excavate lies in hands of archaeological companies (state or private) and archaeologists responsible for conducting of particular fieldwork. To conduct a particular development-led excavation, the archaeological companies have to make a bilateral agreement. How the agreement is fulfilled as well as methods used in the course of the fieldwork are fully in the hands of the archaeologist and developer while the state authorities have only minimum possibilities to intervene in the on-going project. The absence of enforceable rules and effective supervision in the course of archaeological fieldwork represent a considerable problem not only to the archaeological heritage, but it also undermines the reputation of archaeology in public.

Under the current conditions, the quality of the fieldwork can only be evaluated from excavation reports, which are usually written up to three years after the completion of fieldwork.

The current legally frozen state of archaeological heritage care system produced some unique not-official solutions and structures. Among the most important ones belong the centralised system of evidence of archaeological fieldwork and their results – the Archaeological map of the Czech Republic or regional archaeological commissions.

Generally speaking, the current state of archaeological heritage care system can be defined as extremely fragile and unsustainable from a long-term perspective.

04 BUILDING EUROPEAN RESEARCH AGENDAS FOR INVESTIGATING AND PROTECTING THE BURIED ARCHAEOLOGY OF CASTLE SITES

Author(s): Banerjea, Rowena (University of Reading) - Huisman, D. J. (Cultural Heritage Agency of the Netherlands; Groningen Institute of Archeology, Groningen University) - Nicosia, Cristiano (Università di Padova) - Borderie, Quentin (Département d'Eure-et-Loir, CNRS

- UMR 7041 ArScAn „Archéologies Environnementales") - Colenberg, Jesper (Independent) - Béguier, Irène (Service départemental d'archéologie du Calvados)
Presentation Format: Oral

Castle sites are scattered across Europe and are iconic reminders of the conflicts of the Middle Ages that have shaped present day European society and its geography. This paper presents key results from sites around Europe, arising from a recent collaboration of researchers working within the frameworks of research projects and developer-led archaeology. It aims to explore the practicalities of building future, pan-European research agendas for investigating and protecting the buried archaeology. The castle case studies are growing in number and currently cover Estonia, France, Latvia, Poland, Italy, Spain, The Netherlands and the UK.

This paper highlights the scientific value and the potential threats to the buried archaeology based on geoarchaeological research. The buried archaeology can be overlooked in favour of the protection and consolidation of standing remains, and developments such as reconstruction and rebuilding projects. Our results show that burial plays a critical role in preserving the buried archaeology on these sites- very much like an urban environment. Also, the removal or alteration of above-ground structures and/or the removal of rubble from collapsed structures during any renovation or conservation work may have implications for the preservation of deposits as they become unsealed. Several of our sites have shown exceptional preservation of the stratigraphy, and the application of micromorphology has enabled some important information to be collected. These results relate to the early history of the castles, as well as the later re-use of these sites, which are crucial for understanding issues of conquest, conflict and co-existence in Europe. There is a case to be made for comprehensive, scientific investigation of these deposits, which uses micromorphology at the very least, when these deposits are exposed. The challenges of developing future research frameworks for sites with different levels of protection are discussed in relation to national and European heritage legislation.

05 THINKING GLOBALLY: LINKING UK RESEARCH FRAMEWORKS ACROSS EUROPE

Author(s): Knight, David (York Archaeological Trust)
Presentation Format: Oral

There has been significant investment across the UK in the development of regional, national and subject-based research frameworks, but many of the questions which have emerged have raised issues that transcend national boundaries. Prehistoric pottery specialists, for example, have emphasised in a recently published research framework the importance of focusing more closely upon ceramic interactions across the European continent. Similarly, at the other end of the chronological spectrum, industrial archaeologists working on the origins of the factory system and its global impact have emphasised the need to investigate the close linkages between pioneer industrialists from Britain to Russia, and beyond that to the eastern seaboard of North America.

There are strong arguments for investing in research frameworks that can be applied across Europe and, in some cases, farther afield, but how this might be achieved is not easily resolved. We will consider examples of UK World Heritage Site, regional and subject-based frameworks which demonstrate the merits of linking national research agendas, with particular focus on the potential of interactive online frameworks as a methodology for facilitating international collaboration. It is hoped that this will provide useful data for discussion of the merits of a more integrated approach to the development of research frameworks across Europe, and of the methods that would allow us to achieve this ambition.

06 BUILDING A RESEARCH FRAMEWORK FOR EUROPEAN INDUSTRIAL ARCHAEOLOGY

Author(s): Nevell, Michael (University of Salford)
Presentation Format: Oral

This paper will look at the role and value of research frameworks within Industrial Archaeology, here defined as the archaeology of industrialisation during the 18th, 19th and 20th centuries. It will ask whether there is a need or a role for an Industrial Archaeology research framework at a European level and what that might encompass.

It will take as its models the research agenda developed by the Association for Industrial Archaeology since the early 1990s and the UNESCO guidance and descriptors for those World Heritage Sites that have been inscribed as industrial sites across the globe.

Subjects that might be considered for inclusion within such a research framework could include production and consumption; the archaeology of manufacturing, metal and extractive industries; transport; the generation of power; urbanisation and housing; buildings archaeology; the archaeology of landownership and use; resistance and conflict; the biography of manufactured objects.

More broadly how should we approach the archaeology of the recent past? Do we need to engage with those working on 20th century archaeology and within the wider Historic Archaeology tradition? Should we be engaging with Urban Explorers, Steam Punk and other unconventional groups with an interest in this period? This paper aims to start this debate.

07 JOINING RESEARCH FRAMEWORKS THROUGH TERMINOLOGIES – THOUGHTS FROM THE CELTIC FRINGE

Author(s): McKeague, Peter (Historic Environment Scotland) - Binding, Ceri (Hypermedia Research Group, University of South Wales)
Presentation Format: Oral

From the spread of early farming across Europe to the role of pilgrimage, questions about Europe's cultural heritage extend far beyond artificial political boundaries. However, research frameworks tend to approach such themes from a national, regional or lo-

cal perspective. They develop their own approaches to address the key questions in their area. Yet there is a need to see beyond boundaries. Users need to be able to search both vertically between national and regional frameworks and horizontally across regional, national or international geographies. To do so requires the application of consistently framed questions underpinned by data standards.

The need for consistency to integrating regional research frameworks has been recognised in Scotland where adoption of consistent terminologies is being encouraged to improve the connections between regional frameworks. Although there are published controlled vocabularies for monuments and objects such as http://www.heritagedata.org/, until now there no consensus on the application of periods and date ranges so that there has been no agreed published list of terms and date ranges as exists in England and some other countries. Scotland's Archaeological Periods and Ages has collated existing period terms, including cultural groupings and date ranges to publish defined definitions on heritagedata.org. Together with the monument and object thesauri, period labels and date ranges can help link research questions across frameworks and in the case of England and Scotland help update key research framework question through the online reporting of fieldwork through as part of an upgrade to the OASIS system. In a European context, the use of controlled terminologies already underpin cross searching of heritage databases through the Ariadne Portal, highlighting the potential for linking research framework questions.

08 MULTI-SCALAR, ISLAND APPROACHES TO ARCHAEOLOGICAL RESEARCH AGENDAS – EARLY INSIGHTS FROM A THREE-ISLAND FRAMEWORK IN SCOTLAND.

Author(s): Rennell, Rebecca - Downes, Jane (Archaeology Institute, University of the Highlands and Islands) - Murphy, Kevin (Comhairle nan Eilean Siar) - Gibson, Julie (Orkney Islands Council) - Turner, Val (Shetland Amenity Trust)

Presentation Format: Oral

This paper will introduce a pioneering new project to establish Research Assessments and Agendas for Scotland's three island-based Local Authority areas (Western Isles, Shetland and Orkney Islands). These will be positioned within a broader three island-wide Research Framework, referencing and complementing the existing national research Framework in Scotland (ScARF). The project is a cross-sector collaboration between Local Authority archaeologists (Comhairle nan Eilean Siar, Shetland Amenity Trust and Orkney Islands Council), and the University of the Highlands and Islands, supported by national agency organisations (Society of Antiquaries of Scotland and Historic Environment Scotland). The project also contributes to the Scottish Government's 'Our Islands, Our Future' agenda. The multi-scalar approach responds to wider discussions regarding the development and integration of regional, national and international/European-level research agendas. Our project also raises crucial questions about the role and relationship between the public, local and national government agencies and academic institutions in setting out research priorities.

Our paper will consider the implications of island-based geographical and political boundaries in the development of research frameworks and agendas. We will explore some of the conceptual and methodological challenges and opportunities of a multi-scalar, island-based approach. More specifically - and with reference to Article 174 of the Treaty on the Functioning of the EU (TFEU) and UNESCO Small Islands Developing States (SIDS) - we will argue that the island context invokes important questions about the relationship between 'core' and 'periphery', both for our understanding of archaeological resources and their research potential, and the role of heritage and heritage management within a modern European setting. This discussion is relevant to other European islands and peripheral regions, and is timely within a Scottish context, where the recent Islands Bill proposes to devolve greater powers to island-based local authorities.

09 SCOTLAND'S PLACE IN EUROPE: ARCHAEOLOGICALLY SPEAKING

Author(s): O'Riordan, Emma Jane (Society of Antiquaries of Scotland)

Presentation Format: Oral

The Scottish Archaeological Research Framework (ScARF) is the national archaeological research framework for Scotland. It launched in 2012 as a set of reports and questions split by archaeological period, from the Palaeolithic to the Present. Hundreds of archaeologists and others contributed, which ultimately produced hundreds of research questions about all aspects of Scottish archaeology. It was seen as new and exciting at the time, that this resource was published as an open-access website. Over time, the ScARF gradually became embedded in Scottish archaeology, with references to it popping up in academic papers, commercial reports and elsewhere. Now, in 2018, it has become commonplace to refer to ScARF - the bright young thing has become part of the establishment.

ScARF only covers the area of Scotland as defined in the modern day. What does this mean for those researching Scotland's near neighbours or looking at bigger trends? If researchers could use frameworks to see where their own work sat in the wider world, then these borders could go - allowing larger sets of comparative finds, sites or other data and so enriching our picture of the past.

If Scotland can demolish artificial archaeological divisions with our immediate geographical countries, then can we also apply this model further afield? To our Irish cousins, our Norse neighbours, to our Continental compatriots? It seems so obvious that one set of answers could help inform others with similar questions; are research frameworks a solution to sharing current knowledge?

This paper will look at how Scotland developed a research framework nationally, and is now refining the picture to allow for focused study of smaller regions. It will also look at the issues (good and bad) raised when creating national and regional frameworks with the hope that others can learn from our journey so far.

10 DEVELOPING AN ONLINE PLATFORM TO SUPPORT RESEARCH AGENDA DEVELOPMENT AND MANAGEMENT IN ENGLAND

Author(s): Lee, Edmund (HE - Historic England)
Presentation Format: Oral

My contribution will describe work funded by Historic England to develop a new generation of 'research frameworks' for archaeology in England. These publications traditionally have been presented as monograph publications, or as static .pdf electronic publications. They are intended for use to guide the design of new investigative projects, setting the research agenda or research questions that new investigations should seek to answer. By doing this they help to co-ordinate the resources available for research to obtain the most useful knowledge, and show the public value of archaeological work. I will briefly review the need for better ways to develop, publish and manage research frameworks that has been established by previous user research. I will then describe the opportunities that arise from migrating these research frameworks to a digital platform. Principally these are that: the content can be structured to make access easier for those who need to commission new research; the content can be more easily kept up to date; and the content can be searched across all the research frameworks using the common platform. I will outline how the adoption of shared standards for organising and indexing the content offers the possibility that a common platform could be used to develop, publish and manage research frameworks, initially in England, but potentially from any number of different administrative regions and states.

11 BUILDING THE RESEARCH FRAMEWORK PLATFORM

Author(s): Rocks-Macqueen, Doug (Landward Research Ltd.; Archaeology Scotland; Recording Archaeology)
Presentation Format: Oral

A number of research agendas are now online providing opportunities to link agendas... we just have to do it. This paper presents the work of such a project to create digitally linked research frameworks across multiple regions in England and even included a region in another United Kingdom country, Scotland. This brief discussion the lessons learned from such a project. But, more importantly it will discuss how these lessons can be applied to future projects and if it is possible to link up Research Frameworks and if we should.

This discussion will primarily focus on the more technical aspects of such a project. Though not things such as shared vocabularies and how to translate terms e.g. time periods, sites and monument type names, etc. across diverse regions. This discussion is more focusing on the website infrastructure and the use of CMS systems to manage digital Research Frameworks. It will also discuss the framework set up to handle the exchange of data between such a platform and outside websites so that linked data could be implemented. While the focus was on UK institutes the framework was set up to be international and it is hoped that part of the discussion can focus on crossing even greater distances (physical and cultural) to make linked Research Frameworks a possibility.

700 RE-APPROACHING IDENTITY IN ARCHAEOLOGY

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Gomes, Sergio (CEAACP - University of Coimbra) - Arezes, Andreia (DCTP - FLUP | CITCEM) - Vale, Ana (CITCEM - University of Porto) - Garcia Rovira, Irene (University of Manchester)
Format: Regular session

Identity has always been a central issue in the interpretation of the archaeological record. If we look at the history of the discipline, we can identify different approaches to the question, "how can we recognize identities through material evidence?" In response, archaeologists have created many different areas of research, such as: social identity; ethnicity; gender; and the contemporary political use of cultural identities. These studies have allowed a better understanding of past communities and have contributed to the understanding of archaeologists as social and political actors mediating cultural diversity. Recently, identity as a concept to discuss the archaeological record seems to have been overshadowed by concepts such as networks, social and cultural contact, mobility, ritual, and the body. However, all these views are profoundly linked to identity through their exploration of different aspects of the dynamics of social identity. These perspectives, even if not foregrounding identity, have enlarged the understanding of the complexity and instability of the processes under which identities are created and negotiated, adding to archaeological research questions regarding the transversality, liminality, mutability, performativity, intermediality and fluidity of identity. In this session, we aim to re-approach the concept of identity by considering the contributions from different theoretical perspectives, different objects of analysis and different analytical methods. We welcome papers focusing on distinct aspects of material culture and chronologies, in order to enhance our ability to address identity from an archaeological point of view and to understand the elusive alterity of the past.

01 RE-APPROACHING IDENTITY: INTRODUCTION

Author(s): Gomes, Sergio (CEAACP - University of Coimbra) - Arezes, Andreia (DCTP - FLUP; CITCEM) - Vale, Ana (CITCEM) - Garcia Rovira, Irene (University of Manchester)

Presentation Format: Oral

This introduction aims to briefly present some of the concepts referred to in the session's abstract: transversality, liminality, mutability, performativity, intermediality and fluidity. Each concept allows to re-evaluate the diversity and instability of the processes under which identities are constructed. The understanding of this complexity challenges archaeologists to think about how problematic it can be to address identity through the archaeological record. These concepts may then be used to explore the limits and the possibilities to study identity in archaeology. In this introduction, we also aim to present the structure of the session, regarding the key concepts already enunciate and how the research questions entailed by each concept could promote the dialogue between the different case studies presented in the papers of this session. By doing this, we will try to promote the debate between the different approaches to identity developed in the various contributions of this session.

Re-approaching identity is about facing the limits and the possibilities when interpreting the archaeological record. Re-approaching identity is then an opportunity to revisit and to transform the un-certainties that frame the archaeological research; uncertainties that should be considered as a part of the process of making visible the alterity of the past.

02 SETTING ARTEFACTS FREE: NEW INSIGHTS ON IDENTITY IN LIGHT OF REFINED ARTEFACT-INDEPENDENT CHRONOLOGIES

Author(s): Adams, Sophia - Hamilton, Derek (University of Glasgow)

Presentation Format: Oral

Complex chronologies based on artefact typologies have driven how archaeologists understand diachronic change across the Iron Age of North-West Europe, with brooches forming a key 'dateable' artefact class that spans the entire period. The stylistic distinction presented by brooches provides the single-most widespread and continuous record of cultural connectivity between Britain and the European continent. Their variation over time has the chronological sensitivity necessary for comparing sites across regions throughout most of the first millennium BC. Furthermore, the large numbers of brooches available allow for analysis into modes of production and patterns of exchange; while their role as items of personal adornment and their visual complexity allows brooches to figure prominently into discourses surrounding individual and group identities, as well as the (re)production of social systems. However, there now exists an inherent circularity whereby brooches are interpreted within chronological frameworks initially defined by brooches.

This paper will explore the importance of developing refined artefact-independent chronologies in order to create robust diachronic interpretations. We will stress both how and why detailed study of the actual artefacts is necessary to interrogate multiplicity of identity: identity of specific individuals who engage with the objects and group identity explicitly or inadvertently distinguished by these artefacts.

03 TRACING CHANGES IN FOOD PRACTICE AND SOCIO-POLITICAL DEVELOPMENT IN IRON AGE SCANDINAVIA

Author(s): Bukkemoen, Grethe (Dep. of Archaeology, Conservation and History, University of Oslo)

Presentation Format: Oral

Scandinavian societies went through significant changes in social structure and organisation during the course of the Iron Age (500 BC-1050 AD). Food practice and food technologies are often viewed as small-scale practices grounded in the everyday. However, food practices can be approached as multi-generational bodily practices and as part of a society's collective knowledge production. It is integral to different levels of society and often intertwined with changing social and spatial contexts. Until 550 AD the use of pottery vessels remained a constant, although not unchanging, factor within Iron Age society. Nevertheless, the 6th century crisis, lately termed the Late Antique Little Ice Age, seems to be a turning point in the production of vessels and kitchen utensils in general. New food technologies related to both the use of new raw materials as soapstone and iron, as well as an increased focus on food preparation techniques is developing from the dawn of the Viking Age. In this paper I explore the interplay between socio-political development and changes in food technologies and address in particular the development of vessels in a communities-of-practice perspective and in relation to social memory as material practice. Earlier approaches to soapstone vessels have favored a focus on the industrial-like mode of production and the ostensible standardisation of vessel types. How these chronological changes on the lower level of production, types, materiality and use might be related to the larger scale of social institutions, e.g. architecture and burial practices, with different temporal changes remain largely unexplored.

04 PREHISTORIC FLINT INDUSTRIES AS IDENTITY TRAJECTORIES: A CASE STUDY FROM BULGARIA

Author(s): Gurova, Maria (National Institute of Archaeology with Museum)
Presentation Format: Oral

There are various and challenging approaches to identity, using different analytical methods and cognition levels. Apart from recent theoretical and multifaceted approaches to conceptualizing identity, there are relevant, valuable and still insufficiently explored empirical datasets to be used. Material culture from prehistoric Bulgaria offers abundant evidence for elucidating the identities of Neolithic and Chalcolithic communities through their specific lifestyles. The flint industry interpreted in its complexity (chaîne opératoire) and inevitable social proxy merits special attention.

Numerous studies of prehistoric assemblages from Bulgaria have allowed the recognition of characteristics that could be considered as diagnostic and culture bearing. Their comparative and diachronic analysis suggests various levels of inter-site networks and social interrelations. Beyond 'modernity' in the motion of identity, the evolution of the flint assemblages shows substantial changes in raw material, technological and functional perspectives, as well as in symbolic value (with best manifestation in the mortuary domain). These specific features present a challenging opportunity for re-thinking the communities and highlighting their role in the context of basic level identity.

This paper offers empirical data and interpretive observations on prehistoric flint industries from the VI and V millennia BC in Bulgaria, which has always been a crossroads and social arena of people and ideas.

05 SYNCRETISM AND SOCIAL GROUPS: ESTABLISHING PRODUCERS' IDENTITY THROUGH METALWORK IN VIKING AGE LINCOLNSHIRE

Author(s): Libby, Kathryn (University of Sheffield)
Presentation Format: Oral

This paper examines metalwork, principally dress accessories, from Viking-Age England to provide new insights into the impact of Scandinavian settlers on Anglo-Saxon society and economy. Over the last 20 years, metal-detected finds reported to the Portable Antiquities Scheme have transformed our understanding of Viking-Age England, as thousands of items of metalwork have been recovered that reveal evidence of Scandinavian influence, especially in areas of eastern England, where the Scandinavian settlement was densest, and where agricultural regimes render metal detecting a particularly popular undertaking. While coinage and ingots have been extensively studied with respect to manufacturing processes and economic activity, the insights to be gained from analysis of dress accessories and jewellery have been less extensively explored. Exceptions have been the work commenting on aspects of ethnic identity on the basis of the stylistic attributes of this metalwork. Missing, however, from all of their work is detailed consideration of manufacturing techniques, which will be the focus of this paper. A combination of items found through the PAS in the historic county of Lincolnshire and excavated finds will be evaluated to determine if the ethnic identity can be revealed through manufacturing processes or evidence. This will include an evaluation of stylistic elements, such as designs and shapes employed, and well as specific external production markers, and lastly, p-XRF analysis will be performed to test past theories hypothesising that there were differences in the metal compositions between Scandinavian produced items and Anglo-Saxon produced items.

06 IDENTITIES IN TRANSITION: LIVING LIKE A ROMAN IN INDIGENOUS CONTEXTS

Author(s): Peñalver, Tamara (Dpto. Prehistoria, Arqueología e Historia Antigua, Universidad de Valencia) - Moreno, Manuel (Dpto. Prehistory and Archaeology, University of Granada; Faculty of Classics, University of Cambridge)
Presentation Format: Oral

Roman expansion in the Western provinces called for the Urbs to "invent" new interactions in their relationship with indigenous societies. We have to emphasize that these processes involve an interaction, whose influences work in both directions, overcoming the traditional concept of Romanization as the imposition of the conqueror culture. One element that we cannot ignore is the presence, in the pre-Roman world, of Mediterranean traditions and influences that are the basis of these societies.

This paper aims to detect the results of this cultural contact in the domestic units, which are a reflection of the inhabitants' identities. We will discuss on the process of assimilation of the pre-Roman societies in domestic environments: Does it affect all social levels equally? Can we determine processes of resilience or even resistance?

In order to answer the previous questions, we have chosen several examples related to three levels of analysis:

1. Urban planning. Cabezo de Alcalá (Azaila) stands out the construction of houses with Roman/Mediterranean features that would indicate a desire of identity assimilation on the part of the local elite of the new Roman culture. The Roman house of Chao Samartín (Grandas de Salime, Asturias) involves the construction of a Roman domus in the heart of a castro.

2. The house itself as an identity construction. In this case, we will study the Domus 1 of Lesera (Forcall, Castellón), a city located on an Iberian center. This modest house, dated in the first century A. D., is the best example of syncretism between both cultures.

3. Finally, we will analyse the Hellenistic mosaic, II-I B.C., of the Domus 5F (Ilici). It combines Hellenistic and Roman techniques and motifs with an inscription which represents Iberian names in the Latin alphabet, as the Iberian epigraphs of the mosaics of La Caridad (Teruel) and Andelos (Navarra).

07 THE ROLE OF IMAGERY IN THE PROCESSES OF IDENTITY CONSOLIDATION DURING RECENT PREHISTORY IN THE NORTHERN PLATEAU OF IBERIAN PENINSULA

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

Presentation Format: Oral

Graphical expressions, such as rock art and pottery decoration, are active elements of material culture, being an integral element of a codified discourse that act as a mechanism for the construction of identities.

We are based on the empirical evidence (supported by archaeological data) that the motifs from rupestrian art and ceramic decoration have parallel developments in formal and chronological terms. In this sense, they represent important instruments for the understanding of the ideological system that conceived them, being able to be analyzed as iconographic discourse of the society. The exercise we propose is based on the assumption that such designs constitute a code ratified / authorized by the community instances, acting as an active (continuous) element in the identity consolidation.

The aim of this communication is to present a research project that is currently being developed, whose objective is to study the iconography of the schematic art and the decoration of pottery from the 4th to 2nd millennium BC on the northern plateau of the Iberian Peninsula (Spanish Meseta and Portuguese Trás-os-Montes province). The motifs in rock art and ceramic decoration chosen in this study can be analyzed as "texts" that communicate a meaning, which is the result of the orderly interaction of elements that can bear meaning (signs) in different social instances of the community. We will explore not only the organic/spatial relation of the motifs to each other, but also between them and the space of representation.

We intend to demonstrate that the study of iconography in Recent Prehistory, in both contexts (rupestrian sites and ceramics), is an important contribution to the understanding of the processes of identity consolidation.

08 STUDY OF LIDS IN PALESTINE DURING THE HELLENISTIC AND ROMAN PERIODS -THROUGH THE ANCIENT'S POTTER'S VIEW-

Author(s): Makino, Kumi (Kamakura Women's University)

Presentation Format: Oral

This paper focuses on lids, as well as covers and stoppers, aiming to find out the trace of Jewish identity through potter's view for producing them.

Life in Palestine in the Hellenistic and Roman periods faced with acculturation with pagans. According to the oral Torah Mishnah, lids are important in the daily life of the people in order to prevent contamination or impurity brought through pagans (Makino 2015, 2017). The changes in the relationships between lids and vessels discovered from several archaeological sites in Palestine were analyzed by how they mate or fit with each other among the associated examples. The results of the analysis indicate that the function of the lids changes from purely stopping the contents from internal leaks (type A) to external intrusion prevention (type B and C) (Makino 2018). The above considerations help us to find out that the importance of lids had raised in these periods, just like Mishnah implies.

Producing lids are, however, not so simple especially if their relations with vessels has significance. Function of purification of lids can be fulfilled only with vessels. Certain types of lids mate with certain types of vessels. Certain parts of the certain types of lids should be carefully made to be mated with certain parts of the certain types of vessels.

This, potter's view for producing lids, can be understood by comparing the length of the determinative parts of the lids or types A to C. The result will give us a hint to clarify non-associated lids, as long as the associated ones. This also gives us to find out how people react against the acculturation and reconfirm their identity.

09 IMPERIAL IDEOLOGY IN THE CONSTRUCTION OF SOCIAL IDENTITIES. THE CONTEXTUALIZED STUDY OF FLAVIAN DYNASTY REPRESENTATIONS IN HISPANIC POTTERY

Author(s): Gordillo Salguero, David (University of Salamanca; FPU13/05106. Ministerio de Educación, Cultura y Deporte)

Presentation Format: Oral

Pottery is omnipresent in the everyday life activities of Roman society. It is therefore a perfect medium to spread religious, political and moral messages, among others. The deliberate choice of these messages according to the context allows us to study the construction of personal or collective identities through material culture.

On this contribution, I will analyse the representations of the Flavian family on Hispanic ceramic products produced during the years 70-96 A. D. Specifically, I will refer to the imperial portraits on fine pottery, called "Hispanic Terra Sigillata", and the Iberian terracotta which reproduced the hairstyle and appearance of the Flavian imperial women.

In connection with the study of identities, this research helps us to advance the ideological and social interpretations of these objects. I will attempt to demonstrate how the diffusion of the Roman imperial ideology changed the ways in which the provincials expressed their political, religious, or social identity in different archaeological contexts, such as public, domestic and funerary contexts.

In this process, the Imitation of the imperial models of behaviour by the provincials was an important factor in the construction of

new local identities within globalizing Empire. However, the emperor was not the only focus of attention. The Principate was a hereditary monarchy based in the transmission of power within the Domus Augusta. For this reason, the members of the imperial family were important pieces within the strategies of political and dynastic legitimation, specially, the women. These imperial ladies came to assume the role of the traditional roman matron, becoming ideals of feminity and maternity for the provincial women, as will be proven in the present study.

10 FAMILY IDENTITIES IN IRON AGE VENETO: A METHODOLOGICAL APPROACH TO THE STUDY OF BURIALS

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

The reconstruction of identities in protohistoric contexts is mainly grounded on the analysis of the funerary contexts: funerary ritual, type of burial and grave goods are all useful elements to shape the identity of the deads.

In the last decades, the research conducted in Northern Italy and particularly in Veneto (North – Eastern Italy) has identified many burial grounds, especially crematory burials, dated from the IX to IV century B.C. The study of these contexts has also concerned the reconstruction of individual identities (especially regarding gender, status and social role) by chronological and typological analysis of findings and by the understanding of the supposed funerary ritual.

Therefore, this paper aims to provide theoretical and methodological guidelines for a research that has as its main targets: 1) identification of the households in the community; 2) reconstruction of the identities of the involved families; 3) reconstruction of the possible ways in which the hereditary transmission of goods occurred.

More specifically the focus is to identify any archaeological indicators (such as jewels, imported goods, pottery and their figurative decorations, etc) that can show bonds of kinship or can represent hereditary gifts. Data obtained from the analysis of grave goods and burials will be integrated with the results of anthropological analysis of cremated bones.

As a representative case-study, the proposed research will take in consideration the reconstruction of the identities, the social profile and the role of some households as they were in the protohistoric region of Veneto.

11 IDENTITIES IN ROMAN FUNERARY CONTEXTS FROM A NUMISMATIC APPROACH

Author(s): Blázquez Cerrato, Cruces - Andújar Suárez, Ana (University of Salamanca)
Presentation Format: Oral

Coins deposited in ancient funerary contexts have usually been considered as the obol that the dead had to pay to the ferryman Charon for his journey to the Afterlife. However, a detailed and recent analysis has allowed to reject the unidirectional lecture accepted until now. Different deposition patterns support the need to offer new interpretations for these pieces.

More specifically, during the Roman Age it is possible to observe diverse factors involved in the selection process for the numismatic material accompanying the dead. Coins, as an integral part of the burial good, had an added symbolic meaning and, therefore, conditioned the amount of pieces deposited in each burial, the place where they were located, the value and type of the coin chosen for this function, the modifications suffered by the coins themselves, etc. We believe these parameters are largely defined by age, gender, social status or cultural identity.

Since the tombs are not just containers of corpses, we find interesting to carry a detailed analysis of these coins found in funerary contexts from an integrating perspective. We have undertaken to observe all the distinguishing components and factors to identify the protocols used, and verify the characteristics that reflect the circumstances for this type of burials. We think this study will enable us to observe the possible significances of these practices, their similarities, and/or differences among the depositions associated to different segments of population.

12 KINSHIP AND ARTIFICAL BODY DEFORMATION OF CHILDREN FROM SAN FRANCISCO, YAUCA (PERU)

Author(s): Socha, Dagmara (Antiquity of Southeastern Europe Research Centre, University of Warsaw)
Presentation Format: Oral

The study of juvenile remains can give us answers to many questions about past populations, e.g., health condition and physical activities in which individuals could have participated. The many child mummies was found on archaeological site San Francisco. It is located in the Yauca Valley on the south coast of Peru. This region is a part of the Atacama Desert. Thanks to the arid climate and alkaline soil, human bodies and organic materials are preserved in good conditions. An archaeological mission led by Francisco Riddel and Agusto Belan conducted research in this region between 1987-1988. 16 children mummies from this excavation were the object of an anthropological research conducted in 2017 by the author of this paper.

A radiographic research was conducted in order to investigate wrapped mummies without the risk of their destruction. Some of the mummies had colorful textiles and the "poorest" ones were buried in brown-cream colored wrappings. It is possible that color and materials were connected with the sex of the deceased. Children in the Late Intermediate Period (900-1476 AD) and the Late Horizon (1476-1534 AD) in the Yauca Valley shared the same burial patterns and grave goods as adults. Children have separate bundles with personal grave goods like chuspas (textile bag with coca leaves) and belts. Although all of the burials were located in the same area,

great variability between individuals existed. It was probably connected with social status or kinship.

The results of these studies revealed examples of permanent body decorations. For example: artificial cranial deformation (attested in all cases) and ear deformity caused by orejeras (earring). This high variability of cranial deformation in such a small sample could have many explanations. The differences can be originated from the assigned social status related to different kinship or parents' professions.

13 IS THERE ARCHAEOLOGICAL EVIDENCE FOR THE SOCIAL TREATMENT OF DISABLED PERSONS: THREE CASES OF CRIPPLED INDIVIDUALS FROM ARCHAEOLOGICAL CONTEXT (SERBIA)

Author(s): Djukic, Ksenija - Pavlovic, Tamara - Djuric, Marija (Laboratory for Anthropology, Faculty of Medicine, Belgrade)
Presentation Format: Oral

Disability represents a complex phenomenon, which includes the interaction between disabled persons and society in which they live. According to the World Health Organization, today, "disabilities" is an umbrella term, which encompasses impairments, activity limitations, and participation restrictions. Thus, disability is not only a health problem but also a question of social norms for acceptance.

The idea of marginalization of crippled people in ancient populations is based on the contemporary marginalization and discrimination that face disabled people.

Bearing in mind that any marginalization in fact begins with the non-acceptance, it can be concluded that the ancient peoples did not accept the disabled. However, in archaeology and bioanthropology there is very little evidence that disabled people were actually marginalized. The aim of this paper is to present three cases of disabilities from different historical periods from the territory of present day Serbia. In all three cases individuals suffered from long-lasting pathological conditions that probably caused difficulties in everyday life activities. These pathological conditions not only caused difficulties during the daily life of these individuals, but also caused their altered physical appearance. However, the archaeological context and anthropological analysis not suggest that these persons were excluded or marginalized by other members of the community, and do not indicate poor living conditions or malnutrition. It is also important to note that all three persons died as a senile. Additionally, anthropological results clearly suggest that these individuals have been living with a disability for years or decades, which indicates that some members of the community must have been involved in the care of these people.

14 PERSPECTIVES ON THE IDENTITY AND ETHNICITY OF "BARBARIAN" PEOPLES IN IBERIA: FROM ANCIENT WRITTEN SOURCES TO MODERN ARCHAEOLOGICAL APPROACHES

Author(s): Arezes, Andreia (CITCEM; Faculty of Arts - University of Porto)
Presentation Format: Oral

It is said by the scarce contemporary written sources (case of the Chronicle of Hydace of Chaves) that groups of "barbarian" migrants (first the sueves, alans and vandals, and later, the visigoths) entered the Iberian Peninsula from 409 AD onwards, causing conflicts and great disruption. For a long time, these groups were viewed as homogeneous and closed entities, sharing physical features, character traits and beliefs, among other characteristics.

The archaeological narratives of the mid-twentieth century continued to reproduce echoes of preconceived ideas and scenarios transmitted through early written sources as well as by romantic authors, usually without introducing critical perspectives. Yet, the 1930s and '40s were rife with excavations of extensive and paradigmatic "visigothic" necropolises, namely in Meseta. How can we deal with the materials and informations recovered in those sites today, considering the objectives and methodologies applied (in some cases, deeply questionable and controversial) as well as the political context experienced at the time?

Recent studies of identity and ethnicity have pushed for the reformulation of narratives firmly set on issues related to the so called "barbarian" migrations. While on the other hand, archaeologists have redefined both theoretical and field/methodological approaches to this subject and to the sites that could allow us to explore it. The modalities of settlement, especially in the case of visigoths, as well as the strategies they may have used to consolidate political power, have been highlighted by new research. Finally, new methods of analysis have been applied to recover and understand remains: from human bones to seeds.

In face of all this, I intend to discuss the meaning of these transformations and the potential of new contributions, in order to reflect on their implications on the studies focused on the identity of migration groups.

15 BEHIND EVERY GREAT (RO)MAN... A CASE STUDY ON NORTH-WEST ITALIAN MORTUARY ARCHAEOLOGY IN THE WAKE OF THE ROMAN CONQUEST

Author(s): Scheffler, Sarah (University of Leicester)
Presentation Format: Oral

When 'Romanisation' was first discussed as a term and concept, scholars challenged the depth and modus operandi of the cultural change initiated by the Roman conquest. For most, the final outcome, however, was obvious – indigenous would become (provincial) Roman. Scholarship finally 'Romanised' the object – whether the subjects had perceived themselves as Roman or not. Although such Roman-ness of north-west Italy has been questioned (e.g. Haeussler 2013), archaeological studies of the material culture and in par-

ticular mortuary contexts inevitably describe them as 'fully Romanised' latest by the Augustan period. Therefore, my PhD research has been focussed on a theoretical-material analysis of the mortuary assemblages published for the north-western Italian Lomellina (province Pavia). Defining 'Roman' and finding the 'Romans' in the data has shed a new light on the cultural change in the interplay between central places and periphery, landscapes transformed by centuriation and those untouched, between urban classes and the people of rural communities. Meanwhile men disappeared… the more 'Roman' the material culture of the Lomellina became, the more prominent female gendered assemblages featured in the archaeological record, leaving men – the Iron Age warrior behind. This observation contrasts the general assumption that the integration of indigenous communities into Roman society favoured men and the public sphere while restricting women to the private space.

This paper shall highlight how material and cultural change might reflect profound changes within peripheral communities and re-interpret how we 'Romanise' the indigenous.

16 FOOD FOR MANIPULATION: TRANSFORMATIONS OF GENDER IDENTITIES IN LATIUM VETUS (ITALY) FROM THE 10TH TO THE 6TH CENTURY BC

Author(s): Venderbos, Ilona (Vrije Universiteit Amsterdam; CLUE +)
Presentation Format: Oral

Recently, identity has become a much-debated subject for Protohistoric Italy, especially in relation to the increasing social stratification and state formation processes attested from circa the 10th to the 6th century BC. In the context of this debate, the subject of gender is frequently addressed. Most of these studies either discuss gender as part of a wider research question concerning identity, or focus only on a particular site, relatively short time period or a certain category of objects. Due to this fragmented state of research, a coherent view is still absent on how exactly gender identities changed in the long-term, and – even more importantly – it currently remains unclear how such changes related to the profound socio-political, economic, cultural and ideological transformations in this period.

In order to shed more light on the relation between changes in gender identities and the profound transformations in Italic societies between the 10th and 6th century BC, the author conducts research on this subject in the context of a PhD dissertation. The results of this research are presented in this paper. Using funerary data (since for Italy burials are the prime source of information on identity in this phase) from the area of Latium Vetus as a case-study, this paper provides an illustration on how gender identities were reinvented during the 10th to 6th century BC. Moreover, on the level of the individual these gender identities were probably not only reinvented, but also consciously manipulated. In Latium Vetus such redefinitions and manipulations might have occurred already much earlier than generally thought. Finally, the subject is addressed how these processes of reinventing and manipulating gender identities were connected to the profound societal transformations at stake in these centuries.

17 CRAFTSMEN OR RITUAL SPECIALISTS? SOCIAL IDENTITY OF CHALCOLITHIC METALWORKERS IN THE LEVANT

Author(s): Gošic, Milena (Department of Archaeology, University of Belgrade)
Presentation Format: Oral

The aim of the proposed paper is to reconstruct social status metalworkers had in the Chalcolithic societies of the Levant by juxtaposing the idea of metalworkers as craftsmen that brought on the first industrial revolution, i.e. the introduction of metal, to the idea that the earliest metalworkers were ritual specialist who, through mastering the art of material transformation, i.e. metallurgy, established a new ritual practice that defined their identity.

Chalcolithic metallurgy has been extensively studied in the past decades, ever since the discovery of a hoard of over four hundred metal objects in a cave in the Judean Desert in 1961. Several production sites have been excavated, finished copper artifacts have been found at settlements and burial sites throughout the region and main source of ore utilized has been identified. Several important questions still remain unanswered, including the origin of arsenic, antimony and nickel rich ores, as well as location(s) of lost wax casting workshop(s). It appears that numerous attempts to provide definitive answers to these questions by using ever more sophisticated, yet essentially the same scientific methods, have rendered us incapable of looking beyond them in trying to understand who the people practicing the craft were and how did they identify themselves. The proposed paper focuses instead on the archaeometallurgical data that is available, but also on the wider archaeological and social context in which metallurgy developed, in order to reconstruct the social dynamics that forged metalworkers' identity.

18 BUTCHERY AS A BORDERLINE SYNDROM – THE IDENTITY OF THE BUTCHER IN IRON AGE SWEDEN

Author(s): Stolle, Bettina (Stockholm University)
Presentation Format: Oral

Butchery marks are one of the earliest and clearest traces of human – animal interaction in prehistory. The interest in butchery marks has a long tradition within zooarchaeological research. New methods and experimental studies have made the investigations and interpretations more nuanced and informative over the past decades. However, while butchery marks are successfully used to describe carcass processing and consumption patterns, they are rarely linked back to the individuals in action – namely the people who killed and processed the animals. The possibility to make social inferences from animal bone analyses is widely recognized today.

This paper aims to discuss the somewhat hidden role of the butchers in Iron Age Sweden and the potential to trace their identity through animal remains. While we have clear evidence of butchery as a profession from the Middle Ages and onwards, the organization of animal slaughter is somewhat more diffuse in the preceding periods. Assuming that butchery required detailed knowledge of animal anatomy and food culture it is an activity that has probably been conducted only by parts of the society. Moreover, increased notions of ritual killing and slaughter of animals from the Roman Iron Age and onwards indicate that butchery was more than common day praxis and that butchers played an active part in religious rites. The role and identity of the butcher therefore receives an intriguing connotation, permeating both mundane and ritual spheres. It might even be described as a borderline identity and a clear argument for the indivisibility of these spheres. With examples from the Mälaren region in eastern Sweden this paper tries to shed light on this hidden identity and its intrinsic organization.

19 "FOR THE LOVE OF GOD AND ARCHAEOLOGY": THE AFFECTIVE ECONOMY OF PORTUGUESE ARCHAEOLOGISTS DURING THE "ESTADO NOVO" DICTATORSHIP

Author(s): Gomes Coelho, Rui (Cultural Heritage and Preservation Studies, Rutgers University)
Presentation Format: Oral

Archaeologists become a community through the exchange of ideas and arguments. All those exchanges have a very sensorial dimension as they correspond to a material exchange of letters, cards, photographs, and printed papers. The circulation of those objects embodies an economy of affections that defines the practice of archaeology itself. To write a letter is to act upon the receiver; but it also acts back, and writing is an act of subjectification. Thus, to engage with other archaeologists is a performance of cordiality in its deepest sense: to behave according the heart (cordis). My question here is: how does the materiality of archaeologists' economy of affections contribute to the construction of institutions, especially institutions under dictatorial regimes? My argument is that this economy of affections obscured the inherently political role of archaeology by establishing a barrier between the practice of "good" science as an affective project, and "bad" science as a politically informed practice. An examination of the materiality of previous generations of archaeologists and their interactions with powerful figures is a way of understanding how we define ourselves as a community, and what kind of political subjects we are. In this paper I will examine the context of Portuguese archaeology during "Estado Novo"'s dictatorship (1933-1974) assuming the dictator's office as a site, and his exchanges with archaeologists as archaeological strata.

20 HOLDING AND LETTING GO. REGIONAL IDENTITIES OF MARGINALITY THROUGH 1800 YEARS

Author(s): Christiansen Broch, Mathias (De Kulturhistoriske Museer i Holstebro kommune; University of Copenhagen, The Saxo Institute)
Presentation Format: Oral

In "Holding and Letting Go. The Social Practice of Personal Identities" (2014), Lindemann published her take on how personal identity is formed, maintained and deconstructed through social practice. Through narratives and case studies, she explores and develops the concepts of 'Holding' and 'Letting Go' – two concepts that influence how we through social interaction effect other individuals and hold them in their identity. 'Holding' can be done well when an individual is treated accordingly to narratives constituting a current identity – and poorly when not. Furthermore, when a narrative expires or ceases to be of relevance the possibility of 'letting go' facilitates a possibility to change identity or uncomfortably holding an identity in place.

Even though Lindemann's concepts were developed with individual identity in mind, the concepts seems applicable when dealing with regional identity as well. In this paper, I will attempt to apply Lindemann's concepts of holding and letting go as an analytical tool to that of regional identities through a specific Danish case study: Western Jutland during 1-2000 AD. This particular region is strongly defined as a contemporary Danish periphery. The etic view of the regional identity as being provincial, of low cultural complexity, and underdeveloped has largely been unchanged throughout at least 300-400 years. Notions enforcing such perceptions appear frequently and in various contexts of both political and more poetic character. In addition, the archaeological knowledge from western Jutland has until recent years been remarkably sparse and the region have thus been interpreted along similar lines of liminality.

Both historical and archaeological heritage narratives revolve around a Danish 1800-year-old outskirt, but how does this holding of identity correlate with the emic regional identity in western Jutland, and is it time to let go of some of the heritage-related narratives when new archaeological data becomes available?

21 RE-DEFINING IDENTITY THROUGH A REGIONAL ANALYSIS OF THE PERSONAL ADORNMENT OF UPPER PALAEOLITHIC EUROPE

Author(s): Kang, Amanpreet (University of Sydney)
Presentation Format: Oral

This paper will establish how identity can be recognised in the archaeological record of Upper Palaeolithic Europe. Moreover, it will address the scholarly debate surrounding the Kulturpumpe model, which postulates that the Swabian Jura was an area of fundamental behavioural development. The premise of this model is that this geographical region and its cultural innovation of the Aurignacian predates parallel developments elsewhere in Europe. This paper will test this model through a regional analysis of the personal

adornment of Europe. Most importantly, the central theme of this paper is to unravel the concept of identity and how it has changed with existing scholarship. This also leads to an overarching conceptual issue surrounding hominid cognition. Can a regional analysis of personal adornment trace behavioural patterns in the archaeological record? This is the fundamental aspect of this paper, which will assist in developing the theoretical aspects of identity in Upper Palaeolithic Europe. This paper also contributes to the wider sphere of behavioural modernity. How do we re-define these terms and how can they be integrated in forming a theoretical framework to identify patterns of behaviour in hominids? This paper posits such questions to reconsider the concept of identity in the Upper Palaeolithic of Europe.

22 IDENTITY AS A STRUCTURED SOCIAL PRACTICE AMONG HUNTER-GATHERERS IN SOUTHERN NORWAY

Author(s): Olsen, Dag Erik Færø (University of Bergen - Norway)

Presentation Format: Oral

Identity and ethnicity has been important aspects of Mesolithic and Neolithic research in Norway the last 25 years, where establishing ethnic boundaries or social identities based on material culture has had a particular focus. This paper aims to explore group identity among hunter-gatherers in the late Mesolithic-Early Neolithic as a structured social practise and central to groups "world view" or perspective of life. Here, identity is not seen as resulting from contact with others but as an integral part of what can be called a situated habitus. Based on Pierre Bourdieus habitus concept, its starting point is that variations in material culture could reflect varying behavioural patterns among different hunter-gatherer groups, thus also reflecting differences in how one perceived the world and the other people inhabiting it. A situated habitus incorporates places of living and the accumulation of tradition that occur over time, as part of the transmission of knowledge between generations. Variations in settlement patterns and material culture in western and eastern coastal Norway constitute the basis for this case-study where specific environmental and geographical conditions has had a substantial impact on the development of life and social groups in these areas. The establishment of unique habitus, or social traditions, anchored in the landscape and place of habitation, will also incorporate the notion of identity both in- and between hunter-gatherer groups in Southern Norway.

23 TWO MEROVINGIAN GRAVES IN SOUTHERN GERMANY – THE SOCIAL CONSTRUCTION OF IDENTITIES?

Author(s): Werner, Michael (Archaeological Institute, Dept. of Early Medieval and Medieval Archaeology; University of Freiburg, Germany.)

Presentation Format: Oral

Inspired by Berger and Luckman's "The Social Construction of Reality" one can formulate the following deliberation, concerning the (re-)construction of the past from archaeological material. By exploring and interpreting past identities, processes of construction happen on three different levels.

First, each reality is constructed by its inhabitants through the externalisation of ideas and understandings. Second, on a material level, our sources are throughout constructed as well – both being man-made objects in a literal understanding and being social constructions in terms of being externalisations of ideas. Finally, on an epistemological level, we as archaeologists construct descriptions of past identities which matches our knowledge and understandings. But which are not identical with past reality and neither are to be regarded as plenary objective. In a constructivist view 'appropriate descriptions', in a sense of being descriptions matching our sources, open up the possibility of several, equally 'correct' interpretations of one and the same phenomenon. However, it is crucial to stress the importance of formulating descriptions of identities and in a broader sense narratives, which are indeed matching the archaeological material.

With these considerations in mind, our current research on a group of two newly discovered Merovingian graves from Southern Germany is presented. Their location isolated from other graves as well as settlement structures, just as the objects of both richly furnished burials are debated. The possibilities to reveal gender, social identity, ethnicity or even origin is critically reflected, with the focus on exposing each line of argument. The crucial role of different concepts on the epistemological level of archaeologists is highlighted. The influence of ideas and narratives about contacts, migration and mobility, or more traditionally ethnicity, on the interpretation of the material and the reconstruction of past identities is discussed.

24 IDENTITY AND POWER RELATIONSHIPS: THE CASE OF THE SO-CALLED 'VISIGOTHIC BURIALS'

Author(s): Tejerizo, Carlos (Institute of Heritage Science, CSIC)

Presentation Format: Oral

Since the 80s, identity has constituted a central problem within social sciences, including archaeology. Moving forward from functionalism and processualism, recent theoretical approaches on the archaeology of identity have emphasized its flexibility, resilience and historicity. Identity has no longer seen as a given entity but a complex and intersectional social construct. However, the connections between the construction of social identities and power relationships among different social groups in specific historical contexts have been less considered in the archaeological discipline. In the case of Early Medieval societies, the study of social identities have been commonly determined by the question of ethnicity, mostly understood from a historical cultural and determinist point of view. However, recent theoretical approaches and the development of new archaeological excavations have questioned this straightforward relation between identity and ethnicity in early medieval societies. In this paper, I will consider, from a Marxist and symmetrical point of view, the relationship between identity and power relationships within rural societies in northern Iberia through

the reconsideration of the classical 'Visigothic burials', those related with 'Germanic' objects. I will argue that these burials show not only the complex social relationships among local communities, but also their interconnection with extralocal power relationships, including the Visigothic state.

25 THE OTHER BODY: MULTIPLE BURIALS ACROSS VIKING AGE SCANDINAVIA AND THE INSULAR WORLD

Author(s): Ratican, Claire (University of Cambridge)
Presentation Format: Oral

This paper takes a new approach to the formation and expression of identity through the multiple burial rite in Viking Age Scandinavia and the Insular World from the late 8th to 11th century AD. In the past, multiple burials have been categorised as the burial of more than one individual in the same grave context and they are a common feature of the Viking Age cultural landscape of the North Sea region.

Traditionally, study of the multiple burial rite has been quite conservative. Classification has been limited by an emphasis on closely constrained spatial configurations with multiple interments taking place within a short period of time. Multiple burials have been investigated as a narrow subcategory of funerary practice preoccupied with the violent treatment of those interred—slaves, criminals, sorcerers. This has led to interpretations heavily laden with concepts of deviancy and 'otherness', while also being greatly influenced by historiographic assumptions regarding the nature of gender and social status.

As a result, a restricted collection of identities has been constructed and assigned to the dead in Viking Age multiple burials. This fails to fully realise both the diversity and complexity of identity being expressed. By adopting a posthumanist approach and challenging the present theoretical construction of a multiple burial to embrace a wider concept of 'being' (one that includes nonhuman identities like animals and ritually modified or 'killed' objects), we can gain greater insight into the scope of identities that are mediated through this rite.

703 REPRESSED BODIES AS A RESEARCH THEME: ARCHAEOLOGY, MEMORY AND POLITICAL USES

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Solé Barjau, Queralt (Universitat de Barcelona) - Marín, Carlos (Universidad de la República, Uruguay) - Gallego Vila, Laia (Universitat de Barcelona) - Herrasti, Lourdes (Universidad del País Vasco)
Format: Regular session

Searching, studying and treating repressed bodies of contemporary conflicts have conformed an important part of the archaeological agenda in recent years. Amongst forensic disciplines, archaeology has gained growing social recognition and played a relevant role as a procedure and research methodology, but also a tool towards the defense and vindication of Human Rights. Scientific procedures and the specific nature of materiality have surrounded the intervention of archaeology with a hint of objectivity which has led to favour its forensic interest over historical interpretation.

Repression on bodies performed in diverse historical situations have conformed specific particularities and problematics to distinct archaeological contexts. Repression executed over bodies affects the ways of studying the archaeological record, but also the discourses, the social processes for dealing with trauma and the action of memorial and political agents.

The role of archaeology in searching and exhumating repressed bodies has raised many questions. In a context where the International Law has been partially imposed, some states consider exhumations as historical facts, while others consider them as crimes against humanity on the condition of the moment of the assassination. Which role has archaeology played, plays or should play? Is archaeology forced to make final decisions in light of insufficient laws? How can one be objective but not impartial?

The present session encourages thoughtful and analytical presentations on the mentioned theme to assess it globally from various geographical and chronological contexts.

ABSTRACTS

01 CITIZEN FORENSICS: GRASSROOTS MOVEMENTS AND THE UNEARTHING OF BODIES

Author(s): Renshaw, Layla (Kingston University London)
Presentation Format: Oral

In many parts of the world, successive governments have not adequately responded to the issue of missing bodies and clandestine burials resulting from war and human rights abuses. This paper will look at the kind of grassroots movements that fill the vacuum of state inaction, and the emergence of a form of social action identified as Citizen Forensics, analogous to Citizen Journalism, that has the power to radically transform public and political discourse on the past. Looking in particular at the search and recovery of human remains, and the banking and matching of DNA from both the living and the dead, this paper will employ the concept of biological

citizenship, and related ideas from science and technology studies, and apply these to the search for missing ancestors and loved ones. It will further propose that developing notions of forensic and archaeological citizenship are useful to understanding these campaigns. It will use these ideas to evaluate why this form of direct action is successful in challenging prevailing memory politics and repressed histories, and problematize the ethical and political positions of archaeologists who work in this field. It will draw on both archaeological and ethnographic fieldwork on mass grave investigations, and reference case studies from Spain, Latin America and World War I graves from the Western Front.

02 INDIGENOUS BONES AND ETHICAL DILEMMAS. A CASE STUDY IN THE CANARY ISLANDS

Author(s): Farrujia de la Rosa, Jose (Sociedad Española de Historia de la Arqueología) - Hernández-Ojeda, María (City University, New York)

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 ancient Amazigh magical-religious practices.

The entire indigenous culture, which had existed in the Canary Islands for approximately 2.000 years, began to disappear irreversibly, following the European conquest and colonization of the Archipelago since the Late Middle Ages. This led to the gradual disappearance of the indigenous settlements, the elimination of material items from the indigenous culture, and the new settlers' appropriation of indigenous areas. The colonizer imposed their western views of life, as well as European systems of social organisation and production. These values and regulatory mechanisms were alien to the indigenous Canarian world. Over time, the development of an imperialist archaeology in the islands, which developed during the 19th century and a good part of the 20th century, would perpetuate the Eurocentric interpretation of the indigenous Canarian past. From the bioanthropological point of view, indigenous female lineages have survived in present-day populations since the conquest, experiencing only a moderate decline, whereas indigenous male lineages have fallen consistently and have been replaced by European lineages.

This paper analysis the ethical dilemmas within the recent use of Canarian indigenous bones from El Museo Canario, in an exhibition of Contemporary Art in Gran Canaria, which opened to the public until the 21.1.2018. Those ancient and sacred bones were used, without anatomical connection, in the making of an artistic installation. This paper also deals with the ways in which the remains are stored and handled in museums, with the ICOM Code of Ethics for Museums, and it calls the attention on the mortuary evidence seen as an integral part of the archaeological record of past culture and behavior.

03 FORENSIC ARCHAEOLOGY IN ROMANIA

Author(s): Cozma, Elena („Alexandru Ioan Cuza" University, Iasi)

Presentation Format: Oral

This paper outlines the development of forensic archaeology in Romania. Forensic archaeology consists in applying principles, techniques and classical archaeological method of a judicial context. It is a branch of archaeological practice that is applied in the field of judicial issues and is closely related to the work of courts of law.

Forensic archaeology is very new in Romania and still lacks power and supporters among non-archaeologist experts. Many of them do not know what it means or do not heed the term, or believe that it is an industry that is gives archaeologists another excuse to 'snoop around'. Some of the questions asked of forensic archaeologists: Why do we need such a specialist? Not doing forensics alone without help from archaeologists? Everyone knows how to dig a hole why do we need archaeologists?

This paper was prepared in order to justify the relevance of forensic archaeology in Romania and respond to these questions addressed above, opening the way for a new specialty that can be helpful in solving as well as possible cases of genocide and crimes against humanity. It will be presented some cases where the methods and principles of forensic archaeology were applied and the Visinescu Case.

04 THE GERMAN-RUSSIAN FRONT IN SOUTHERN POLAND, WINTER 1945: HISTORY AND ARCHAEOLOGY

Author(s): Niebylski, Jakub - Tunia, Krzysztof (Polish Academy of Sciences, Institute of Archaeology and Ethnology)

Presentation Format: Oral

At the end of 1944, the Western Allies, having trouble stopping the attack of German troops in the Ardennes, turned to the Russians for help to speed up the offensive on the Eastern Front. The Soviet General Staff decided to strike in the direction of Berlin. The part of this offensive known as Operation Vistula-Oder began on January 12, 1945, in southern Poland, north of the Carpathian Mountains. On January 24, the city of Chrzanów, located about 30 km west of Cracow was liberated by Gen. Ivan Koniev's troops, continuing their attack in the direction of Silesia. A large number of casualties was the result of reckless combat tactics on the part of the Red Army.

Immediately after the war, such fallen soldiers were transferred to larger cemeteries, one of which was situated in Chrzanów. Due to the difficulty of securing and maintaining this monument over the years, it was decided to transfer the soldiers' remains to a more closely monitored municipal cemetery in Chrzanów. After obtaining the consent of the officials from the Russian Federation, exhumation was carried out in January 2018. The number of soldiers interred at the monument was determined to be 1340.

During the exhumation, a relatively large number of small items associated with soldiers' burials were obtained. Preliminary observa-

tions indicate that this is a valuable source for multifaceted historical research. Many soldiers were buried with elements of equipment and munitions. A number of personal items were discovered as well, including some with initials. A detailed analysis of this set of finds can give us a picture of the everyday life of soldiers of the Red Army at the end of World War II, and can hopefully help in identifying—after more than 70 years—those individuals who thus far have remained nameless.

05 REPRESSED IDENTITIES DURING STATE VIOLENCE: A PERSPECTIVE FROM BUREAUCRACY

Author(s): Hattori, Márcia (Institute of Heritage Sciences - Incipit)
Presentation Format: Oral

How do memory sites – mostly monuments and plaques, created in recent years in Brazil (2013-2016) legitimized the exclusion and especially the non-existence of other people who are not recognized as victims? Based on the concept of bare life (Agamben, 1995) and lives that are grievable (Butler,2016), my presentation will discuss on how we could try to go beyond a discussion of inclusion of groups and people and to be enable to reveal what the machine and power of supermodernity does not want to be shown (González-Ruibal 2006). To do so, I will use one of my case studies in Brazil analysing documents produced for the bureaucracy of death but also the memory sites created until now. In the last years (2013-2017) the municipality of São Paulo has created different memorials included in the Project "Places of Memory", whose purpose is to promote the democratization of public spaces by fomenting the debate about places and symbols. However, this project, part of the politics of transitional justice and the debates for Historical Memory related to the last dictatorship, didn´t discuss the concept of who is considered victim and who is not. In consequence, most of the memory sites is representing people who were involved with the struggle against dictatorship.

06 JUSTICE, HUMAN RIGHTS AND EXHUMATIONS. OBSERVATIONS ON THE SEARCH FOR DISAPPEARED DETAINEES FROM ARGENTINA AND URUGUAY

Author(s): Marín, Carlos (Universidad de la República - UdelaR) - Rosignoli, Bruno (CONICET)
Presentation Format: Oral

The Argentinean Team of Forensic Anthropology (EAAF) started the search of disappeared detainees of the last dictatorship in 1984. In a few years, it became an international reference in the field of forensic archaeology, keeping its independence from the political power. The team has been identifying human remains and generating judiciary evidence for trials of crimes against humanity in Argentina. However, the volume of work and the social demand for excavations throughout the country has driven the formation of new teams. Over the last years, several groups of forensic archaeologists started filling the gaps in remote provinces such as San Juan, Mendoza, La Rioja or Tucumán. Most of these forensic teams are linked to local universities and/or human rights organizations, depending on the judiciary to fund their researches. Uruguay waited over twenty years for the creation of a similar organization. The center-left political coalition Frente Amplio won the general elections in 2005 and requested the creation of the Forensic Anthropology Research Group (GIAF) in the University of the Republic (UdelaR). The GIAF followed the Argentinean model but has been under political control since the beginning, especially from 2015 onwards. The group has been unable to contribute much to the judiciary because of the limited results of its researches, and because of the continuing political impunity of the dictatorship's crimes in Uruguay.

07 IDENTIFICATION AND THE ROLE OF ARCHAEOLOGY IN COMPLEX CONTEXTS: A PERSPECTIVE FROM BRAZIL AND THE SEARCHES OF DISAPPEARED PEOPLE

Author(s): Hattori, Márcia (Institute of Heritage Sciences - Incipit) - Barrio Martínez, Candela - Moreli Tauhyl, Ana Paula (Comissão Especial sobre Mortos e Desaparecidos Políticos) - Inglez, Mariana (Laboratorio de estudos ecológicos evolutivos humanos. Universidade de São Paulo) - Gratão, Marina (Comissão Especial sobre Mortos e Desaparecidos Políticos)
Presentation Format: Oral

In July 2014, a Working Group was formed by the Special Secretariat for Human Rights of the Ministry of Justice of the Federal Government (SEDH / MJ), the Secretariat of Human Rights and Citizenship of the Municipal Government of São Paulo (SMDHC) and the Federal University of São Paulo (UNIFESP). The objective of the group is to search for 41 political disappears from the military dictatorship (between 1964 and 1985), which could be among the human remains found in a mass grave located in the neighborhood of Perus, Sao Paulo. The mass grave was formed in the years 1975 and 1976 and is composed of more than a thousand human remains of victims of the military dictatorship, death squads and the neglect of the Brazilian State with the homeless, among other victims. Since its discovery in 1990, its content has undergone many processes and institutions that have influenced the integrity and state of bone preservation.

The purpose of our communication is to discuss, from a concrete case, the role of Archaeology and Forensic Anthropology in contexts of human rights violations in contemporary conflicts. The research carried out with the Perus mass grave serves as an example to explain how the multidisciplinary study, especially Archaeology, was crucial for the case.

08 FROM THE EXHUMATION OF BODIES TO HISTORICAL KNOWLEDGE. ANALYSIS OF IRREGULAR FRANCOIST REPRESSION FROM THE EXCAVATION OF MASS GRAVES (1936-1948)

Author(s): Muñoz-Encinar, Laura (Extremadura University)
Presentation Format: Oral

The Francoist repressive strategy used after the coup d'état of July 17th, 1936 caused the death of 13.205 people in Extremadura (Spain). Of these victims, at least 9.293 were executed irregularly, without any judicial procedure. Detained illegally for political reasons, their tracks were lost in the repressive process and eliminated directly through War Declaration Decrees (bandos de guerra) between July 1936 and 1948. The bodies of these individuals were buried in mass graves, thrown into riverbeds or buried in mines. These deposits in which corpses were buried have been investigated with the aim of analyzing the repressive act that they represent and the strategies that the facts address. To do this, we investigated ten cases that expand over the wide chronological span of War Declaration Decrees. The methods used for the analysis are based on those of archaeological and forensic anthropology disciplines. These allowed us to infer the repressive events that the mass graves represent, to define the perimortem and postmortem actions used on victims, the cause of death, and to identify the bodies and determine the role played by violence in the socio-political and chronological context to which the executions belong. Strategies of elimination represent the first step in the Francoist repressive processes, showing its complexity and organization. The diversity of tactics inferred indicates the role of violence as a way to eliminate the enemy and a tool of social control. Through these strategies, we have verified the intentionality and systematic character of these forms of repression.

09 HOW DO WOMEN DIE? ARCHAEOLOGY OF THE REPRESSION TOWARDS WOMEN

Author(s): Herrasti, Lourdes (Sociedad de Ciencias Aranzadi) - Solé, Queralt (Universitat Barcelona)
Presentation Format: Oral

Since 2000 more than 600 common graves of victims of the repression of the Spanish Civil War and post-war period have been exhumated throughout the state. Most of the recovered victims are from the male sex, and just 2-3% belong to women. Throughout the work of archaeology associated objects are analyzed: several objects show clear gendered attributes such as hairpins and combs to tie back the hair, bars of corset or sewing thimbles which denote a characteristic feminine labor activity. Likewise, it has been analyzed some characteristic ways in which women were murdered or differences in body depositions.

Repression executed against women consisted in shaving their heads and forcing them to ingest castor oil willing to humiliate and denigrate. Mistreatment, vexation and rape were also common, yet they are tough or impossible to analyze through archaeology or anthropology. Some examples of mass graves in which women were buried are presented.

In many cases, the historical account explains that some women were pregnant when assassinated and a number of these cases have been confirmed by archaeological exhumations.

Repression against women was also the means to exert pressure and social control. It was a weapon of war aimed at the civilian population. The silence and the fear subsequently imposed concealed a buried reality.

10 INDIVIDUALS AS MEN: A GENDERED ARCHAEOLOGICAL APPROACH ON MASCULINITIES AND REPRESSION IN THE SPANISH CIVIL WAR

Author(s): Santamarina-Otaola, Josu (University of the Basque Country - UPV-EHU)
Presentation Format: Oral

The Spanish Civil War, one of the most relevant historical events in European contemporary history, can be understood as an armed political conflict in which different ideologies clashed brutally. In this sense, Otherness is a useful term in order to understand how repression worked from physical extermination to symbolic destruction.

The conceptualization of the Other as an enemy can also be understood under parameters of gender. Some authors have highlighted the specific roles of women in conflict in different sides: as soldiers, as nurses, as victims, etc. Archaeology has brought us some interesting examples of specifically gendered repression against women, for example, throughout the study of 'special punishments' –shaving their hair, forcing them to sweep the streets as a public humiliation, etc.– or murdered and buried in mass graves across Spain –with some social and geographical particularities.

In this paper, we are going to try to analyse some technologies of violence and repression focusing on perpetrators and victims as men, as embodied political subjects. After the war, repressed bodies had different treatments depending on the side they had been aligned with, also under gender parameters: victors (the Fallen) were glorified as examples of manhood and, in opposition, defeated –the wretched Other– were humiliated as degenerate subjects. In summary, we are going to try to answer this question: is it possible to characterize specifically gendered traces of repression by and against men in the archaeological record of the Spanish Civil War?

11 VALUATIONS AND EXPERIENCES IN ARCHAEOLOGICAL INTERVENTIONS IN THE BATTLEFIELDS AND SPACES OF REPRESSION OF THE SPANISH CIVIL WAR IN CATALONIA

Author(s): Busquets, Cesc (Atics SL; Arqueologia UAB) - Ramos, Jordi (Atics SL)

Presentation Format: Oral

In the last decade, archaeological interventions of the time of the Spanish Civil War have increased. We present some assessments and experiences of archaeological actions in the spaces of the war conflict in the Catalan territory. Within the current legal and legislative framework, the archaeological company ATICS SL has participated in several projects of emblematic sites of the Spanish Civil War, studying, evaluating and even avoiding the affectation of the cultural heritage, especially archaeological and architectural. In order to achieve the goals of knowing, documenting, evaluating and, definitively, avoiding any loss of the cultural values of heritage assets, a whole series of work has been carried out during the previous studies and the drafting of projects during the approval and, finally, during the execution.

In the same way, we have made an assessment based on the experience of the problems and results of some excavations carried out in the documentation, intervention and recovery of the bone remains. With some examples we intend to approach the reality of the bone remains scattered throughout the Catalan territory, and the way of considering the archaeological and anthropological study in relation to possible similarities and differences between the various archaeological excavations. For this reason, we show some cases of the recovery and dignification of the human remains of combatants and civilians who disappeared in some places in Catalonia where the Civil War was carried out or as a result of repression.

12 EXCAVATION OF THE MASS GRAVE OF THE SPANISH CIVIL WAR LOCATED OUTSIDE THE FIGUEROLA D'ORCAU CEMETERY (LLEIDA)

Author(s): Busquets, Cesc (Atics SL; Arqueologia UAB) - Ramos, Jordi (Atics SL) - Armentano, Núria - Nociarová, Dominika (Antropòlegs. lab; GROB-UAB) - Gutiérrez, Aida (GROB-UAB)

Presentation Format: Oral

In March 1938 when Nationalist offensive broke the Aragon front and the troops advanced to Vinarós, Catalonia was isolated from the rest of the Republican territory. At the same time the rebel troops occupied the Vall d'Aran and the western part of the Noguera Pallaresa, Segre and Ebro rivers; his progress on the Pallars had the objective of controlling the hydroelectric power plants. The town of Figuerola d'Orcau (Isona i Conca Dellà, Lleida) was occupied on 9 April 1938 by the 63rd Division of the troops of Navarre. The population was confused in the confrontations of the Pallars front.

The most notable combat was the republican counter-offensive on the Tremp bridgehead, between May 22 and 31, when the front was located very close to the town. The republican advance was suffocated by the troops of divisions 150 and 152 of the Moroccan Army Corps.

Throughout 2017, the documentary research and prospecting work (visual, remote sensing and geophysical prospecting) has been carried out, in order to find and exhume the remains of the pit adjacent to the cemetery of the town of Figuerola d'Orcau. It has been an archaeological intervention that is included in the Action Plan of mass graves of missing persons during the Civil War and the Francoist dictatorship that the Department of Foreign Affairs, Institutional Relations and Transparency of the Government of Catalonia is developing.

The mass grave, about 9 meters long, was located outside the cemetery, and contained the skeletal remains of 17 male individuals, well-disposed. The elements of military clothing, religious medals and identification badges that accompanied them indicate the Franco faction of the victims. The location and excavation of the mass grave have allowed to confirm some stories of the villagers and to rewrite the war episodes of April and June 1938.

13 A GRAVEYARD FOR TWO ARMIES: THE MASS GRAVES AT EL SOLERÀS (1938-1939)

Author(s): Camats, Anna - Escala, Oscar (Iltirta Arqueologia SL) - Fernandez-Vilela, Andrea - Lopez-Onaindia, Diego - Montes, Nuria (Iltirta Arqueologia SL; Grup de Recerca Aplicada al Patrimoni Cultural - GRAPAC. Unitat d'Antropologia Biològica; Departament de Biologia Animal, Biologia Vegetal i Ecologia; Universitat Autònoma de Barcelona) - Moya i Garra, Andreu - Riudor, Noemi (Iltirta Arqueologia SL) - Subirà, Eulàlia (Grup de Recerca Aplicada al Patrimoni Cultural - GRAPAC. Unitat d'Antropologia Biològica; Departament de Biologia Animal, Biologia Vegetal i Ecologia; Universitat Autònoma de Barcelona) - Tartera, Enric - Vidal, Ares (Iltirta Arqueologia SL)

Presentation Format: Oral

During the Spanish Civil War, the village of El Soleràs (Garrigues, Lleida) hosted two Republican army military hospitals in local buildings and become a point of reception of wounded soldiers, first from the batalla de l'Ebre, and afterwards from the batalla del Segre. Some injured ended up receiving burial in this place. Republicans excavated four major mass graves. Later, with the occupation of the area for part of the Francoist army, the cemetery continued serving as burial place for its soldiers.

The Pla de Fosses 2017-2018 has been launched by the Departament d'Afers i Relacions Institucionals i Exteriors i Transparència de la Generalitat de Catalunya aiming to contribute to the recovery of the historical memory and the culture of peace. The initiative, funding, and coordination of this Department allowed the archaeological works to be carried out.

At least 6 longitudinal common graves along the cemetery have been excavated during the first quarter of 2018. In the republican graves, the corpses appear overlapped, layered, and thrown in carelessly. Many of these bodies show evidences of medical treat-

ment: immobilization with plaster, use of splints, drainage tubes, suture threads, and amputations. In contrast, in the rebel graves the bodies are carefully arranged. These soldiers retain mostly a good part of their clothing and personal belongings. These data suggest that these soldiers died in battle and buried in the cemetery without being attended in the hospital.

Moreover, by means of the historical and documentary research, including oral testimonies, we have been able to reconstruct the experiences of the inhabitants of the village and the medical team in this period.

14 THE VALLEY OF THE FALLEN, WHERE HUMAN REMAINS DISAPPEAR. A FUNERARY MONUMENT FOR THE DICTATOR

Author(s): Solé Barjau, Queralt - Gallego, Laia (Universitat de Barcelona)
Presentation Format: Oral

The presentation that we pose will focus on the scientific and social significance of the displacement of the remains of the bodies of the Spanish Civil War from the military cemetery and the common graves to the Valle de los Caídos in Madrid.

This is a monument conceived and promoted by dictator Franco. Its construction began in 1940 consecrated to the memory of all the fallen soldiers and civil victims who supported the coup d'état, containing all of their skeletal remains. The construction prolonged until 1959, when it was unveiled. Unexpectedly, in 1958, also corpses from republicans had been moved to the funerary monument. Displacements took place between 1958 and 1981.

The presentation will address the methodology employed for the (unscientific) exhumation and displacement of the skeletal remains and focus the analysis on the consequences of those displacements: on the one hand, the constant presence of the absence of the relatives suffered by the defeated, dead in the front, buried in unknown common graves or forbidden to exhume the remains; on the other hand, the public tributes to the fallen victors. The comparison between the contrasting experiences of the permanent absence of the republican bodies and the omnipresent memory of the victors will be addressed in order to understand the construction of the dichotomy defeated-victor by the dictatorship.

The monument of the Valle de los Caídos accurately embodied the agenda of the francoist dictatorship, being the most prominent funerary monument and common grave of the Regime. Both the location (competing with the royal monument of El Escorial) and its characteristics were part of a conceived project for a meditated social, national, cultural and political construction, which we claim that deserves a thorough study.

706 ART AS MATERIAL CULTURE

Theme: The archaeology of material culture, bodies and landscapes
Organisers: López-Bertran, Mireia (Universitat de Valencia) - Horcajada-Campos, Patricia (Universidad Autónoma de Campeche) - Vidal-Lorenzo, Cristina (Universitat de València)
Format: Regular session

This panel aims to explore art objects in terms of material culture. As stated by John Robb and Elizabeth de Marrais (2013, 4), art helps to constitute social relations and is more about doing than viewing. Following this argument, we welcome papers focusing on the economic and social consequences of crafting artistic objects as well as the physical and emotional impact on the users. We are particularly interested in papers that considers iconography and representation as either material strategies to construct social and political identities such as gender, race, and class, or materializations of religious or symbolic beliefs. We encourage papers dealing with all chronologies and geographies to enrich the discussion and the interdisciplinary and comparative perspective.

Elizabeth DeMarrais & John Robb (2013): Art makes society: an introductory visual essay, World Art, 3:1, 3-22

ABSTRACTS

01 INTRODUCTION: DIALOGUING WITH THE PAST THROUGH THE ARTS

Author(s): Horcajada Campos, Patricia (Universidad Autónoma de Campeche) - Vidal Lorenzo, Cristina - López-Bertran, Mireia (Universidad de Valencia)
Presentation Format: Oral

Throughout history, art objects have been used for several reasons beyond their aesthetic properties. Art has participated in the creation of social and political identities such as gender and class. The use of art as a medium for propaganda and a tool for political legitimation and indoctrination is as common as its use to contest existing ideologies and legitimacies. And last, but not least, art, sometimes encapsulates magical and religious beliefs in ancient history.

The study of art objects is valuable to reconstruct historic, social and economic aspects of a given society, which can be approached from several viewpoints. As a matter of guiding principles, stylistic studies, represented images and symbols, and the manufacture

techniques with which art materials were produced are some of the avenues of study that deal with the materiality of art. The contextual analysis and the distribution are no less relevant for a better understanding on the use and significance of artistic objects. In all, art objects can be active agents in social relations, past and present.

Therefore, we consider that there is potential to discuss different methodological approaches that treat art and art objects as active materials in shaping people's lives. We intend to do so without geographical or chronological limits.

02 ANCIENT AMERICAN ART: AN APPROACH FROM ARCHAM ARCHAEOLOGICAL PROJECTS (CNRS & UNIVERSITÉ PARIS 1 PANTHÉON-SORBONNE, FRANCE)

Author(s): Testard, Juliette (CNRS)
Presentation Format: Oral

The iconographic samples of different objects and materials brought to light by archaeological projects, are regularly analyzed from a marginal perspective and thematic approach, related to each project issues. Archéologie des Amériques department researches are based on fieldwork and carried out within regions of North (Arctic), Middle (Western and Maya area) and South America (the Andean area of Peru and Ecuador). Its research focuses on five themes: "Societies, habitat and landscapes"; "Production and exchange"; "Ideologies: practices and images"; "Mobility, migration and temporalities". The author approaches these thematic axes from the perspective of images. The development of cross-sectional methodologies is the main challenge of the project, both in the collection of new iconographic corpus (3D modeling, photogrammetric), in leveraging ancient corpus (digitalization), in its management and treatment (annotation, indexation), in the establishment of common repositories, in the construction of an interrelated data bank and, therefore, in the analytical, both formal and symbolic process. This approach fits into the field of Digital Humanities (interoperability, collaboration etc.) and integrates anthropology of art current discussions (agency, performativity, social lives of objects etc.). The paper discusses some concrete applications of the present case studies : i.e. figurations on ceramic pots, clay figurines and cave paintings.

03 ART AND GENDER IN ANCIENT NEAR EASTERN STUDIES

Author(s): Garcia-Ventura, Agnes (IPOA, Universitat de Barcelona)
Presentation Format: Oral

Debates about the gender identity of anthropomorphic figures are always among the most vivid when discussing how certain art objects have to be interpreted. Some of these debates, initiated at the end of the 19th century and beginning of the 20th century, may help us to understand how were certain ideals of femininity and masculinity constructed then. Moreover, I defend that good knowledge and analysis of these past debates may help us to understand how we construct these discourses nowadays as well.

To reflect on these issues, in this communication I pay special attention to the way the shape of the chest and the presence of more or less prominent breasts, widely considered now as secondary sexual attributes signaling femininity, was interpreted in these debates on anthropomorphic figures in the framework of ancient Near Eastern studies. To do this I start from two main images: the one of the peg-shaped foundation figurines from Nippur and a relief from Hattuša, materials widely discussed at the beginning of the 20th century. Putting on the table both secondary literature and archival documents (photographs, drawings and letters) I aim to proof as well their value as primary sources when carrying out a historiographical approach as the one proposed here.

04 THE TEOTIHUACÁN CERAMIC TRADITION IN THE ACÁMBARO'S REGION (GUANAJUATO). AN ICONOGRAPHIC APPROXIMATION

Author(s): Faugere, Brigitte (Paris 1 University)
Presentation Format: Oral

The archaeological investigations realized in the Acambaro's valley during the Tigre/Lerma Project gave ceramic materials of Teotihuacan's tradition, some of which with incised motives or painted on stucco. From time, Teotihuacan influence is known in Northwestern Mexico. On one hand, local ceramic imitates Teotihuacan's type in forms, colors and motives, but using different technologies for their elaboration; it is the case, for example, in Michoacan in the Cuitzeo lake region, where Teotihuacan motives were painted on stucco but realized with local tradition skills. In Queretaro, on the other hand, the data from El Rosario seem to indicate that this site would have been a Teotihuacan enclave, with some of the materials possibly imported and because painted decoration on stucco, clearly Teotihuacan in style, had been realized inside architectural structures. In the Acambaro's region, various ceramic types include motives incised on monochrome or dichromic pottery and take again geometric or figurative figures very popular in the tradition of the Great City during her apogee. Nevertheless, as in the Cuitzeo Basin, the analysis of clay geochemical composition obtained recently showed that none of these types were imported but that it was mainly a local production. After a description of the types, this presentation will discuss the possible meanings of the motives and the ideological message exported through Teotihuacan's iconography.

05 MATERIAL CULTURE VS ARTISTIC REPRESENTATION: A VIEW FROM THE ATHENIAN KERAMEIKOS

Author(s): Rodríguez Pérez, Diana (University of Oxford - Wolfson College)
Presentation Format: Oral

In my contribution I focus on a particular Attic shape known as plemochoe or exaleiptron as a case study to discuss the (in-)convenience of interpreting the archaeological record in the light of Greek vase painting and to reflect on questions of gender and identity in 5th century Athens from the entry point of contemporary material and visual culture.

The shape that scholars call plemochoe was frequently represented on Attic vases, in particular in the so- called 'toilet scenes' and in scenes of the visit to the tomb on white-ground lekythoi during the 5th century BC. At first sight, images show the vessel in close association with women and therefore it has traditionally been assumed that this shape was a perfume/cosmetics container whose use was restricted to them. This assumption sometimes drives the interpretation of the archaeological record: when a tomb contains a plemochoe it is assumed that the deceased was a woman. Nevertheless, the contextual analysis of the shape shows a much more complex reality: the extant examples come from 6th and 5th century tombs of both sexes in Macedonia and Boeotia, and deposition of this vessel in the tomb may have not been informed by gender issues at all.

My contribution therefore touches on several questions of current concern to modern scholarship, such as the relationship between "art" and "life", the role of iconography in crafting identities, the interactions between human beings and material culture, and the fundamental question of how to understand Greek imagery.

06 POLYCHROME CERAMICS FROM NAKUM: THE HISTORICAL AND STYLISTIC SIGNIFICANCE OF VESSELS WITH HIEROGLYPHIC TEXTS

Author(s): Zralka, Jaroslaw (Institute of Archaeology, Jagiellonian University in Krako) - Helmke, Christophe (Department of Cross-Cultural and Regional Studies, University of Copenhagen) - Hermes, Bernard (The Nakum Archaeological Project)
Presentation Format: Oral

Nakum is an important Maya site located in north-eastern Guatemala, in the area of the Triangle Yaxha-Nakum-Naranjo National Park. Recent research carried out at this centre by the Jagiellonian University project (The Nakum Archaeological Project or NAP) brought about the discovery of a large collection of ceramic artefacts from many different archaeological periods (from the Middle Preclassic till the Terminal Classic [1000 BC - AD 950]. This substantial assemblage includes fragments of polychrome vessels that are decorated with elaborate iconographic scenes and painted hieroglyphic texts. Most of them date to the Late Classic period (ca. A.D. 600–800), which represents the peak of pre-Columbian Maya civilization. Fragmentary vessels and sherds with hieroglyphic texts provide us with significant historical information, both in terms of local rulers (some of them were identified for the first time during the NAP research) but also with regards to links—via both trade and socio-political alliances— that the Nakum elites maintained with neighbouring Maya centres and polities. This paper presents the collection of Nakum hieroglyphic ceramics in a wider cultural and geographic context focusing on their epigraphic content and meaning as well as their stylistic affiliation. Our study contributes to the subject of the production of polychrome ceramics as well as the geopolitical organisation and trade relations between different Maya sites located in this part of Maya lowlands.

07 ART FOR EVERYONE? PRODUCTION, FORM AND SYMBOLISM OF EARTHENWARE, 1500-1800

Author(s): Witte, Frauke (Museum Sønderjylland)
Presentation Format: Oral

During many periods of human history, common people's art was dominated by decorated pottery.

Compared to the preceding period, dramatic changes in the ceramic tradition in northern Europe become apparent from the beginning of the 16th century: potters introduced new vessel forms and started decorating the wares in completely different ways. After centuries of black- and redfired wares, only rarely with plastic decorations, potters started producing redfired objects decorated with different glazes and painting (e.g. slipglazing) as well as many new vessel forms. In this way, the earthenware acquired a completely different appearance and aspects of the ornamentation took on the hitherto unknown function of expressing certain signals and values.

These changes in the ceramic tradition took place at the same time as the Reformation put focus on the relationship between the individual and Christianity, and the Renaissance challenged the medieval perception of art. The new vessel forms and ornamentation which characterise locally produced earthenware through most of the 16th and into the 17th centuries reflect the need of the owners to distinguish themselves visually from their surroundings. These changes in forms and especially ornamentation reflect a new development towards the use of meaningful symbolism.

In the past northern European societies ways of visually expressing personal beliefs and statements were limited. One such way was art. In contrast, pottery has over a very long period brought art into all homes, from the rural farm to the castle. Only few were able to represent status and decorate through the choice of books, tapestries, and paintings, whereas all levels of society used ornamented pottery whose different motives and forms developed into "everyday art" which was displayed, e.g. hanging on the wall.

08 THE EARLY MYCENAEAN ICONOGRAPHY OF POWER – THE METAL VESSELS AND ITS SOCIO-POLITICAL CONTEXT

Author(s): Dudlik, Katarzyna (Adam Mickiewicz University)
Presentation Format: Oral

Contacts between the communities of the Aegean are part of the complicated system, integrating regions of luxurious objects production, which further were the product of exchange between cultures. It is clear that the intensification of contacts between the centers of the eastern Mediterranean was one of the most important in the process of a complication of Mycenaean social structures.

The idea of the paper is to present one of the most prestigious objects of the Early Mycenaean period (ca. 1775-1420 BC), discovered in several places across the Peloponnesus (Mycenae, Dendra, Vapheio). They were manufactured in different crafting traditions and in the highest quality – in various and complicated techniques, and with elaborated, sophisticated ornaments. The highest importance will be dedicated to the narrative decorations, showing various realistic representations and activities, both animals and humans, on the background of cities and rural landscapes.

The main question of that paper will be the social and political context of the artifacts and the potential origins of particular iconographical motives. They need to be placed within the strategy of Mycenaean self-definition through the mortuary behaviors, where the conspicuous consumption of luxurious objects was crucial in the status creation of new social elites. Moreover, based on the analogies to the other groups of narratively decorated burial offerings (daggers and cloth adornments) from the Early Mycenaean period, the clear preference to the hunting and combat scenes is visible. Last but not least, the medium of the image should be considered – as it is assumed that the importance of the communal drinking and feasting clearly raised in that time, as a complementation of strategies in social status creation.

09 IMAGES FOR THE HEREAFTER: THE ICONOGRAPHY RELATED TO FUNERAL FOOD IN THE PUNIC IBIZA (V-II CENTURIES A.E.)

Author(s): Vendrell-Betí, Alicia (Universitat de València)
Presentation Format: Oral

One of the central moments of the Punic funeral practices was the act of preparing and consuming food. These feasts -that happened during the burial and subsequently- required the use of many objects, both for cooking and consuming food. Some of these objects are configured as an exceptional support to endow with sacredness the act of cooking, eating and drinking. With this purpose, we interpret the proliferation of images on vessels, such as jars, askoi and bowls, terracottas and cake moulds, among others, located in the tombs of Punic Ibiza (5th-2nd centuries BC). The objective of this paper is to present all the material and its iconography chosen for -through the food and the drink- making easier the contact between the alive and the deceased with the Hereafter.

10 DEFINING FIGURES: ATHENIAN POTTERY AT HOME AND ABROAD

Author(s): Langridge-Noti, Elizabeth (American College of Greece)
Presentation Format: Oral

Athenian figured pottery has always straddled the gap between being defined as objects of material culture or as art objects and, as de Marrais and Robb note, it is often ideologically loaded in the meaning(s) it is made to bear. However, Athenian figured pottery is found across the Mediterranean in variety of different contexts from sanctuaries to domestic, public to private that frequently do not include the initial Athenian-based makers of this pottery. As scholars focus more on individual artifact provenances or biographies, they have begun to recognize that interpretive moments for any individual piece of pottery spans the place of making to the place of deposition—and that these different places affect the pots made and the scenes depicted and how those pots and those scenes are understood by a viewing public.

This paper considers the slippage in meaning and value for Athenian figured pottery and its imagery between the places of making and the places of consumption through a small number of case studies that examine both the value placed on a given pot in the examination of a group of mended vessels from graves in Spina and through iconographic choices, the sphinx and Triptolemos, that appear on pottery in Athens and Attica as well as at other places around the Mediterranean and for whom the construction of meaning can differ if the scene is found at home or abroad. These case studies will permit the demonstration of the multivariate ways in which Athenian pottery can be given more or less value and more or less meaning depending on the circumstance of consumption. In doing so, this demonstration will lead us back to the play of definitions between objects of art and objects of material culture.

11 ULUA TRADITION FIGURINES AS ART, AS MATERIAL CULTURE, AND AS PERSONS: A BIOGRAPHICAL AND RELATIONAL ANALYSIS

Author(s): Hendon, Julia (Gettysburg College)
Presentation Format: Oral

The Ulua figurine tradition is made up of three-dimensional clay figures that are sometimes anthropomorphic, sometimes zoomorphic, and sometimes unusual combinations of human and animal characteristics. Many of these figurines were designed to be mu-

sical instruments as well. Produced in Honduras (Central America) during the 6th to 9th centuries C.E., they were widely traded and have been found at large and small settlements associated with different indigenous groups. These figurines are notable for the detailed depiction of clothing, jewelry, and faces. Although made partly from molds, few identical examples have been found. They exemplify anthropologist Alfred Gell's concept of "cognitive stickiness": objects that draw the viewer's attention through the complexity of their appearance. From a semiotic perspective, Ulua tradition figurines index social relations and serve as icons of social identities. This paper considers these figurines as human-like persons. Evidence from excavations at a number of Honduran sites such as Copan, Cerro Palenque, Travesia, Tenampua, and others provides important contextual information on how these other-than-human figures were made, used, exchanged, and disposed of. Combining contextual information with the features of the figurines themselves allows me to discus the biography of these human-like persons and the ways they enter into relations with humans and other non-human persons.

12 PHOENICIAN BOTTLE-SHAPED REPRESENTATIONS (7TH-3RD CENTURIES BCE): ICONOGRAPHY AND SYMBOLISM

Author(s): López-Bertran, Mireia (Universitat de Valencia)
Presentation Format: Oral

Phoenician art is varied in terms of supports and representations: decorated ivories, engraved metal jars, clay figurines, reliefs, stelae or glaze paste objects. All of them were decorated with different motifs, geometrical, anthropomorphic or vegetal, and shows how eclectic and heterogeneous is Phoenician art. Indeed, Phoenician artists were famous in Antiquity for their skills in metalworking and it is attested that some artisans lived and worked in foreign cities and colonies due to the appreciation of their talent.

This communication focuses on a specific type of representation: bottle-shaped figurines found on different supports that resemble human bodies. They have been identified carved on funerary stelae, and on jewels. In addition, some terracotta figurines are labelled as "bottle-shaped" because of their appearance and because they were modelled using the standard technique to make bottles, but they were turned into anthropomorphic figurines by the addition of arms, genitalia and breasts and also by transforming the necks of the "bottles" into faces. It is my intention to offer a contextual analysis of these images in order to explore the implications that they have in creating a specific way of perceiving social relations. Furthermore, I will argue to what extent we can explore issues of corporealities and conceptions of the body from such material culture.

13 CERAMIC FIGURINES FROM CALAKMUL (CAMPECHE, MEXICO): ARCHAEOMETRIC STUDY

Author(s): Horcajada, Patricia - Domínguez Carrasco, Mª del Rosario (Universidad Autónoma de Campeche)
Presentation Format: Oral

The ceramic figurines constitute an important source of information so as to gain knowledge on Ancient Maya culture. In this sense, through morphological analysis and iconological studies of the images represented in them have provided insights on different aspects in the sphere of worldview, customs, traditions and beliefs. Also, the physical-chemical characterization of their material, clays and pigments, allows us to inquire about their origin and distribution routes. Thus, this methodology provides information about the relationships and interactions between different urban centres and regions and sheds light on specific aspects related to their production process. This point is essential not only to study their manufacturers but also to inquire about the socio-economic implications that surrounded these pieces.

In this work we will approach these figurines from the point of view of their materiality. Specifically, we will present the results of the archaeometric study carried out on clay and pigments of different figurines found in the Structure II – a pyramid temple- and in the Structure III – a great palace - of the ancient Maya city of Calakmul (Campeche, Mexico), which is considered one of the most largest and most powerful cities of the Maya area during the Classic period (250-950 A.D.).

14 MODELLING IBERIAN ANCESTORS. NEW EVIDENCE OF TERRACOTTA HEADS AND RITUAL PRACTICES IN EASTERN IBERIA IRON AGE.

Author(s): Grau, Ignacio (Universitat d'Alacant) - Amorós, Iván (Museu de Prehistòria de València. SIP)
Presentation Format: Oral

The Iron Age sanctuary of La Serreta (Alicante province, Eastern Spain) is one of the most important cult places in the Mediterranean area of Iberia. Excavations carried out during the first half of the 20th cent. recovered one of the largest collections of Iberian terracotta figurines. There are more than 400 pieces, mainly dated between the 3rd and the 1st cents. BC. One of the specific types of terracotta in this repertoire is a head-shaped figurine that we analyze in this paper.

First, we carry out a detailed analysis of the manufacture and decoration of these pieces. The ornaments and jewelry are related to Iberian women and men with high status, and the fact that the details make each piece unique leads to the consideration that it is the representation of individuals.

Secondly, we placed these terracotta heads in relation to other similar figurines in the region, specially with the head-shaped terracotta from the Valley of Turia in Valencia Province. These figurines are related to domestic and community cults. According to the typological and contextual data, we propose its relation with the cult of ancestors. Through the construction, use and deposit of these figurines in cult places, household and group identities were created and linked to prominent symbolic figures in the past.

15 ARCHAEOLOGICAL FLINT AND OBSIDIAN ARTIFACTS OF PREHISTORIC RUSSIAN SITES WITH UNUSUAL SHAPES, UNKNOWN FUNCTION(S) AND AN OLD FASHION NAME: "ECCENTRICS"

Author(s): Coskunsu, Güner (Centro Internazionale di Sperimentazione, di Documentazione e di Studio per la Preistoria e l'Etnografia dei Popoli Primitivi) - Skakun, Natalia (Institute for the Material Culture History, Russian Academy of Sciences, Saint-Petersburg)
Presentation Format: Oral

One of the hallmarks of hunter gatherers from the Late Neolithic European Russian forest zone are flint and the occasional obsidian figurines depicting humans, animals, fantastic images, and geometrics (a.k.a., "eccentrics" in American archaeological terminology). Most of those unusual, realistic or stylized shapes were knapped or "carved" beautifully on flints like sculptures by master sculptors. Such flint and obsidian artifacts are widely known as "eccentrics" worldwide, mainly because of their frequent occurrence in Mayan Archaeology literature and the large interest of the public. These European flint figurines are primarily known from the Middle and Upper Volga Region in great numbers. The best expamples are from the ancient Russian hunter-gatherer forest people of the Late Neolithic-Early Metal Age Volossovo culture (4th – 3rd mill. calBC). Taking the shapes of bird, fish, elk, bear, beaver and human, these very elaborate small objects were fashioned with fine retouch.

Generally speaking, the presence of these extraordinary items and associated archaeological sites remained almost unknown outside of Eastern European scientific society. Because of this and other reasons they are worthy of study. Therefore, this presentation, which will be a preliminary assesment of Russian flint figurines, aims to introduce these Neolithic treasures to the rest of the Archaeological community, outside of Eastern Europe. This paper will explore their function(s), meaning, importance, manufacturing processes, and their relationship with similar lithic objects in other regions, both in the Old and New World. Additionally, this paper will discuss the current terminology and suggest new ones, including "figurines," which is used here. Terminology will also be discussed by way the following analyses: technology, typology, use-wear, spatial and raw material analyses.

16 MEMORY AND MIMETIC PRACTICES IN ANCIENT IBERIA: THE ENGRAVED PLAQUES AND BELL BEAKERS

Author(s): Lillios, Katina (University of Iowa) - Kohring, Sheila (University of Cambridge)
Presentation Format: Oral

During the late 4th/early 3rd millennium BCE, hundreds of exquisitely engraved plaques made of slate were crafted and placed with the dead in tombs throughout Southwest Iberia. The plaques' geometric designs and ocular imagery have captivated the imaginations of archaeologists for over 150 years, and many perspectives have been used to interpret their functions and meanings (Lillios 2008). This paper explores the plaques from a new angle and considers them as multi-temporal objects that materialized and were entangled in diverse communities of practice, which included the producers of Bell Beaker ceramics. Cross-over in technical practices, especially decorative techniques, are explored as a social mechanism for memory practices and for anchoring changing social ideals in the 3rd millennium BCE. Specifically, this paper presents the spatial and contextual evidence that suggests that the creators of Bell Beaker ceramics in the Estremadura mimetically drew from the potent iconography of the plaques to create new objects, new practices, and new social identities. The relationship between material culture, memory, and the iterative behaviors involved in mortuary rituals during this period is also discussed.

Reference:

2008 Lillios, K.T. Heraldry for the Dead: Memory, Identity, and the Engraved Stone Plaques of Neolithic Iberia. Austin, TX: University of Texas Press.

17 ART OR ACTIVITY? RECONSIDERING INTERPRETATIONS OF THE NASCA GEOGLYPHS IN SOUTHERN PERU

Author(s): Reindel, Markus (German Archaeological Institute)
Presentation Format: Oral

The geoglyphs of the Nasca culture (200 BC-650 AD) on the south coast of Peru traditionally have been considered as art works executed on the desert surface. Figurative geoglyphs with motives similar to the ones on ceramic vessels and textiles, are fully appreciated only from the air. This observation led to phantastic theories about the intention of the Nasca people to build the geoglyphs for the gods, about special engineering skills of the Nasca peoble and even about flying devices of the Nasca.

Recent research of geoglyphs in the Nasca area has shown that ony a minimal part of the Nasca geoglyphs represent animals, plants or human beings. Most of the geoglyphs have geometric shapes. They form lines, rectangles and trapezoids. Moreover, archaeological and geoarchaeological research of the geoglyphs, as well as excavations on the geoglyphs has shown convincingly that the geoglyphs of the Nasca culture were used for rituals related to water and fertility, including processions and offerings. The geoglyphs therefore have to be interpreted as activity areas rather than art works.

We reconstructed the history of geoglyphs from their origin in Paracas times (800-200 BC), when anthropomorphic or zoomorphic figures were placed as images on the slopes of the desert hills. In the context of the Paracas culture, the geoglyphs indeed can be considered as artistic representations of animals or human beings. In the following Nasca culture, however, geoglyphs changed their character to become places and stages for the performance of religious activities.

18 ARCHITECTURAL CULTURE AS ART: TECHNIQUES OF CONSTRUCTION, REPRESENTATION AND MEANING IN BALEARIC PROTOHISTORY (BALEARIC ISLANDS, SPAIN)

Author(s): Torres Gomariz, Octavio (University of Alicante)
Presentation Format: Oral

Architecture is, as a part of art, one of the most eloquent material reflections of society. The art of constructing spaces agglomerates the dialectic of human communities, being social productions and configuring scenarios of daily life. It is the realization of places of representation that emphasize socio-economic indicators, ranging from the choice of materials and techniques to the semiotic codes they embody, also read from artistic criticism. For this reason, the study of architectural culture, understood as a characteristic and identity of the society that develops it, is a fundamental resource to approach the knowledge of past societies.

The prehistory of the Balearic Islands (Spain) is an exceptional laboratory for the development of these theoretical assumptions. From the first human colonization to the arrival of Rome, the island population has expressed its historical dynamics in an always monumental architecture, emphasizing different areas of their daily life over time. The architectural expression and its iconography, as an artistic expression, was used by the insular society as a strategy to build social and political identities, which, depending on the period, may indicate resistance to certain historical phenomena, or inclusion and incorporation into new currents In this communication, this type of architectural art will be addressed diachronically as an instrument of social action and representation.

19 ART AND COMMERCE IN THE ROMAN CITY

Author(s): Lauritsen, Taylor (Christian-Albrechts-Universität zu Kiel)
Presentation Format: Oral

Excavations in Pompeii, Herculaneum and other well-preserved urban contexts have shown that Roman cities were awash with painted decoration. Art situated in the domestic sphere has received the bulk of scholarly attention over the years, but public wall paintings represent an equally compelling corpus of material with which to work. In the street, wall decoration was positioned at the centre of a dynamic relationship between patron/artists and their viewership. The diversity of images (and graffiti) applied to the facades of Roman buildings reflect the wide range of messages that were passing between individuals. Naturally, context played a central role in structuring these conversations. The 'public relations' aims of an elite householder, the owner of a fullery and a shopkeeper were different, and were reflected in their respective choices of décor. Recent studies have emphasised the economic importance of urban commercial facilities, and, at the same time, interest in 'sub-elite' art, public graffiti and facade architecture has grown, but wall decoration in and around shops remains a comparatively neglected topic. Although associated categories of decorative media (e.g. terracotta signs) have been subject to thorough analyses, no comprehensive examination of commercial decoration has been produced to date. This paper takes preliminary steps in that direction by exploring some common images and ornamental designs found on shop facades in Pompeii and Herculaneum.

20 NARRATIVE SPACES AND IMAGES IN THE MAYA BUILT ENVIRONMENT

Author(s): Salazar-Lama, Daniel (Universidad Nacional Autónoma de México, UNAM; Centro de Estudios Mexicanos y Centroamericanos, CEMCA)
Presentation Format: Oral

The integration of sculptural programs in Maya architecture has been widely documented by archaeologists, especially for the Late Preclassic (400 BCE - 250 CE) and Classic (250 - 900 CE) periods. According to several studies, some images show royal characters - rulers and ancestors - with superhuman faculties and attributes that differentiate them from the rest of the population. However, a little explored dimension are the visual narratives of the scenes and the conventions used for their representation.

The analysis presented deals with the narrative of the sculptural programs from an interdisciplinary approach that encompasses iconography, the history of art, the study of architecture and the built environment, and tries to answer the questions: How are narrative images constructed? What messages do they transmit to the viewer? What is the environment and the receiving public?

Applying the theoretical foundations to some cases of studies, it is observed that the narrations are not only constructed from the images, the architectural space of the facades and the built environment are also involved and allow the linking of the episodes represented, as well as the participation of the audience. Regarding the meaning, the narrations constitute an effective contextual framework in which the rulers assert their status as sacred beings, close to the gods. The intention is to create a set of symbolic values related to identity and royal function.

708 DATA-DRIVEN CHRONOLOGY

Theme: Theories and methods in archaeological sciences
Organisers: McLaughlin, Rowan (Queen's University Belfast) - Hannah, Emma (Queens University Belfast) - Fernández López de Pablo, Javier (Catalan Institute of Human Paleoecology and Social Evolution - IPHES)
Format: Regular session

Data-driven chronology is one of the most exciting and fast-moving developments in archaeological science in recent years. As the logistics of doing fieldwork for primary research becomes ever more problematic, and in many countries the data-base of results from developer-funded fieldwork grows to an unprecedented size, many workers are 'digging' through 'grey literature' and legacy data in order to uncover new insight about the past. In doing so, new methods have been developed, particularly in statistics, GIS and modelling. Some of these, such as the use of summed radiocarbon, have provoked debate about how much we can read into the patterns of change suggested by the data at face value. Can these methods be used for case studies with short chronological frameworks, and if so, how short? In this session, we explore case studies where new data-driven methods have been applied to archaeological problems, especially in chronology. We invite papers exploring aspects of large radiocarbon databases, papers exploring the value of 'traditional' chronological (e.g. pottery seriation) approaches in today's data-driven world, or other data-rich chronological studies, including methodological advances in statistics, Bayesian modelling and GIS. We seek to open a forum where regional studies especially can be presented, allowing the cross-fertilization of ideas and lively debate.

ABSTRACTS

01 ADD AND CONQUER. WHEN JOINING CURRENT RADIOCARBON DATABASES AND USING DATA DRIVEN KNOWLEDGE RETRIEVING INFORMATION SYSTEMS ALLOW NEW KNOWLEDGE CREATION

Author(s): Colobran, Miquel - Barcelo, Juan Anton - Capuzzo, Giacomo - Morell, Berta - Bogdanovic, Igor (UAB - Autonomous University of Barcelona)

Presentation Format: Oral

When one integrates heterogeneous radiocarbon databases, new insights, challenges and patterns are suitable to raise.

In order to achieve this goal, a google like search engine needs to be made. It is composed by four main elements. The first component are the crawlers who undertake the role of obtaining the information from public radiocarbon databases. They are custom made and store the crawled information in an internal format. The second one undertakes the uploading of the information into a global database, and the third component is responsible for indexing all the information within the database so that end users can consult it through a web server.

At his point, the issue is focused on the extraction of the information and the creation of knowledge. The possibility of handle chronological series of dates, along with their properties, like material or taxonomy, allow the creation of new research questions. In this scenario, the triple <geoposition, time, material> becomes key. Despite that fact, in order to manage this huge amount of information, the construction of tools are needed for an efficient use of the information in order to create knowledge. Otherwise a big quantity of textual and numerical information is obtained, which is hard to manage or useless even. The mentioned three components are finished and currently about 150.000 dates are collected from several databases such as the Canadian Archaeological Radiocarbon Database (CARD), the Archaeology Data Service, Catalan C14 telearchaeology, EUBAR and others.

Therefore, our purpose is focused on the fourth element, the radiocarbon retrieving information system (RIS). A RIS radiocarbon centered is made using HCI, data driven and expert system technologies all together. The milestone is to obtain useful knowledge from the radiocarbon information that permits the development of new hypothesis or becomes a bottom line for further research.

02 BEYOND SINGLE DATES – DATABASE OF ARCHAEOLOGICAL EVENTS

Author(s): Bogdanovic, Igor - Barceló, Juan Antonio - Colobran Huguet, Miquel (Quanititative Archaeology Lab, UAB)

Presentation Format: Oral

In this paper, we present a semantically enriched chronometric database, designed to provide output for Chronological Bayesian modelling, GIS, and other analytical purposes. Instead of single chronometric dates, our system stores dated archaeological contexts and allows the user to retrieve complex queries allowing reliability and validation measures of chronometric dates (Radiocarbon, Thermoluminiscece, Uranium-Thorium Series, etc.). The database is designed around the idea of the "archaeological event" (minimum spatiotemporal unit that can be distinguished during an archaeological excavation) as a basic analytical unit. We define different archaeological event kinds at different analytical levels of reality, integrating this conceptual hierarchy into an integrated chronological inference chain. Event categories are ontologically related to each dated sample using simple relationships ("contains" / "is contained in", or, "is a set of" etc.), and enriching the possibilities of complex temporal queries by using 13 types of temporal relations based on enhanced Harris matrix and Allen algebra. A probabilistic Expert System has been designed using advanced artificial intelligence methods to suggest measures of reliability and validation of dated samples in terms of available stratigraphic information. The paper presents all details of the conceptual model, the ontology and actual implementation using MySQL. An example is discussed using radiocarbon data sets from Catalonia (Northeastern Iberian Peninsula) with more than 1200 C14 dates.

We address the need to upgrade methods of registering, presenting and retrieving archaeological data, in order to make them appropriate for analytical procedures, which should handle huge amount of data. In this sense we have proposed concept of Telearchaeology conceived as a set of computational concepts, solutions and tools for connection, integration and management of heterogeneous data distributed on the World Wide Web. The model of distributed archaeological data has a complex infrastructure based on interrelated units. One of these units is the chronometric data system.

03 FROM DEEP LAKES TO MOUNTAIN TOPS: EXPLORING LONG AND SHORT CHRONOLOGIES WITH BAYESIAN STATISTICS

Author(s): Brunner, Mirco (Institute of Archaeological Sciences, University of Bern; Oeschger Centre for Climate Change Research - OCCR, University of Bern; Graduate School «Human Development in Landscapes», Christian Albrechts University Kiel) - Heitz, Caroline (Institute of Archaeological Sciences, University of Bern; Oeschger Centre for Climate Change Research - OCCR, University of Bern) - Steuri, Noah (Institute of Archaeological Sciences, University of Bern) - Hinz, Martin (Institute of Prehistoric and Protohistoric Archaeology, Christian Albrechts University Kiel) - Hafner, Albert (Institute of Archaeological Sciences, University of Bern; Oeschger Centre for Climate Change Research - OCCR, University of Bern)

Presentation Format: Oral

This paper aims at exploring the potential of Bayesian statistics for chronologies using radiocarbon-dates from different settings: dry- and wetland sites of the Northern Alpine Foreland and the Inner Alpine area. In order to understand dynamic cultural phenomena independent scientific dating is indispensable. Beside dendrochronology, radiometric dating methods based on carbon isotopy are still most important. For multi-site evaluations easily accessible data collections are vital as e.g. provided by the database 'Radon'1 used here. Furthermore, statistical approaches such as sequential calibration, work best with large amount of data. In our three case studies, the combination of both has yielded compelling results beyond conventional approaches:

1. Sequence-models of Neolithic wetland sites stratigraphies: Despite the possibility of using high-precision dendrochronologies, 14C-dates are still needed in cases of poor organic preservation. Using prior information such as stratigraphies, stratified artefacts and isolated dendrodates, extraordinary high-confindence Bayesian models can be achieved, like the examples Zurich-Kleiner Hafner (CH) and Ehrenstein (D) of the MET-project1 show.

2. Sum calibration-models for Inner Alpine Neolithic and Bronze Age sites: Until recently, having nearly no radiocarbon dates at hand, the chronology of this area was based on typological comparisons with the Swiss Plateau and Southern Germany. Within the CMCT-project3 we were able to generate new samples for Radiocarbon dates from Neolithic and Bronze Age sites. Hence, an absolute chronological framework can be established for the first time.

3. Systematic radiocarbon dating of Late Neolithic human remains: The dolmen of Oberbipp (CH) is one of a rare undisturbed inhumations collective burial with approximately 40 individuals. More than 60 samples of right femora could be dated in three different laboratories, yielding very robust results regarding the burial sequence.

In all examples the statistic software R and c14bazAAR4 were used.

1 radon.ufg.uni-kiel.de

2 SNSF-project: http://p3.snf.ch/Project-156205

3 SNSF-project: http://p3.snf.ch/project-165306

4 https://github.com/ISAAKiel/c14bazAAR

04 TRENDY ARCHAEOLOGY: EXPLORING PATTERNS IN SPACE AND TIME

Author(s): McLaughlin, Rowan (Queen's University Belfast)

Presentation Format: Oral

This density of archaeological data informs us about the past. In this paper I introduce and discuss some practical methods for exploring trends and patterns in archaeological datasets using open-source software tools. Kernel density estimation (KDE) in particular is quickly gathering momentum as the best method for transforming lists of radiocarbon dates into a time series, and is set to replace the commonly used but contentious summed probability method. I present a method for quickly and efficiently bootstrapping the confidence interval of KDE models for archaeological-chronological data, and explore a case study from medieval Britain that combines different kinds of 'dates' (radiocarbon, archaeomagnetic dendrochronological, and numismatic) in one analysis. Exploring archaeological data as a time series offers a powerful method to compare different archaeological contexts or data from different regions. It also allows for the comparison of archaeological data and other forms of time series such as palaeoenviromental proxy data. KDE density models can also be used to develop estimates of how intense the landscape was settled at any given point in time, and identify 'hotspots' and 'coldspots'. As I discuss, this spatial application of KDE analysis, despite technical challenges, offers unprecedented insight into the dynamics of human landscapes and populations of the past.

05 CRAFT AND CHRONOLOGY IN IRELAND 400-1200 CE

Author(s): Hannah, Emma (Queen's University Belfast)

Presentation Format: Oral

The archaeological landscape of Ireland has well and truly emerged from the soil beneath our feet via an almost unparalleled series of excavation and post-excavation investigation. These have presented us with an inordinate amount of data to quantify, analyse, and interpret. Chief among this is radiocarbon dates. Irish archaeology is now almost uniquely placed to produce data-driven chronologies for many archaeological time periods, not least the early medieval period (400-1200 CE). This paper forms a case-study for a data-driven chronology using a kernel density estimate method in the investigation of a particular facet of early medieval life: craft-working. The activities of metal-working, bone-working, antler-working, wood-working and the production of textiles, among

others, formed the tools, equipment, clothing, and accessories which people relied upon daily.

The chronological development of craft-working is poorly understood, the latter centuries particularly so. This data-driven approach has compiled information from hundreds of reports and enables a narrative to be constructed for the entirety of the period. The research question at its core is whether the production processes of crafts migrated from rural, mainly domestic settings to urbanised areas (Viking-Age towns, e.g. Dublin, Cork, Waterford, Wexford) and major monasteries from the beginning of the tenth century CE and how extensive this was. Preliminary results indicate a more complex mechanism of change underlying the latter centuries of the first millennium CE which does not centre around the development of these early "towns".

06 RDF BASED MODELLING OF RELATIVE AND ABSOLUTE CHRONOLOGICAL DATA: EXAMPLES FROM THE CENTRAL AFRICAN RAINFOREST AND ROMAN PERIODISATION

Author(s): Seidensticker, Dirk (Gent University) - Thiery, Florian (Römisch-Germanisches Zentralmuseum Mainz) - Schmid, Clemens (University of Kiel)

Presentation Format: Oral

Chronology in Archaeology contains many hidden assumptions. Chronological intervals resulting from data analysis are sometimes based on absolute "certain" datings (e.g. C14 or Roman emperor reign years) or derived from relative datings or combinations of these. This may even lead to circular argumentations with hidden contradictions. To produce verifiable chronological relations, a well documented data scheme containing all the relevant chronological archaeological information is required.

We modeled this scheme as an RDF (Resource Description Framework) based ontology comprising Allen`s interval algebra and provided the results as Linked Open Data. This is exemplarily done by parsing CSV based datasets of two case studies, one concerning the Iron Age settlement history of the Central African rainforest, and the second focusing on a system for Roman period classification used at the RGZM in Mainz.

The first case study was based on a recently finished PhD thesis and reviewed the current knowledge on the settlement history of the Central African rainforest. The available data derived from surveys and excavations between present-day Cameroon and Angola. Chronological relations between groups have been modeled within a RDF graph in order to produce a machine readable and processable semantic representation. Additionally, we used radiocarbon dates from the OpenAccess data repository Archives des datations radiocarbone d'Afrique centrale (aDRAC).

For the second case study, we developed a workflow for the RGZM retrieval system "easydb" in which a wide variety of time interval descriptions is used. Apart from the historically definable Roman emperor reigning years, which can often be subdivided by the consulship years of an emperor, many descriptives such as "early Roman" or "late Roman/early Medieval" are regularly used but far from being precise.

For both case studies using RDF based modeling generated a reproducible representation of the state of knowledge concerning the temporal sequences of time intervals.

07 RECALIBRATING GRAVE GOOD CHRONOLOGIES: NEW AMS 14C DATES FROM BRONZE-IRON AGE BURIALS IN LIKA, CROATIA

Author(s): Zavodny, Emily - Culleton, Brendan - McClure, Sarah - Kennett, Douglas (The Pennsylvania State University) - Balen, Jacqueline (Archaeological Museum in Zagreb)

Presentation Format: Oral

In the Lika region of central Croatia, archaeological research over the past century has focused predominantly on Late Bronze and Iron Age burials, resulting in tightly ordered grave good typologies that are the primary means of establishing chronology. The beginning of this relative chronology is tied to the appearance of distinct materials and objects at the end of the Bronze Age, which are thought to be the first evidence of a newly developed and cohesive culture - the Iapodians- on the landscape. No systematic AMS 14C dating, however, has been conducted to test these sequences and the periodization here remains unchanged since its introduction by R. Drechsler-Bižić in 1987. This paper tests current hypotheses about cultural development by comparing new AMS radiocarbon dates with relative chronological assignments of key burial contexts from the earliest period of the Iapodian typology and chronology. Results demonstrate inconsistencies between reported relative and absolute dates, suggesting that the initial emergence of the Iapodian culture was not as rapid or widespread as previously believed. These findings emphasize the care with which burial-based typologies must be used when explaining larger cultural processes and further highlight the need to continuously re-evaluate old chronological models as new data emerges.

709 RAW MATERIALS SOURCING AND EXPLOITATION IN MOUNTAIN REGIONS: RESOURCE-HUMAN-LANDSCAPE DYNAMICS FROM PREHISTORY TO HISTORICAL PERIODS

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Gutierrez Garcia-M., Anna (Institut Català d'Arqueologia Clàssica - ICAC; Universitat Autònoma de Barcelona - UAB) - Sánchez De la Torre, Marta (IRAMAT-CRP2A UMR 5060 CNRS - Université Bordeaux Montaigne)
Format: Regular session

Since the dawn of humanity, the importance of specific raw materials has led to their search in regions which are not easy to access. The case of specific rocks or stones, widely used as raw material and ubiquitous in most sites, is a case point. Yet many other materials (minerals, pigments or even wood) were also sourced and exploited in these areas.

The development of archaeometry during the last decades has significantly increased our knowledge of not only the potential sources but also of the scope of their movement or distribution either by the same human groups that exploited them or as part of trade networks. Additionally, the recent advances on the landscape archaeology of mountain regions show that, far from acting as a natural border, they were a place of contacts and transit between the human societies inhabiting on their sides or even the nearby lowlands.

The goal is to set up a debate about human behaviour and the relationships with the environment regarding raw material procurement, from a broad and diachronic point of view. We will address:

- the analytical methods to characterize/identify these materials

- the study of the sites/outcrops from a comprehensive perspective

- the dynamics between the sourcing of these resources, the strategies to exploit them, the supply mechanisms and connections/commerce networks,

- how the natural landscape shaped the cultural one

- the changes/continuities derived from the exploitation of these areas through time, by comparing case studies from different mountain regions.

ABSTRACTS

01 QUARTZITE PROCUREMENT IN CONGLOMERATES AND DEPOSITS IN PICOS DE EUROPA: DIALECTIC EXPLOITATION OF RESOURCES IN MIDDLE AND LOWER ALTITUDES

Author(s): Prieto, Alejandro - García-Rojas, Maite - Yusta, Iñaki (University of the Basque Country) - Baena, Javier (Autonomous University of Madrid) - Arrizabalaga, Álvaro (University of the Basque Country)
Presentation Format: Oral

The development of raw material characterisation in Palaeolithic Archaeology in the last fifty years has widened our knowledge about the societies that inhabited Europe in the past. The characterisation of raw material, specially flint, has allowed defining the mobility of stones and people, selective processes to obtain specific varieties and proto-mining or mining activities. It also enables the researcher to better understand knapping or use properties of specific raw materials. The analysis of quartzite, the second most frequently used lithic raw material in the Palaeolithic, has developed in the recent years, offering us new information about past societies and environment.

This contribution intends to follow with the characterisation of quartzite in the mountainous region of Picos de Europa, with the aim of understanding better the procurement strategies of this material during the Middle Palaeolithic. To this end, we present the comprehensive characterisation of massive outcrops, conglomerates, and river deposits, the three main types of environments where quartzite could be caught. The exploitation of quartzites in the sites of El Habario and El Arteu allow us to understand the dialectical territorial management of this mountainous area through the combination of selective processes and mobility mechanisms in lower and middle altitudes. These perspectives let us to understand this mountainous region not as a barrier but as an environmental-mosaic managed and optimised by Middle Palaeolithic societies. The methodology used for this research combines Geographic Information Systems, geo-archaeological fieldwork, macroscopic description of material, binocular characterisation, petrography, and X-Ray Fluorescence.

02 NEW INSIGHTS INTO PALAEOLITHIC HUMAN MOBILITY THROUGH THE PYRENEES

Author(s): Sanchez De La Torre, Marta (PPVE. Universidad de Zaragoza; SERP. Universitat de Barcelona) - Mangado, Xavier (SERP. Universitat de Barcelona) - Le Bourdonnec, François-Xavier - Gratuze, Bernard (IRAMAT-CEB - UMR 5060) - Domingo, Rafael - Montes, Lourdes (PPVE. Universidad de Zaragoza) - Sacchi, Dominique (TRACES - UMR 5608) - Utrilla, Pilar (PPVE. Universidad de Zaragoza) - Fullola, Josep Maria (SERP. Universitat de Barcelona)
Presentation Format: Oral

During the last decades from the past century, the analysis of lithic raw materials to determine the origin of the exploited rocks and

thus, to infer into human mobility and knowledge of ancient territories, heavily increased. Last years, to the already well known and used techniques to determine the features of rocks preserved at archaeological sites –textural, micropalaeontological and petrological analyses– some mineralogical and geochemical techniques, as X-Ray Diffraction, X-Ray Fluorescence or Inductively-Coupled Plasma Mass Spectrometry, have successfully been incorporated to complete the traditionally used tools for analyses.

In this paper we would like to delve into new data that have been obtained after the analysis of chert tools recovered at several Upper Palaeolithic sites placed in the Pyrenean mountain range. The archaeopetrological analysis of chert has included textural, micropalaeontological, petrological and also geochemical techniques –Energy Dispersive X-Ray Fluorescence and Laser-Ablation Inductively-Coupled Plasma Mass Spectrometry–. Results allows us to determine the sourcing areas of the exploited cherts. This study, that has included several archaeological sites occupied during the Magdalenian period (c. 19000 - 14000 cal BP) and placed in the Pyrenean region (Montlleó open-air-site and Cova del Parco in Catalonia, Cova Alonsé and Forcas I Shelter in Aragón, and Belvis Cave in Occitaine), lead us to suggest that the Pyrenees were part of these human's territory, being a place where regulars contacts between both Pyrenean slopes took place.

03 PHYSICO-CHEMICAL CHARACTERIZATION OF RED PIGMENTS IN MESO-NEOLITHIC MATERIALS

Author(s): Orera, Víctor (Instituto de Ciencia de Materiales de Aragón - ICMA. CSIC-Universidad de Zaragoza) - Utrilla, Pilar - Bea, Manuel - Villalba, Vanesa (Departamento de Ciencias de la Antigüedad, Group PPVE & IUCA. Facultad de Filosofía y Letras, Universidad de Zaragoza)

Presentation Format: Oral

Different physico-chemical analysis methods; X-ray diffraction (XRD), Field Emission Scanning Electron Microscopy (FESEM), Energy Dispersive X-ray Spectrometry (EDS/EDX), Micro-Raman spectroscopy (mR) and magnetic characterisation, have been used to analyse several coloured archaeological remains beside the Aragón territory in North-East Spain. In particular, we studied some skeletal rests from the Ancient Neolithic cave of Chaves in Bastarás, Huesca, as well as some samples from Levantine rock art paintings and ochre residues in the archaeological levels beneath the decorated panels. Also, some red residues in Neolithic pottery, as those recovered from the caves of Gabasa and Chaves in Huesca. The studies of pigments from paintings and the natural ochres (raw materials) in the paint places were carried out in samples from different sites in Teruel province as Arenal de la Fonseca in Castellote, La Vacada also in Castellote, and Ceja de Piezarrodilla in Tormón, as well as in samples from some other natural raw materials procurement places close to the referred sites.

The study determines the morphology (grain size and shape), element composition and molecular structure (crystallographic structure) and magnetic properties of the pigments. All the residues analysed contains haematite as red pigment. However, its morphology, structure and composition vary for the different sites. These pigment characteristics may be used to get insight on the anthropogenic modifications of the archaeological remains in mountainous territories throughout different chronological and cultural prehistoric periods. In this case in the pre-Pyrenean and Maestrazgo Mountain Range.

04 WHERE WERE THE POTENTIAL SOURCES OF LITHIC RAW MATERIAL? A PILOT STUDY ON LATE NEOLITHIC COLLECTING ACTIVITIES IN MECSEK MOUNTAIN

Author(s): Szilagyi, Kata (Eötvös Loránd University - Institute of Archaeological Sciences; Móra Ferenc Museum)

Presentation Format: Oral

Recently, we began a new geoarchaeological research project in the eastern Mecsek to determine the exact geological sources of local radiolarite. The main aim of the project is to find and document the knappable raw materials in East-Mecsek. The east part of Mecsek Mountain means the microregion of this investigation. The basis of the research is chipped stone assemblage of the southeast-Transdanubian group of the Late Neolithic Lengyel culture. In particular, Alsónyék-Bátaszék site and it's chipped stone collection means the origin of the investigation.

The Late Neolithic settlement of Alsónyék has got nearly 7000 pieces stone tools. The dominance raw material is Mecsek radiolarite, which located in East-Mecsek Mountain. This area means the local supply zone of the settlement. We know some geological sources (Komló, Hosszúhetény, Kisújbánya, Magyaregregy, Vékény) in the East-Mecsek, but the provenance research of this micro-region stands at a basic level. The color and texture of Mecsek radiolarite are much diversified which reflect the different geological formations.

In these field surveys, we found many debris excavations and rock outcrops where there was radiolarite in form of pebbles, blocks and bands. We presume that knapping specialist choose consciously the appropriate geological sources and it depended on what type of artefacts wanted to create. Lithic raw materials play an important role in the organization of technology. It is apparent that raw material availability, size, and quality have complex influences on different aspects of stone tool technology. This fact alone makes lithic raw material an important resource for gaining insight into the human land use and mobility patterns and relating those to lithic technology.

05 HARD AS A ROCK: EARLY CONSUMING OF STONE AND MARBLE MATERIAL USE IN PREHISTORIC NW ANATOLIA WITH KANLITAŞ SETTLEMENT CASE

Author(s): Türkcan, Ali Umut (Anadolu Üniversitesi)
Presentation Format: Oral

The stone material has been the most important raw material from the earliest technological artefacts as well as change of cultural indicator throughout the humankind. In order to trace the raw material sources around the site-catchment areas of Kanlıtaş just at the slopes of the hillyl areas which surround its catchment area in mountanious regions of Inner western Anatolia. Kanlıtaş Survey research since 2008 has recognised many stone sources that have been also found on the site itsef. Ongoing Kanlıtaş Excavation Research (Early 6. the mill. B.C) with systematic expeditions around the raw materials. Kanlıtaş is the raw materials around Kanlıtaş settlement are noteworthy with many types of flint, opal, radiolarite, chalcedon as well as abundance of marble and basalt sorces.. Kanlıtaş and its contemporary settlements which are mainly located near Porsuk River between Eskişehir and Kütahya provinces in Inner Western Anatolia, many of them located near the river or streams of Porsuk River. Many of them are all dated to Early 6. the mill. B.C. The site gave a rare evidence on consuming so many varieties of raw materials, so contemporary settlements used which sites used which sources, especially from Kanlıtaş Area, became a research question. Besides, all chaine repertoire of a rare bracelet industry has been already documented on the site. Actually, analysing the materials and related tools with XRF and EDS tools to trace the raw material sources with chemical composition gave rich results of stone consuming, It seemed to have been a settling down factor for the first settlers of Kanlıtaş within the results of the site-catchment area.

This study offers an avenue to further explore how provenance research can inform us of the importance of understanding social and environmental landscapes

06 A COLOURFUL PAST: THE ROLE OF RESOURCE SELECTION AND MANIPULATION IN DETERMINING THE CHEMICAL COMPOSITION AND SOURCING OF EARLY COPPER ALLOYS

Author(s): Mlyniec, Michael - Doonan, Roger (University of Sheffield)
Presentation Format: Oral

Much work has been conducted on the studies of copper mining and production, however the intermediary steps and interactions with raw material between mineral extraction and primary smelting have not merited much attention. The process of beneficiation, crushing and sorting mineral, is often seen as a means to facilitate ease in transportation from difficult to access terrains. This process can lead to alterations in the chemical composition of source material. These technological choices during this process would lead to further changes of the chemical composition of the primary copper produced (Merkel 1985, Doonan 1994).

The exploitation of oxide ores from Rudna Glava in the mountains of Eastern Serbia has been discussed extensively (Jovanović and Ottaway 1976). Recent scholarship focused at the site of Belovode has provided additional insights concerning resource procurement strategies employed by the Vinča peoples (Radivojevic et al 2010). This research has shown evidence of relationships between Belovode and multiple mines, Rudna Glava and Ždrelo. It has been argued that the inhabitants of Belovode exploited both sites for copper minerals due to naturally occurring colour differences. The mineral colour provided the selection criteria for use within different industries, bead production and smelting (Radivojevic 2014). Prioritizing certain colours may have played an additional role during the beneficiation process prior to smelting.

This paper reports an experimental campaign of beneficiation undertaken using copper minerals from Ždrelo to assess the impact of different beneficiation strategies on the chemical composition of ores. Multiple selection strategies were employed using colour selection with the accumulated samples described and quantified with HHpXRF analysis. Results show the chemical composition of subgroups vary compared with that of the exploited outcrop. It is argued that more attention should be given to beneficiation and resulting alteration of chemical compositions, when undertaking archaeological investigations sourcing ores exploited in metallurgical production.

07 IRON PRODUCTION IN MOUNTAINOUS AREAS IN SOUTHERN NORWAY – A PREREQUISITE FOR PERMANENT SETTLEMENTS IN THE NEARBY LOWLANDS?

Author(s): Stene, Katherine (Museum of Cultural History University of Oslo)
Presentation Format: Oral

In prehistoric southern Norway most places where iron was extracted were located in upper valleys and in the lower parts of mountainous areas, which were rich wooded and where the bedrock or mineral soils contained iron. It is still unknown when and how the production of iron was introduced. The first traces of this process can be dated back to the last centuries BC. In some places it appears that the production method was already developed at this time. Even where the technology follows the same principles, different types of furnaces have been uncovered. This indicates that the people who operated in the mountain regions were familiar with these landscapes and the opportunities these landscapes gave. Furthermore, there must have been contacts with other groups/societies that possessed the knowledge of iron production.

The extraction of iron was part of an increasing resource utilisation in mountainous areas that took place at the beginning of the Iron Age, such as hunting and trapping, quarrying of stone, and the use of summer pasture and shielings. This activity is mainly seen in the context of the growing agrarian settlements, the farms, and the development of political centres, chiefdoms, in the nearby low-lying

areas – by the fjords and main valleys. Based on two case studies of iron production sites dated to the centuries around AD 1 I will focus on resource exploitation as a locally based and specialized enterprise. The issue to discuss will be whether the resource utilisation in the mountains, especially iron productions, were a prerequisite for the establishment of permanent agrarian settlements in the nearby lowlands.

08 IRON EXPLOTATION AND PRODUCTION IN THE ROMAN PYRENEES (2ND CENTURY BC – 5TH CENTURY AD)

Author(s): Gutierrez Garcia-M., Anna (Institut Català d'Arqueologia Clàssica - ICAC; Universitat Autònoma de Barcelona - UAB) - Olesti, Oriol (Universitat Autònoma de Barcelona - UAB)

Presentation Format: Oral

In the last 15 years, the archaeological research developed by several teams in the Eastern Pyrenees has showed the importance of the Iron production in this area during Roman times. Despite the traditional consideration as a marginal zone, the Oriental Pyrenees appears as an important territory in relation to some natural resources, especially the iron, during Antiquity.

We will discuss the results of new excavations and landscape surveys in the northeasternmost region of the Hispania Tarraconensis province, with a particular focus on the Cerdanya area, a relatively difficult to access plain located amidst 2000 to almost 3000 meters high mountains. Despite the problems of our data collection (scattered and limited), we can propose some historical interpretations about the Roman presence in the Pyrenees.

The analysis of some key sites, many of them found in high altitude locations, shows the historical evolution of this Iron production, from the Late republican period (2nd – 1st centuries BC) to the Late Antiquity (4th - 5th centuries AD). It is also possible to distinguish important differences in the iron exploitation patterns during this Roman period: intensive activity is documented in Late republican times and specially during the Late Antiquity. On the contrary, during the Early Empire there are indicators of a lower interest in this resource. One of the possible interpretations is the connection between Iron production and the presence of the Roman army in the region.

09 MOUNTAINS OF MARBLE: PYRENEAN STONE RESOURCES, THEIR IDENTIFICATION AND TRANS-REGIONAL TRADE NETWORKS IN ANTIQUITY

Author(s): Gutierrez Garcia-M., Anna (Institut Català d'Arqueologia Clàssica - ICAC; Universitat Autònoma de Barcelona - UAB) - Lapuente Mercadal, Pilar (Universidad de Zaragoza) - Blanc, Philippe (Université Pierre et Marie Curie) - Royo, Hernando (Independent researcher) - Savin, Marie-Claire (IRAMAT-CRP2A UMR 5060 CNRS - Université Bordeaux Montaigne) - Blanc, Annie (Institut National du Patrimoine) - Boudoumi, Selim - Pianet, Isabelle (IRAMAT-CRP2A UMR 5060 CNRS - Université Bordeaux Montaigne)

Presentation Format: Oral

This paper addresses one of the natural resources most specific of Roman times, the marmora (marbles and other ornamental stones) and in particular how the search and exploitation of these highly prized raw materials shaped the presence and establishment of humans in mountain regions in Antiquity.

Indeed, marble was one of the noblest materials in the Roman world, used especially during the Imperial age as raw material in high-grade sculpture, architecture and epigraphy. In the Roman West, the demand for this type of stone came along the adoption of a new urban codes and lifestyle, and involved not only the arrival of imported materials from the central and eastern provinces but also the search for closer sources of similar materials, which sometimes are quite difficult to differentiate.

We will present our latest advances on the archaeometrical characterization of several white, grey and white/grey marbles from the Pyrenees as well as the provenance studies carried out thanks to applying this new, updated reference data on a large collection of archaeological objects. The results showed that a much larger array of marble varieties were exploited and used by the Romans in relatively distant territories on both sides of this mountain range.

The combination of this recent data with that from previous studies in the area (such as those of R. Sablayrolles in Saint-Béat, J.-L. Schenk-David in Saint-Bertrand-de-Comminges, Ch. Costedoat on the white marbles and F. Antonelli on the Campan limestones, among others) provide an extraordinary leap forward in our understanding of the production and use of non-imported yet luxury commodities in extended trade networks and the prominent role of Pyrenean marbles in both the local and supra-local economy.

10 HIGH MOUNTAIN RESOURCES: SPECIALISED PRODUCTION TYPES FOR EXTRA-REGIONAL TRADE

Author(s): Palet, Josep Maria (Institut Català d'Arqueologia Clàssica) - Orengo Romeu, Hèctor (McDonald Institute for Archaeological Research, University of Cambridge) - Ejarque Montolio, Ana (3Université Clermont Auvergne, CNRS, GEOLAB, Clermont-Ferrand) - Miras, Yannick (CNRS - Histoire Naturelle de l'Homme Préhistorique - UMR 7194) - Riera Mora, Santiago (Seminari d'Estudis i Recerques Prehistòriques, Universitat de Barcelona)

Presentation Format: Oral

This paper will present evidence drawn from the Madriu-Perafita-Claror and Ter high mountain valleys (Andorra and Catalonia) to show how high mountain areas were well-integrated in extra-regional trade networks from the Neolithic onwards.Our multidisciplinary high spatial and temporal resolution approach integrating archaeological survey and excavation, multi-proxy palaeoenvironmental analysis, bioarchaeology, and the analysis of historical documents succeeded in reconstructing rural production dynamics

that would have remained invisible to traditional archaeological approaches.

Particular attention will be paid to the Roman period, when these valleys become integrated in the Roman economic sphere. During this period, the Madriu-Perafita-Claror valleys show the development of specialised local production of traditional products based on forest exploitation. Specialised pastoral practices for regional and extra regional distribution are also attested in all studied areas. These attest to the development of different types of markets such as that of luxury food where mountains, given the specific nature of their environment, had an important complementary role to play.

Although high mountain areas have often been overlooked in the analysis of Roman landscapes and economic practices, pastoralism have received an increasing amount of attention during the last years. Nevertheless, high mountain pastoralism is still regarded as a set of indefinite practices and little has been done in order to define types of husbandry practices, how these affected the environment and how were integrated within general economic dynamics.

11 COMPARISON STUDIES OF PIGMENTS IN THE DECOR OF BONE ENGRAVED OBJECTS AND IRON-BEARING ROCKS FROM THE EKVEN SITE (CHUKOTKA)

Author(s): Pakhunov, Alexander (Institute of Archaeology Russian Academy of Sciences) - Devlet, Ekaterina (Institute of Archaeology Russian Academy of Sciences) - Dneprovsky, Kirill (The State Museum of Oriental Art) - Sukhorukova, Elena (The State Museum of Oriental Art)

Presentation Format: Oral

The studies of ancient Chukotka Eskimo were focused on the problem of depicting material culture realia (dwellings, hunting equipment, and boats of sea hunters), as well as technological features of art (use of pigments and coloring of objects, engraving techniques, etc.). Art and technological studies are based on the materials from the collection of the State Museum of Oriental Art, that possess material from archaeological excavation (more than 10,000 items of the 1st millennium CE) at Chukotka obtained by archaeological expeditions led by the project participants,

The methods of micro-X-ray fluorescence analysis and scanning electron microscopy were used to studies several objects from three burials of Ekven. These are bone items (canine and walrus burqulum): harpoon tips and zoomorphic figures, fragments of iron-bearing rocks of different shades, with traces of abrasion and without them, and two stones with traces of paint on the surface.

The items are decorated with both engraving and paint, rubbed into engraved lines. It has been established that the set of micro impurities in the pigments from the investigated burials is different, associated with various sources of raw materials, which are abundant in the ore-rich mountainous regions of Chukotka. Comparison of the morphology of hematite particles in pigments from engraving and from rocks in burial 302 showed that paint from limestone slab was used for a zoomorphic product, whereas the harpoon tip was decorated with the different material. The samples of paint from objects reveal a high content of potassium than didn't reveal in the raw materials - evidence of a purposeful addition of potassium-containing minerals (probably mica) to the red paint.

This study was supported by the Russian Foundation for Basic Research, Project 17-01-00395.

12 THE TURN OF XIII CENTURY IN SUDETEN (SW POLAND). THE RAW MATERIAL DIVERSITY IN THE EARLY AND LATE MIDDLE AGES.

Author(s): Lisowska, Ewa (Institute of Archaeology, Wrocław University)

Presentation Format: Oral

The 13th century in the Sudetenland is a breakthrough moment in which there are series of processes related primarily to the colonization of mountainous areas, including the emergence of the first cities and castles and the development of new communication routes. This change is also visible in the enlargemnt of rock raw materials types and ore extracted in the Sudetenland.

From the period of the early Middle Ages, (from the 6th century to the 12th century), we do not know archaeological sites related to the extraction of gold, silver and copper, they appear at the end of the 12th century and in the 13th century. The development of ores acquisition is the direct cause of the location of the oldest cities in Poland – Złotoryja and Lwówek Śląski in Sudetenland. Extraction of ores is the main driving force behind the economic development of this mountainous region, leading to a fairly rapid enrichment of the society.

In the 13th century, the spectrum of extraction of particular types of stone raw materials is also changing. In the early Middle Ages, the sources located in the lower parts of the mountains, mainly granite, quartz shales and sandstones were exploited. In the 13th century, the basic raw material obtained from this area is sandstone used in sacral architecture, and to a lesser extent, granite, quarry and marble deposits were used.

The necessity of transporting the spoil also implied the development of the road network. Most of the rivers flowing from the Sudety Mountains were not suitable for floating material, it was possible only on sections of large rivers in the lowest parts of the mountains.

13 THE SPATIAL ORGANISATION OF IRON PRODUCTION IN THE PARE MOUNTAINS, TANZANIA

Author(s): Iles, Louise (University of Sheffield)

Presentation Format: Oral

The Pare Mountains in northern Tanzania was an important precolonial centre of iron production, producing high-quality iron that both

used locally and supplied to neighbouring regions. This thriving economy was based partly on the rich supply of raw materials available there – magnetite ore sands, clay, water and charcoal – as well as it's position on a caravan trade route that linked the Swahili coast to the east African interior.

Historical sources suggest that different stages of iron production activity were distributed unevenly across the highland and lowland areas of the Pare Mountains, with iron smelting concentrated in the lowlands, and smithing carried out in the highlands. It has been possible to corroborate these patterns and extend them into the more distant past with recent archaeological and archaeometallurgical research. Raw materials were moved up and down the mountains following the same paths by which cattle were transported for grazing and trade.

This paper will consider why these spatial distinctions exist and why production activity was organised in this way. It will explore the spatial variability of raw material distribution across the mountains, in conjunction with the location of production sites and settlement sites, as well as the physical obstacles presented by the mountainous landscape itself and the natural environments immediately surrounding them.

14 TRANSFORMATION OF THE ŠUMAVA MOUNTAINS LANDSCAPE DUE TO FIRE-WOOD TRADE IN 19TH CENTURY

Author(s): Blažková, Tereza (Charles University, Faculty of Humanities)
Presentation Format: Oral

The nature of the Šumava mountains is protected as a national park today. But this mountain region, which represents also SW border of the Czech Republic with Bavaria, undergone long development only seldom impaired by people till the end of 18th century. Land use for sourcing golden raw material started in some regions with aurifeous streams with La Téne Celtic Culture there. And the gold sourcing from the streams and also gold mining continued in the Middle Ages, but the resources were exhausted soon. So called Golden trail for trade has led across the mountains probably since prehistoric times. The mountain forests and rocks were also base for raw material for glass production, so there were established few glassworks in 18th century. But the landscape was not hardly affected in a whole.

The complete transformation of the landscape started with the end of the 18th century due to exploitation mountain forests as a base for needed raw material – fire wood – for industrial use in lowlands (mainly Prague). The aristocratic entrepreneurs bought extensive remote forested mountain estates, they have built transport systems, mainly for river navigation as water canals for timber floating and they started with wood cutting of original forests for wood trade. In first decades of 19th century there was no forests renewal, in the middle of the 19th century the deforestation started to be solved with tree planting but the multispacious forests were replaced with spruce plantations, which were destroyed with windbreaks and bark beetle in 1870´s. The 19th century exploatation caused multi-layered and far-reaching changes in landcape, settlement, ecology, ecosystems…, that are still up to date. We´ve used interdisciplinary approach, combining landscape archaeology (non-destructive research) with written and cartographic sources and environmental analysis.

711 TAKING CONFLICT ARCHAEOLOGY BEYOND NATIONAL BORDERS

Theme: The archaeology of material culture, bodies and landscapes
Organisers: van Lochem, Philip (University of Birmingham; Ironbridge International Institute for Cultural Heritage) - Carman, John (University of Birmingham; Ironbridge International Institute for Cultural Heritage) - Reynolds, Kyle (University of Birmingham; Ironbridge International Institute for Cultural Heritage) - King, Christopher (University of Birmingham)
Format: Regular session

In recent decades Conflict Archaeology has established itself as a distinct multifaceted discipline in the extensive study of human warfare and conflict. Its acceptance as a distinct discipline is apparent by its regular feature at international conferences and through a growing number of publications.

Arguably though, the discipline continues to be characterised by closed communities, divided along the lines of specific time periods and expertise- and in particular nationality. While Conflict Archaeology as a discipline provides a wider discourse concerned with the complex nature of human conflict, contributors often argue from their own geographical and national backgrounds.

Despite these constraints the overlying themes emerging within Conflict Archaeology regularly explore and reach beyond these boundaries, focussing on a range of subject areas including- but not exclusively: heritage management, identity and theory.

This session aims to move beyond the discipline's closed communities and explore its overlying themes. The session organisers welcome specific research rooted in respective national entities, but ask for contributors to provide papers on what they set out to achieve within Conflict Archaeology on a transnational level.

Taking into account the meeting of archaeologists from around the globe in Barcelona, we as session organisers hope to explore the true potential of Conflict Archaeology by thinking beyond our own geographical restraints. It aims to establish an exchange of ideas; achieving a discussion not divided along period or geographical boundaries. This session therefore welcomes contributions from all who may consider

Conflict Archaeology a specific specialism or merely an adjunct to other work.

ABSTRACTS

01 AT THE CROSSROADS OF ETHICS, ARCHAEOLOGY AND MILITARY REGULATION: THE RECOVERY OF FALLEN SOLDIERS FROM THE FIRST WORLD WAR

Author(s): De Decker, Sam (Onroerend Erfgoed)
Presentation Format: Oral

The soil of the Ypres Salient contains the remains of thousands of fallen soldiers from the First World War: soldiers whose remains were left forever where they fell in action or where they were temporarily buried by their comrades.

In recent years there has been a striking rise in the number of bodies of fallen soldiers that are being recovered. Whereas until a few years ago about ten bodies per year were registered, 50 to nearly 100 bodies have been registered during the last years. This is partly due to the commemoration of the First World War and a result of the awareness-raising of the war past. However, it is undoubtedly the result of the increased attention to conflict archaeology.

In order to create a clear and legal framework, a number of agreements have been made with the Public Prosecutor's Office, police, defence and the nation states involved. Indeed, a fallen soldier from the First World War is, from a legal point of view, first of all a fallen military casualty and therefore comes under the provisions of the Geneva Convention. This implies, among other things, that a nation state always has the right to recover and/or to repatriate its fallen soldiers. At the same time this international legislation does not exclude that such a recovery is carried out in compliance with archaeological standards; everyone acknowledges these days that the bodies and the contexts in which they are discovered also have an archaeological value and that the use of archaeological methods can provide useful information on, for instance, the cause of death or the identification.

This combination of (national) archaeological and international military legislation has not only led to an increase of finds and discoveries, but certainly also to an increase of the quality and serenity of these recoveries.

02 UNDER A SPREADING CHESTNUT TREE – RECORDING ANZAC FIRST WORLD WAR GRAFFITI ON SALISBURY PLAIN

Author(s): Miles, Daniel (HE - Historic England)
Presentation Format: Oral

The presentation will look at how a small local First World War centenary project recording graffiti has extended out from the battlefield to transcend county and national geographical boundaries as well as the temporal framework of the Great War. It has linked a small village in Wiltshire, England to thousands of overseas Anzac troops and an American poet.

Hundreds of First World War graffiti have been recorded written and carved into the fabric of the village of Figheldean. These are testament to hundreds, probably thousands, of Anzac troops, who visited the village whilst training for the Front on Salisbury Plain. These troops were attracted by the desire to visit the Old World villages of their parents' homeland, and by their understanding that the smithy with its chestnut tree in Figheldean was the one described in Henry Wadsworth Longfellow's famous poem, "The Village Blacksmith". This poem was part of these troops schooling and cultural identity and drew them closer to the idyll that Figheldean represented. However, digging a bit deeper, it became clear that this cultural association was fabricated - Longfellow's poem was based in America, not Wiltshire. However, a local tourist industry developed, attracting and at the same time exploiting the visiting troops.

Discovering the graffiti has led to discovering the wider story and cultural significance of these 100 year old testaments. Although nearly completely forgotten about locally, the stories of Anzac visitors to the village have been recorded in a large number of diaries, letters and archives across the waters in Australia and New Zealand. The research has moved from the local to the international and from the training ground and battlefield to the social and economic impact of the war, and the creation of myths, tourist attractions and economic exploitation.

03 SAMI BORDER PILOTS AND GERMAN BORDER GUARD DURING THE SECOND WORLD WAR

Author(s): Andersen, Oddmund (Árran lulesamisk senter)
Presentation Format: Oral

During the Second World War, a lot of people fled from the German occupied Norway to the free Sweden. In northern Norway, one of several escape routes went over the mountain range of Tysfjord into Sweden. The German armed forces present in the region tried to stop the refugee traffic. The soldiers build guard posts in 1942/43 along the border between Norway and Sweden. Between these posts soldiers patrolled to stop the refugees. People who wanted to escape received help from border pilots, to accompany them past the guard lines to safety in Sweden. The local Sami became central pathfinders in this task due to their inherent knowledge on the crossing of the mountain range, and updated intelligence on the location of the guard posts. Today, some of the traces of the refugee traffic are documented. Firstly, this comprise some of the central places where refugees stopped for rest on their way to Sweden. Furthermore, records have been made of some of the German guard bunkers that were built along the border. In this lecture, this war memorial landscape will be described, and the various guard bunkers will be compared to the known escape routes. The work

of border pilots in relation to the German guards will be dealt with as well.

04 DEATH, MEMORY, AND PLACE: AMERICAN ATTITUDES TOWARD MILITARY BURIALS OVERSEAS

Author(s): Reynolds, Kyle (University of Birmingham; Ironbridge International Institute for Cultural Heritage)
Presentation Format: Oral

This paper seeks to understand the attitudes toward death and military burial outside of national borders. During the 18th and 19th centuries, warfare took on a larger scale and scope across the world. With increases in efficiency and efficacy of battlefield technology, death rates also saw a substantial increase. In response, removal of the dead after the fact took on a more personal role for all nations. In many cases, military cemeteries arose within very close proximity to the battlefield that was the source of the casualties. Specifically, American attitudes toward military burials and commemoration overseas will be the focus of this study. Military cemeteries are usually under the jurisdiction of a specific agency. However in recent years, military cemeteries and burial complexes in the States have been added to the National Register of Historic Places, classifying them as heritage places deemed worthy of protection and conservation. A look into military cemeteries as heritage will form a framework from which American attitudes toward military burial overseas may be assessed and contrasted with sites and complexes of similar size or notoriety from mainland America. The hope is that this study will help shed light on the effect of place and memory in commemoration practices.

05 THE GREAT ESCAPE OVER THE BALTIC SEA

Author(s): Arnshav, Mirja (Stockholm University)
Presentation Format: Oral

During the World War II, the Baltic states (Estonia, Latvia and Lithuania) were occupied and annexed by the USSR and the Nazi Germany. Tens of thousands of people were deported, arrested or mobilised and warfare devastated much of the countries. When the Red Army began to reoccupy Estonia and Latvia in 1944 refugees preceded its advance. In the autumn, the so far relatively small-scale fleeing and evacuation turned large-scale. People fled westwards and more than 30 000 braved the Baltic sea in small fishing boats to Sweden. All sorts of people escaped, however many of them carried guns, and were prepared to fight border guards or overpower the German crew on evacuation ships in order to make escape. Amongst the refugees were also involuntary conscripts of the German army.

"The great escape", as it is often labelled in history writing, forms an example of the wider consequences of modern conflict, and its impact on neutral countries. What is the heritage of this escape? How is it commemorated at a grass root level? And why is it that it is not really acknowledged by Swedish national heritage agencies?

In discussing the distribution of guns, memorials and sunken or abandoned wrecks of refugee boats, this paper seeks to relocate the conflict in the landscape, and in public memory. Focusing on the voyage over the sea, and acknowledging that a great part of the escape took place on the waters outside of the sovereign territories of the states and involved the crossing of Estonian, Latvian, Finnish and Swedish borders, it is argued that a transnational approach is key to understanding the event.

06 THE DESTROYER OF THE WORLDS IS HIDDEN IN THE FORESTS. COLD WAR NUCLEAR WARHEAD STORAGE SITES IN POLAND

Author(s): Kiarszys, Grzegorz (Department of Archaeology, Szczecin University)
Presentation Format: Oral

About 25 years have passed since the soviet nuclear warhead storage facilities located in Poland were abandoned by the Russian troops. It happened soon after the beginning of democratic transformation of Central European countries, which was followed by the deep economical crisis and the final collapse of the Soviet Union in 1991. Withdrawing Russian troops took with them many secrets regarding their presence in the territories of Poland, which lasted for almost 48 years. Among one of those secrets was a myth of Poland being declared nuclear weapon free zone during the Cold War period. Due to the archaeological perspective an attempt can be made to debunk this myth. In my presentation I will refer to ALS data, historic and modern aerial photographs, declassified satellite imagery (Hexagon and Gambit), declassified CIA reports regarding military situation of the Warsaw Pact, the Polish-Russian agreements and other documents from the files of 'Wisla Project' available in archives of the Institute of National Remembrance (Poland). I intend to search for an answer to the questions about the cognitive potential of the archaeological perspective in studies of the places that were to be 'erased' from the history. Such approach may be seen as qualitative turn in narrating of the recent past events and help in protection of the abandoned Cold War military installations from further decay. Regarding the main topic of the session, the Cold War was one of the conflicts that ignored national borders and spread all around the globe. It established new order, dividing the world between hostile fractions that, in most cases, had nothing to do with cultural or national identities. It left countless materialized results of mental reaction to the political ideology, devastating psychological effects of long-term latent conflict, stress and primal fear fuelled up by propaganda.

07 WHAT IS A 'HISTORIC BATTLEFIELD' AND DOES IT MATTER THAT WE KNOW? A QUERY TO THE INTERNATIONAL BATTLEFIELD ARCHAEOLOGY COMMUNITY

Author(s): Carman, John - Carman, Patricia (Ironbridge International Institute for Cultural Heritage, University of Birmingham)
Presentation Format: Oral

Despite the growth in interest in battlefields as objects of study by archaeologists and the concern for their preservation as sites of importance, it is interesting to note how little work has been undertaken to understand their ontology. Archaeologists have written copiously about the nature of 'the site' as a concept – including approaches to 'off-' or 'non-site' archaeologies – and how the objects of our attention are conceptualised. By contrast, there is no similar work to conceptualise the object of battlefield archaeology. While heritage agencies have offered definitions of the specific qualities required of a site to be included in national registers, and scholars have discussed issues of methodology in relation to their investigation, an understanding and conceptualisation of the historic battlefield as a general category eludes us.

This paper – based around developing work derived from the study of battlefields as particular kinds of landscapes – will address this issue directly. It will draw on specific examples of fights generally recognised as 'battles' and others similar in form but which are not identified as battles. It will offer reasons why the question may be worth asking, and some preliminary answers, in the spirit of opening a debate in the field on the nature of our object of study.

08 THREATS TO THE SURVIVAL OF UK BATTLEFIELD ASSEMBLAGES: IMPLICATIONS FOR PRESERVATION

Author(s): Rowe, Samantha (University of Huddersfield; Historic England)
Presentation Format: Oral

Since Conflict Archaeology has been considered a discipline in its own right, research has focused around the battles which took place. However, sites of conflict are excellent examples of landscapes which require management which can steer the way in heritage management on a global scale.

In recent years the deterioration of metal artefacts in ploughsoils has been identified as a threat to archaeological data loss across Europe. Sites of conflict are particularly vulnerable to data loss through degradation as their primary evidence consists of artefact scatters in the ploughzone. 100s of sites of conflict exist across the UK, only 47 of which are registered, leaving numerous sites vulnerable to damage as they lack any means of statutory protection. This presents an opportunity to explore the relationship between battlefields and the degradation of these buried assemblages in order to aid future heritage management policies.

This paper seeks to identify the reasons behind the degradation of battlefield assemblages in the ploughzone by assessing the condition of artefacts and correlating this data with the soli chemistry and historic land use of 17th century sites of conflict. Case studies are taken from the UK, though the methodologies used are applicable to cross-border sites where the geology and land management will also have impacted on the preservation of archaeological assets.

This paper will highlight the impact arable cultivation has had on the condition of battlefield assemblages and suggests the best way of preserving these sites for the future is to revert land to pasture of maintain landscapes under permanent pasture. The methodologies laid out in this talk have further implications for the management of archaeological sites across the world and highlights the significance conflict archaeology has to our world heritage besides the battles which took place.

09 STUDYING BATTLEFIELDS AT THE CROSSROADS OF ARCHAEOLOGY, HISTORY AND HERITAGE

Author(s): van Lochem, Philip (University of Birmingham; Ironbridge International Institute for Cultural Heritage)
Presentation Format: Oral

Some of the leading developments in the field of battlefield research have been pioneered by archaeologists over the last few decades, leading to the development of battlefield and conflict archaeology. Within these disciplines specific methodologies continue to be developed in order to investigate a wide variety of sites, spanning the full scope of human history and warfare. While specifically tailored methodologies are developed to explore battle sites, discussion and publications furthermore focus on related aspects such as heritage, theory and the context in which battles should be placed and understood.

The investigation of battles is not merely a recent phenomenon though. References to warfare and battles feature in some of the earliest classical works by historians such as Herodotus and Tacitus and traces of warfare can be found in remains of some of the earliest societies. Likewise battlefields have been studied and explored by historians and archaeologists with various backgrounds for centuries.

This paper explores the context in which battles are investigated and why the development of battlefield and conflict archaeology in particular is so important. This paper draws from the author's current research of battlefields in the Netherlands and the impact of battlefield and conflict archaeology in this enquiry.

10 THE APPLICATION OF BATTLEFIELD LANDSCAPE ANALYSIS TECHNIQUES TO MULTIPLE BATTLE SITES

Author(s): King, Christopher (University of Birmingham)
Presentation Format: Oral

This presentation outlines the application of multi-layered Geographic Information Systems (GIS) techniques in the analysis of his-

torical Battlefields in the geographical area of modern England and Wales, and also exploring their wider application.

The aim of my PhD was to elucidate the reasoning behind the utilisation of certain landscape features in a given range of battlefields, both on the choice of location and movement of troops.

It was shown that utilising GIS in an in-depth analysis of the battlefield landscape has applications across the breadth of Conflict Archaeology. It has already been demonstrated that focussing on this type of complex, data driven analysis of battlefields, has proven valuable to studies in both different time periods and different geographical settings. This suggests that these techniques have beneficial applications beyond just British battlefields.

The use of GIS techniques was expanded by using a multi-resolutional approach, which includes looking spatial utilisation of troops on a battlefield, accessibility of visual features in a battlefield landscape, and the estimated effective range of contemporaneous weaponry. By integrating these different data sets, useful interpretations can be generated, including which areas of the battlefield could be directly affected by the forces involved.

This presentation will describe the specific GIS techniques that have already been used in my current research and also outline how they have been applied to battlefields outside of the UK. By describing the development and utilisation of these techniques, this presentation aims to demonstrate how the discipline of conflict archaeology can benefit by widening the nature of battlefield study itself.

713 THE FOURTH AND THIRD CENTURY BC - A PAN-EUROPEAN TURNING POINT

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Martens, Jes (University of Oslo, Museum of Cultural History) - Nakoinz, Oliver (Christian Albrechts Universität, Kiel) - Vorotinskaya, Larissa Vorotinskaya (The State Hermitage Museum, Sct. Petersburg) - Filet, Clara (University of Paris 1 Pantheon-Sorbonne, UMR 7041 ArScAn 'Archéologies Environnemenrales' UMR 8546 AOROC) - Feugnet, Aurélia (University of Paris 1 Pantheon-Sorbonne, UMR 7041 ArScAn 'Archéologies Environnemenrales' UMR 8546 AOROC)
Format: Regular session

Changing burial rites, art and settlement patterns indicate a break which seems to be more radical than the transition from Bronze Age to Iron Age in some regions. The transition in the fourth and third century represents a significant transformation of the social and cultural system and a new configuration of economic structures and the European system of interaction. Central Europe is characterized by the end of the social, cultural and economic system of the Hallstatt/Latène tradition, the Celtic migration, the occurrence of coinage and new technologies. In the North-Pontic region the Sarmatians take over after the Skythians. In the north-east new cultures like the Poienesti-Lukasevka, Zarubintsy and Przeworsk Cultures are replacing various Early Iron Age cultures while the Jastorf culture of the north-west undergoes fundamental changes. The different regions influencing each other form a rather complex system of interrelationships with unforeseen effects such as the emergence of new supra-regional interaction structures and adaptive circles. This session aims to explore the transition described above in Europe. We invite papers on information from different regions on what is changing, on the chronology of different transformations, on the influence of other regions and on the interpretation of the changing features.

This session is part of the SIMB initiative ("Spheres of Interaction between the Mediterranean and the Baltic in the first millennium BC", https://a-simb.gitlab.io/home/).

ABSTRACTS

01 INTRODUCTION

Author(s): Martens, Jes (University of Oslo, Museum of Cultural History)
Presentation Format: Oral

The fourth and third century is a period of cultural transformations over large areas of Europe between a system with roots in the Late Bronze Age and another that goes on into the first millennium AD. The transition appears to represents a significant transformation of the social and cultural system and a new configuration of economic structures and the European system of interaction. Central Europe is characterized by the end of the social, cultural and economic system of the Hallstatt/Latène tradition, the Celtic migration, the occurrence of coinage and new technologies. In the North-Pontic region the Sarmatians take over after the Skythians. In the north-east new cultures like the Poienesti-Lukasevka, Zarubintsy and Przeworsk Cultures are replacing various Early Iron Age cultures while the Jastorf culture of the north-west undergoes fundamental changes.

It is the aim of this session to explore this, to look for common grounds and causes. Are these changes synchronous, is it a chain of events, or is it just a coincidental cluster of transformations? Are the transformations entirely cultural or are they due to changes in the environment, and if so which kind of environmental change would lead to such fundamental cultural and social changes? European archaeology is divided into several branches

dealing their special type of archaeology (mediterranean, central european, northern European etc) and members of the different

groups do not often meet in discussions on common themes like this. It is therefore the aim of this session to initiate a discussion across these borders. This session is part of the SIMB initiative ("Spheres of Interaction between the Mediterranean and the Baltic in the first millennium BC", https://a-simb.gitlab.io/home/).

02 LONG-TERM CYCLICAL CLIMATE CHANGE AND THE GALLIC INVASION OF ROME IN 390 BC: A TENTATIVE HYPOTHESIS

Author(s): de Verteuil, Michaël (University of Toronto)
Presentation Format: Oral

In book V of his History of Rome from its Foundation (Ab Urbe Condita Libri), Livy provides us with the only still extant early history of the Celtic tribes we now associate with the Hallstatt and La Tène cultures. He briefly alludes to the existence c.600 BC of a vast Gaullish tribal confederacy under the leadership of Ambigotes, King of the Bituriges. During the course of the sixth century, the Gauls were to reach the southern-most extension of their successful expansion into the Po valley of northern Italy. After a subsequent century of relative stability, in 391-90 a force of several thousand crossed the Apennines in an ultimately futile attempt against Etruscan Clusium (Clevsin) and, more famously, the early Roman Repulic itself. The dates provided by Livy for these events correspond strikingly to those that can be inferred from a highly speculative long-term cyclical climate model developed to explain the repeated and regular sequential pattern of political consolidation followed by collapse in northern Messopotamia during the Bronze and Iron Ages. The model suggests that Western and Central Europe north of the Alps and Pyrennees might have experienced a peak in optimal climactic conditions c.550 BC, favouring the development of higher-level political superstructures. A subsequent and progressively sharp climactic deterioration, also predicted by the model, could have led to a crisis for fragile large-scale political units like tribal confederacies, beginning towards the end of the fifth century, prompting their breakup and spurring desperate outward migrations such as those led by the Sesones into central Italy.

03 CULTURAL CHANGES ON POLISH LOWLAND AT THE TURN OF THE EARLY AND LATE PRE-ROMAN PERIOD

Author(s): Grygiel, Michal (Independent)
Presentation Format: Oral

The Early/Late Pre-Roman Period transition was a time of a profound cultural changes in the Odra and Vistula drainages, on the north-eastern periphery of the Celtic world. Its result was the decline of the "post-Hallstatt" Pomeranian-Cloche Grave Culture previously spread across much of Poland, now replaced by two formations deeply influenced by the La Tene Culture – the Przeworsk and the Oksywie cultures. The view dominant in the literature is that these two are a direct continuation of the "post-Hallstatt" cultures. According to currently accepted views the main cause of this major cultural transformation was impact from the La Tene Culture which triggered significant changes in the spiritual and the material culture, and in the economic systems of the "Pomeranian-Cloche Grave" communities. Only recently the role of the Jastorf Culture in this process has come to be recognized as vital. The number of "Jastorf" sites recorded across the Polish Lowland, far east of the lands on the lower and the middle Odra settled by the communities of the peripheral Gubin Group and the Oder Group of the Jastorf Culture.

The presence of "Jastorf" communities in the Lowland used to be linked with the migration of the Germanic Bastarnae, who supposedly moved through the Odra and the Vistula drainages in the end of 3rd century and in 2nd century making for the south-eastern regions. In the light of new discoveries "Jastorf" settlement on Lowland shows clear connections on the one hand with Jutland Peninsula and borderland of the northern Germany, on the other is clearly linked to the early Przeworsk culture, which starts on Lowland area from A1=ca. LTC2 phase (180-120 BC).

04 THE PROBLEM OF 3RD CENTURY B.C. IN NORTHERN BLACK SEA REGION AND APPEARANCE OF ZARUBINTSY CULTURE IN THE DNIEPER BASIN

Author(s): Vorotinskaya, Larissa (The State Hermitage Museum)
Presentation Format: Oral

Traditionally it is considered that continuous development of Scythian culture from VII century B.C. in steppes of Northern Black Sea Region is suddenly stopped at the boundary between 4th and 3rd centuries B.C. or at the beginning of 3rd century B.C. The heated discussions in Russian literature as for this question have always been held. Appearance of Zarubintsy culture in the Dnieper basin belongs to the end of 3rd century B.C. This date is determined by findings of the Middle La Tene fibulas in burials and amphora marks on the sites of ancient settlements. Therefore, there is a problem of chronological hiatus between Zarubintsy and previous Scythian culture.

However, it is common knowledge that kitchen ceramic ware of the Scythian character are dominated in Zarubintsy settlements of the Middle Podneprovie. Many specialists strongly believe that the Scythian component was significant during formation of Zarubintsy culture.

May we think today that this problem still exists? For the recent 15-20 years many Scythian monuments in the Dniester basin (Glinnoye) with variety of fibulas of the Middle La Tene construction dated up to the end of 3rd century B.C. were investigated. These investigations promote new researches with revision of late date of all Scythian culture of Podneprovie to the later date. The inves-

tigators distinguished the burial complexes of 3rd century B.C. on Scythian burial grounds. Thus, the old contradictions as for the correlation between late Scythian and Zarubintsy culture in Podneprovie are gradually eliminated.

05 ALL ANEW - THE EMERGENCE OF THE IRISH IRON AGE IN THE 4TH C. BC

Author(s): Becker, Katharina (Department of Archaeology, University College Cork) - Armit, Ian (University of Bradford) - Swindles, Graeme (University of Leeds)

Presentation Format: Oral

The Irish Iron Age is problematic to define in terms of its beginning, as after the end of the Bronze Age, during what is elsewhere the Hallstatt period, a very limited range of archaeological sites falling into the period between 800-400 BC has been uncovered. As the Irish dataset is mainly comprised from data from large scale infrastructural schemes, that provide a relatively unbiased cross-section of human activity through time, it is likely that this picture is not due to taphonomic factors, but reflects an actual crisis with low levels of population. The re-emergence of significant levels of human activity around the 4th century BC goes hand in hand with the appearance of La Tène style artefacts, and other indicators of a broad cultural and social shift, which represent the emergence of the 'Iron Age proper' in Ireland. However, other elements of the archaeological record clearly indicate a broad cultural continuity with the Bronze Age, suggesting a transition of great complexity. This, as well as the fact that the cultural transition goes hand in hand with demographic and also changes in landscape use raises fundamental questions about the drivers of change in this period in a post Celtic paradigm era.

06 EMERGENCE OF THE LA TÈNE CULTURE IN SOUTHERN PANONNIA

Author(s): Drnic, Ivan (Archaeological museum in Zagreb)

Presentation Format: Oral

The period between the 6th and 4th c. BC in southern Panonnia was marked by the development of various Early Iron Age communities with eclectic material culture that combined elements from various cultural regions: eastern Hallstatt, Balkan and Eastern Carphatian Basin. The first items of La Tène origin appeared in the region at the end of the Early Iron Age (LT B1), but during the second half of the 4th c. BC a new cultural phenomenon - La Tène culture - was introduced. Older research views this process in the frame of the „great Celtic migrations", but recent theoretical development, backed up by new archaeological data and reinterpretations of old material enable us to interpret this transitional period in more complex perspective. The key question is to determine the ways in which La Tene was introduced in the region, because not every autochthonous community nor micro-region experienced the same level of "latenization" or "Celtisation". While in some parts of southwestern Panonnia gradual transition between the Early and Late Iron Age can be followed, available data suggest a more dynamic process in the southeastern part with the influx of new population, probably in the form of the smaller groups of colonists. This process is attested by several new cemeteries (Beograd-Karaburma, Kostolac-Pećine), starting from LT B2 phase, with the graves containing typical La Tène warrior panoplies and, interestingly, hybrid attires in some female graves composed of the Early Iron Age and La Tène elements. For the rest of the 3rd c. BC archaeological evidence suggest further development of the communities established in the previous period. Their material culture display significant similarities to that of the communities from other regions of the Carpathian Basin thus being the part of the cultural complex, often labeled as the „Eastern Celtic".

07 THE FOURTH AND THIRD CENTURY BC IN EASTERN CARPATHIAN BASIN. EARLY IRON AGE TRADITIONS AND LATE IRON AGE TRANSFORMATIONS

Author(s): Rustoiu, Aurel (Institute of Archaeology and History of Arts Romanian Academy Cluj-Napoca)

Presentation Format: Oral

The eastern Carpathian Basin largely consists of the Great Hungarian Plain (eastern Hungary), the Transylvanian plateau and the valleys and hills on the inside of the Carpathians range (north-western Romania and Trans-Carpathian Ukraine). At the end of the Early Iron Age, the Vekerzug culture from eastern Hungary and the Ciumbrud group from Transylvania established numerous connections with Scythian populations from the northern Black Sea steppes, adopting a nomad pastoralist lifestyle. Archaeologically, this period is largely characterized by the amalgamation of local communities with warrior groups that arrived in the 7th century BC from different northern Pontic areas.

The evolution of these communities, whose cultural connections were mostly oriented eastward, was disrupted by Celtic "colonization" after the middle of the 4th century BC. This process had happened in successive stages during the second half of the 4th century and at the beginning of the 3rd century BC, being documented archaeologically by cemeteries displaying specific elements of the funerary rite, ritual and inventory. One result was the appearance of new communities which were again defined by the cultural amalgamation of local and incoming groups.

Starting from these features, the paper will discuss the manner in which the lifestyle, symbolic concepts and social practices of these communities had evolved through time by analyzing the changes in settlement organization, funerary practices and relations with the landscape. These will be compared with patterns resulting from the analysis of settlements and cemeteries from the mountainous regions untouched by Celtic "colonization". The latter reflect the evolution of local communities from the Early to the Late Iron Age according to a cultural model resembling those from the Lower Danube and the northern Balkans.

08 FORTIFICATIONS IN A PEASANT LANDSCAPE – DISCONTINUITY AND CHANGE IN WEST JUTLAND, DENMARK IN THE 4TH-2ND CENTURY BC

Author(s): Rindel, Per Ole (Saxo Institute, University of Copenhagen)
Presentation Format: Oral

The Pre-Roman Iron Age (5th-1st century BC) is in many ways a period of discontinuity in West Jutland. Settlement patterns, burial rites, pottery shapes and dressing equipment all expose dramatic and important changes around the third or second century BC. At Grøntoft the settlement pattern changes from dispersed farmsteads to a common-fenced hamlet. At Lyngsmose a similar change took place, but in this case the hamlet was enclosed by a wall and ditch with a pattern of pointed wooden sticks in the bottom.

During the excavations at Grøntoft 1959-1972 a remarkable linear system of rows of small pits was identified for the first time in Denmark. It consisted of several sections in a U-shaped stretch of about one kilometre, situated in culture landscape with farmsteads, field systems, roads and cemeteries from the early part of the Pre-Roman Iron Age. During the last few decades such linear pit zones have turned out to be a wide-spread phenomenon, especially in western Jutland, and most of them most probably belongs to the 5th-3rd century BC. It is currently the assumption that there have not been any large posts set in the holes/pits, but that they have been left open. There is no doubt of the defensive nature of at least some of the pit zones and just like the fortified settlement at Lyngsmose they may reflect times of instability and change in the local society.

09 FALL OF THE GETAE, RISE OF THE DACIANS?

Author(s): Berzovan, Alexandru (Romanian Academy, Iasi Institute of Archaeology)
Presentation Format: Oral

During the 5th-3rd centuries BC, in the East Carpathian Area flourished the culture of the Getae. These Northern Thracian tribes built massive fortresses, some of them covering large areas. Large barrows and impressive hoards attest to the level of power and prosperity attained by the local elites. This time frame has often been called in historiography as the „era of the Golden Princes".

However, at the end of the 3rd century BC, most of these forts seem to be either destroyed or abandoned. This process has been linked with the arrival of the northern Poienești - Lukasevka culture, identified with the historical warrior tribes of the Bastarnae. Even if certain aspects of this process are still unclear, the break in the archaeological record happening in the last decades of the 3rd century BC is clearly visible.

The purpose of our paper is to discuss the possible fate of the East Carpathian Getae after this „catastrophe". We believe that no definite and certain answers can be given at this moment, due to the sketchy archaeological record and the incipient stage of research. An entertaining hypothesis is that at least a part of the Getae could have migrated westwards, towards the Lower Siret valley and the Eastern Transylvania, where, beginning from the first half of the 2nd century BC we see a sharp demographic increase as well as the rise of a new society that will eventually lead to what will be later known as the Dacian Kingdom.

10 VARIOUS IMPACTS OF EUROPEAN TRANSFORMATIONS IN THE 4TH AND 3RD CENTURY BC IN THE FRENCH ALPS

Author(s): Tremblay Cormier, Laurie (Antea Archeologie; UMR 7044 Archimède) - Landry, Christophe (Inrap; UMR 5138 ArAr)
Presentation Format: Oral

The pan-european interactions which bring the transformations from the 4th and 3rd centuries BC cross the Alps in every direction: from the Celtic world to the Mediterranean, with the migrations and mercenarism, and from the Mediterranean to the Celtic world with the diffusion of coinage and prestige goods. Both also imply material (objects, raw materials…) and immaterial (beliefs, know-how, aesthetics…) exchanges, as well as political alliances between peoples.

However, these transformation vectors do not affect the French Alps in a consistent manner. Indeed, their impact greatly differs regarding the place of each valley in the transalpine circulation networks, its topographical reachability and its local background. The break of the 4th and 3rd century BC therefore has different faces in the French Alps, and can be seen through material culture as well as the arrival of new communities. This phenomenon is particularly strong in the funerary aspect, with the creation of cemeteries and the integration of new practices such as social and gender selection, and funerary depiction.

To reflect the variability of the transformations from the 4th and 3rd centuries BC, two iconic cemeteries have been selected. The Chens-sur-Leman cemetery, on the shore of the Geneva lake and at the foot of the Chablais massif, is set in a characteristic north-alpine environment showing narrow relations with neighbouring Switzerland. This site has a pioneering role in the scheme of the French Alps celtisation, following the theories of A. Bocquet. On the other side, located in the southern Alps between the Rhone valley and northern Italy, the Ubaye valley is an unconventional microcosm well represented by the Jausiers cemetery, where rich women graves embody this european turning point.

11 RELATING RADIOCARBON DATING TO TYPOLOGY – A STUDY OF THE PRE-ROMAN IRON AGE IN DENMARK

Author(s): Rose, Helene (Centre for Baltic and Scandinavian Archaeology, Schleswig; Christian Albrechts Universität, Kiel)
Presentation Format: Oral

A chronological framework is needed when investigating transformations and turning points in prehistory. In terms of settlement archaeology, the Bronze-Iron Age transition in Denmark is a continuous trend, but the introduction of urnfield cemeteries as a new burial rite indicates a change in the social and cultural system. There is a great deal of stylistic variability in cremation urns and metal objects found with cremations, partly as a function of time. Pre-Roman Iron Age chronologies for Denmark are based on traditional artefact typologies, but researchers have shown it to be difficult to harmonize metal and ceramic typologies. Because of the plateau in the radiocarbon calibration curve between 750 and 400 cal BC, there are very few absolute dates available, making it difficult to critically review the existing typo-chronologies. In order to investigate change and possible transformations in this period it is necessary to improve the chronological resolution.

I present new radiocarbon dates on cremated human remains from Aarupgaard, the largest known urnfield cemetery from Denmark. There are discrepancies between the results and the relevant typo-chronologies and I will discuss different ways of relating radiocarbon dating to typology. By applying Bayesian chronological modelling to a large number of radiocarbon dates, I want to clarify whether the existing typo-chronologies need to be revised. The aim is to establish a site-specific absolute chronology for Aarupgaard, but it is also part of an ongoing project into the transition from Bronze Age to Pre-Roman Iron Age in Southern Jutland.

a. THE OLDEST PHASE OF THE GRAVEYARD IN MALBORK-WIELBARK (NORTH POLAND) - THE EARLY IRON AGE TRADITION OR A NEW BEGINNING?

Author(s): Luczkiewicz, Piotr (Institute of Archaeology Maria Curie-Sklodowska University - Lublin)
Presentation Format: Poster

The graveyard in Malbork-Wielbark (former Willenberg) in northern Poland is an eponymic site for the archaeological culture from the Roman period and the beginning of the Migration period (Wielbark culture), which is related to Goths and covers the area from the southern coastline of the Baltic sea to the western part of the Ukraine. On his site nearly 2000 graves have been discovered, as a result of excavation of German archaeologists in the 20ties of the 20th century and since 2008 as a common Polish-German research project.

The cemetery was set up in the middle of the 2nd century B.C. Its origin expresses the cultural changes taking place in northern Poland and marks a break with the early pre-Roman Iron Age, where cemeteries contained family and multi-generation graves in large stone cists, in which the urns with images of human faces were placed. The oldest graves in Malbork-Wielbark are almost exclusively cremation graves (urn graves), placed in a small pit. However, there is a clearly discernible continuation of many features of the older burial rites: cremation; burnt human remains were placed in urns; instead of stone cists, graves were covered with paving and stone stelae; the urns were often covered with other vessels.

The same rites are however characteristic of the Jastorf circle, covering at this time most of today's central and norther Germany and most of Jutland. The question is, we are dealing with a complete break with an older tradition and an emergence of a new wave of settlers, possibly connected with the Jastorf circle, or whether it is some sort of continuation of the older tradition, albeit in a new form.

715 ARCHAEOLOGIES OF UNFREE LABOR IN EUROPE AND THE MEDITERRANEAN

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Gomes Coelho, Rui (Cultural Heritage and Preservation Studies, Department of Art History, Rutgers University) - Dikkaya, Fahri (Basic Sciences Unit, TED University)
Format: Regular session

Throughout most history, the subjection of people to forms of unfree and coerced labor was an important aspect of class-based societies in Europe and in the Mediterranean basin. The labor of slaves, bonded or forced workers were in many cases the main source of economic prosperity, and their bodies were the violent marker of social boundaries and modes of existence. In 'Anthropologie de L'Esclavage' (1986), Claude Meillassoux argues that people are desocialized, depersonalized, desexualized and decivilized during the process of enslavement. In the end, the subject is unable to socially reproduce itself while being assigned to economic functions. In this session we will ask: In what ways does unfree labor have a materiality, from prehistory to now? How can we use materiality to examine the different modes of unfree labor, historical transitions between unfree labor and freedom, its experiences and legacies? We welcome contributions about contexts in Europe, from Scandinavia to the Mediterranean, as well as case studies from around the world that are related to the legacies of colonialism and imperialism in European and Mediterranean contexts.

01 OBLIGATORY CITIZENSHIP AS COMMODITY FOR THE KINGS IN IRON AGE NORTH SYRIA AND MESOPOTAMIA

Author(s): Denel, Elif (American Research Institute in Turkey)
Presentation Format: Oral

Textual sources distinguish labor as the most important commodity in the Neo-Assyrian Empire. But the great economic value assigned to labor was not exclusive to the Assyrian world. Production by human power was greatly valued in economic and political systems in the Iron Age. The Neo-Assyrians developed an elaborate system of population deportation for the regions that they brought under their authority and thus controlled the distribution of labor both in the heartland and in the wide geographical extent of their Empire. Many deportees were sent into the Neo-Assyrian controlled lands for physical labor, but not without any assigned privileges. Skilled craftsmanship, such as in the arts of writing, stone carving, and architectural construction, was also greatly valued and provided rather high social privileges, even in the court of the elite and the royalty. In fact, new capital cities, such as Nimrud or Nineveh, were built through elaborate planning and a massive force of labor, a substantial part of which were provided by newly settled deportees. However limited, the similarities in the degree of greatness for the building programs in other neighboring Iron Age powers, such the Neo-Hittite kingdoms in north Syria or the kingdom of Urartu in the north, strongly suggest similar attitudes in moving large groups of populations between conquered regions and heartlands of power and access to skilled labor and new knowledge. While deported populations were not entirely reduced entirely to the level of slavery, they lost substantial freedom and came under the absolute authority of the king. This paper will combine textual with archaeological sources to discuss different Iron Age strategies to gain and ensure loyalty among the deportees, whose newly assigned identities ranged from their commodification to their receipt of certain social, such as land allocations or even important positions in the royal palace.

02 IDENTIFYING THE AFRICAN SLAVE PRESENCE IN PORTUGAL: ARCHAEOLOGY AS AN AGENT FOR A DECOLONIZATION OF THOUGHTS AND KNOWLEDGE

Author(s): Simões, Sara (Cambridge Archaeological Unit, University of Cambridge)
Presentation Format: Oral

Despite Portugal's long and intense past as both a slave trader and a colonial nation, the terms "slave" and "slavery" only recently became part of the country's archaeological lexicon. However, in the past few years, we have seen an increased interest in the study and knowledge of the African Diaspora and the repercussions of the slave trade both in the communities of origin and in the destination locations. The identification of sites and material culture related to African slave populations in the Post-Medieval Portugal (16th-18th centuries) illustrates the richness and potential lurking in a study of the enslavement process carried on in this territory. This fact raises some questions such as what the possibilities and specificities of an archaeological study of the African diasporic contexts in Portugal are, or how the materiality, with its social dynamics and processes of subjugation, rupture, assimilation or continuity, reflects the experience of Africans during the slave period. Can we recognize how the intangible elements and African cultural backgrounds are reflected in the material culture of slave populations? How did they influence the Portuguese materiality itself? Working on the assumption that the African cultures are complex and home to multiple cultural matrixes, mapping the slaves' origins and their different ethnic groups emerges as the necessary starting point for an archaeological research. In this sense, our intent is to reflect on how the possibilities of ethnicity worked as a determining factor in the shaping of new African and Portuguese identities, approaching the multicultural nature of African symbols and structures through the concepts of cultural syncretism and creolization. Through the valuing of the Luso-African syncretic forms, the archaeological studies should be fundamental in the review of these territories' heritage legacies.

03 OTTOMAN BLACKS: ARCHAEOLOGY, SLAVERY AND SETTLEMENTS

Author(s): Dikkaya, Fahri (TED University)
Presentation Format: Oral

In the 18th and 19th centuries, a number of Africans came to the some fertile lands in the Ottoman Western Anatolia as forced labourers via Zanzibar named as Zanj in Ottoman Turkish. Because of the name of Zanj, the Africans in Ottoman Empire were described as "zenci" meaning person from Zanzibar, the coast of black people. Ottoman Africans, Zencis, were settled in the villages closing to farming areas in the Ottoman Western Anatolia, and became significant population in the some areas of Aegean Turkey, especially İzmir, Aydin and Mugla. In the end of the 19th century, many Ottoman Africans were freed as a result of the democratization pressure of Western European powers on Ottoman policies. The descendants of Ottoman Africans, called Afro-Turks today, continue to live in their villages that were founded in the 19th century. This paper aims to investigate the material culture of the Ottoman Africans and their archaeological contexts. The settlement distribution of Ottoman African sites and its reflection on social and cultural phenomena in the regions, where they were settled, mostly in Western Anatolia, will also be discussed. Furthermore, Western Anatolian Ottoman Africans, who ought to be identified as forced labourers in the 19th century will be compared with black Eunuchs in the Ottoman Palace and with black Muslim Cretans, who moved to Anatolia after the population exchange between Greece and Turkey in 1923.

04 DISCARDED IN THE DUMP: SLAVES' BURIALS IN VALLE DA GAFARIA, LAGOS (PORTUGAL; 15TH – 17TH CENTURIES)

Author(s): Ferreira, Maria Teresa - Coelho, Catarina - Rufino, Ana - Navega, David - Coelho, João - Cunha, Eugénia (University of Coimbra) - Almeida, Miguel (Dryas Octopetala) - Wasterlain, Sofia (University of Coimbra)

Presentation Format: Oral

Portuguese maritime expansion began in the first half of the 15th century, and Prince D. Henrique (Henry, the Navigator) was its driving force. During his life (1394-1460), it was at Lagos' port (south-west Portugal) that the ships from Africa stopped, loaded with their goods, which included slaves of sub-Saharan origin. Although historical sources are rich, until recently they were the only source of knowledge about the North Atlantic slave trade.

With the emergency archaeological excavation carried out in 2009 in Valle de Gafaria, located outside the medieval walls of Lagos, a new source of knowledge has been brought to light. The skeletal remains of 158 individuals (56 females, 24 males, 27 adults with unknown sex; 49 non-adults; and two individuals of unknown age) were exhumed from an urban dump used between the 15th and 17th centuries. Besides the archaeological and historical contexts, the anthropological analyses (morphometry of the skull, genetic analysis, presence of dental modifications) revealed that these individuals had a sub-Saharan African origin. The conditions of burial (in a dump), the fact that five individuals showed evidences of being tied up, the positions of the bodies (disrespecting the canonical burial traditions), are a strong indication of their low social status.

With this communication, we intend to present a summary of the most important results obtained so far.

05 FORTUNATE NO MORE. ARCHAEOLOGICAL AND BIOANTHROPOLOGICAL EVIDENCE OF SLAVERY FROM THE SITE OF FINCA CLAVIJO (CANARY ISLANDS, SPAIN)

Author(s): Santana, Jonathan (Durham University) - Fregel, Rosa (Department of Genetics, University of La Laguna) - Lightfoot, Emma (Department of Archaeology, Cambridge University) - Alamón, Martha - Moreno, Marco (Tibicena, Arqueología y Patrimonio) - Guillén, José (Cabildo de Gran Canaria) - Morales, Jacob (Department of Historical Sciences, University of Las Palmas de Gran Canaria) - Pino, Miguel (Department of Archaeology, Sheffield University) - Kacki, Sacha (Department of Archaeologt, Durham University) - Rodríguez, Amelia (Department of Historical Sciences, University of Las Palmas de Gran Canaria)

Presentation Format: Oral

The presence of enslaved population in the Canary Islands is attested since the end of 15th century AD, where these people -chiefly African in origin-, were employed as workforce in the lucrative industry of sugar production. Unfortunately, their presence in the written sources is rather limited, and most of their daily life remains unknown. In order to tackle this situation, this paper presents the data available from the site of Finca Clavijo (Gran Canaria Island), a multi-ethnic cemetery dated back between the 15th and 17th centuries AD.

According to our results, genetic data show that the people buried at Finca Clavijo had North–African and sub-Saharan African lineages, including an indigenous descendent individual. In addition, isotopic data suggest that some individuals were born outside Gran Canaria. Skeletal markers of physical activity and pathological changes on bones suggest that those individuals displayed high efforts and infectious diseases, supplying direct evidence of their living conditions. Nevertheless, the occurrence of non-Christian funerary practices, along with African material culture, attests certain control of their cultural practices. We discuss this set of evidence in order to explore the construction of new identities in the emergence of the colonial society in the Canaries during the 16th century AD, a multi-cultural and multi-ethnic community.

06 THE ARCHAEOLOGIST ADRIFT: PSYCHOGEOGRAPHIES OF UNFREE LABOR IN THE ATLANTIC WORLD

Author(s): Gomes Coelho, Rui (Cultural Heritage and Preservation Studies, Rutgers University)

Presentation Format: Oral

Slavery is the mode of production that allowed the formation of the modern world-system, and an institution that has been constitutive of modernity. To persevere and be legitimized in the eyes of an increasingly liberal Western society, slavery gradually became a holistic institution that started to parallel other institutions that sought to create self-disciplined bodies in the modern society, such as the factory (industrialized labor), the prison (the enslavement of workers), and the school (ideological production of subjects). In this sense, the progressive abolition of slavery in most of the Atlantic world was a step that marked the emergence of a new group of individuals nominally free but bounded to work and subjected to the discipline of modernity. The experience of factory workers, landless peasants or forced laborers collapsed into a new form of subjectivity, often racialized and flattened by the former institution of slavery. I argue that the transition between different forms of subjection in liberal modernity is materialized in landscapes that perpetuate the transition. The architectures of masters' houses and the pathways that led slaves to the fields are still out there, enforcing the psychogeography of a perpetual transition. Drawing from International Situationist discussions on the material constraints of modernity, I will show how archaeology has the power to navigate the landscapes of unfree labor and make sense of its legacies in the contemporary. I will focus on my own experience as an archaeologist who was born in a family of landless peasants of Alentejo, Portugal, then went on to study slavery in the Paraíba Valley of Rio de Janeiro, Brazil and journeyed back to confront the unfinished emancipation.

721 CONNECTIONS AND CONCURRENCIES: THE GLOBAL TURN IN HISTORICAL ARCHAEOLOGY AND FUTURE CHALLENGES IN EUROPEAN HISTORICAL ARCHAEOLOGY

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Nordin, Jonas (The Swedish History Museum) - Horning, Audrey (Queens University, Belfast)
Format: Session with keynote presentation and discussion

The last two decades have seen a rapid growth in global perspectives in historical archaeology. The early modern emergence of the entwined forces of capitalism, colonialism and modernity are increasingly understood as global currents capable of interrogation from a wider range of comparative geographical standpoints, such as The Atlantic or The Arctic. However, global history and global archaeology can be critiqued as too general and too overarching, downplaying and overlooking the peculiarities and divergences of local perspectives, contexts and experiences. Eurocentrism is another concern. Global perspectives have tended to focus more upon European imprints in the world, instead of upon global impressions in Europe or multidirectional flows of influence. Addressing this critique is a rise in multi-sited archaeology and parallel studies, alongside a growing interest in concurrency as regards development and change in different geographical regions and across continents.

With this session we seek to gather scholars working with comparative, global perspectives in historical archaeology, from the medieval to the early modern periods. We specifically seek to discuss connections and relations between different localities, currents and experiences of the rise of globalization in local as well as global perspectives. Ultimately, we wish to explore and identify future directions for global historical archaeologies that clearly situate yet de-centre Europe in examining wider processes and expressions of transformation and globalization.

ABSTRACTS

01 EUROPE'S HOLY WARS: COMPARATIVE ARCHAEOLOGIES OF CRUSADING AND CULTURAL TRANSFORMATION

Author(s): Pluskowski, Aleks (Department of Archaeology, University of Reading)
Presentation Format: Oral

The 'Pluralist School' of crusader history established by Jonathan Riley-Smith expanded the recognition of crusading from its traditional focus in the Latin East to other regions of Europe and beyond. Today, most historians view the crusading movement as a connective and integral cultural element within medieval European Catholic society. Some, including Robert Bartlett and Nils Blomkvist, have also viewed it as an important driver for the process of 'Europeanisation' – the expansion of Christendom at the frontiers of Europe. The territorial extensions of Christian states in both northern and southern Europe were often associated with the ideology of holy war, whether crusading officially sanctioned by the papacy or unofficially inspired by crusading. Crusading is also associated, both directly and indirectly, with the rise of supra-regional trading networks: the Hanse in the north and the maritime Italian republics in the south. Archaeologists working with these frontier societies have developed an increasingly visible body of data, although in contrast to historians their research largely remains regionally atomised and isolated from the broader historiographic framework of the crusading movement. This paper will take stock of the common archaeological themes that have emerged from the study of the various regions affected by crusading, particularly regime change, colonisation, social and religious re-organisation and trade. It will consider the military orders as truly international crusading institutions that archaeologists continue to study from a regionalised perspective. At the same time, the regional characteristics of long-term inter-cultural dynamics resulted in important differences. If we accept the premise of 'Europeanisation' as a type of globalisation – the imposition of a new 'world system' – the comparative study of regions targeted by crusading, an ideological framework that transcended political borders, should facilitate its problematisation and perhaps lead to a more de-centralised perspective of the historical origins of modern Europe.

02 DECOLONIZING THE COLONIZED: NEXUS1492 - NEW WORLD ENCOUNTERS IN A GLOBALIZING WORLD

Author(s): Hofman, Corinne - Antczak, Andrzej (Faculty of Archaeology, Leiden University)
Presentation Format: Oral

The European conquest of the Americas represents a landmark in global history. The indigenous Caribbean, the first area that was impacted by the Spanish in 1492, was suddenly and dramatically transformed. The Indigenous peoples were put to work in the goldmines and farms of Hispaniola, Cuba, and Puerto Rico or in the pearl fisheries in Cubagua, and the encomienda system further generated an intensive exploitation that disarticulated the indigenous societies and transformed their sociocultural practices. The indigenous voice, however, has remained marginalised in colonial and post-colonial historiographies and in traditional narratives of colonisation. The influence of a forced African diaspora, and the concomitant Amerindian-African-European inter-cultural dynamics at play, changed the indigenous Caribbean islandscape forever. The impact of the initial acts of colonialism and the role played by the Amerindian populations in the colonial process are often overlooked and to this day remain a neglected chapter in global history. The NEXUS1492 project funded by the European Research Council is a trans-disciplinary research programme that inquires multiple temporal and spatial scales of indigenous histories and legacies. Through discourse and practice drawn from an archaeological perspective we are aiming at bridging the divide between prehistoric and historic archaeology across a continuum from pre-colonial to colonial times.

03 BRIGHT LIGHT AND INCLUSION: CARIBBEAN INFLUENCES IN THE DEPICTION AND CREATION OF CULTURAL LANDSCAPES

Author(s): Armstrong, Douglas (Syracuse University)
Presentation Format: Oral

An examination of the influence of art, plants, and people of the Caribbean in the cultural landscape of Europe. The paper will center on the influence of St. Thomas born artist Camille Pissarro, his use of bright colors and light and his centering of common people in the impressionist landscapes that he depicted in the Virgin Islands and Europe. Around this theme I will explore an array of material and asthetic influences from the Caribbean on Europe by looking at intersections of art, plants, food, and people that derive from a variety of Caribbean contexts. Camille Pissarro was born on St. Thomas, Virgin Islands to mixed race parents he drew the people and landscape of the islands with a sensitivity to light and shadow and positioned active, working, people of color centrally in his paintings. His perspectives on the cultural landscape of the Caribbean widely influenced trends in impressionist art. His impact will be used as a medium to discuss an array of social and material influences from the Caribbean on Europe. The presentation will explore the theme of connections and concurrencies and complexities of colonialism by looking at the impacts of materials, things, and ideas from the Caribbean to illuminate ways in which the colonies impacted the colonizers.

04 WHAT IS THE IMPACT OF GLOBAL CHANGE ON THE NATURE OF HISTORICAL ARCHAEOLOGY IN POLAND?

Author(s): Duma, Pawel (Institute of Archaeology University of Wroclaw)
Presentation Format: Oral

The last twenty years have been a period of major change in historical archaeology in Poland. This is due both to external factors (for example, the marked progress of historical archaeology worldwide) and developments at home eg, accelerated economic development, change of perspective and sensitivity of archaeologists. For many decades, archaeology in Poland was developing separated from the main theoretical currents, within the culture-historical paradigm, and this affected the very nature of historical archaeology. The main difference in comparison to the situation worldwide is that some issues were not studied at all, often due to a lack of awareness caused by a shortage of research literature, contacts or financing. Until recently, the study of historical periods was dominated by the investigation of urban centres, town and country seats, fortified structures or religious edifices, often according to research programmes drafted by architecture historians. On the other hand, the study of the more recent period focused mostly on armed conflicts (mostly World War II), undeniably, in response to the proliferating metal dectorist movement. At the same time, despite these changes, many research problems are still neglected by Polish archaeologists (for example, the process of industrialization, or the study of groups underrepresented in the historical record: peasants, for one). Another problem not addressed in the Polish archaeology is colonialism; while Poland was never an active player in this process, it was part of the global trade network and pursued its own, internal colonization policy in its eastern regions. In recent years a few universities in Poland have added historical archaeology courses to their curriculum introducing students to the advanced made by this field of study worldwide, along with problems not addressed in the Polish research literature. This is the first step in giving a broader perspective to local studies in the near future.

05 REFLECTING FUTURES: EMPLOYING GLAZED COARSE EARTHENWARE TO EXPLORE THE CONFLICT BETWEEN IDENTITY AND CULTURAL CHANGE IN POST-MEDIEVAL ULSTER

Author(s): Carver, Naomi (Queen's University Belfast)
Presentation Format: Oral

The themes of colonialism and capitalism are inherent to the study of historical archaeology, as the period after 1500 is characterised by the expansion of the Atlantic world on a socioeconomic level. Seventeenth-century Ireland was at the centre of this process, undergoing rapid changes through the imposition of plantation-settlements informed by the same ideologies underpinning New World colonisation. Plantation-era Ireland witnessed a convergence of societies, creating complex identities which were reflected in contemporary material culture. Historical archaeology in Ireland is continuing to engage with the island's rich material culture, developing more critical methods of analysis and applying improved theoretical approaches and ideas. Material culture can show patterns of incorporation and rejection of new ideas and practices, or it can indicate where native transitions have ceased abruptly. This paper, which is based on current PhD research, will employ a multi-scalar approach, beginning with an overview of the evidence for the production and consumption of pottery in post-1500 Ulster. On a global level, it will seek concurrencies with local pottery traditions in colonial settings. The paper will explore the available data and use it to address wider questions on the conflict between identity and cultural change and investigate how the answers may be employed to understand relevant modern situations, for example, the enduring legacy reflected in the fractured society of post-conflict Northern Ireland.

06 COMPARATIVE ARCHAEOLOGIES OF COLONIALISM IN THE EARLY MODERN ATLANTIC: DISSONANCE AND CONCORDANCE

Author(s): Horning, Audrey (Queen's University Belfast; College of William & Mary)
Presentation Format: Oral

This contribution to the broader discussion session will focus upon the comparative archaeology of cultural encounters in the North Atlantic with a particular eye towards the ongoing legacies of early modern colonialism in North America and in Europe. Transdisciplinary and transatlantic discourse can significantly enhance and complicate regional and national archaeological interpretation of entangled histories by acknowledging that flows of ideas, peoples, and objects knit worlds together. Taking such a transatlantic perspective necessitates a consideration of communities of practice and the diverse histories and trajectories of American historical archaeology and European post-medieval archaeology. Traditionally, historical archaeology prioritized research into the character and processes of European expansion as materialized in colonial settlements, seldom taking into account the complexities of European geopolitics and cultural transformations, and often downplaying or oversimplifying the roles played by indigenous peoples. Unsurprisingly, the Columbian encounter was seen as initiating a major reorientation of global history; inaugurating modernity and precipitating the seemingly inexorable decline of indigenous societies. By contrast, post-medieval archaeology tended to focus upon historical continuities as well as the material expressions of modernity within Europe and upon its subsequent impacts and extension, rather than seeking evidence for the external influences upon European cultures wrought via global encounters. In recent years, the imprint of indigenous America upon both colonial and European societies has been increasingly recognized, decentring hegemonic European narratives. Greater attention to the incomplete nature of many colonial efforts has allowed for a reconsideration of multi-scalar indigenous cultural dynamism. Applying a global perspective to early modern encounters does not inevitably result in overlooking or downplaying local and individual contexts and circumstances. Rather, by following LaTour's metaphor of the railroad, it is possible to understand all zones of encounter as concomitantly very local and very global.

07 HUGE OCEANS, SMALL COMPARISONS: DANISH ENCLAVES IN THE INDIAN AND ATLANTIC OCEANS

Author(s): Hauser, Mark (Northwestern University)
Presentation Format: Oral

Where did the plantation begin? It is received wisdom that this socio-ecological form developed in a long circuitous route beginning in the Mediterranean, Brazil and then the Caribbean (Mintz 1985). Accordingly, only after its materialization in the Atlantic World did it migrate to the Indian Ocean (Manjapra 2016; Reddock 1985). Scholarship tracing the changing form of the plantation as it migrates through space and time reveals it to be a particular useful way to understand how different colonial regimes re-shaped socio-ecological arrangements in diverse geo-political settings. Danish colonial settlements, as territorially limited enclaves engaged in agriculture and commerce in both oceans provide an important lens to document the emergence of shared and novel spatial and material that relate to land use, social roles and commerce. I propose to examine how Danish colonialism adopted plantation landscapes in different parts of the world. I ask the question, how did long-term histories of trade and land use form unique landscapes that structured social roles, economic relations, and their materialities of their expression? I utilize my expertise in Caribbean landscapes and plantation archaeology, including the Danish West Indies, as a lens through which to examine changes in the landscape surrounding the Danish commercial center, Tranquebar (Tharangambadi), in Nagapattinam District, Tamil Nadu. I will look closely at transformations in the landscape by mapping changes and continuities in material and spatial practices, specifically those related to social roles, land use, and economic orientations.

08 COLONIAL HIERARCHIES AND LOCAL PRAXIS: THE CONSTRUCTION OF ETHNIC HIERARCHIES IN FENNOSCANDIVA

Author(s): Nordin, Jonas (Swedish National Historicla Museum)
Presentation Format: Oral

Colonial hierarchies and local praxis: the construction of ethnic hierarchies in northern Europe.

This paper deals with the presence of Sámi and Inuits in central southern Fennoscandinavia in the seventeenth century. The Nordic countries have generally been perceived to be ethnically homogeneous, with the colonial subjects not being present in the center of these empires. For example, Sámi as well as Inuits were perceived as living at places at great distance from the core of the empires. Drawing on the experience of the role and presence of indigenous people from the Americas and the Arctic in England and Continental Europe in the seventeenth century, this paper examines the multi-ethnic aspects of early modern Copenhagen and Stockholm, as imperial centers.

With the aid of material and historic evidence this presentation demonstrates how ethnically diverse the Nordic countries were during the early modern period and how that was a situation both created and counteracted by the ruling elite. This created a difficult situation for the Inuits and the Sámi who by a plethora of reasons had ended up living and working the southern Fennscandinavia. Modernist ideologies saw to a growing ethnic separation and from a diverse situation during the late medieval and early modern periods the Nordic countries developed, in tandem with the rest of Europe, into an ethnically more separated region during the high modern period.

09 CONNECTIONS AND CONCURRENCIES: EARLY MODERN EUROPE AND NORTH ATLANTIC AMERICAN COLONIES

Author(s): De Cunzo, Lu Ann (University of Delaware)
Presentation Format: Oral

Session Organisers present a challenge that requires re-visioning historical archaeological research in the contemporary world. My approach has been inspired by work in a contested borderland in the middle of the North American Atlantic colonies, in particular the site of a Dutch fort in the lower Delaware Valley. It involves tracing the movements, encounters, contests, and exchanges of individuals, populations, materials, goods, ideas and knowledge to and from this place, and is thus multisited, multiscalar, and multivocal. Native Lenape, immigrant Iroquois, and European military, traders, and settlers moved in and out, around, and through this place during twenty years of Dutch, Swedish, and English imperial contests for hegemony in the region, between 1650 and 1670. A focus is on the processes and outcomes of the shifting and deepening entanglements of this place and people with Atlantic coast native populations, contemporary colonies to the north and south, the Netherlands, England, Sweden, and western Africa. Each locus is examined in relation to others connected and from the perspectives of its diverse actors. For this paper, connections among the colonial American fort, the Gothenburg port serving the New Sweden colony, and Amsterdam are highlighted. Transcending and transgressing national boundaries presents special challenges, as do coordination of independent and collaborative projects.

10 CONSUMERISM AND COMMODITY PRODUCTION

The Long Arc Connecting Past and Future
Author(s): Mrozowski, Stephen (Fiske Center for Archaeological Research)
Presentation Format: Oral

This paper argues that consumerism and large-scale commodity production are part of a long arc that connects pasts with futures that present global challenges. Focusing first on the growth of cosmopolitan consumerism this paper seeks to link the nascent stages of mercantile capitalism to a variety of technologies and practices developed to meet the demands of an expanding market for household and personal goods. Driven in part by colonialism and urbanization the subsequent growth of factory-based industry in the middle of the 18th century stands as a major contributor to climate change that now imperils the planet. Rather than use archaeology to solely document the causes of climate change or reactions to it in the deep past, this paper argues that Historical Archaeology should focus on how material culture helped to mask the connection between cultural practices and their biological implications whether they involve personal health, the spread of disease, or large-scale environmental deterioration. Using a combination of examples drawn from material culture studies and environmental archaeology this paper seeks to argue for an archaeology of the future that raises questions about the link between climate change and issues of universal employment if large-scale commodity production is no longer sustainable.

723 CREATING REPRODUCIBLE RESEARCH. NEW DEVELOPMENTS IN COMPUTATIONAL AND QUANTITATIVE METHODS

Theme: Theories and methods in archaeological sciences
Organisers: Grunert, Nicole (Christian-Albrechts-Universität Kiel; Graduate School Human Development in Landscapes; ISAAKiel https://isaakiel.github.io/) - Filet, Clara (Université Paris 1 Panthénon-Sorbonne; ISAAKiel https://isaakiel.github.io/) - Tietze, Carolin (Christian-Albrechts-Universität zu Kiel; ISAA Kiel)
Format: Regular session

Buzzwords like Big Data and modelling, derived from the so-called 'third science revolution in archaeology', currently transform the theory and practice of archaeological research into something more abstract and subjective to the researcher. However, the mere presence of a large amount of data and the collection alone is not a scientific result, whereas digital data and methods are one answer to the question of how transparency can be achieved. This is the point at which quantitative methods come into play. Research environments such as R, Python and other structured open source evaluation methods offer the possibility to recreate processes by documentation to enable Reproducible Research and Open Science. Our session is intended to provide a forum for contributions dealing with methods for managing the increasing flood of data and their transparent transfer into an archaeological interpretation. We would like to encourage potential presenters to demonstrate their individual case studies, methodological approaches and especially Reproducible Research and its application all across the different archaeologies and its many adjacent disciplines. The talk should also reflect on the difficulties their approach presents while using the tools of the 'Third Science Revolution'. Presentations concerning practical solutions such as software are particularly welcome - whether they are finished products, beta stages or conceptual designs.

01 COMPUTATIONAL APPROACHES TO DIVERSE, COMPLEX AND LARGE ARCHAEOLOGICAL DATASETS: THE EXPERIENCE OF THE CDAL AT CAMBRIDGE

Author(s): Orengo, Hector (McDonald Institute for Archaeological Research, University of Cambridge) - Crema, Enrico R. (Department of Archaeology, University of Cambridge) - Wilkinson, Toby C. (McDonald Institute for Archaeological Research and Churchill College, University of Cambridge) - Petrie, Cameron A. (Department of Archaeology, University of Cambridge) - Leppard, Thomas P. - Gjesfjeld, Eric - Garcia, Arnau (McDonald Institute for Archaeological Research, University of Cambridge) - Kryzanska, Marta (Department of Archaeology, University of Cambridge) - Conesa, Francesc C. (McDonald Institute for Archaeological Research, University of Cambridge)
Presentation Format: Oral

The Computational and Digital Archaeology Lab (CDAL), at the McDonald Institute for Archaeological Research of the University of Cambridge is a new research laboratory specialised in the archaeological application of computational and digital methods, including GIS, agent-based simulation, network analysis, spatial statistics, remote-sensing, machine learning, digital recording methods such as photogrammetry or LiDAR, complex text data mining and digital support for fieldwork tasks. Current research examples include the detection of archaeological sites in large areas of South Asia, the high-resolution modelling of ancient transcontinental routes and the computer simulation of cultural transmission of pottery decorative styles.

In this paper we will briefly describe current CDAL projects involving complex, multi-temporal and large datasets and present the conceptual and methodological approaches adopted to deal with these such as the use of high-performance computing including parallel computing, cloud computing and virtual machines and the development of algorithms and their derived code.

The paper will present current workflows from project design and execution to dissemination, which includes not just open access publication but open code procedures. Problems derived from the use of diverse coding languages (and software), research design and interests for the co-development, integration, comparison and sharing of procedures will be highlighted and discussed.

02 NAVIGATING A NEW DIGITAL INTERFACE: USING AUTOMATED IMAGE RECOGNITION TO IDENTIFY POTTERY IN THE ARCHAIDE PROJECT

Author(s): Gattiglia, Gabriele - Anichini, Francesca (University of Pisa) - Wright, Holly (Uiversity of York)
Presentation Format: Oral

Archaeological Automatic Interpretation and Documentation of cEramic (ArchAIDE) is a H2020 funded project (2016-2019) developing digital tools to support archaeologists in recognising and classifying pottery. ArchAIDE is not designed to replace the knowledge of pottery specialists, but seeks to complement by speeding time consuming tasks, provide support for non-specialists, help students learn more about pottery recognition, and aid in the collection of metadata needed to describe the pottery. ArchAIDE is developing a tablet-based mobile app which relies upon image recognition and uses deep learning to narrow and suggest possible matches. While ArchAIDE has been careful to design a tool that allows classification decisions to be made by users at key points in the recording workflow, the app uses digital tools and methods for a significant tasks that were previously carried out using analogue methods. This paper will explore how users are engaging differently with the archaeology when using a digital workflow for identifying, classifying and recording pottery, as observed by the ArchAIDE project partners in early testing. This will include issues around using digitised comparative collections rather than paper catalogues, using the app to identify pottery while still in the field-rather than during post-excavation, how users might 'see' pottery differently through a digital rather than analogue analysis, and whether pottery identification using a digital interface changes knowledge transmission and learning processes. While the purpose of the ArchAIDE project is to make pottery identification faster and easier, this paper will pause to reflect and critically engage with moving to a digital workflow, and how this may influence how archaeological knowledge is produced and understood.

03 THE DEVELOPMENT OF A TYPOLOGY FOR MAJOLICA FROM BARCELONA AND VALÈNCIA BETWEEN 13TH AND 18TH CENTURIES. A COMPOSITIONAL EDMA APPROACH

Author(s): Buxeda i Garrigós, Jaume - Miguel Gascón, Eva - Pinto Monte, Mireia - Madrid i Fernández, Marisol - Peix Visiedo, Judith (ARQUB-GRACPE, Universitat de Barcelona)
Presentation Format: Oral

To present, the classification of ceramics is largely carried out by heuristic methods based on someone's expertise and the use of analogue catalogues held in archives and libraries. These archives have the classifications currently encoded in drawings and written descriptions. However, in the case of Majolica products there does not exist a general accepted catalogue of types. Traditionally, its classification is based on art history criteria mainly related to decoration.

Within the frame of ArchAIDE research project (Archaeological Automatic Interpretation and Documentation of cEramics, European Comission H2020-693548) we are developing a new typology for majolica, focussed on Barcelona and Valencia area products. The aim is to obtain a digitization that can successfully identify them. Thus, in order for ArchAIDE system to be able to deal with majolica the transformation of the paper and digital publications in a digital description is needed. It requires digitize one by one the drawings of each pottery coming from well-defined archaeological context to be introduced in a geometric 2D description of each ceramic class in the database. To determine these classes is necessary standardize the drawings at the same scale and try to observe

similarities and differences in order to define the possible types. This study will use the Compositional EDMA (Euclidean Distance Matrix Analysis) geometric morphometric method to approach the form and/or shape of ceramics, capturing their geometry. This coordinate-free landmark method enables the study of form avoiding the nuisance parameters of translation and rotation, and the study of shape regardless of size. Thus, this paper tackles one of main subjects in archaeological studies, the establishment of typologies, which is approached by the application of an statistical coordinate-free landmark geometric morphometric based on several in-house R routines that will be presented.

04 TAMING TIME - MODELLING UNCERTAINTY AS REPRODUCIBLE LINKED OPEN DATA

Author(s): Thiery, Florian - Mees, Allard (Römisch-Germanisches Zentralmuseum Mainz)
Presentation Format: Oral

It is a stroke of luck that the RGZM (Römisch-Germanisches Zentralmuseum Mainz) hosts already since the mid-1990s several online available databases containing millions of datasets, with content from many different archaeological disciplines. These databases where constructed in interdisciplinary transnational projects and include a lot of "hidden archaeological assumptions" in their relational data models. Especially short cutted relative chronological information and its dependencies are not modelled using transparent methods. The aim of our project is to make these hidden assumptions in archaeology visible and provide them as Linked Open Data to establish reproducible research as a fundament for Open Science.

In particular the Samian Research database at the RGZM offers nearly 250'000 identified potter stamps, which are traditionally dated in a short cutted way. In Roman archaeology this is usually expressed by establishing "absolute dates" in well known "from-to" tables, whereas in reality, the situation is much more diffuse. In fact, Limes fortress dating is often done based on circular arguments. Samian stamps, for example, are being dated by sites, which on their own are again being dated by Samian.

This paper focuses on modelling these circular dating arguments using a relative chronology based on Allen's interval algebra for temporal reasoning in the Academic Meta Tool (AMT) to create Linked Open Data for reproducible and transparent research. AMT allows us to create a fitting ontology and visualise the reasoning results in a web app for detecting errors and circular reasoning. As an example, we will take a deeper look into the relative chronological relationships of the Limes fortresses.

05 RCARBON : AN R PACKAGE FOR CREATING AND TESTING SUMMED PROBABILITY OF RADIOCARBON DATES

Author(s): Crema, Enrico (University of Cambridge) - Bevan, Andrew (UCL)
Presentation Format: Oral

Summed probability distribution of radiocarbon dates (SPDRD) is quickly becoming a standard tool in archaeology. While its core assumption (more people -> more objects -> more dates) is not immune to problems, the possibility to benefit from the growing number of large collections of radiocarbon dates and the opportunity to generate time-series within an absolute chronological framework has re-ignited a strong interest in prehistoric demography. In particular, the possibility to formally assess temporal correlations with climatic time-series or to compare inferred demographic trajectories across different regions makes this technique particularly appealing. Early applications of this method have been primarily centred on qualitative and visual assessments of summed probability distributions, which fail to take into account the presence of spurious signals generated by sampling error and the idiosyncrasies of calibration curves. More recently, a suite of statistical techniques that takes into account these factors have been developed, enabling the formal testing of observed SPDRDs against a wide range of null models. Examples include Monte-Carlo simulation-based tests for population growth models (e.g. exponential, logistic, etc.), permutation tests for comparing two or more different SPDRDs, and spatio-temporal hot/cold spot analysis. This paper will briefly review these and other techniques and introduce rcarbon, an open source R package which includes a variety of functions for the creation, analysis, and visualisation of SPDRDs.

06 USING R TO TRACE CHANGES WITHIN THE NECROPOLEIS OF THE ROMAN PROVINCES. TWO CASE STUDIES

Author(s): Tietze, Carolin (ISAAKiel; CAU Kiel)
Presentation Format: Oral

As archaeologists we are always trying to find the point of origin for changes within past societies. It could be as inconsequential as a small object of foreign form and material or as comprehensive as the change of a whole tradition, influencing further generations of a society. This kind of change can for example be seen within the necropoleis of the Roman provinces or any society which borders on its outskirts. Traditions like placement, orientation, decoration and inscription of the funerary monuments suddenly change their characteristics or even transform into something entirely different after just one initial or even consequent contact. Such shifts within the Roman provinces have been traditionally examined from the 'Roman' scientists point of view, expecting the indigenous traditions to be absorbed or overwritten by this new culture. This kind of research perspective focuses on a single-minded theoretical approach and not on the actual findings.

Using environments like R and GIS to analyze the given data from a much more neutral position can help to detect the actual process of change a society like Palmyra and Hatra encounter, while also providing an entry point into the workings of Reproducible Research. These two cities have been in the grasp of the Roman Empire but have not been entirely integrated, therefore an analysis of their

remains should provide a better understanding to which degree the contact with a foreign society can change indigenous traditions and their society.

07 CREATING REPRODUCIBLE SUM CALIBRATIONS FOR ARCHAEOLOGICAL DEMOGRAPHIC ASSESSMENTS. THE R PACKAGE 'OXCAAR'

Author(s): Grunert, Nicole (Graduate School Human Development in Landscapes; ISAAKiel; CAU Kiel) - Hinz, Martin - Schmid, Clemens (CAU Kiel; ISAAKiel)

Presentation Format: Oral

The use of sum-calibrated 14C data as a demographic indicator is a controversial field of archaeological methodology. It requires the largest possible number of source data, which in themselves only have a weak coupling to the phenomenon of investigation (population) and are influenced by a wide range of different biases. This makes it particularly important to disclose the data basis as well as the methodology of data processing: A high degree of transparency can serve (not only) in this case to establish a basis of trust from the very beginning. This is all the more relevant as Monte Carlo simulations already have established themselves as a gold standard for assessing the robustness of population size extrapolations.

We (the working group ISAAKiel) have developed the R package oxcAAR to facilitate accessibility to the methodology, the standardisation of the procedure and thus the comparability of various studies. It is designed to obtain sum calibrations from within the statistical framework R (which is excellently applicable for reproducible research and Monte Carlo simulation) by means of a generally accepted calibration standard (OxCal), which serves as a basis for the reconstruction of demographic developments. We would like to take this opportunity to familiarize the listeners with the underlying issues and the solutions our workflow provides. This will be done with the help of another R package developed by us: c14bazAAR, a database crawler for 14C data. In the lecture, we will go through our workflow in an exemplary manner and also discuss the general pitfalls involved in sum calibration and how to avoid them.

a. DEEP LEARNING SOFTWARE FOR THE CLASSIFICATION AND CLUSTERING OF MUSEUM COLLECTIONS

Author(s): Roberts, Matthew - Willcocks, Christopher - Leone, Anna - Obara, Boguslaw (Durham University)

Presentation Format: Poster

In the last ten years the use of Convolutional Neural Networks for image recognition has become a popular focus of study. The use of machine learning to automatically classify digital images of objects into specific categories has demonstrated promising results; further, the popularity of this research has resulted in a number of open-source libraries and framework architectures being made available online. As museums, heritage organizations, and auction houses increasingly produce repositories of digital content, an opportunity to expand this branch of data research into the antiquities sector presents itself. Furthermore, the development of automated recognition tools for cultural antiquities has the potential for relevancy beyond just academic research; as conflict zones in the Near East and North Africa produce an outflow of looted artefacts, improved methods and tools to identify objects of illicit provenance are increasingly needed. In this paper, we would focus on:

1) The construction of an image dataset of cultural antiquities (using the digital records of the Durham University Oriental Museum as a case study)

2) The setup and development of a deep learning framework using open source software

3) Methods of visualization and clustering of high dimensional image data

4) Discussion of potential applications to the heritage sector, including way to improve semantic categorization and classification of antiquities, as well as tools for cultural heritage preservation and identification

724 ENGENDERING STRATEGIES FOR THE DISSEMINATION IN ARCHAEOLOGICAL SITES AND MUSEUM

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

Organisers: Risquez Cuenca, Carmen (Instituto Universitario de Arqueología Ibérica. Universidad de Jaén) - Colomer, Laia (Affiliated researcher in Heritage Studies. Linnaeus University) - Soler Mayor, Begoña (Museo de Prehistoria de Valencia) - González Marcén, Paloma (Departamento de Prehistoria. Universidad Autónoma de Barcelona) - Sánchez Romero, Margarita (Departamento Prehistoria y Arqueología. Universidad de Granada)

Format: Regular session

In recent years, museums and archaeological sites have become reference places and spaces of memory in which ideas about different categories of identity are transmitted, although not always with the necessary care in terms to gender and age. This session aims to gather experiences throughout Europe both related to strategies for the visibility of gender and age identities and relationships in museums and archaeological sites, and referred to the way of constructing gender discourses and representations in museum and site interpretation practices. We aim thus to gather papers and researchers interested on critically reflect on the creation of content, and especially, in the application of new

technologies and digital media: websites, apps, or the use of social networks in museums and archaeological sites, from a gender perspective.

ABSTRACTS

01 MUSEUMS, SITES AND FEMINIST ARCHAEOLOGY. AN INTRODUCTION

Author(s): Risquez Cuenca, Carmen (Universidad de Jaén) - González Marcén, Paloma (Departamento de Prehistoria. Universidad Autónoma de Barcelona) - Sánchez Romero, Margarita (Departamento Prehistoria y Arqueología. Universidad de Granada) - Soler Mayor, Begonya (Museo de Prehistoria de Valencia) - Colomer Solsona, Laia (Heritage Studies. Linnaeus University)

Presentation Format: Oral

Feminist archaeology has been characterized since its inception by the desire to influence substantively the conventional representations about the past. However, while it is true that it has consolidated its presence in the international academic debates, its incidence has been lower in the public and non-formal dimension of research. This line of thought and action seems now an urgent endeavour, since in recent years, museums and archaeological sites have become reference places and spaces of memory in which ideas about different categories of identity are transmitted, although not always with the necessary care in terms to gender and age. The increasing globalisation and popularization devices, fed by digital representations and social networks, put even more in the forefront of archaeological practice the reflection about gender and age stereotyping in museums and archaeological sites presentation It is necessary to review experiences throughout Europe both related to strategies for the visibility of gender and age identities and relationships in museums and archaeological sites, and referred to the way of constructing gender discourses and representations in museum and site interpretation practices. But beyond revisions and criticism, time is to create new images for our museums, to think about new museographical discourses and to propose effective and feasible strategies to widen the impact feminist archaeology research on the general public.

In this session we intend not only to advance in all these aspects already mentioned, but also to consolidate networks of collaboration between researchers interested in the public dimension of feminist archaeology and in the proposal of guidelines for the creation of images about women of the past and for the presentation of the archaeological heritage from a feminist perspective.

02 CHILDREN, IMAGES AND ACTIONS. GENDER ROLES IN ARCHAEOLOGICAL EDUCATION ACTIVITIES

Author(s): Gonzalez-Marcen, Paloma (Centre d'Estudis del Patrimoni Arqueològic de la Prehistòria) - Masriera-Esquerra, Clara (Universitat Autònoma de Barcelona) - Cacheda, Maria (Agencia Catalana del Patrimoni Cultural)

Presentation Format: Oral

The communicative power of the images in the field of archaeology increases when the target audience is children. For this sector of the public, the image is a fundamental way of learning, especially in this era in which visual language is the fundamental means of obtaining information. In the context of educational actions related to archaeology that take place in schools and museums, graphic support is essential. However, the majority of materials that are available are designed for a more adult audience, or reproduced as a way to "simplify discourse" gender stereotypes much more marked even than in representations for a general public.

It is also necessary to understand that in formal or informal educational contexts the use of images is associated with manipulative actions, analysis or creative work with this or from these images. In this presentation we propose to analyze the use of images in educational, school and museum contexts and reflect on the implications of the repertoire of images that are available and propose guidelines that incorporate the gender perspective also for this segment of the audience. Special attention will be given, not only to dimensional images, but also to objects and activities that are incorporated in the different activities.

03 THE AGES OF THE IBERIAN WOMEN. AN APPROXIMATION TO THE FEMININE SPACE IN THE IBERIAN SOCIETY

Author(s): Rueda, Carmen - Risquez, Carmen (Instituto Universitario de Investigación en Arqueología Ibérica, Universidad de Jaén) - Herranz, Ana B. (Museo Ibero de Jaén, Junta de Andalucía; Instituto Universitario de Investigación en Arqueología Ibérica. Universidad de Jaén) - García, Antonia (Universidad de Jaén) - Hornos, Francisca (Museo de Jaén, Junta de Andalucía)

Presentation Format: Oral

We present an exhibition experience that has allowed an approach to the feminine social space, through material culture documented in places of worship and in the necropolis of the Upper Guadalquivir. The exhibition The Ages of the Iberian Women propose a new way of looking at the Jaén Museum collections, on this occasion demonstrating that the discourse on archaeological remains is not unique and invariable, but offers great riches and multiple readings. This exhibition articulates a journey through public spheres and religious processes, from which they reveal very relevant aspects of the role of Iberian women in their societies. We approach contexts and spaces in which they are protagonists, contributing to break with the traditionalist ideas that relegate feminine activities to the domestic sphere and to an 'inactive' attitude in social relations. On the contrary the archaeological record demonstrates the participation of women, in their different stages, in the formulas of legitimacy and social cohesion. As such, we build a discourse that favours the communication of our past in a way that is fairer and closer to reality, distanced from the great deeds recorded in the traditional discourses and fostering education in equality.

This exhibition was inaugurated in March 2016 at the Museum of Jaén and currently is travelling for different spaces of Andalucía.

04 GENDAR & PASTWOMEN: DIGITAL TOOLS TO OVERCOME GENDER BIAS IN RESEARCH AND DISSEMINATION OF PREHISTORY

Author(s): Risquez Cuenca, Carmen (Universidad de Jaén) - Herranz, Ana B. (Museo Ibero de Jaén, Junta de Andalucía; Instituto Universitario de Investigación en Arqueología Ibérica, Universidad de Jaén) - Rueda, Carmen (Instituto Universitario de Investigación en Arqueología Ibérica, Universidad de Jaén) - González Marcén, Paloma (Universidad Autónoma de Barcelona) - Soler, Begonya (Museo de Prehistoria de Valencia) - Sánchez, Margarita (Universidad de Granada)

Presentation Format: Oral

GENDAR is a research project funded by the Junta de Andalucia "Resources for Research into the Archaeology of Women and Gender in Spain. HUM-1904", which brings together a group of researchers from different universities, cultural institutions and companies, to research the activities and work of women in different periods and cultures, from the Palaeolithic to the Iberian era, giving continuity to a previous project called "Women's work and language objects" funded by the Instituto de la Mujer - 002/07).

This project is based on an analysis of the material culture examined from a gender perspective and aims to focus attention on the importance of the female agency in the social life of all the periods and cultures, at the same time as eliminating the transmission of markedly sexist values in historical dissemination. An important part of the project is directed at preparing documental and graphic material using advanced technological resources. The objective is to develop informative/educational content without gender bias to be used online and for transfer to interactive media, thus opening up new scenarios for tourism.

We aim to raise awareness of those historically silenced women of our past and their importance in day-to-day economic activities and socialisation, as well as of their role as active agents in the development of the different cultures and historical periods we are analysing. We also look at the way in which the heritage they are part of is interpreted, attempting to move beyond the inequalities reflected in them.

Our proposal is thus orientated to contribute a new way of looking at archaeological heritage, in our case from a gender perspective, thus enriching the discourses established to date.

05 GIVING VISIBILITY TO WOMEN AND CHILDREN IN THE MUSEO MONOGRÁFICO DE PUIG DES MOLINS (IBIZA, BALEARIC ISLANDS)

Author(s): Delgado Hervás, Ana - Rivera Hernández, Aurora (Universitat Pompeu Fabra)

Presentation Format: Oral

Academic studies on the Phoenician and Punic worlds have traditionally been characterised by their markedly androcentric character. In the past few decades, however, several publications inspired by gender archaeology have managed to "give a voice" to traditionally silenced social groups — mostly women, children, and subaltern groups. While these new readings have become well-established in academia, they have not found their way to the general public through museum discourses, where androcentric and elitist accounts still prevail. In this context, the aim of this project is to critically analyse, from a gender perspective, the museum discourse in the exhibits of Ibiza's Museo Monográfico de Puig des Molins (MAEF). After a closure of 17 years, the museum reopened in 2012. It boasts the largest state-wide collection of Phoenician and Punic archaeology, originating mostly from excavations of the large necropolis the museum is named after. Despite its recent reopening, as well as the presence of countless objects and plentiful archaeological information concerning the women and children of Ibiza's Phoenician-Punic communities, the museum's exhibits do not present a discourse that gives them visibility. Such a discourse would put the focus on the active role that women and children played within their groups and communities. Through a critical analysis of the permanent exhibition and the dramatized visits undertaken in the necropolis, the paper formulates a series of proposals that would create a more inclusive, equitable discourse — a discourse that gives visibility to the experiences and emotions of the women and children of Punic Ibiza, thus empowering them.

06 MNEMEA. AN E-LEARNING TOOL FOR DISSEMINATION OF WOMEN´S HISTORY

Author(s): Sanchez Romero, Margarita (Uni Granada Dpto de Prehistoria y Arqueologi) - Alarcón García, Eva - Milesi García, Lara - Lozano Medina, Agueda (Universidad de Granada) - García Luque, Antonia (Universidad de Jaén) - Aranda Jiménez, Gonzalo (Universidad de Granada)

Presentation Format: Oral

MNEMEA expose how History and Archaeology all too often have hidden women´s experiences, identities and knowledges, when building discourses related to identity, erasing them from collective memory. As scientific discourses have not considered women, dissemination strategies have not contemplated to include them in their narratives, and women are absences in museums, archaeological sites, guides, leaflets not only in texts but also in visual representations.

MNEMEA pretend to offer new and innovative approach to understand the history of women. Through this E-learning tool it would be possible to explore three archaeological sites: Antequera Dolmens site (Antequera, Málaga), Los Millares (Santa Fe de Mondujar, Almería) and Castellón Alto (Galera, Granada). Throughout the different sections special attention is paid to social groups and activities than have been marginalized in historical explanations.

MNEMEA has Responsive web design (RWD) and, in a very easy and intuitive way, it would be possible to access to photographs, vid-

eos, drawings and text specially generated for this purpose. It could be used for preparing the route to the sites previously or during the visit. Sites from different periods could be easily added. Through this digital tool, we intend to build new strategies through the knowledge of excellence and the dissemination of quality that allow people to understand how women contributed with their stories to our history.

a. THE ARCHAEOLOGICAL EXCAVATION AT THE TIME OF SOCIAL MEDIA:RESEARCH AND STORYTELLING AT BRUNCU 'E S'OMU - VILLA VERDE (SARDINIA- ITALY)

Author(s): Matta, Valentina (Aarhus University) - Cicilloni, Riccardo (Università degli Studi di Cagliari) - Scema, Roberto (Ministero dell'Istruzione) - Cabras, Marco (Universidad de Granada)

Presentation Format: Poster

In the last few years, the use of social media has become essential within communicating cultural heritage, whether archaeological or artistic. Thus, even archeology had to adapt to new methods of communication, especially towards an audience of "layperson". This resulted in a reduced scientific language without the loss of information to create the dialogue with the "modern" public.

This aspect does not only concern the social media aspect: A new relationship between archaeologist and public was born and it makes archaeological sites and museums alive. This new approach focuses on education and entertainment.

In this project we present a series of activities that our excavation team proposed to the citizens of Villa Verde (Sardinia) and the web-public. The MU.NU. Interactive and multimedia museum of the Nuragic civilization and the Nuragic village of Bruncu 'e S'Omu, in the Municipality of Villa Verde (Oristano - Italy), have been the main location.

Different methods (both social media as physical attractions) were tried in order to attract the attention of the public and evaluated to secure the largest reach out. The project presented here is about the experience, the mistakes made and its incompleteness, and how we moved towards the understanding of the different types of public that we met. The first results have shown how effective communication, even at no-cost, involve the public. We could prove that the use of key- interpretations and effective input, allows the public to interpret and approach the archaeological contexts. This experience teaches how even in the social era there is a great need for storytelling and knowledge and how much the archaeologist should be the main actor on this scene.

725 THE EU EIA DIRECTIVES AND ARCHAEOLOGY: WHAT HAVE WE LEARNT AND WHERE NEXT?

Theme: Archaeology and the European Year of Cultural Heritage
Organisers: Hey, Gil (Oxford Archaeology) - Waugh, Karen (Vestigia) - Thomas, Roger (Oxford University)
Format: Regular session

The EU's 'Environmental Impact Assessment' (EIA) Directive is one of the very few pieces of EU legislation that deals with archaeology (because this is treated as part of 'the environment'). The first Directive (issued in 1985) and its successive updates have had a major influence on the development of professional archaeology in Europe. With over thirty years' experience of EIA and archaeology now behind us, it seems timely to review what we have learnt and to think about the future.

Characteristics of the Directive include: implementation through the domestic legal systems of member states; archaeology takes its place alongside other environmental issues; environmental considerations are embedded in the planning and execution of major projects from the start; public consultation on the environmental impacts of projects and on mitigation proposals.

Papers are invited on the experience of undertaking archaeology in an EIA context. We are particularly interested in reflections on how the domestic legal systems and institutional arrangements for archaeological heritage management affect the practice of archaeology within an EIA in different member states; on how the EIA 'translates' once projects begin, especially in relation to the accurate identification of mitigation and amelioration impacts and the preparation of specifications for these post-EIA; the impact of working alongside other environmental professionals and on experiences of working on EIA projects which cross national boundaries, such as pipelines or transport links.

Discussion will also include the need for a broader approach, exploring the strengths and applicability of associated mechanisms, such as Heritage Impact Assessments.

ABSTRACTS

01 AN INTRODUCTION TO THE SESSION ON EU EIA DIRECTIVES AND ARCHAEOLOGY: WHAT HAVE WE LEARNT AND WHERE NEXT?

Author(s): Hey, Gil (Oxford Archaeology) - Waugh, Karen (Vestigia) - Thomas, Roger (Oxford University)

Presentation Format: Oral

This introduction will provide a short overview of the progress of the EAA EIA Community, and it will state the aims of the session. The Directive and its successive updates have had a major influence on the development of professional archaeology in the European

Union, and during the course of this session we will consider how domestic legal systems and institutional arrangements for archaeological heritage management have affected the practice of EIA and archaeology in different states. How does an EIA 'translate' once a project begins, especially in relation to the accurate identification of impacts and the preparation of specifications (post-EIA) on mitigation and amelioration impacts, and what is the impact of working alongside other environmental professionals and, for the same teams, working on EIA projects in different jurisdictions? What is the effect that the EIA approach has had beyond the EU, including on 'ethical' funding mechanisms, and what does this say about its efficacy? With over thirty years' experience of EIA and archaeology now behind us, it seems timely to review what we have learnt and to think about the future.

02 ASSESSING THE IMPACT: WORKING WITH EIA IN THE NETHERLANDS

Author(s): Waugh, Karen - Hessing, Wilfried (Vestigia BV, Archeologie & Cultuurhistorie)

Presentation Format: Oral

In the Netherlands, Cultural Heritage and Archaeology have formed an integral part of EIA assessments for the last 20 years. Throughout this period the approach to both the process and content of these impact assessments have undergone a number of important, and necessary, changes. In the early years there was much unease and resistance, from developers in particular, towards the large amounts of time-consuming and expensive research that were apparently necessary to compare alternative project design options. Today, objective and high-quality archaeological and cultural historical impact assessments are widely accepted as essential instruments within an EIA for large, infrastructural or development projects or as a basis for spatial planning decisions, on land and at sea, Pitfalls and examples of bad practice notwithstanding, this paper will discuss a number of factors that have had a positive effect on the rigour of research and the quality of archaeological and cultural historical results used in EIAs in the Netherlands. Case studies will be used to illustrate how the incorporation of heritage values within the spatial planning system is leading to an increasingly multi-disciplinary approach to data collection. Fast moving innovations, particularly in the integration, interpretation and visualisation of multi-disciplinary data are presenting new opportunities as well as challenges in maintaining the integrity and reliability of collected data and conclusions.

03 THE ROLE OF SERVICE OF ARCHAEOLOGY AND PALEONTOLOGY ABOUT ENVIRONMENTAL IMPACT ASSESSMENT AND URBAN PLANNING IN CATALONIA

Author(s): Miró Alaix, Maria Teresa (Servei d'Arqueologia i Paleontologia, Generalitat de Catalunya)

Presentation Format: Oral

In Catalonia, since 1986, when the government approved the first law about environmental impact, the Service of Archaeology and Paleontology uses the environmental legislation to protect archaeological heritage in order to prevent affectations of sites and to make all the necessary archaeological interventions (prospection, excavation, etc.) to document the sites and increase the knowledge about past.

The current legal framework, with respect to the evaluation of environmental impact of projects, is the one regulated through the Law 21/2013, of December 2013, of environmental evaluation. It gathers in only one legal body the former regulations related to the environmental evaluation of plans and programs and to the environmental evaluation of projects and it has incorporated into the juridical ordering the European Directives.

The Urban Planning is very useful to prevent archaeological heritage. The Service informs several types of urban planning. We check out if the plans of municipal urban ordering including archaeological sites and measures for their protection, especially with the catalogue of cultural heritage. We examine the derivative planning (partial plans, mostly) and we order the preventive actions that are necessaries to know and protect the archaeological heritage, sometimes our rapport force the change of the urbanistic design to preserve the site. We inform, also, about activities in non-developable ground (most of them with relation to evaluation of environmental impact) and forest breakings.

The experience about participation of the Service concerning environmental impact and urban planning, in the last decades, is very positive and it has allowed the realization of centennials of archaeological interventions that provided us a major knowledge of our past and a tool to protect our sites.

04 THIRTY YEARS OF PUTTING EIA MITIGATION INTO PRACTICE: THE PLEASURES AND THE PAIN

Author(s): Hey, Gil (Oxford Archaeology)

Presentation Format: Oral

The EIA Directive has been applied in the UK since 1985, and over the 30 years plus that it has been in effect, very many schemes have been covered by its regulations in both urban and rural environments. It has been positive and productive, but sometimes painful. From the perspective of an archaeological organisation undertaking fieldwork as a result of the mitigation measures specified in EIAs, how effective have EIAs been at identifying cultural heritage and at targeting resources appropriately?

In 2005, Oxford Archaeology undertook a 'Review of Cultural Heritage Coverage in Environmental Impact Assessments' under Planarch 2. Taking this as a base line, to what extent has the situation changed since then? The talk will also explore how much difference EIAs have made to the way that archaeology is undertaken in advance of development; the extent to which it has changed the way we identify sites and excavate landscapes in practice; the extent to which work undertaken under EIAs differs from projects under

standard conditions in planning (is it just a matter of scale, or is there a qualitative difference); and also whether it has changed fieldwork practice. What are the lessons we can apply to future legislative change?

05 THE ISLE OF MAN AND EIA: A QUESTION OF SCALE

Author(s): Johnson, Andrew (Manx National Heritage)
Presentation Format: Oral

The potential impact of development on cultural and natural resources is almost universally recognised, and many planning systems today provide the means to counter this. Across Europe, the EIA Directive offers the opportunity to set consistent standards for the evaluation of impacts, and provides mandatory and advisory lists of the types of projects requiring assessment.

Meanwhile, at national and local levels, statutory and regulatory frameworks provide the detailed controls deemed necessary to undertake the provisions of the Directive: it is at this point that practice takes over from theory.

A clear fundamental of the Directive is that it is designed to deal with large-scale development inherently likely to have large- and wide-scale impacts; and as soon as the types of development are categorised, it becomes yet clearer that they are mostly selected with an eye on the scale of their European impact. What about the smaller jurisdiction, where even a medium-scale development can have significant environmental impact?

The Isle of Man is onesuch jurisdiction, just 580 km² in size, and surrounded to east and west by the United Kingdom and Ireland. Its planning and heritage laws are similar to the UK, but regulation and policy can be significantly divergent, and scale, in many forms, is an issue.

A series of case studies will explore what are sometimes pragmatic approaches to the specification of assessment and the design of mitigation for a number of different types of development, with assets at risk ranging from buried archaeology, ancient monuments and historic buildings (and the settings of both), to landscape impact. Consideration will also be given to the gradual improvement of legislation and regulation, which has sometimes been achieved in spite of political resistance.

06 FINANCIAL INSTITUTIONS AS PARTNERS IN EIA AND HERITAGE MANAGEMENT

Author(s): Fleming, Arlene (The World Bank)
Presentation Format: Oral

Environmental Impact Assessment (EIA) was disseminated throughout the world during the late 20th century requiring attention to effects of development projects on biophysical, social and cultural heritage features. EIA is now mandated by legislation and regulation in virtually all countries, and required by international and bilateral grant making and financing institutions. The World Bank, which lends to governments, and its sister organization, the International Finance Corporation (IFC), a source of financing for private-sector development projects, have required inclusion of cultural heritage in EIA since the mid-1980s. Development banks in Europe and other regions have followed suit, and over 90 commercial banks, under the rubric 'Equator Principles,' voluntarily follow IFC policies for environmental and social impact assessment, including cultural heritage.

Thus, national laws and regulations for EIA operate in tandem with policy requirements of international and regional public and private financial institutions, and in some instances the latter serve to heighten attention and strengthen national action for identification and management of cultural heritage, including archaeological survey, documentation, excavation and management. Several cases illustrating the interplay between financial institutions and national governments are identified and described.

It is important to understand differences between EIA and Heritage Impact Assessment (HIA), favored by some heritage proponents. EIA focuses on the area of a development project's assumed impact. It investigates a given landscape for evidence of human habitation, past and present, resulting in discovery, thus increasing knowledge and understanding of heritage. In contrast, HIA determines the potential impact of development on a known heritage site, and as a separate study, may not be included in a project's management system and budget, a distinct disadvantage.

Now, as never before, it is urgent to identify, document and protect evidence of the world's cultural heritage. In this effort, financial institutions can be valuable partners.

726 FARMING UNDER THE CRESCENT MOON: ARCHAEOLOGICAL INSIGHTS INTO THE MEDIEVAL 'ISLAMIC GREEN REVOLUTION'

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Garcia, Marcos (Department of Medieval History, University of Granada) - Ros, Jérôme (UMR7209, CNRS-MNHN-SU) - Alexander, Michelle (Department of Archaeology, BioArCh, University of York)
Format: Regular session

The impact of the medieval Arab expansion on agriculture was famously coined as a 'revolution' by Watson in 1974, although the use of this term and the nature of the impact are debated. Previous research in this area has targeted specific aspects of this topic, but studies focusing

on agricultural practices themselves remain scarce. Archaeological approaches to understanding medieval agriculture have undergone development over the last decades, due in part to the increasing importance of the role played by techniques such as bioarchaeology (archaeobotany, zooarchaeology, biomolecular analysis) and geoarchaeology. This session aims to bring together researchers who have an interest in the consequences of the medieval Islamic conquests on farming systems in the Middle East, North Africa, Sicily or Iberia from bioarchaeological, geoarchaeological and other related perspectives, in order to discuss the contribution of archaeological data to the understanding of the agrarian regime(s) in the medieval Dar al-Islam. Topics that might be addressed include: the characterisation of diachronic breaks with the agricultural past driven by new farming techniques (e.g. irrigation, lack of integration of crop and animal production) and the introduction of new species or, on the contrary, the evidence of continuities with previous agrarian situations following the Islamic conquest; the integration of different lines of evidence to define the relationship established between the two main agrarian subsectors (i.e. agriculture and animal husbandry); the quantification and measuring of agrarian production and specific farming techniques (irrigation, manuring, etc.); the detection of trends of intensification and/or diversification in agriculture or livestock production.

ABSTRACTS

01 INTRODUCTORY REMARKS: PEASANTS, AGRICULTURE AND THE 'LONG SHADOW' OF WATSON

Author(s): Garcia, Marcos (Department of Medieval History, University of Granada) - Ros, Jérôme (UMR7209, CNRS-MNHN-SU) - Alexander, Michelle (Department of Archaeology, BioArCh, University of York)

Presentation Format: Oral

The impact of the medieval Arab expansion on agricultural practice in the Middle East, Central Asia and the Mediterranean was famously coined as a 'revolution' by Andrew M. Watson (1974, 1983), although the use of this term and the nature of the impact are debated. Previous research in this area has targeted specific aspects of this topic (e.g. spatial organization of the settlements, land parcel structures, irrigation systems), but studies focusing on agricultural practices themselves remain relatively scarce. Archaeological approaches to understanding medieval agriculture have undergone development over the last few decades, providing direct means to investigate the agricultural regimes in the early Islamic world and the spread of vegetal species and farming practices from new perspectives.

This paper situates the archaeological study of the medieval 'Islamic Green Revolution' within the theoretical framework and current perspectives regarding the archaeological study of the agrarian regime(s) in the medieval Dar al-Islam. We delineate the significance of Watson's thesis –as well as its weaknesses–, outline the potential of archaeology to explore some of the criticisms and limitations of his arguments and introduce the main issues at stake with respect to the understanding from an archaeological perspective of the consequences of the medieval Islamic conquests on farming systems.

02 ARCHAEOBOTANICAL STUDIES AT THE TASHBULAK ARCHAEOLOGICAL SITE DURING THE QARAKHANID PERIOD

Author(s): Spengler, Robert (Max Planck Institute for the Science of Human History)

Presentation Format: Oral

Historical rhetoric in Central Asia often paints a clear economic dichotomy between sedentary and nomadic groups; as an example, the peoples of the Qarakhanid Empire (A.D. 840-1212) are often portrayed as pastoralists while the Samanid people (A.D. 819-999) are often depicted as farmers. Archaeological data shows that this dichotomy was not so well defined, but rather that medieval Central Asia was culturally diverse and marketed by exchange and interaction along the routes that most scholars refer to as the Silk Road. The mountain foothills of Central Asia and western China are marked by an ecologically rich mosaic of environments, which have fostered an equally diverse array of human cultural traits. As far back as the third millennium B.C., people were transporting items, ideas, technology, and genes along this trans-Eurasian mountainous corridor, spanning from the Kopet Dag to the Tien Shan and reaching into China. Historically documented exchange medieval Central Asia relied on established vectors of interaction, and fostered the spread of many of our most familiar fruits, nuts, grains, and legumes. Focusing on new archaeobotanical data from a Qarakhanid period site in the mountains of Uzbekistan, Tashbulak (ca. A.D. 900-1100), I will talk about the spread of crops, and trace the path that plants followed on their long journey across the Old World, ultimately reaching our dinner plates today.

03 AGRICULTURAL EVOLUTION IN BILAD-AS-SHAM FROM THE BYZANTINE-ISLAMIC TRANSITION UNTIL THE OTTOMAN PERIOD. A ARCHAEOBOTANIST'S REVIEW OF WATSON'S ARAB AGRICULTURAL REVOLUTION

Author(s): Hansen, Annette (University of Groningen)

Presentation Format: Oral

With his theory of the Arab Agricultural Revolution, Andrew Watson (1974, 1983) set in motion a major paradigm shift in the approach to the agricultural economies of the Islamic Empires. While the Islamic period had previously been seen as period of decline or stagnation, Watson countered this view and argued the period experienced a strong economic revival. Key to his theory was Watson's assertion that 'innovative' crops allowing for economic growth had been introduced. Using multi-period archaeobotanical

evidence, it has been argued that some of the crops Watson suggested were new, had already been well-integrated empire-wide long before the 8th century, the most notable example being hard wheat (Triticum turgidum ssp. durum) (Hansen, 2012; cf. Heinrich, 2017). For several of Watson's innovative crops the timeline of their introduction remains fragmentary.

This paper's first objective is to further explore the diachronic trends in crop selection, the 'crop chronologies', through the study of published archaeobotanical materials. In this context I will contrastingly reflect on Butzer et al.'s (1985) theory of an 'agricultural evolution' instead of revolution. In the second part of this paper, I will focus on the regional trends in crop selection during the Byzantine-Islamic transition through the Ottoman period in Bilad as-Sham. Here I will show that though Watson may have been incorrect about certain crops being new introductions of the early Islamic period, they did in fact become far more widely cultivated. While previously cultivated crops did not disappear, the focus in terms of regional specialization appears to have shifted with innovation in particular being exhibited through new agricultural strategies. To argue this, new archaeobotanical results from the settlements at Tall Hisban, Khirbet Faris, Ghor as-Safi, Shuqayra al-Gharbiyya, and Khirbet Beit Mazmil will be presented.

04 INNOVATION OR PRESERVATION? ABBASID AUBERGINES, ARCHAEOBOTANY AND THE ISLAMIC GREEN REVOLUTION

Author(s): Fuks, Daniel - Weiss, Ehud (Archaeobotany Lab, Bar-Ilan University)
Presentation Format: Oral

The topic of agricultural innovation in the early Islamic empires has become increasingly relevant for historians, archaeologists and agricultural scientists. The validity of Andrew Watson's original "Islamic Green Revolution" hypothesis will ultimately be confirmed or confuted by archaeobotanical research, as Watson himself has hinted. However, rigorous criteria for exploiting the available archaeobotanical data and testing this hypothesis are needed. We propose methodological criteria to test for new introductions, applying them to four "first-finds" for Levantine archaeobotany. The finds derive from one cess pit and two refuse pits in an Abbasid Jerusalem bazaar which contained an unprecedented concentration of mineralized plant remains for the Levant. This led us to wonder whether the "first-finds" were more a reflection of preservation conditions than crop diffusion. After applying our proposed test for new introductions and considering the archaeobotanical, historical and genetic evidence, we concluded that one species from the assemblage, the eggplant (Solanum melongena), represents a new introduction. The earliest evidence of eggplant in the Levant, this find exemplifies the phenomenon of Early Islamic westward crop diffusion. However, it does not necessarily reflect "revolutionary" agricultural innovation. We address the relationship between new introductions and agricultural innovation, advocating a regional, crop-by-crop strategy for further interdisciplinary research on the Islamic Green Revolution.

05 NEW ARCHAEOBOTANICAL EVIDENCE OF EARLY ISLAMIC AGRICULTURAL ECONOMY AT ASHKELON AND CAESAREA MARITIMA

Author(s): Forste, Kathleen (Boston University)
Presentation Format: Oral

There is a growing interest in studying the archaeological evidence of agricultural practices during the Early Islamic period in the Levant. Archaeological plant remains (seeds, fruits, plant parts, and wood charcoal) are direct evidence of the plants grown and used by people, and provide information about preferred cultivars, land-use, and the organization of the agricultural economy. I will use data from archaeobotanical remains recovered from two cities on the Mediterranean coast of modern-day Israel, Ashkelon and Caesarea Maritima. Archaeobotanical remains were sampled from a range of domestic contexts, including refuse pits, interior and exterior floors, and a tabun (oven). This paper will bring together the data of wood and non-wood remains for a more complete analysis of plant-use during this time period, rather than focusing exclusively on the seeds of cultivated and wild plants. I will address questions of land-use, timing of the agricultural cycle, and the acquisition and use of wood resources using qualitative analysis of ecological requirements of the plants represented, as well as descriptive simple statistics such count, percentage, ubiquity, and density of wild and domesticated plant remains in order to understand the characteristics of the assemblages and determine frequent and rare taxa. Comparing the data from these two sites will illuminate possible variability in the agricultural economy across the region, and will contribute new data to previously conducted analyses of plant remains from Ashkelon and Caesarea Maritima.

06 ARCHAEOLOGICAL INDICATIONS OF AGRICULTURAL INNOVATION IN SICILY, 9-11TH CENTURY

Author(s): Carver, Martin (University of York) - Fiorentino, Girolamo - Primavera, Milena (University of Salento) - Aniceti, Veronica (University of Sheffield) - Molinari, Alessandra (University of Rome Tor Vergata)
Presentation Format: Oral

In Sicily, farming practice, the cultivated crops, and the resulting commodities that were traded, varied in emphasis during the Byzantine, Islamic and Norman periods. Our contribution combines the evidence of plant remains (Fiorentino, G., V. Zech-Matterne 2017), pollen analysis (Sadori et al 2016), animal husbandry, pottery, settlement and landscape (Molinari 2015) to present a critical evaluation of the innovations in agriculture predicted by Andrew Watson's 'Green Revolution' (1983).

Current research by the authors finds that there are indications of investment in new crops and ways of growing them, new animal stock and new modes of dining, as well as an increased creation of wealth reflected in the rise of exports. However the impact is not felt until the installation of the Fatimid regime in the mid 10th century, and is then uneven in its application. In parts of the island,

and in certain sectors of the population, the impact is slight. Elsewhere the innovations in agriculture augment, rather than replace, traditional modes of production and dietary preference. These variations are allowing us to illuminate the patterns of power and differences in belief in Fatimid Sicily. The research is being conducted under the aegis of the ERC project Sicily in Transition (sictransit) which also encompasses studies in diet drawn from stable isotopes (to be presented by team member Alice Ughi in the same session).

07 DIET IN TRANSITION: STABLE ISOTOPE ANALYSIS OF HUMANS AND ANIMALS FROM MEDIEVAL SICILY

Author(s): Ughi, Alice - Alexander, Michelle (University of York, BioArCh)
Presentation Format: Oral

This research explores the dietary impacts of regime change in Medieval Sicily between the 5th century AD and the 13th century AD as part of the collaborative project Sicily in Transition (SICTRANSIT, York, Rome, Lecce). The overall aim of the project is to better understand the social, economic, and demographic changes that occurred through successive changes in socio-political and religious power (Byzantines, Arabs, Normans, Swabian) in Sicily. Using stable isotope analysis of both humans and animals, our specific research questions are: can isotopes detect a change in diet and therefore in agriculture and society? If so, what form did these shifts take? Also, what can intra-population variation tell us about dietary diversity in different groups?

Bulk Carbon (δ13C) and nitrogen (δ15N) bulk values of bone collagen have been obtained to directly assess individual diets from a range of sites, representing distinctive religious backgrounds (Christian, Muslim) over a c.1000 year time period. Contemporaneous animal remains have been analysed to build an isotopic baseline and offer information about changes in husbandry regime and agriculture practices.

In addition to carbon and nitrogen bulk stable isotope analysis, the object of this project is to optimize and develop compound specific stable isotopes analysis of collagen amino acids (CSIA-AA) via GC-C-IRMS. This technique, only recently being applied to archaeological populations, offers an opportunity for better resolution on animal and human diets, particularly in circumstances where consumption of Mediterranean fish and C4 protein are difficult to disentangle.

08 TECHNOLOGY OR TECHNIQUE? IRRIGATION AS A SOCIOTECHNICAL OPTION IN AL-ANDALUS

Author(s): Carvajal Lopez, Jose (University of Leicester) - Jimenez Puertas, Miguel (Universidad de Granada)
Presentation Format: Oral

Ever since the beginning of the debate about the Islamic Green Revolution, most scholarly attention has been paid to the expansion of vegetal species and irrigation techniques over the Dar al-Islam and to its economic impact. In Iberia, this debate was channelled through the proposal of "Hydraulic Archaeology" of M. Barcelo and his team of the Autonomous University of Barcelona, and more attention was paid to the role of the techniques of irrigation in the configuration of al-Andalus as a "society without lords". While accepting the basic premises set up by the extensive research of Barcelo's team, and acknowledging the vast amount of research on irrigation systems done in Iberia from several points of view, we believe that the basic questions of how the use of irrigation as a technology shaped the society in al-Andalus is still overlooked. With this in mind, we wrote a paper (published in Spanish in 2011) with a proposal to look at this issue from the theoretical perspective of sociotechnical systems (Pfaffenberger 1992) and using the case study of the Vega of Granada. In this presentation, we will review this approach to include current theoretical perspectives on migration, fields of action and collective agency. From this point of view, we expect to reach a position where irrigation can be understood as a sociotechnical option which shaped to a large extent Andalusi conditions of life. The aim of this presentation is to contribute to the creation of a fresh research framework where the questions about the appropriateness of the term "Green Revolution" can be put aside to focus work in understanding the cultural change that Islamization brought about.

09 NATIVE PEASANTS, SETTLER COLONIZATION AND DRY FARMING IN CASARABONELA (MÁLAGA), XVTH-XVITH C.

Author(s): López García, Esteban (Esteban López García)
Presentation Format: Oral

The conquest of the emirate of Granada by Castile (1482-92) was the beginning of a long and complex process of colonization that meant the construction of a new social organisation. The previous agrarian regime was confronted with the imposition of a new colonial order that implied changes in the land property, the taxation, the productive orientation and the organization of peasant work among other aspects. With the study of the small town of Casarabonela, in the western part of the district of Malaga, we have carried out a detailed research on how that transformation took place. It has been especially useful for studying to what extent the Castilian colonization implied a rupture in the rainfed agriculture regime or if there were elements of continuity. It has also been possible to compare the dynamics of dry farming with the situation in other agricultural sub sectors such as irrigated agriculture or livestock. Based on the analysis of an extensive colonial documentary record and the methodology of landscape archaeology, we have identified the spatial distribution of the properties of colonisers and the native peasants immediately afterward the conquest and its transformation throughout the sixteenth century, up until the moment of definitive rupture that entailed the expulsion of the native population. Finally the arrival of new settlers after 1570 was used for a whole reorganization of dry farming land ownership that meant a break with the previous state of affairs.

730 MOUNDSCAPES IN THE DIGITAL ERA: DATA ACQUISITION, ANALYSIS AND INTERPRETATION OF PAST FUNERARY LANDSCAPES THROUGH GEOSPATIAL TECHNOLOGIES

Theme: Theories and methods in archaeological sciences
Organisers: Carrero-Pazos, Miguel (University of Santiago de Compostela, GEPN-AAT) - Rodríguez del Cueto, Fernando (University of Oviedo) - López Romero, Elías (LabEx LaScArBx-Université de Bordeaux) - Vilas-Estévez, Benito (University of Vigo)
Format: Regular session

The study of moundscapes has been a recurrent theme in the Archaeology, due to the fact that mounds are one of the most common remains in the World because they were built in different periods and by different societies. They have been traditionally studied from a chronological point of view and in Western Europe this has usually focused on the Neolithic or the Bronze Age periods. Recently, these monuments have been analysed in a wider perspective, based on the idea that their role in the landscape goes beyond their chronology.

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 and reconstruction of such moundscapes. The role the latest technological advances play in data acquisition, analysis and interpretation will be central to the session as they contribute to get and collate new information about these landscapes. Thus, we will accept papers related to the following topics:

- Data acquisition: proposals involving photogrammetry and remote sensing (e.g. LiDAR) techniques will show how to get accurate information as a basis for the development of good practices in research.

- Analysis and Interpretation: computationally-informed landscape archaeology. GIS and Spatial statistics techniques, with presentations on how these monumental landscapes can be statistically modelled to analyse settlement patterns, locational preferences. Case studies on Viewshed analysis or mobility patterns are also welcome, as they will show how geospatial techniques are fundamental to get new knowledge from past societies.

ABSTRACTS

01 SESSION #730 MOUNDSCAPES IN THE DIGITAL ERA: DATA ACQUISITION, ANALYSIS AND INTERPRETATION OF PAST FUNERARY LANDSCAPES THROUGH GEOSPATIAL TECHNOLOGIES

Author(s): Carrero-Pazos, Miguel (University of Santiago de Compostela, GEPN-AAT) - Rodríguez del Cueto, Fernando (Universidad de Oviedo, Facultad de Filosofia y Letras, Departamento de Historia) - López Romero, Elías (LabEx Sciences Archéologiques de Bordeaux - LaScArBx)
Presentation Format: Oral

The study of moundscapes has been a recurrent theme in the Archaeology, due to the fact that mounds are one of the most common remains in the World because they were built in different periods and by different societies. They have been traditionally studied from a chronological point of view and in Western Europe this has usually focused on the Neolithic or the Bronze Age periods. Recently, these monuments have been analysed in a wider perspective, based on the idea that their role in the landscape goes beyond their chronology.

The main themes in this session are the following:

- Data acquisition: proposals involving photogrammetry and remote sensing techniques -such as LiDAR- will show how to get accurate information as a basis for the development of good practices in research.

- Analysis and Interpretation: computationally-informed landscape archaeology. Proposals concerning GIS and Spatial statistics techniques with presentations on how these monumental landscapes can be statistically modelled to analyse settlement patterns and locational preferences.

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 and reconstruction of such moundscapes. The role that the latest technological advances play in data acquisition, analysis and interpretation will be central to the session as they contribute to get and collate new information about these landscapes.

The session, which is composed by eleven oral presentations and one poster, will be divided in three time-blocks defined by a geographical division to ensure debate in discussion slots. In all these blocks there will be presentations on both the main central themes.

02 "WITHIN THE GIANT'S BELLY". MULTI-METHOD APPROACH OF THE LONG BARROWS OF TUSSON (CHARENTE, FRANCE)

Author(s): Ard, Vincent (CNRS, UMR 5608 TRACES, Toulouse Jean Jaurès University) - Legrand, Victor (UMR 5608 TRACES, Toulouse Jean Jaurès University) - Camus, Adrien (ADERA, UMR 7266 LIENSs, La Rochelle University) - Lüth, Friedrich (Deutsches Archäologis-

ches Institut, Berlin) - Mathé, Vivien (UMR 7266 LIENSs, La Rochelle University) - Calastrenc, Carine (UMR 5608 TRACES, Toulouse Jean Jaurès University) - Poirier, Nicolas (CNRS, UMR 5608 TRACES, Toulouse Jean Jaurès University)
Presentation Format: Oral

Known since the nineteenth century, the barrows of Tusson (Charente) is one of the most impressive "giant" megalithic monuments of Western-Central France built during the Middle Neolithic in the 5th millenium BC. The longest, the Gros Dognon, is 145 meters long, 30 meters wide and 10 meters high. This cemetery still counts today three long barrows and two smaller round ones. Probably protected by their dimensions, these monuments have never been excavated.

As part of an on-going collective research project and during a Master's work, we decided to reinvest the study of these monuments with a multi-method approach using non-invasive tools, such as geophysical prospecting (electrical and magnetic) and LIDAR. The aim is to study the architecture of monuments (installation condition, morphology and internal structure) and their large-scale archaeological environment (structures such as quarries and traces of settlements). The first results are very interesting and open up new research perspectives especially on the environment of these monuments. Fist surveys were conducted in the quarries discovered in 2017.

The new ANR (French National Research Agency) project MONUMEN (Monumentality, landscapes and social competition during the Neolithic in Atlantic Europe) of a duration of 4 years (2018-2021) has for objective to perfect these methods of study with the monumental sites (megaliths and enclosures) on several windows of the south-west of France, between Loire and Pyrenees.

03 (RE)DISCOVERING "THE LARGEST" MEGALITHIC NECROPOLIS LOCATED IN THE NORTHWEST OF THE IBERIAN PENINSULA: SERRA DO LEBOREIRO (GALICIA/PORTUGAL)

Author(s): Vilas-Estevez, Benito (University of Vigo) - Carrero-Pazos, Miguel (University of Santiago. GEPN AAT)
Presentation Format: Oral

One of the most important ideas when trying to research the Megalithic phenomenon of the Northwest Peninsula is that these studies should be done in close collaboration between Galician and Portuguese prehistorians, although, this collaboration is far from be effective. This is particularly clear when studying the necropolis of the Serra do Leboreiro (Galician) or Laboreiro (Portuguese) since the megalithic monuments extend to both sides of the border.

This lack of communication was recently confirmed by some scholars mentioning that despite geographical proximity and the recognition of being in front of a common geographical phenomenon, research has rarely transcended the artificial administrative borders, which would not represent at all the "borders" of the megalithic phenomenon of the northwest.

Such is the case of the necropolis of the Serra do Leboreiro that despite being known since the 80s, was not studied jointly until 2013 although it was a revision with partial data. Currently and given our ongoing works on this area, we have 125 tumuli in just an area of 8 km², although there are areas still to be surveyed.

The objective of this communication is to show the final results of an intensive prospecting project based on traditional methods and the use of the latest remote sensing technologies, such as airborne LIDAR. In this way we have almost 200 registered burial mounds taking into account both sides of the border, conforming one of the most important megalithic necropoleis in the Northwest Iberia, allowing us to carry out spatial studies in future contributions.

04 CONTRIBUTIONS FROM LIDAR TECHNOLOGY TO THE SITES AND MONUMENTS RECORDS: THE PREHISTORIC BARROWS OF SALAS COUNCIL (ASTURIAS, SPAIN)

Author(s): Rodríguez del Cueto, Fernando (Universidad de Oviedo, Facultad de Filosofia y Letras, Departamento de Historia) - Carrero Pazos, Miguel (University of Santiago de Compostela, GEPN-AAT)
Presentation Format: Oral

Since the last decade, LiDAR technology is playing an important role in the substantial changes that have taken place in the sites and monuments records of the northwest of Iberia. Hillforts, Roman camps, as well as Neolithic tombs have seen the importance of remote sensing techniques to identify sites and for updating the inventories.

The present study aims to explore a specific area in northwestern Asturias: the central and Southwestern part of Salas council. This territory contains five prehistoric cemeteries with thirty-two barrows. Most of them probably built during prehistoric times, between the Neolithic and the Bronze Age.

Jointly with other works carried out in this area, a remote prospection campaign through LiDAR visualisation analyses was carried out in Salas, in order to identify the changes that occurred between the Catalogue (1990) and current times. After the application of these techniques, a field survey was developed to check the information provided by LiDAR analyses.

The results allow us to propose that remote sensing technologies such as LiDAR are key tools for cataloging and recording archaeological remains in Asturias. As forested areas are being gradually increased, archaeological surveys are really difficult and prospection works sometimes fail in the identification of prehistoric sites. Not only through lowland forest but also from the difficulties created by dense pine forests. Although this key problem is being compensated by LiDAR technology, the results should be always treated with caution and checked by intense fieldwalking.

This work will present the preliminary results of our ongoing project. While additional works are needed, we believe that an initial as-

sessment of the case studies will promote further discussion on the role that remote sensing techniques are playing in prospection works of prehistoric moundscapes.

05 GUIDOIRO AREOSO MOUND4 (A ILLA DE AROUSA, PONTEVEDRA, NW SPAIN). DIGITAL RECORDING AND ANALYSIS OF A MEGALITHIC MONUMENT AT RISK

Author(s): Lopez-Romero, Elias (LabEx Sciences Archéologiques de Bordeaux - LaScArBx) - Vilaseco Vázquez, Xosé Ignacio (Grupo de Estudos para a Prehistoria do Noroeste – Arqueoloxía, Antigüidade e Territorio, Universidade de Santiago de Compostela) - Güimil-Fariña, Alejandro - Mañana-Borrazás, Patricia (DIMENSO Institute of Heritage Science Spanish National Research Council - Incipit, CSIC) - Otero Vilariño, Carlos (Independent researcher)

Presentation Format: Oral

The islet of Guidoiro Areoso is located in the middle of the Arousa estuary in Galicia (NW Spain). In spite of its small size (c. 8 Ha.) it is home to an impressive number of archaeological evidence, including several Neolithic mounds, Bronze Age cists and paleosols. Coastal erosion in the last 20 years has dramatically increased the number of sites in the islet's inventory, with new sites revealed as beaches rapidly lose their sand (more than 70 cm in depth was lost between 2007 and 2013). It is not clear when this territory became an island but, following currently available models, it is plausible that this happened after the mid-Holocene.

In this paper we will discuss the different methodologies that had been set up in 1988 and between 2011-2017 on Mound 4 (mámoa 4), a megalithic monument at risk of destruction due to coastal erosion. Among these methodologies, a series of non-invasive and digital tools were used, including geophysical surveys (gradiometer), digital photogrammetry and 3D laser scanning. Added to this, a crowdsourcing initiative (Guidoiro Dixital) was launched in 2014 that aimed to compile old videos and photos of the islet thus generating a response from the local community interested in preserving their heritage while contributing to the long-term analysis of site erosion. The images compiled through this initiative were used to obtain fresh information (generation of additional 3D models) of eroding or already destroyed archaeological sites, including Mound 4.

The combination of these non-invasive and digital approaches has proved to be perfectly adapted to get accurate information on the mounds in Guidoiro Areoso; they were also essential to inform the excavation process that eventually took place on Mound 4 -during the summer of 2017- in order to rescue scientific information from the site before it is destroyed.

06 TOWARDS THE DEFINITION OF SPATIAL REGULARITIES IN GALICIAN MOUNDSCAPES. A CASE STUDY IN MONTE DE SANTA MARIÑA (NW IBERIA)

Author(s): Carrero-Pazos, Miguel (University of Santiago de Compostela, GEPN-AAT)

Presentation Format: Oral

In Galicia (Northwest of the Iberian Peninsula), works that have been interested on the study of megalithic locational patterns have developed only fieldwork-based approaches. As a result, the locational criteria were defined using ideas extracted through direct analyses at field, and have not been quantified and modelled with Geographic Information Systems until recent times. In this proposal, a GIS methodology and a point pattern approach for the study of megalithic locational patterns is carried out.

Starting from the definition of locational factors previously managed by certain authors, a number of first and second order variables were factorised and converted into spatial variables. Next, a site predictive modelling approach was the method used to derive which variables are good predictors of the current distribution of mounds and, therefore, could have influenced the site location in the past. On the other hand, a study of visibility as locational factor is also proposed, using Monte Carlo simulation to potentially check whether there is a preference on megalith location focusing on visual trends (size of visual basin). The results allow to propose specific regularities among the distribution of sites, which determine trends in Galician megalithic occupation and, on the other hand, open new possibilities of analysis for the study of Galician megalithic landscapes.

07 MOUNDSCAPE IF THE PRIMIVAL FOREST. FROM PAST SOCIETIES BARROWS TO MODERN CHARCOAL PILES IN THE BIAŁOWIEŻA FOREST, POLAND

Author(s): Szubski, Michal (Institute of Archaeology, Cardinal Stefan Wyszynski University in Warsaw)

Presentation Format: Oral

With area of more then 62 000 ha the Białowieża Forest is one of the largest woodlands in Poland. Because almost all of it has been protected since the sixteenth century it is considered as a primeval forest. This unique situation results in very good preservation of archaeological features with anthropogenic form. However dense woodland was almost inaccessible for standard prospection methods. Technology development of airborne laser scanning (ALS) changed this situation and provide new data to analysis currently forested landscapes.

Ongoing project "Cultural and natural heritage of the Białowieża Forest", which aims at interdisciplinary examination of archaeological features of this area made a perfect opportunity to investigate forest landscape in large and in small scale. We mapped hundreds of anthropogenic features with preserved own form using ALS. One type of features dominates figures – almost 90% of all are mounds. They occur alone, in clusters, in very different morphology. How can we distinguish sepulchral barrows form well preserved traces of modern exploitation of forest resources (production of charcoal, wood distilling, potash production)? How we can date such features without excavating? How this landscape had appeared when barrow cemeteries were created?

Answers for those questions might be in spatial analysis combined with environmental approach. In discussed area there is unique opportunity to investigate very insular and isolated landscape. In small scale complexes of different mounds from prehistory to modern times indicating continuing occupation of landscape making almost a palimpsest of features. This small-scale study provide data to identify and try to understand this kind of sites also in larger, regional context.

08 DID LOCATION MATTER? THE NEOLITHIC MONUMENTAL CEMETERIES FROM THE MUSZKOWICE FOREST (SOUTH-WESTERN POLAND) IN THE LIGHT OF GIS ANALYSES

Author(s): Przybyl, Agnieszka (Institute of Archaeology, University of Wroclaw)
Presentation Format: Oral

The main purpose of the presentation is to answer the question of the importance of the factors and conditions in the Neolithic monumental cemeteries location. In order to achieve the aim of this study, GIS analyses with the use of archaeological evidence were performed.

The project is part of the research program, carried out by the author at the Institute of Archeology, University of Wrocław, concerning recognition and reconstruction of the Neolithic landscape with the earthen long barrows of the Funnel Beaker culture.

Through the use of geospatial analyses of the archaeological evidence, it was possible to recognize the choices made by the Neolithic community of monumental barrow builders. The use of GIS tools made it possible to assess the environmental conditions of the earthen long mound distribution, but also to address the important issue of potential cultural factors which may have been decisive in the choice of places for their construction.

The analysis was based on detailed data on the location of the monumental burial places, which could be obtained from the digital terrain model generated on the basis of airborne laser scanning data. The analyses covered 16 archaeological sites, comprising a total of 26 earthen long mounds, located in the relatively small forested area of Muszkowice Forest in the Niemcza-Strzelin Hills in the Sudeten Foreland of south-western Poland.

09 INDIGENOUS MOUNDSCAPES IN THE CARIBBEAN: REGIONAL CONSIDERATIONS TOWARDS A NEW SYNTHESIS

Author(s): Herrera-Malatesta, Eduardo (Universiteit Leiden) - Ulloa Hung, Jorge (Instituto Tecnologico de Santo Domingo; Universiteit Leiden) - Sonnemann, Till (Bamberg University) - Hoogland, Menno - Hofman, Corinne (Universiteit Leiden)
Presentation Format: Oral

Recent surveys on coastal and mountainous environments in the northwestern Dominican Republic managed to identify over 200 archaeological sites. While some of these were registered by the clustering of material evidence scatter on the surface, others display an arrangement of artificial mounds. Previous archaeological research interpreted these mounds as part of a specialized agricultural system that allowed generating a surplus to sustain large populations within hierarchical political polities. However, solid regional archaeological data or contextual large-scale excavations never sustained these hypotheses. Current research within the context of the NEXUS 1492 project is challenging these initial interpretations. By photogrammetrically recording a sample of sites with mounds, it was possible to create an overview of their size, distribution, as well as arrangement of mounds and flattened areas. In addition, large-scale excavations made it possible to better understanding the function of some of these mounds as part of the settlements. The moundscape reconstructed so far indicates that this evidence was the result of the interaction of people with the immediate environment in a wide range of activities and tasks. A result from earth movement within the settlement, the mounds had been used for agricultural activities, as garbage dump, and had even served as burial ground.

Based on the newest research of NEXUS 1492 in the area, a new synthesis of the distribution and relation with different environmental variables can be created by means of GIS and spatial statistics. This paper will firstly discuss previous ideas on the functionality of mounds in the area. Secondly, a new spatial statistical analysis will be presented, to provide new insights on their distribution and relations on a regional scale. Particularly, the analysis focuses on evaluating the distributional patterns of these mounds and the relation between their location and different environmental variables, material culture and temporality.

a. USING LIDAR DTM TO MEASURE MORPHOLOGICAL VARIABLES OF MEGALITHIC MOUNDS: THE CASE OF BARBANZA PENINSULA (GALICIA, NORTHWEST SPAIN)

Author(s): Canosa-Betés, Jorge - Fábrega-Álvarez, Pastor - Villa-Indurain, Iñaki (Instituto de Ciencias del Patrimonio - Incipit. Consejo Superior de Investigaciones Científicas - CSIC)
Presentation Format: Poster

In 2016 and 2017 an archaeological survey project through LiDAR was carried out in the Barbanza peninsula (Galicia, northwest Spain) to identify and characterize all its megalithic monuments. This survey, that included both remote sensing and fieldwork, finished with a study sample of 119 mounds.

The later work has been destined to research issues about the relation of these mounds with the mobility at different scales and their perception of the landscape. Inside this study, we raised the need of obtaining information about the morphological variables (surface, diameter, height and volume) of each mound. To do it, we elaborated a semiautomatic method that calculates these variables from the DTM using surface calculation tools of ArcGis.

After selecting the megalithic monuments that were not excessively deformed we obtained their contours using an homogeneous criterion. Once delimited, we restored the removed parts of the mounds that showed inner alterations and then we calculated the rest of the variables inside each of the generated polygons.

Obtaining these values has helped us to characterize the megalithic phenomenon in the peninsula faster than in the field. The results show significant differences of some of the monuments respect to the rest. Furthermore, standardizing these methods will help us to carry out similar studies in other regions of Galicia.

b. MULTISCALE APPROACH TO MEGALITHIC BURIALS IN SOUTHWESTERN FRANCE: THE USE OF QGIS IN THE DEFINITION OF IMPLANTATION MODELS

Author(s): Boscus, Sarah (UMR 5608 TRACES, Toulouse) - Ard, Vincent (CNRS, UMR 5608 TRACES, Toulouse)
Presentation Format: Poster

For several years, the study of megalithic burials and their spatial distribution has been gaining ground in Europe, thanks to new architectural studies and spatial analyzes carried out thanks to GIS. As part of a Master's degree (Univ. Toulouse Jean Jaurès, France), a thematic survey and a PhD thesis in progress, we have developed a systemic and multiscale approach to megalithic burials. This one aims to approach the complexification of the societies of the end of IVe and the IIIe millenaries before our era, through the study of these architectures of stone and their architectural project in the south-west of France. For each megalithic burial, it is a question of characterizing the choices made by the builders in terms of architecture (materials, layout of blocks, technique), and implantation in the landscape (topography, visibility, organization of the territory). This work combines two scales of analysis, that of the site through the architecture of the megalithic chamber and that of the territory by the study of the establishment of monuments and visibility from and between these sites. These spatial and visibility analyzes are carried out by free software from GIS, QGis, and complementary modules allowing topographic cuts, identification of path zones and visibility zones. We will see here, through examples from our work in Quercy and Ariège, the interest, but also the limits of each analysis.

731 MUSIC ARCHAEOLOGY: RECENT TRENDS AND FUTURE CHALLENGES

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Jiménez Pasalodos, Raquel (Universidad de Valladolid; European Music Archaeology Project) - S. Lund, Cajsa (Linnaeus University, Växjö-Kalmar; European Music Archaeology Project) - García Benito, Carlos (Centro de Estudios Turiasonenses)
Format: Regular session

This session aims to debate recent developments in music archaeology, where music is understood as a human behaviour that leaves patterns in the archaeological record. It is a crucial cultural element that embodies a significant set of symbolic values, specific behaviours, culturally-defined concepts and a highly specialized set of material culture, which requires a particular theoretical and methodological framework. In addition, there is also an increasing awareness of the importance of music for the human species, based upon neurological studies, music cognition research and evolutionary perspectives, adding to the complex interdisciplinarity of studies dealing with past musical cultures. Finally, ancient music is a powerful tool for engaging audiences with archaeological heritage. Ancient music dissemination is a field on its own that manifests its own trends and challenges.

In this session, we would like to invite researchers to share recent investigations into past music cultures, with a special focus on theoretical and methodological challenges regarding the study of music as culture (such as, for instance, the interconnectedness between music and gender, music and power or music and identity); the study of music as a biological human feature; and the interaction between both cultural and biological perspectives (including neurological, evolutionary and phenomenological approaches). We also welcome reflections on the limitations of contemporary approaches to past music, including modern conceptions of music projected onto past cultures as well as presentations dealing with public engagement and dissemination of archaeological musical heritage, which calls for negotiations between research, art and entertainment.

ABSTRACTS

01 "HUNTING CALLS" IN THE EUROPEAN PREHISTORY

Author(s): García Benito, Carlos (Centro de Estudios Turiasonenses) - Mazo Pérez, Carlos - Alcolea Gracia, Marta (University of Zaragoza)
Presentation Format: Oral

The aim of this work is to study the perforated bone pipes from the Upper Palaeolithic sites of Le Placard, Isturitz and La Garenne (France). Their morphology is very simple, a bone pipe of between 23-27 cm long, made with the ulna of a great bird of prey (maybe vultures) with a slit/groove of 1,5 cm long by 1mm wide, near to the wider end. They have been interpreted acoustically as kazoos (membranophone) or whistles (aerophone) and functionally as "hunting calls", but other possibilities such as ritual or leisure uses cannot be discarded.

In order to evaluate their acoustical capacities, we have developed a complete experimental protocol using bone of griffon vulture, and we have analysed their manufacturing process and studied the use wear produced both on the lithic tools and on the bone during the transformation from raw material to human artefact.

With all data extracted from the experimental phase, we will discuss, on the one hand, their organological capacities (modification and enlargement of sounds) and, on the other hand, their functional interpretation as Prehistoric "hunting calls". In addition, other archaeological remains will be reviewed, as even if they show a different morphology, may have been used with the same functions.

02 11TH CENTURY FRAGMENT OF STRING INSTRUMENT IN OSTRÓW LEDNICKI, POLAND

Author(s): Mazurek, Stanislaw (Independent) - Popławska, Dorota (Independent)
Presentation Format: Oral

In the archives of the Museum of the First Rulers of Poland there is a piece of wood. That piece was found in the soil layers during the construction of the bridge between of Island of Ostrów Lednicki and the solid land. At first, that object was classified as a slotted spoon. However, after further investigation, it was found that it was a fragment of a string instrument: a pegboard with a short neck. This finding can be dated to the second half of the 11th Century and the second half of the 12th Century.

In European museums' collections, there are at least a dozen or more fully or partially preserved string instruments of different types that can be dated to medieval times. We can also find string instruments portrayed on rich medieval iconography depictions. Based on these discoveries, we have attempted to match this particular finding from Ostrów Lednicki to a specific type of string instrument that existed from the 10th to the 13th Centuries.

Once we know the type of instrument, we can try to compare its musical possibilities with other instruments from early medieval Poland. The obtained results allow us to get to know, even if partially, the Polish musical culture of the early Middle Ages.

03 A SINGING BONE FROM THE ROTTEN LAKE (MÄTÄJÄRVI) QUARTER OF MEDIEVAL TURKU, FINLAND: COMMUNICATION, ENTERTAINMENT, CONTEMPORARY MUSICAL EXPLORATION

Author(s): Tamboer, Annemies (Independent researcher) - Rainio, Riitta (University of Helsinki, Department of Musicology) - Riikonen, Taina (Independent artist)
Presentation Format: Oral

Around 1400 in the town of Turku (SW Finland) a new quarter was built near a lake that came to be known as Mätäjärvi, the Rotten Lake, possibly because it was polluted by the waste from leather tanners. In the excavated remains of a wooden house in this quarter objects like leather scraps, shards of unglazed earthenware, spindle whorls, bone beads and numerous bones of juvenile cats, dogs, sheep, pigs and cattle were found, allowing the conclusion this might have been an artisan's dwelling. On the premises a part of a worked sheep shin bone was found that we have interpreted as a flute of the block-and-duct type with two or three finger holes. This is a rare find for Finland, where, contrary to other parts of Europe, only a very small number of bone wind instruments is known, dating from the late Middle Ages only and all found in or near Turku. This flute was a coarsely made simple instrument. In many regions flutes were traditionally played by shepherds as a means to communicate with their flock and as an entertainment while herding. As we know sheep were kept in Turku, it is tempting to interpret the flute as a shepherd's instrument, but sources pertaining to this are lacking. We made a reconstruction of the flute from a similarly shaped and sized medieval sheep shin bone. Flutist and sound artist Taina Riikonen then explored the musical possibilities of the reconstruction, making this medieval instrument sound – or sing – again.

04 MUSIC AND DANCE IN BABYLONIAN RITUALS: PROBLEMS AND CHALLENGES IN MATCHING TEXTS AND IMAGES

Author(s): Shehata, Dahlia (University of Würzburg) - Bellucci, Benedetta (Istituto "Carlo del Prete", Cassolnovo)
Presentation Format: Oral

Music performers and dancers are represented in the art of Ancient Babylonia on a number of objects, such as cylinder seals, terra-cotta as well as stone reliefs. Many of the scenes depicted recall cultic ceremonies or rituals. Also texts inform us about the course of events and the participants in Babylonian religious ceremonies. Information on rituals and their course of events may be found not only in ritual texts, but also in literary texts, such as hymns, prayers and laments, as well as letters and administrative texts. Albeit the richness of documentation the matching of the information from textual and iconographic evidence still poses problems due to contradictions and inconsistencies.

Our paper aims to investigate the cultic personnel related to music and dance known mainly from Babylonian sources from the late third and the second millennium BCE. A special focus will be directed towards methodological issues as well as the difficulties in correlating images and texts. The investigation - while focusing on the the personnel's charachteristic's, whether they are humans or animals, their gender, clothing, activities and body postures - will also pay attention to contextual information, such as accompanying persons (also gods), objects and other details pointing to the ritual's function and content.

05 MUSIC AND RITUAL IN HELLENISTIC AND PARTHIAN BABYLONIA: ARCHAEOLOGICAL CORRELATES AND WRITTEN EVIDENCE OF TEMPLE CEREMONIES

Author(s): Da Riva, Rocio (University of Barcelona)
Presentation Format: Oral

Contrary to the common marginalization of ancient music studies, they often provide evidence that considerably improves our understanding of cultural interdependencies within a given society. Due to its diffusion among all levels of community life, music is a crucial link that connects many social activities, either sacred or profane. Though admittedly difficult to analyse, there is plenty of archaeological, iconographic and textual evidence to study the role of music in the temple ceremonies in Babylon, a major Mesopotamian religious hub, during the last centuries of the First millennium BCE. The purpose of this paper is to present the potentiality of the sources to address a series of issues that have to do with the terminology, arrangement and setting, sequence and timing, intention and function of music in ritual, in order to identify the types of rituals and the specific contexts and contents of a rite in question. Of interest here are aspects connected to gender, social cohesion and cultural identity, as well as questions related to the spatial dimension of the musical performance (ceremonies carried out in public spaces, religious processions organized in the city or between Babylon and other religious centres, etc.).

In order to illustrate the potential of this line of enquiry, I have opted for the case study of music in the ritual performances connected to the goddess Ishtar and her temple Eturkalamma in Babylon.

06 ROMAN DOMESTIC SOUNDSCAPES: A NEW VESUVIAN PERSPECTIVE

Author(s): Mungari, Pasquale Mirco (Independent Researcher)
Presentation Format: Oral

The Vesuvian sites, mostly Pompeii and Herculaneum, keep the best preserved examples of Roman private buildings (domus), including elevations up to roof. Even if a complete reconstruction of households and use of the spaces is not always possible, the Vesuvian domus allow some considerations about soundscapes in private spaces. Several literary sources give us clues about the sound relationship between outdoor and indoor ambient, and the differences of soundscapes in different parts of the domus (public rooms and intimate spaces, gardens, rooms for hospitality and celebrations, ritual places); by crossing these clues with the copious and precious archaeological data about Roman music and soundscapes coming from the Vesuvian sites (instruments, soundtools, depictions, finding and probable using contexts) it is possible to attempt some preliminary considerations about domestic soundscapes in a Roman urban landscape, outlining a research frame that can be developed in the field. Afterwards, the research shall be focused on domestic spaces in which music could have been performed: official and unofficial occasions for music within the familiar space of the domus are described by literary sources, fixed into depictions, suggested by music findings in the Vesuvian area. Again, a data-crossing based research can make us achieve a first glimpse on the private dimension of Roman music.

07 RELIVING ANCIENT MUSIC. SOUNDSCAPES OF ANTIQUITY REVISITED TODAY. FROM THE WRITTEN AND MATERIAL SOURCES TO THE EXPERIMENTATION ON THE STAGE

Author(s): Panosa Domingo, Maria Isabel (Associació Cultural Arqueoescena)
Presentation Format: Oral

The paper introduces some experiences about reconstructing sounds and music of ancient civilitzacions, with a special focus on Pharaonic Egypt and the Graeco-Roman Antiquity. These experiences have been driven by a transversal team composed by archaeologists, musicians, actors and dancers, among others.

The basis considered for this reconstruction consists of archaeological findings, iconographical elements, ethnomusicological tracks and written sources (manuscripts, papyri and inscriptions).

Written sources are analysed focusing on all kind of contents, taking into account both text and context. Iconography and material culture provide objective information about real practice of ancient music: instruments, functions, places of performance, musicians, other individuals involved and other useful references or features. The ethnomusicological tracks help us to understand or reorient some problems encountered whilest performing ancient music with replicas of instruments based on archaeological remains. The results obtained through the research made on all these elements are collected toghether and processed in order to find out objective criteria for performance. Next step deals with experimentation, which is one of our main purposes. Collaborative work with all team members is crucial at this stage, contributing each one from his/her field (Music, Dance, Archaeology, Philology, Communication, etc.).

The second purpose, being derived from the research and experimentation pursued, consists of a real proposal for the public dissemination. It requires to find a concrete solution for re-acting ancient music towards contemporary audiences. This constitutes in itself a difficult challenge, since we create performances for cultural dissemination today based on experimental hypotheses: every concert, every play is a work in progress. Interpreting Past in Present requires always renewed approaches to connect as well with contemporary spectator's point of view.

08 MUSIC ON BOARD THE ROYAL SWEDISH FLAGSHIP KRONAN (LOST 1676)

Author(s): Stomberg Lund, Cajsa (Linnaeus university, Sweden)
Presentation Format: Oral

Music archaeology has an exclusive capacity as a tool in the so-called Third Mission of Academia, that is, to present research results to the general public (children as well as adults, scholars and laymen) in a way which brings them to life - in that it involves source material which can sound! Music archaeology is an instrument for both art and knowledge.

As an example of public outreach I will present the multimedia programme Music on Board the Royal Swedish Flagship Kronan (The Crown). The ship capsized, exploded and sank off the Swedish island of Öland in the Baltic Sea in 1676. Of the 842 men in the crew only about 40 were saved.

The Kronan wreck is an extremely important find – a Pompeii of the Baltic Sea. With its abundant equipment, its large company and its hierarchical social structure the ship was a society in miniature. Several musical instruments and other sound tools, intact or in fragmented form, have been found on the wreck. Both stringed instruments, wind instruments and percussion instruments are represented. There are, of course, many musical instruments preserved from the 17th century. What is special in this case is that the instruments from Kronan are part of an archaeological find-complex that can, moreover, be exactly dated.

The musical instruments and sound tools excavated from the Kronan wreck form the basis of the programme that also includes commentaries and a slideshow. Who performed music on board, for whom was the music intended, and what did they play?

Questions, problems, methods concerning the current studies of the instrument finds from the Kronan wreck constitute an illuminating example of what I call "historical music archaeology".

09 A PAN FLUTE FROM EGYPT: PUBLIC ENGAGEMENT AND DISSEMINATION AT MUSEUM OF ARCHAEOLOGICAL SCIENCES AND ART, UNIVERSITY OF PADUA, ITALY

Author(s): Menegazzi, Alessandra (Museum of Archaeological Sciences and Art, University of Padua) - Zanovello, Paola (University of Padua; Department of Cultural Heritage)
Presentation Format: Oral

Between 2015 and 2016 the Museum of Archaeological Sciences and Art (MSA) took part in the University project "Archaeology and virtual acoustic. A Pan flute from Egypt" carried out together with archaeologists (Dept.of Cultural Heritage, head of the project prof. Paola Zanovello) and sound engineers (Dept. of Information Engineering, CSC-Sound & Music Computing Group, head of the project prof. Giovanni De Poli). The instrument is a Pan flute from Greek-Roman Egypt. It had arrived at the museum in the 1930s from the archaeological excavations held by Carlo Anti, professor of archaeology in Padua at that time. After World War II and for a long time this artefact as the others from Egypt remained in storage. Only in 2013, thanks to an exhibition organized by the research group "Egypt in Veneto" (head Paola Zanovello) the flute was restored and exhibited. The first presentation was strictly conservative. It was necessary, therefore, to find out a new model to display ancient musical instruments in archaeology museums. The project listed above adopted a multidisciplinary approach that allowed to rebuild virtually the flute and its sound. The virtual presentation is now available to the public thanks to an electronic device: the Pan flute can be virtually played and explored in deep by the public (e.g. related myths, material culture, cultural context). The tool is highly appreciated by the public because it brings together aspects of research, education and entertainment. We also have started to test its use for social inclusion.

As a next step the Musem is working on a project about ancient music dissemination.

10 RESEARCH INTO USING VIRTUAL REALITY AND ARCHAEOACOUSTIC ANALYSIS TO STUDY AND EXHIBIT PRESENCE

Author(s): Wolfe, Kristina - Till, Rupert (University of Huddersfield)
Presentation Format: Oral

This paper will discuss the research and ongoing results of the MSCA funded VRAASP Project (using Virtual Reality and Archaeoacoustic Analysis to Study and exhibit Presence) currently being undertaken at the University of Huddersfield. The aim of this project is to study the phenomenology and psychoacoustics of archaeological spaces and to improve the experience of virtual public exhibitions through the promotion, dissemination and experience of virtual archaeological spaces imbued with their original sense of sound presence. The second aim of this project is to develop tools and step-by-step guides to aid both researchers and artists in building immersive audiovisual, interactive, and VR/AR worlds derived from real-world acoustic landscapes. The EAA session on public engagement and dissemination of archaeological musical heritage represents an ideal outlet for this project objective. In the session, we will discuss our developments in compositional and creative tools to help composers and performers create and prototype works based on spaces. These tools will hopefully increase awareness and public interest in archaeoacoustics and the archaeoacoustic process. They can also serve as 'ear training' to train listeners to listen more closely to space. To illustrate all of these concepts and the overall project direction, we will present one or two of our recently analysed and reconstructed archaeological spaces. We will also present creative work based on these reconstructions.

11 THE PRODUCTION AND DISSEMINATION OF MUSIC ARCHAEOLOGICAL KNOWLEDGE: SCIENCE, ART AND ENTERTAINMENT

Author(s): Jiménez Pasalodos, Raquel (Universidad de Valladolid)
Presentation Format: Oral

The dissemination of music archaeological research calls, even more than in other branches of archaeology, for the negotiation between science, art and entertainment. The reconstruction of musical instruments or acoustic environments can often only be transmitted through experiencial learning, and the public engagement that can be achieved thanks to these musical experiences is remarkable. However, there are certain problematics that need to be discussed. On the one hand, as any other human science, music archaeology proposes particular narratives about music history and human cultures that often project onto the past modern musical identities and concepts, which legitimate contemporary social and political agendas. On the other hand, one of our main objectives as researchers is to question these narratives and preconceptions in the light of archaeological data. However, public engagement can only be achieved by a certain degree of negotiation between this scientific approach and the artistic and entertainment expectations of the audiences. Based on the experiences gathered in the European Music Archaeology Project and the exhibition Archaeomusica, this paper will discuss possible ways of transmitting music archaeological knowledge through art and entertainment and will propose ways of challenging certain harmful narratives and concepts about past music, while trying to offer results that are still significant for the general public and artistically relevant.

12 MUSIC ARCHAEOLOGY IN EDUCATION

Author(s): García Benito, Carlos (Centro de Estudios Turiasonenses) - Láinez Gracia, Beatriz (Independient researcher)
Presentation Format: Oral

Music Archaeology is practically absent from the curricula of formal or regulated education, for this reason, the only way to be trained and acquire knowledge in this field of research at a non-university level is through non-formal education (outside the school environment, with activities promoted by other types of educational institutions as investigation centres, museum, archaeological parks, etc., through exhibitions, workshops, lectures, etc.) or in an informal manner (such as in a self-taught way, through the bibliography published on this topic or by attending workshops and informal conferences).

In higher education, the panorama is not very different and, in order to access this knowledge in a regulated manner, those interested often study two degrees separately: History / Archaeology and Music (mainly Musicology or Ethnomusicology, but any other degree in music can also be valid), and then continue with a master's degrees and a doctorate degree.

In this paper, we will put this problem in perspective through the analysis of several experiences at formal, non-formal and informal education levels. We will evaluate diverse aspects such as their adequacy to the different levels of learning and their didactic resources. Finally, we will propose possible strategies and methodologies to better developed music-archaeological education and dissemination.

732 ARCHAEOLOGICAL EDUCATION BEYOND ARCHAEOLOGY: LOOKING AT THE CULTURAL AND SOCIAL RELEVANCE OF RESEARCH

Theme: Archaeology and the European Year of Cultural Heritage
Organisers: Gonzalez-Marcen, Paloma (Universitat Autònoma de Barcelona) - Henson, Don (University of York) - Dutra, Ivonne (Kalmar läns museum; GRASCA - Linnaeus University) - Cacheda, Maria (Agència Catalana del Patrimoni Cultural; CEPAP - Universitat Autònoma de Barcelona)
Format: Regular session

The recognition of the role that archaeological dissemination and heritage education can play as a tool to boost social integration and enhancement of democratic values, beyond conservationist objectives, has been embodied in the Council of Europe Framework Convention on The Value of Cultural Heritage for Society, signed in Faro (Portugal) in 2005. This document not only demands, the commitment to "facilitate the inclusion of cultural heritage dimension at all levels of education", but also presents three innovative values associated with cultural heritage: diversity, cultural rights and peaceful and democratic coexistence.

The purpose of this session is to reflect and provide successful archeological cases related to the educational field, placing special emphasis on two aspects: firstly, which contents and methodologies of archaeological research are relevant for educational practices in the broad sense developed by the Faro Convention; and secondly, which mechanisms for a critical understanding of past and contemporary societies are provided by archaeology to the adults of the future.

01 DEFINING THE SOCIAL ROLE OF ARCHAEOLOGY AFTER THE FARO CONVENTION

Author(s): Gonzalez-Marcen, Paloma (Centre d'Estudis del Patrimoni Arqueològic de la Prehistòria) - Masriera-Esquerra, Clara (Universitat Autònoma de Barcelona)

Presentation Format: Oral

The recognition of the role that archaeological dissemination and heritage education can play as a tool to boost social integration and enhancement of democratic values, beyond conservationist objectives, has been embodied in the Council of Europe Framework Convention on The Value of Cultural Heritage for Society, signed in Faro (Portugal) in 2005. This document not only demands, in article 13a, the commitment to "facilitate the inclusion of cultural heritage dimension at all levels of education", but also presents three innovative values associated with cultural heritage: diversity, cultural rights and peaceful and democratic coexistence. In this way, cultural (and archaeological) heritage is no longer simply considered as inherited wealth to be listed and valued, but eminently as an expression of rights that must be recognized in every democratic society.

The presence of archaeology in our society reaches far beyond the school and, in fact, forms part of a cultural imaginary that transcends the concepts and visions that emerge from research. Increasingly, this characteristic of archaeology is no longer considered a deviation to be corrected, but an expression of the potential that archeological education and popularization entail to take active part in social and cultural relevant issues and not to be limited to the transfer of academic knowledge to a non-specialized public. Archaeology education should and can be (and indeed is) more that proposing a certain vision of past societies, but to become an instrument of skills acquisition, cultural and economic activation, of social cohesion,, of community bonding and of identity recognition and dialogue. So, in this framework the already mentioned idea of the applicability of archaeology has generated and continues to generate presentation formats and communication strategies that are contributing to a renewed and more relevant presence of archaeology in contemporary society.

02 CONTRACT ARCHAEOLOGY'S UNIQUE QUALITIES IN THE ENCOUNTER WITH THE PUBLIC

Author(s): Dutra Leivas, Ivonne (Linneaus University; Kalmar County Museum)

Presentation Format: Oral

Since the turn of the millennium, concepts such as democracy, participation and dialogue have become guidewords in the field of Public Archaeology, not at least in educational practices in contract archaeology.

In order to democratically make the cultural heritage accessible it is not sufficient to open up and invite for dialogue and participation. There is also a need for create conditions for understanding 1) how knowledge about the past is created in the present; 2) knowledge about how this knowledge is used in the present.

Archaeological sites have unique qualities that textbooks, reconstructions or museums cannot provide – for example, the unique experience of coming close to the archaeological record or the discoveries that happen just now and then on a site. Such physical contact with the past opens for the possibility of dialogue for archaeologists and the public to talk about people in the past and present, enhancing understanding of time, culture and humanity, as well as the understanding of how knowledge about the past is created. To not use these unique qualities in an archaeological excavation is to waste the unique potential of contract archaeology to make available vital knowledge. Vital knowledge to understand how contemporary narratives of the past are created.

In this paper I will discuss that, in the process of democratization of archaeology, one of the primary goals in the educational practices in contract archaeology should be to reveal the conditions of how the knowledge of the past is created in archaeology.

03 HERITAGE EDUCATION AS A TOOL FOR THE DEVELOPMENT OF SIGNIFICANT LEARNING. THE MIRAVET'S CASTLE AND THE COP HERITAGE AND SCHOOL

Author(s): Cacheda, Maria (Àrea de Monuments i Jaciments, Agència Catalana de Patrimoni Cultural; CEPAP, Universitat Autònoma de Barcelona) - Miquel, Marina (Director of Àrea de Monuments i Jaciments, Agència Catalana de Patrimoni Cultural)

Presentation Format: Oral

Researching, studying and looking for new ways of doing in the educational programs of cultural institutions is essential because the learning that is promoted is significant and students are questioning themselves.

From the Area of Monuments and Archaeological sites of the Catalan Cultural Heritage Agency, we need to overcome the model of transmitting education and enable children and young people to enjoy monuments, having relevant learning experiences, that help them to be independent and critical people. This way of teaching and learning will revert to a more cohesive society, capable of responding to global challenges, forming free and responsible citizens. We have the challenge of improving the pedagogical methodologies of the activities and, therefore, we try to create new programs with this change of perspective.

In this paper, we are presenting the case study of the educational program of the Miravet's Castle. Students are expected to carry out tasks or situations in which they must use different types of knowledge, skills and values, which integrate the different educational competencies based on the Competitive Guidance Model, recently developed by the Department of Education of the Generalitat de Catalunya.

The objectives of the educational action developed at the Miravet's Castle and other monuments and sites of Generalitat are that students participate actively and autonomously, and to generate motivation and curiosity. We try that these tasks are being structured, as far as possible, in real situations. We also try to promote cooperative learning structures.

An approach between museum and school, it is also convenient to ask ourselves what we can offer and contribute from heritage education. We start from the conviction that education improves through collaboration, exchange and mutual learning. That is why a group of formal and non-formal education professionals has volunteered to work horizontally and collaboratively in a Community of Practice.

04 THE PLAN FOR HERITAGE EDUCATION BY "GENERAL DIRECTION FOR EDUCATION AND RESEARCH": CONTENTS, PROCEDURES AND OBJECTIVES WITH AN ARCHAEOLOGICAL SCOPE

Author(s): Taloni, Maria (Ministry of Cultural Heritage and Activities and Tourism - General Direction for Educational Research, Department of Study) - Venditti, Caterina Paola (Ministry of Cultural Heritage and Activities and Tourism - General Direction for Educational Research, Department of Study)

Presentation Format: Oral

The recent reorganization of the Italian Ministry of Cultural Heritage and Tourism creates the "General Direction for Educational Research" assigning to it, along with other competences, the redaction of the annual plan for heritage education, with the goal of better describing its knowledge and its civil function.

The new plan, currently being written by the "Department of Study of the General Direction", perfectly fits both in the revolutionary frame described by the Faro Convention in which it is carried out a programmatic overturning of the meaning and of the value of cultural heritage and in the spirit of the European Year of Cultural Heritage, proclaimed by the European Parliament and by the Council for 2018.

Indeed, the Convention moves the reflection "from the cultural heritage value itself to the value that people should take from it" (Montella, Petraroia, Manacorda, Di Marco 2016), while the European Year wants to highlight the central role of cultural heritage in the promotion of a shared feeling of identity and the construction of the future of Europe.

Starting from the many competency scopes of the Ministry, with a multidisciplinary and interdisciplinary approach, we will try to illustrate how, through contents and methodologies, heritage and archeological research could be a privileged playground on which good educational practices, addressed to a heterogeneous audience, can be performed.

Not only the goal is to develop a critic approach to the study of past and present, but also, and mainly, let the consideration of cultural heritage be more aware and deeper like ktema eis aei, common base for a European society that, despite diversity, can identify itself in cultural values, made of rights and obligations, that make the essential foundation of a shared, democratic and peaceful future.

05 ARCHAEOLOGY AND THE TEACHING OF SCIENCE AT THE EARLY STAGES OF EDUCATION: THE EXPERIENCE OF THE PROJECT SCILIT

Author(s): Ruiz del Arbol Moro, Maria (Institute of History CSIC) - Gómez Díaz, María José - Cejudo Rodríguez, Salomé (VAOCC CSIC)

Presentation Format: Oral

The aim of our paper is to present the results obtained in an Erasmus+ Project coordinated by El CSIC en la Escuela Programme, a programme of the CSIC with more than 25 years of experience. The project, entitled "Scientific literacy at the school: improving strategies and building new practices of science teaching in early years education" (SciLit), has been carried out in collaboration with 8 partners of 5 European Countries (Poland, Estonia, Lithuania, Italy and Spain), between September 2016 and August 2018. Archaeology had a major role on it. Our presentation will focus on how Archaeology, as a Scientific discipline, has been approached within the project. More concretely, we will detail which contents and methodologies of archaeological research have been relevant in our training sessions with teachers (such as stratigraphy, context) and how our ideas and experiences have resulted in a teacher's guide to bring Archaeology at the classroom. Archaeology has several educational values and fits perfectly in the school curricula of partners. We will explain in which way carrying out Archaeology to the classroom has resulted in several benefits, such as better social integration of students; enhancement of the understanding of children's social and environmental background; and motivation through the development of transversal projects).

06 DOES IT MATTER?

Author(s): Vijand, Liia (University of Tartu)

Presentation Format: Oral

25 years ago I told 'hello' to every drunkard in my home village. I was raised to do that – to be polite and think that everybody is equal, although even then I knew it was not the case. In the present day I do not know the villagers anymore and I don´t say 'hello' to anyone. Community has changed, time has changed, and ideology has changed. What happened? And what has archaeology got to do with that?

Archaeology has good resources to introduce diversity and other cultural issues, giving the basis for learning empathy. Empathy, i.e. the ability to put yourself in another person's situation and consideration of the values of cultural diversity, is a skill in the Estonian

National Curriculum, which should be delivered to students. Already Wheeler noted that archaeology has 'social responsibilities and opportunities which can fulfill through school education…'. Building on the latter, my aim is to give a glimpse of the situation in Estonia: how archaeology is delivered there and how it supports empathy and diversity compared to the Soviet times.

It is common in Estonia that history teachers give citizenship lessons, which is a relict from the Soviet Era when history teaching and citizenship were closely linked to ideology. We like to think that Soviet times were bad, they were, but we can take some ideas, such as equality in a diverse community (what my home village had: Ukrainians, Georgians, Belarussians, Russians), to the present day and maybe saying 'hello' comes back to my home village.

In this presentation I will discuss, how link between archaeology and citizenship could help to deliver the messages of cultural diversity and empathy, and how important it is for the modern community to receive those messages despite the changed ideology.

07 ROCK ART AND GRAFFITI: SO FAR AND SO CLOSE

Author(s): Torres, Anna (La Roca dels Moros rock shelter)
Presentation Format: Oral

"Rock art and graffiti: so far and so close" is one of the five activities that constitute the educational project of the Roca dels Moros rock shelter. These activities aim to go beyond what is strictly the Cogul rock shelter and seek to connect rock art not only with the societies that created it, but also with the today's societies in which we live.

"Rock art and graffiti: so far and so close" is a bold, provocative and innovative educational activity that puts together rock art and graffiti, as an artistic expression of contemporary urban mural painting, not mere defacement and vandalism. Here we explore the need for human beings to publicly express ourselves, to share ideas, and to leave a trace in the places where we have been to. We discuss the meanings that different forms of expression acquire with time.

Following the methodology of Visual Thinking Strategies (VTS), different images of graffiti and rock paintings are presented to the students without providing them any details about the works. A series of questions are then introduced, prompting the students to formulate their own interpretations. Later, the educator progressively supplies additional information about the context in which the works were created, stimulating dialogue and discussion. The activity concludes with classmates sharing their learning experiences. The educator takes a bridging role facilitating the students' interaction with the paintings, promoting the acquisition of basic and transversal competences.

The main goal of this activity is to let students take the leading role, allowing them to formulate their own hypotheses and ideas about the past and the present. This set-up promotes critical thinking and reflection, and prioritizes the process of acquisition of new knowledge rather than the learning of any specific content.

08 FOLLOWING SIR GRAHAME CLARK TO PROVIDE A SENSE OF HUMAN SOLIDARITY THROUGH ARCHAEOLOGICAL EDUCATION

Author(s): Henson, Donald (University of York)
Presentation Format: Oral

A passionate advocate the role of archaeology in education was Sir Grahame Clark who wrote an article in 1943 which highlighted the ability of archaeology (described by him as anthropology and prehistory) to develop an understanding of common humanity and put right many of the ills that were plaguing the modern world. The specific context of his advocacy may have been during the Second World War yet his words still have potency today. The growth of a new right in Europe and elsewhere which emphasises national identity and intolerance of difference makes a mockery of the struggles of those who survived the calamity of the war to build a better world. In this paper, I will examine Clark's call and show the embedding of values within school curricula might make is possible to put his advice into practice within one national curriculum, that of England. Linking these values with the teaching of history, I will also show how we might do this using archaeological understandings of the Mesolithic period. I will give examples from teaching resources produced for the site of Star Carr in northern England. These seek to not only provide an understanding of Mesolithic hunter-gatherers as 'other' and different from ourselves, but also to highlight key issues that the hunter-gatherer lifestyle raises for our common humanity.

09 STARTING FROM SCRATCH – PUBLIC ARCHAEOLOGY IN RURAL FINLAND

Author(s): Moilanen, Ulla (University of Turku) - Närväinen, Ninni (Independent researcher)
Presentation Format: Oral

Muistojen ja tarinoiden Kangasniemi (Memories and stories from Kangasniemi) is a multidisciplinary project, that was established to study local cultural heritage, both tangible and intangible, in a small municipality in Eastern Finland. Since its first year (2015), the project has addressed several research topics, e.g. historical health tourism at a mineral spring and material culture of a rural upper-class settlement in the 18th and 19th century. From the outset our goal has been to get the local community interested in their own heritage. In our project we have introduced archaeological research and its methods to a group of people that have had very little prior knowledge and experience in it. It has been very important to us that people who participate can have a sense of contribution as actors in producing scientific information. In this paper we present some of the results we have had in getting local community engaged. Our excavations and events have attracted participants from toddlers to senior citizens and from school-

children to professionals. We narrate the successful aspects as well as the occasional difficulties we have had during this project. What archaeological and educational significance we have achieved so far? What have been especially valuable lessons to us? We also share the feedback we have been receiving since our first public excavations in 2015, especially from school children and their teachers, and discuss the pedagogical aspects of archaeological excavations.

10 USING THE LANDSCAPE AS A CLASSROOM - EXPERIENCES FROM AN EDUCATIONAL PROGRAMME ON THE GREAT NORDIC WAR

Author(s): Toreld, Christina - Nordell, Linnea (Bohusläns museum)
Presentation Format: Oral

300 years ago, the borderland between Sweden and Norway was a war zone. With different activities Bohusläns museum have recognised the memorial of the Great Nordic War, which culminated in the death of King Charles XII in 1718. Students aged 10-12 from the town of Strömstad, on the Swedish west coast, have participated in a cultural heritage educational programme, regarding the war and its local repercussions. Together with archaeologists, the students have discovered the remains of the war. They have climbed battery positions and run in trenches; they have visited the soldiers' camp site and visualised the Danish fleet lying in wait outside town.

Some remains are difficult to understand. Was this jumbled pile of stones really a part of the town´s defence? Despite the difficulties, we believe that the students have gained a deeper understanding of what happened in their town in 1718, other than what traditional history books can offer. By experiencing the physical remains it may become easier to understand this significant part of Sweden´s past. By activating all senses the historical events become tangible, real. Tasting the soldiers´ bread or holding archaeological objects once used by the townspeople helps in getting closer to what happened, closer to the people of the time. In reflecting on how it was when Strömstad was in the eye of the war, in discussing and nuancing the historical events, lies a possibility to problematize current events in today´s war stricken countries.

When we, the archaeologists, come and visit, we are on the students´ home arena. Their sensitivity, curiosity and empathy are tangible, as is their joy in using the outdoors as a classroom. Together we discover another dimension of their familiar grounds. History is present in the cultural landscape, open for anyone to visit and explore.

11 THE CAER HERITAGE PROJECT: CO-PRODUCTION WITH DISADVANTAGED COMMUNITIES

Author(s): Davis, Oliver - Wyatt, Dave (Cardiff University)
Presentation Format: Oral

The CAER Heritage Project has developed from humble beginnings in 2011 to be a major community heritage project in the UK. Focussed on the electoral wards of Caerau and Ely, two economically deprived, but heritage rich, suburbs of Cardiff, Wales, the project is a thriving collaboration between university academics, heritage professionals, community development workers and local schools and communities. From the outset, the project has been steeped in co-productive ideals and principles with the aim of addressing contemporary social and economic challenges through active participation in heritage, and particularly archaeological, research. In many ways the project objectives are not driven by the results of archaeological research, but rather on how such research might be employed to create educational and new-life opportunities in an area where such opportunities are few. The journey from project birth to maturity has been rewarding, but also challenging. As the winner of two recent community archaeology awards (Times Higher Education Awards 2017: Outstanding Contribution to Local Community; National Coordinating Centre for Public Engagement Engage Competition 2014 Award: Overall Winner), we now occupy a national stage. By drawing from the different perspectives of academics, community development workers and participants, this paper will use CAER as a case study to examine the potentials and problems of co-production of research with disadvantaged communities.

12 HEFA - ARCHAEOLOGY ACHIEVING WIDER SOCIAL AIMS BY RAISING EDUCATIONAL ASPIRATIONS IN TEENAGERS

Author(s): Lewis, Carenza (University of Lincoln)
Presentation Format: Oral

The Higher Education Field Academy (HEFA) is a unique WP programme intended to raise educational aspirations by involving young people in original archaeological research. Following a rigorously structured, collaboratively developed programme centred on test pit excavation, HEFA learners unearth, analyse and report on new archaeological data which advances scholarly knowledge of changes in settlement and demography over millennia. This forms the core of a cross-curricular, outdoor scheme of learning and research which aims to extend participants' knowledge, boost their confidence and build their confidence while also developing a range of identified cognitive, technical, social and personal skills vital to success in education and the workplace. Over twelve years, more than 6,000 learners in school years 8-10 have taken part in HEFA programmes over three days, most in eastern England. The archaeological outcomes of their excavations thrown new light on the development of historic settlements and been published in journals such as Medieval Archaeology and Antiquity and inspired thousands of member of the public to take part in community archaeology projects. Robust quantitative and qualitative data from learners and school staff demonstrates the capacity of the programme to inform, upskill and inspire young people. This paper will present the aims and outcomes of HEFA in England and invite delegates to

consider whether this model could work in other European countries.

13 INCLUSIVE HISTORICAL RE-ENACTMENT: MAKING VISIBLE THE SOCIAL DIVERSITY THROUGH THE PERFORMANCE OF THE PAST IN HERITAGE SITES

Author(s): Pérez Herrero, Clara (Museu Comarcal de l'Horta Sud) - Jardón Giner, Paula (Universitat de València) - Soler Mayor, Begoña (Museu de Prehistòria de València)

Presentation Format: Oral

Reenactment and the historical reconstruction of heritage sites, educational use-oriented, must represent the life in the past with the highest degree of rigor. However, they often reproduce important biases. The attraction of certain well-known historical characters (almost always masculine) and exceptional historical events, or the fact of reading the past with 'present eyes', leaves women, children, disabled or different people aside in heritage spaces.

The archaeological record shows a variety of evidence that allow us to analyze the diversity in societies of the past, as it has been made visible by Gender Archaeology. It is also possible to detect behaviors related to the management of otherness, the internal organization of the human groups, the status of certain individuals within them, or interaction between different groups.

Taking into account the results provided by a historical-archaeological research, we stand for the need of incorporating inclusiveness when dealing with the reconstruction of the past. In doing so, visitors can obtain images that are more in accordance with the social and cultural diversity of past societies.

Through the analysis of several cases of reenactment activities in heritage sites, we will emphasize both the problems and the questions that arise when turning archaeological knowledge into dramatic representations.

14 FOSTERING INCLUSION THROUGH PUBLIC ARCHAEOLOGY: USING ARCHAEOLOGY TO SUPPORT MIGRANT INTEGRATION IN SWEDEN AND THE UNITED STATES

Author(s): Westmont, Camille (University of Maryland)

Presentation Format: Oral

Anti-immigrant sentiments have been on the rise in both the United States and Sweden for the past two decades. In the summer of 2014, archaeologists from the University of Maryland (USA) began recruiting local high school students to participate in summer excavations at the site of a former ethnic enclave as a way of starting conversations about parallels between discriminations faced by both historic and modern migrant groups. Separately, an archaeologist from the project "Vems historia?" (Whose history?) (Sweden) hosted an archaeological project for local immigrant children to emphasize their connection to the land and their right to its heritage during the autumn of 2013. While conceived of independently and utilizing two different approaches, these projects both focused on heritage as a means to help integrate migrant children into new surroundings. In this paper, I discuss what was effective (and, in some cases, not effective) about our methods and discuss possibilities for future projects aimed at promoting ethnic inclusion through lessons garnered from the past. Ultimately, I seek to discuss the options moving forward for a social-justice oriented archaeology that specifically emphasizes the role that archaeology can play in alleviating social tensions during times of humanitarian crisis, migration, and culture change.

736 DAIRY AND PASTORALISM IN ARCHAEOLOGY

Theme: Theories and methods in archaeological sciences

Organisers: Wilkin, Shevan (Max Planck Institute for the Science of Human History) - Wright, Joshua (University of Aberdeen Department of Archaeology) - Hagan, Richard (Max Planck Institute for the Science of Human History)

Format: Regular session

The origins and spread of dairying and milk processing technologies in antiquity are an active and growing area of research interest for archaeologists and other scientists utilizing a wide array of well-established and emerging methods — both independently and in concert. To foster interdisciplinary discussions and continue the pace of methodological innovation, we are organizing a dairy- and pastoralism-focused session for the upcoming 2018 European Archaeology Association meeting in Barcelona, Spain. Our aim is to bring together researchers working in disparate geographical regions using traditional and novel methods to understand the histories of dairying in the following areas: Identifying archaeological milk products; linking early and modern forms of pastoralism to increased dairy consumption; reconstructing prehistoric dairy processing practices; revealing new insights in the gene-culture co-evolution of adaptations for lactase persistence and lactose tolerance.

01 PROTEOMIC EVIDENCE OF EARLY DAIRYING AT THE NEOLITHIC SITE OF ÇATALHÖYÜK, ANATOLIA

Author(s): Hagan, Richard (Department of Archaeogenetics, Max Planck Institute for the Science of Human History, Jena) - Knüsel, Christopher (UMR 5199 De la Préhistoire à l'Actuel: Culture, Environnement, et Anthropologie - PACEA, Université de Bordeaux,) - Haddow, Scott (Research Center for Anatolian Civilizations, Koç University, Istanbul) - Larsen, Clark (Department of Anthropology, Ohio State University, Columbus) - Trachsel, Christian - Grossmann, Jonas (Functional Genomics Center Zürich, University Zürich / ETH Zürich, Zürich, Switzerland) - Hodder, Ian (Department of Anthropology, Stanford University, Berkeley) - Warinner, Christina (Department of Anthropology, University of Oklahoma, Norman)

Presentation Format: Oral

Çatalhöyük is a key site in understanding early animal domestication in Neolithic Anatolia. The use of bovine bones as architectural adornment, as well as a large assemblage of faunal remains from sheep and goats, suggest a system of intense exploitation of livestock that served not only an economic function but also an ideological role. It has been argued that bovine remains from the site represent both wild aurochs (Bos primigenius) and domesticated cattle and that sheep formed the primary source of meat, but whether or not these animals were also exploited for milk production remains a debated topic. Mortality rate modeling suggests that dairying may have been practiced at the site, but direct evidence is lacking. Recent advances in the recovery and identification of ancient dietary proteins from human dental calculus have shown that proteins specific to dairy milk can persist for thousands of years. In this study, we investigate direct evidence for the consumption of dairy products at Çatalhöyük by performing LC-MS/MS analysis of dental calculus belonging to individuals excavated from the East Mound. Identification of two milk proteins in dental calculus—beta-lactoglobulin and alpha-S1-casein—indicates the consumption of both whey and curd proteins from the genera Bos and Ovis. These results suggest dairy products were produced and consumed at Çatalhöyük in the Neolithic.

02 SHEEP BIRTH DISTRIBUTION IN NEOLITHIC HERDS IN THE WESTERN ALPS USING THE TOOTH ENAMEL OXYGEN ISOTOPE RATIOS ANALYSIS: FIRST RESULTS

Author(s): Chiquet, Patricia (Muséum d'Histoire naturelle de Genève) - Knockaert, Juliette (University of York)

Presentation Format: Oral

Pastoral activity in the North-Western Alps is internationally renowned for its dairy produce. In temperate latitudes, sheep have a seasonal breeding round leading to births occurring later from winter to early summer. This characteristic induces seasonal variation in fresh animal products availability, in particular, milk. However, some current breeds have the capacity for out-of-season breeding, providing a longer period of access to key animal resources throughout the year. A recent study by Balasse et al. highlighted the presence of this trait amongst 5th millennium BC sheep herds.

Zooarchaeological and archaeological data suggest milk processing in the North-Western Alps during the Neolithic. The sequential stable oxygen isotope analysis in tooth enamel (δ18O) allows us to access to the information related to the season of birth of archaeological sheep. In this paper, birth distribution is investigated via the analysis of several sheep teeth from the Neolithic settlement of La Soie, located on a hill overhanging the alluvial plain of the Rhone (Valais, Switzerland). We aim to determine the period of birth and its duration within sheep herds to assess the organisation of Neolithic agro-pastoral activities in a mountain environment but also to apprehend the availability of fresh milk on a seasonal scale.

03 GRAZING REGIMES AND DAIRY FARMS DURING THE BRONZE AND IRON AGES IN MIDDLE SWEDEN

Author(s): Petersson, Maria (Arkeologerna, Statens historiska museer, Sverige)

Presentation Format: Oral

From the Late Bronze Age and Pre-Roman Iron Age (ca 800 BC – BC/AD) the archaeological record testifies of a well-organized grazing regime in Middle Sweden. Shepherds tended to the domestic herds, there were focal places where the animals were brought to rest and drink. Here fires were lit for cooking purposes and to chase off mosquitos. Some focal places are more elaborate with small huts and animal pens. The shepherds would guard the animals also during the night, rather than bring them back to the farm-toft. This grazing regime also encompasses out-door wintering for most animals.

Around the Birth of Christ the focal places of the grazing landscape go out of use. At the same time long houses with a proper byre section appear in the archaeological material, indicating an emphasis on dairy production at certain farms. Small houses at these farms are interpreted as cooking-facilities for dairy processing. Out-door wintering, however, with a more general approach to animal husbandry products remains the main strategy. This emerging specialization in animal husbandry is tied in with major changes in society such as a more pronounced stratification in society and a new system of land exploitation with large farms and small subordinate units was established. The population grew and labour intensive enterprises were undertaken. One example lies in the field of animal husbandry and dairy production. When the Early Iron Age society finally collapses during the 6th century, the described system of land exploitation and animal husbandry is abandoned.

04 HEIRLOOM MICROBES: THE HISTORY AND LEGACY OF ANCIENT DAIRY BACTERIA

Author(s): Hendy, Jessica - Rest, Matthäus (Max Planck Institute for the Science of Human History) - Reichhardt, Björn (Max Planck Institute for the Science of Human History; Faculty of Humanities and Social Sciences, Humboldt-Universität zu Berlin) - Tsolmon, Soninkhishig (Biotechnology and Nutrition Department, School of Industrial Technology, Mongolian University of Science and Technology) - Rosenstock, Eva (Institute for Prehistoric Archaeology, Freie Universität Berlin) - Makarewicz, Cheryl (Institute of Prehistoric and Protohistoric Archaeology, Christian-Albrechts-Universität zu Kiel) - Warinner, Christina (Max Planck Institute for the Science of Human History)

Presentation Format: Oral

Within and beyond the human body, human cultures enable microbial ecosystems to grow and thrive. This is particularly evident in the creation of dairy foods, where microbes play a central role in generating the enormous diversity of dairy products found around the world, impacting taste, aroma, texture and digestibility. However, modern dairy products in industrialized economies are highly regulated in order to maintain hygiene standards and reproducibility, leading to a striking reduction in the number of microbial strains involved in food fermentation. As a result of contemporary food globalization and industrialization, traditional methods of dairying and their unique microbial cultures are being lost at an alarming pace. In addition, the antiquity of this microbial manipulation remains largely unknown. We remain unaware of the vast microbial diversity involved in ancient food preparation, and the impact this microbial diversity would have had on flavours and textures. In response to these challenges and unknowns, the 'Heirloom Microbes' project explores the antiquity and anthropology of microbial manipulation, and characterizes the rich diversity of traditional microbial cultures. Here we present our project progress to date on investigating the culinary practices of small-scale nomadic pastoralists in Mongolia and the nutritional and microbial diversity of contemporary Mongolian dairy products.

05 INVESTIGATING THE EVOLUTION OF LACTASE PERSISTENCE IN EUROPE

Author(s): Gerbault, Pascale (University of Westminster; Department of Genetics, Evolution and Environment, University College London) - Powell, Adam (Department of archaeogenetics, Max Plank Institute for the Science of Human History) - Swallow, Dallas (Department of Genetics, Evolution and Environment, University College London) - Burger, Joachim (Palaeogenetics Group, Mainz University) - Thomas, Mark (Department of Genetics, Evolution and Environment, University College London)

Presentation Format: Oral

Lactase persistence is the continued expression of the enzyme lactase into adulthood. This derived trait occurs in about 35% of adults worldwide. It allows the digestion of lactose, the main sugar in milk, without symptoms of intolerance. This trait isn't homogeneously distributed, but occurs more frequently in populations with a history of herding and dairying, reaching a frequency of up to 95% in North-western Europe. It has been shown to be genetically inherited in an autosomal dominant manner. Although various DNA substitutions have been associated with this trait, in Europe, one major allele (-13,910*T) appears to be responsible for it. Interestingly, population genetic estimates of the age of this allele bracket the dates for the domestication of milkable animals, around 10,000 years ago. Natural selection has been invoked to explain such a recent allele age coupled with such a high frequency in North-Western Europeans. Computer modelling simulating the spread of this allele with farming, coupled with approximate Bayesian computation, indicated that this allele had been subjected to strong positive selection beginning Central Europe. We present an update of this simulation model to investigate whether this scenario still holds when recent information is taken into account, including ancient DNA -13,910*T allele frequencies and archaeological record of dairy fat residues.

06 EARLY DAIRY PASTORALISM ON THE BRONZE AGE MONGOLIAN STEPPE

Author(s): Warinner, Christina (Max Planck Institute for the Science of Human History; University of Oklahoma) - Jeong, Choongwon - Wilkin, Shevan (Max Planck Institute for the Science of Human History) - Bouwman, Abigail (Institute for Evolutionary Medicine, University of Zürich) - Hagan, Richard (Max Planck Institute for the Science of Human History) - Littleton, Judith (University of Auckland) - Makarewicz, Cheryl (University of Kiel) - Scott, Ashley (Max Planck Institute for the Science of Human History) - Frohlich, Bruno (Dartmouth College; Smithsonian Institution) - Hendy, Jessica (Max Planck Institute for the Science of Human History)

Presentation Format: Oral

The steppe belt that extends across Eurasia was the primary corridor of Eneolithic and Bronze Age migrations that reshaped the genetics of Europe and Asia and dispersed the Indo-European language family. Beginning in the Eneolithic, a new and highly mobile pastoralist society formed on the Western Steppe. These steppe herders expanded both westwards, contributing to the Corded Ware culture of Eastern and Central Europe, and eastwards, contributing to the mobile pastoralist Afanasievo, Sintashta, and Andronovo cultures. The eastern extent of this Western steppe herder expansion is not well defined. Here we investigate genome-wide ancestry data obtained from 20 Late Bronze Age khirigsuur burials from Khovsgol, Mongolia and further investigate evidence for dairy pastoralism by LC-MS/MS analysis of dental calculus. Overall, we observe limited Western Steppe gene flow into Late Bronze Age Mongolia, but a robust adoption of Western ruminant dairying. In total, we identify multiple protein sequences specific to Bos, Ovis, and Capra, and identified milk proteins include the whey protein beta-lactoglobulin and the curd protein alpha-s1-casein. No milk proteins were identified from other Mongolian dairy livestock such as horse, reindeer, or camel. Our results suggest that ruminant dairy pastoralism was established east of the Altai mountains by ca. 1500 BCE.

07 UNDERSTANDING ANCIENT MONGOLIAN DAIRYING THROUGH SHOTGUN PROTEOMICS OF DENTAL CALCULUS

Author(s): Wilkin, Shevan (MPI-SHH Department of Archaeology) - Myagmar, Erdene (National University of Mongolia) - Taylor, William - Ventresca Miller, Alicia (MPI-SHH Department of Archaeology) - Hagan, Richard (MPI-SHH Department of Archaeogenetics) - Trachsel, Christian - Grossmann, Jonas (Functional Genomics Center Zürich) - Boivin, Nicole (MPI-SHH Department of Archaeology) - Warinner, Christina (MPI-SHH Department of Archaeogenetics) - Hendy, Jessica (MPI-SHH Department of Archaeology)

Presentation Format: Oral

The use of mass spectrometry based proteomics presents a novel method for investigating human dietary intake and subsistence strategies from archaeological materials. Studies of ancient proteins extracted from dental calculus, as well as ceramic residues, have robustly identified both animal and plant-based dietary elements. Here we present a recent case study using shotgun proteomics to explore the range and diversity of dairying in the ancient eastern Eurasian steppe. Contemporary and prehistoric Mongolian populations are highly mobile and the ephemerality of temporarily occupied sites, combined with the severe wind deflation common across the steppes, means detecting evidence of subsistence can be challenging. To examine the time depth and geographic range of dairy use in Mongolia proteins were extracted from ancient dental calculus from 32 individuals spanning burial sites across the country between the Neolithic and Mongol Empire. Using liquid chromatography tandem mass spectrometry (LC-MS/MS) and annotated protein databases we identified numerous dairy proteins from multiple sources. Our results provide direct evidence of early ruminant milk consumption across multiple time periods. These data provide evidence that dairy foods from multiple species were a key part of subsistence strategies in the prehistoric Mongolia and add to our understanding of the importance of early pastoralism across the steppe.

08 MILK-BASED PASTORALISM IN EASTERN AFRICA: RESILIENCE AND RESISTANCE

Author(s): Gifford-Gonzalez, Diane (University of California, Santa Cruz)

Presentation Format: Oral

By favoring the survival of females for their potential to rebuild herds after catastrophic losses, African savannan and sahelian pastoralists were probably obligated to opt for dairying, as opposed to carnivorous livestock management, as a central animal subsistence adaptation. Milk based pastoralism can thus be viewed not simply as a subsistence choice but as the dry-land adaptation that offers herds and humans the greatest resilience in the face of the climatic perturbations typical of those zones. Molecular evidence from both ceramics and human genomics suggests not only the antiquity of dairy pastoralism's emergence in the grasslands of the then-green Sahara, as well as its independent, indigenous development during an epoch when the Sahara was beginning to dry. Recent zooarchaeological evidence from Kenya suggests that stone using, "Savanna Pastoral Neolithic" pastoralists were acquainted with iron tools well before their widespread adoption. This presentation makes the case that East African pastoralists may have resisted incorporation into contemporaneous orbits of iron-producing and iron-using migrants into the Lake Victoria region. By remaining with a largely stone-based technology, rather than readily adopting iron, as was the case with many hunter-gathers in Africa, pastoralists would have been able to maintain their traditional property relations and axes of social power.

09 THE ARCHAEOLOGY OF MOBILE PASTORALISM IN THE EASTERN STEPPE: THE STATE OF THE ART IN 2018

Author(s): Wright, Joshua (University of Aberdeen)

Presentation Format: Oral

What was mobile pastoralism in the past? The answer is very much a work in progress. Powerful ethnographic models and nuanced historical studies provide a vivid set of patterns for successful herding adaptations. As will all such analogies, multiple lines of evidence, hermeneutics and a critical awareness of the comparisons being drawn are key. Carefully built and supported analogies along with direct archaeological evidence of practice in the past are building up a picture of the context and medium of early pastoralist practice in the Eastern Eurasian steppe. From archaeological material culture, loosely connected communities of practice across large distances can be seen. The chronology of transition and spatial distribution is at some points rapid and at others punctuated. Models developed using global hunter-gatherer subsistence practice models raise the question of how important was early dairying in communities with long established subsistence traditions? Intensive regional studies provide evidence for social landscapes created by the interrelationships of humans and animals in which many species are active agents. Drawing on an increasing amount of detailed archaeological research in Mongolia and surrounding regions this paper will review some of the macro-traces of early nomads and present a narrative of adoption and adaptation of mobile pastoralism in Eastern Eurasia.

738 FROM CORRUPTION TO CONNECTION AND BACK. NEW ARCHAEOLOGICAL INSIGHTS IN THE MEDITERRANEAN SEASCAPES

Theme: Mediterranean seascapes
Organisers: Sebastiani, Alessandro (University at Buffalo - SUNY) - Vanni, Edoardo (University of Siena)
Format: Regular session

The Mediterranean has been a place of connectivity and mobility of people throughout all the ages. However, during economic crisis and migration period, this seascape has also been the lieu of political conflicts and geographical limitations. As contemporary facts highlight, mobility (and its related connectivity) has been questioned by the recent crisis of Europe together with the geo-political instability of those countries facing the Mediterranean. In order to retrieve a sense of resilience, we as archaeologists, have to contribute through an analysis of historical migration processes, mobility of goods and interconnectivity of social cultures.

This session aims to collect a series of reflections about the Mediterranean as a peculiar space of interactions in terms of politics, economies and social communities. Contributions focusing on the connectivity and mobility across the Iron Age to late Medieval Mediterranean are welcome. Particularly, we welcome papers inherent to these topics: i) Historical migration processes; ii) Material cross-cultural interaction; iii) Material and social integration in the Mediterranean; iv) Trans-maritime and cabotage movements; v) Resilient approaches to connectivity; vi) Interconnectivity among rivers, sea and islands; vii) Ecological changes in relationship with mobility across Mediterranean.

ABSTRACTS

01 INTRODUCTION OF SESSION#738

Author(s): Sebastiani, Alessandro (University at Buffalo - SUNY)
Presentation Format: Oral

The aim of this short paper is to introduce the session "From corruption to connection and back. New archaeological insights in the Mediterranean seascapes" to all the speakers and presenters. The main topics of the different proposed papers will be briefly summarized in order to provide a sense of the session. Each presenter will be properly introduced as well as the topic of the presentation. A general overview of connectivity and corruption in the Mediterranean seascape will start the session. The introduction will also advise the presenters about the possibility of publishing the results of the discussion of the different papers in a peer-reviewed monograph and to let them know about the criteria upon which the papers will be accepted.

The subsequent beginning of the presentation will follow this proposed thematic approach:

i) Historical migration processes;

ii) Material cross-cultural interaction;

iii) Material and social integration in the Mediterranean;

iv) Trans-maritime and cabotage movements;

v) Resilient approaches to connectivity;

vi) Interconnectivity among rivers, sea, and islands;

vii) Ecological changes in relationship with mobility across the Mediterranean.

At the end of the introduction, the session will start regularly by proceeding with the first accepted paper. A certain amount of time will be allocated for quick questions at the end of each paper.

02 THE GIANT SQUID IN THE ACQUARIUM. DEBATING CORRUPTION IN ARCHAEOLOGY: A STORY OF MEDITERRANEAN CONNECTION?

Author(s): Vanni, Edoardo (University of Siena)
Presentation Format: Oral

Nearly eighty years after the publication of Fernand Braudel's first great book, and some sixty years after the Mediterranean became a major category in anthropology, questions and history about the Mediterranean continue to trouble and intrigue us. In 2000 the book The Corrumpting Sea: A Study of Mediterranean History written by Peregrine Horden and Nicholas Purcell challenged the Braudelian categories on Mediterranean. Until this massive and impressive work no one ever published a book about the ancient history of the Mediterranean as distinct from history in the Mediterranean (a distinction, as we shall see, is not without problems). In other words no one had written a book in which the sea and its coastlands had been the central object of enquiry, as distinct from the human activities that took place there in ancient times. From this moment the Ecological History appears in the scene of Archaeological and Historical reconstruction of Mediterranean as well as the hermeneutic concepts of micro-regions, mobility, risk and crisis and resilience. Every work on Mediterranean is constant reference, often admiring, sometimes critical, to The Corrupting Sea as an elephant in the room or (let me say so) a giant squid in the acquarium. After almost 20 years of corruption how useful is the Mediterranean Seascape as an intellectual construct? And how should it be studied? Which is the health of Mediterranean as category? How

the Archaeological narratives have changed our present perception of Mediterranean? Could the history of Mediterranean enlighten the actual social and economic crisis of this region? At which extend the history of Mediterranean could be use as political paradigm for a comparison with the actual situation in this region?

03 THE PHAEACIAN MIGRATION: ANXIETIES OF MOBILITY IN ARCHAIC GREECE

Author(s): van Veldhuizen, Michiel (Brown University)
Presentation Format: Oral

The mythical Phaeacians were imagined in Antiquity as the seafaring people par excellence, facilitating mobility across the Mediterranean (Cook 1992; Dougherty 2001). For audiences of the Homeric epic in the Archaic period, the Phaeacians and their magical ships represented an idealized version of the benefits of trans-Mediterranean conveyance and connectivity (Hom. Od. VI-XIII). In the Classical period, the Corcyraeans, whose island was identified with Homeric Scheria, looked to the Phaeacians to reinforce their identity as a naval superpower (Thuc. 1.25.4; Antonelli 1995). Rather than claiming common ancestry, the Corcyraeans focused on the Phaeacians' proenoikesis (previous habitation) of the island. By examining ancient material and geographical horizons of the mythical Phaeacian past, I argue that the "myth-history of Phaeacian migration" offers a lens through which to examine ancient anxiety about trans-Mediterranean mobility and connectivity (Ahl and Roisman 1996). Phaeacian culture and politics closely mirror that of the Panionian league, thus suggesting a historical connection with Ionian seafarers and migrants (Frame 2009). The Phaeacian migration falls into three stages typical of Greek "colonization" in the Archaic period: geo-political conflict; founding of a new town; renewed mobility. The new Phaeacian settlement demonstrates the principle advocated by Horden and Purcell (2000) that the town, rather than an absolute geographical marker, is but a node in a fluid network of connectivity (cf. Porciani 2015). However, the Phaeacians end up being prohibited to resume their conveyance, cut off from any further relations. The debate in Antiquity whether the Phaeacian city is ultimately destroyed or not reflects the anxiety of disrupted mobility. I suggest, therefore, that the horizon of the Phaeacian migration, embedded in the "mnemonic landscape"—or, rather, seascape—of the Mediterranean (Hamilakis 2013), transmits not only idealized mobility but also the anxieties associated with its potential disruption.

04 FROM COLONIALISM TO CONNECTIVITY: ROMAN REPUBLICAN IMPERIALISM AND THE TYRRHENIAN ECONOMY

Author(s): Collins-Elliott, Stephen (University of Tennessee, Knoxville)
Presentation Format: Oral

The development of commercial routes in the central and western Mediterranean from the late third and second centuries BCE onward has long been seen as a product of Roman imperialism, a result of the victories over Carthage and the need to supply armies on campaign. The connectivity of the central Mediterranean however long precedes Roman military adventurism, and thus raises significant questions about the degree to which the Roman state should be considered to have impacted or changed the normal flows of trade and consumption in Italy and the west. Quantitative measures of scale and extent are therefore necessary, beyond the level of the artifact type or distribution map, using models developed through categorical data analysis to compare the composition of archaeological assemblages. Amphorae and tableware, the mainstay of evidence for maritime trade, can thus serve new methods to measure the mass distribution of commodities and the habits of consumption, to see whether Roman military assignments within and beyond Italy--the Republican provinciae--can be viewed as epiphenomenal to long-term economic trends in the central Mediterranean, or whether they are formative in creating a "Roman" economy. A picture of economic relationships around the Tyrrhenian basin and the western Mediterranean may thus be built from the bottom-up, to inform, rather than assume, the place of state-level operations within the Mediterranean economy, and how those operations are conditioned by wider patterns of human mobility and interaction. These issues bear directly on the way in which the Roman state established itself as imperial power, as consumer-driven explanations of material culture change have begun to supersede older colonialist narratives in scholarship.

05 ETHNIC IDENTITIES AND MOBILITY BETWEEN THE MAINLAND AND THE TUSCAN ARCHIPELAGOS: THE CASE STUDY OF POPULONIA AND THE ELBA ISLAND

Author(s): Di Paola, Giorgia - Pagliantini, Laura (University of Siena)
Presentation Format: Oral

Populonia was a multi-ethnic city starting from its origins. Indeed, people coming from Etruria, Sardinia, Corsica Island, Syracuse, and perhaps the Phoenicians too, made theirs'contribution to the beginning of the city. This particular situation reflects on both archaeological records from Populonia and Elba Island, where the presence of a Corsican community could be detected by some analogies concerning ritual aspects and toponyms. Since some recent archaeological digs dated the Populonia upper wall circuit to the beginning of the III century B. C., we can presume that the centre was a particular port of trade city for a long time. Starting from the Archaic period, Populonia marked its territory with specific type of sites, such as sanctuaries and hilltop fortresses, as well as other Etruscan centres. In particular, the striking hilltop fortress system included land on both the Italian peninsula and the island of Elba, and functioned as an overall unitary system. The hilltop fortresses would have come about in response to an imminent military threat or to the various phases of imperial expansion, particularly on the part of the Romans. These fortifications were often abandoned after such threats had passed, but while in use they constituted a network of constant and widespread surveillance both around Populonia and on the island of Elba. Hence, aside from exhibiting close typological and functional characteristics, these

fortified settlements constituted a well structured system that exercised control over their respective areas as well as the mineral, agricultural, maritime resources within the territory of the city and the Elba Island too. In this paper we will present results of two PhD researches, focusing on the longstanding interconnectivity between the mainland of Populonia and the Elba Island, detectable on ethnic identities and analogies in material cultures, funerary practices and military buildings techniques.

06 QUO VADIS: RECONSIDERING SARDINIA'S CONTACTS WITH TIRRENIC COASTAL LANDINGS

Author(s): Hobart, Michelle (The Cooper Union for the Advancement of Science and Art)
Presentation Format: Oral

Ports, harbors, and coastal cities change continuously through time, not only because of the natural course of history but because their features are perennially reshaped by the water and powerful tides whose actions continuously transform the coast line through corrosion or silting. Some eventually are destined to fall into oblivion. A number of Classical and Medieval ports and/or harbors in Sardinia suffered this ignominious fate and are now long forgotten.

This paper, then, will discuss the Sardinian island from the point of view of its coastal settlements and ports, since it is these that rendered it an economic center of the Mediterranean. Sardinia, as the second largest island after Sicily, has a long and unique history; its geographic placement emphasized transit, while its raw materials attracted all kinds of sea faring nations.

In particular, I am interested in bringing together evidence from the late antique periods from the harbor cities of Cagliari, Porto Torres, Olbia, and Alghero to chart new lines of inquiry so that we may go beyond the documents and portolani. Fortuitous recent discoveries of late antique and medieval abandoned shipwrecks along the coast of Sardinia, will provide comparanda with medieval excavations elsewhere in the Mediterranean; such comparisons are necessary to better understand the sea presence and/or absence of the many different seafaring cultures that explored this central island; such as Germanic or possibly Lombards and Carolingians explorations (?), North African migrations, and finally the Catalan Aragonese. The data collected will be addressed in particular to better understand the contacts between Sardinia and Tuscany. Careful consideration of the archeological record will allow us to have a clearer picture of the role that Sardinia held in the large economic network of the Mediterranean, in a manner that documents cannot fully highlight.

07 WHY A ROMAN FORTRESS AT POGGIO DEL MOLINO?

Author(s): Megale, Carolina (Università di Firenze)
Presentation Format: Oral

The study of the fortified maritimae coloniae of Lazio and Campania (between 4th and 3rd century BCE) is a prime example of how Roman conquerors demonstrated their political power over a regional populace.

The construction of strategic-military structures along the Tyrrhenian coast were used to maintain their direct control over the territories, ports and access roads throughout the hinterland. This was part of a coordinated system for capillary control along the coast, buildings such as fortified sanctuaries, coloniae civium romanorum were used in tandem to solidify the Roman control.

In Etruria, a similar strategic-defensive design has been identified along the connecting countryside of the road Via Aurelia Vetus, from Rome to the military colonies of Cosa and Pyrgi, and of Aurelia Nova at least for on the region between Cosa and the allied civitates of Populonia and Pisa.

The strategic-military interventions and the accompanying political propaganda were systematically deployed by the Romans following the conquest of a new territory. This changed the ancient landscape in a profound and irreversible manner, leaving footprints of massive archaeological significance, particularly in cases where information from the written sources are extremely rare or descriptively limited.

The study of the Roman settlement of Poggio del Molino, when linked to its historical and geographical context, could bring forward new elements for a fuller understanding of the geopolitical status of Populonia in the aftermath of the Roman conquest.

08 INTERCONNECTED MOBILITY ALONG THE RIVER OMBRONE IN THE ROMAN PERIOD

Author(s): Sebastiani, Alessandro (University at Buffalo - SUNY)
Presentation Format: Oral

The aim of this paper is to investigate the interconnected economic and settlement relationships along the flow of the river Ombrone (south Tuscany) during the Roman period.

Drawing from the results of the Alberese Archaeological Project and those of the IMPERO Project, the paper will analyze settlement networks and economic facilities that shaped the middle valley of the river and its final section at the coast.

The area of Alberese, set along the Tyrrhenian coast, has been the focus of several years of archaeological research; here a number of Roman sites have been investigated, providing a firm reconstruction of the landscape and its use between the 3rd c. BCE and the 6th c. CE.

At the same time, archaeological excavations in the modern Commune of Civitella Paganico (Grosseto - IT) are shaping new interesting data for the settlement network from the late Etruscan period to the years of the Second Civil War. Here a sanctuary area, with a related vicus, is currently under investigation, together with the remains of a medieval Castle. These provide a preliminary attempt

to understand human presence in this territory and how settlements were taking advantages of the nearby river Ombrone, as well as of the mainland road system.

The paper will articulate a tentative approach to the study of this part of Roman Etruria in the lights of interconnected economic and settlement networks.

09 CONNECTIVITY AMONG TRANSHUMANCE, CULT PLACES AND SAMNITE FORTIFIED SETTLEMENTS IN MOLISE (ITALY)

Author(s): Trotta, Valentina (Ministry of Cultural Heritage and Activities and Tourism - MiBAC)
Presentation Format: Oral

The transhumance is a seasonal movement of sheperds and their flocks from one pasture to another, along landscape tracks (the so-called tratturi), originated by the transition in the natural and the trampling of cattle. In Molise (Italy) grazing- places already existed since the first millennium BC and the tratturi, well attested in the Roman Republican times, probably took the place of more ancient routes of transhumance.

Therefore, these paths have crossed the landscape for millennia, creating connectivity different societies, economies and traditions.

This paper focuses on the ancient Samnium in central Italy in the last four centuries BC, where the archaeological evidence shows a large number of hill-forts with a single, double or triple polygonal wall circuits. Scholars often connect these fortified settlements - built with the same construction technique- to the control and the management of the transhumance routes, although they may different in function, typology and chronology.

Through the study of the Samnite archaeological sites, the historical cartography and the use of spatial analysis in GIS, this article discusses the relationship between hill-forts, rural cult places connected to transhumance and the tratturi, in order to understand the settlement networks, the defensive strategies, the exploitation of economic, rural resources, and the commercial activities in the pre-Roman and Republican periods.

10 TRANSHUMANCE ROUTES AND ARCHAEOLOGICAL SITES. A CASE STUDY IN WESTERN SICILY

Author(s): Trotta, Valentina (Ministry of Cultural Heritage and Activities and Tourism - MiBAC)
Presentation Format: Oral

This paper examines the transhumance routes called trazzere in the territory of Calatafimi-Segesta (TP). Systematic analysis of historical maps from the 15th to 19th century has allowed the identification of paths of these trazzere between the hills and the coast, as well as their relationship with other trails and springs. Furthermore, our study of 18th and 19th century place names suggests the presence of activities related to the movement and sale of livestock. With this evidence, it is possible to reconstruct the evolution of these trazzere, starting back from the modern age. The goal is to archaeologically ascertain the origins of these paths, as progressive modifications due to changing economic necessities have shaped their layout over the centuries. In order to determine how the trazzere developed, the routes were overlaid with the Topographical Units of the Calatafimi- Segesta Archaeological Map, showing geographical and typological connections with the archaeological evidence. Using this methodology, it can be argued that, starting from the Hellenistic period, farms and rural villages were placed along the trazzere, which confirms the ancient origins of the transhumance routes. Loom weights were found in some of these Hellenistic sites, suggesting the processing of wool and the practice of transhumance as part of the economical practices of the area.

739 REFLECTIONS ON ARCHAEOLOGICAL TOURISM IN THE MEDITERRANEAN AREA

Theme: Archaeology and the future of cities and urban landscapes
Organisers: Chatzikonstantinou, Katerina (MoNUmenta for the protection of natural and architectural heritage in Greece and Cyprus) - Martín López, David (Department of Art History, University of Granada) - Lekakis, Stelios (Newcastle University; MONUMENTA)
Format: Regular session

Tourism has become a critical shaping force for contemporary socio-economic urban landscapes and a central strategic focus in regeneration policies. Mediterranean cities are currently affected by the tourism industries in particular ways. Their rich cultural and archaeological heritage plays a twofold role in the touristic urban development. On the one hand, it comprises an integral part of the identity of the place and, on the other, it serves as a powerful incentive for the tourist attraction of many cities. In this context, the narrative of the past is often re-contextualized through contemporary tourism practices, including the 'disneyfication' of archaeological sites, one-dimensional heritage interpretations of contested sites, and the superficial 'museumification' of cities. This session aims to discuss the different preservation strategies employed in the re-branding of heritage for tourist purposes in the Mediterranean by both the state and private stakeholders. In particular, we would encourage papers that explore topics such as the distinct socio-political and economic circumstances behind national tourism development policies that include archaeology in them; and papers that provide an overview of the international relationship between overseas heritage management politics, urban development and the expansion of tourism. We also welcome contributions analysing the origins of tourism

urban planning and new approaches of heritage management. Finally papers debating on the success or failure of archaeological tourism in regeneration policies are also encouraged to contribute to this session. Contributions that offer comparative perspectives, especially across countries are especially welcome.

ABSTRACTS

01 COMMUNITY- BASED MANAGEMENT IN WORLD HERITAGE SITES: CASE – STUDY OF GIZA WORLD HERITAGE SITE

Author(s): Alhadad, Esraa (BTU- Cottbus) - Moustafa, Ahmed (NMEC Museum, Egypt)
Presentation Format: Oral

Recently, local communities are considered as partners in the site management worldwide, as a main stakeholder especially in the WHS"s, not only in the management, but also in the nomination, heritage processes and tentative lists. Heritage has been playing important role in enhancing and strengthen the community attachment and social capital through the shared values, identity and develop new approaches for tourism development at the same time.

Although applying different community- based management systems are not common in many countries, applying different heritage management approaches and strategies has always been successful. Since local management is a process in which local community level of involvement increase, the level of empowerment, responsibilities a long side formal local government get more and more developed. In sequence, any sustainable development project, if it has no local participatory elements are considered as failures. In different words, community involvement in cultural and touristic activities can strongly develop the socio- economic levels of the locals.

One can ensure that the community involvement in the management processes is one of the best outcomes of democracy that could be given to the attached community. Parts of the contributions and benefits of the participation are represented in various aspects, like: strengthen the social capital, social cohesion, development, democracy and other benefits for individuals as it will be discussed in the paper.

This paper addresses the community- based legal systems, heritage values and significance, how to manage the heritage resources as sustainability enablers and how this effect on the cultural heritage tourism management and sustainability. The methodology is a single case- study addressing the community- based management situation in one of the World Heritage Sites in Egypt, which is Giza platue and ending with strategies and recommendations towards socio- economic sustainable development and effective management approaches in archaeological touristic sites.

02 AMONG HERITAGE SITES, LOCAL IDENTITIES AND NEW TOURIST REALITIES: THE SANCTUARY OF PANÓIAS AND THE TIME OF ÉVORA

Author(s): Teixeira, Rute (Rute TEixeira)
Presentation Format: Oral

Contemporary literature allows us to understand that several theorists from the most diverse scientific areas have studied the intrinsic relation between Cultural Heritage and Tourism, since the Contemporary Society finds a greater affinity between both, due, on the one hand, to the value timeless and unequaled, transmitting historical and ethnographic criteria; on the other hand due to a creative economy resulting from a tourism development that was carried out around a patrimonial activation, through which the regions studied will be analyzed through its economic growth and cultural dynamization.

In this way one of the premises that one intends to analyze in this investigation is the relation. One of the most pertinent premises that I intend to explore in this research is the fact that cultural tourism and the way it is appropriated (re) meanings that Heritage has acquired over time. In this sense, two Roman Heritage Sites will be comparatively analyzed: Panóias Sanctuary, Roman Temple of Évora (Portugal) at the level of tourism development of the regions, their contributions to the patrimonial increase in the local communities through tourism, as well as, the economic dynamization of each of the regions.

To do this, we will take into account the fundamentals of the selection of cultural assets that stand out in both locations, as tourist attractions generating a creative economy and cultural dynamics. It will also be analyzed whether between Évora and Vila Real there is a discrepancy between the tourist value attributed to the Heritage, that is, to the symbols, meanings, beliefs and customs of the local community, because not all cities have turned these places into attractions and tourist destinations.

We will seek to discuss benefits of tourism in local communities, providing them with the means and motivation to take care of their Heritage and boost the local economy.

03 HERITAGE FOR US AND HERITAGE FOR THEM. UNDERSTANDING AND USING MONUMENTS IN GREEK ISLAND DIALECTICS

Author(s): Lekakis, Stelios (Newcastle University; MONUMENTA)
Presentation Format: Oral

This paper discusses the distancing of the Greek public from its archaeological heritage and the role of superficial, touristic narratives cultivated in the local context as a response to the omnipresent touristic gaze and as a means of rapprochement. We will be focusing on the islands of the southern Aegean and especially the Cyclades. Within this context and drawing from the author's experience of working for the Greek non-profit organization MONUMENTA on the island of Naxos, we will be discussing different appropriations of ancient monuments and the relevant narratives of the locals, destined towards the public sphere (national and international) or the private worlds of local communities. How do these narratives interpret the monuments, what do they highlight and how are they interacting with the official management of cultural heritage, as organised by the national authorities. What is their role in the shaping of the rural and peri-urban landscape of the islands and what do they mean for the perception of monuments by the coming generations? Can this body of knowledge –in its historicity- help us organise more strategic and sustainable management practices for the monuments? This paper is part of a monography on the "hidden landscapes of Naxos" to be published in 2019.

04 WHEN ARCHAEOLOGY HAS BEEN LEFT ASIDE: VENICE, CULTURAL HERITAGE AND GLOBAL TOURISM

Author(s): Calaon, Diego (Ca' Foscari University, Venice)
Presentation Format: Oral

Europe is vigorously promoting the role of cultural heritage, acknowledging its role in creating and enhancing EU's social capital. Nowadays, at the local level, the EU call has not the same vigor as it has some decades ago: immigration issues, anti-immigrant policies, and a general budget reduction in the cultural industry is affecting the practice and the policies around the "heritagization" processes. Traditional and orthodox approaches to the conservation and the construction of historical narratives are confronted to new global changes. One of the main reason is the fast transformations of the societal composition: traditional conservation practices are not sufficiently equipped to sustain this confrontation. Local communities seem relatively disempowered to preserve the heritage and build new negotiated identities, also encompassing new people and new needs. In this framework, global tourism industry, with its power in warranting jobs and revenues, acts as a factual policy-maker.

How can we established pragmatic, practical social science instruments for practitioners and scientists, to include ways to significantly implement participatory research and warranty sustainability in the global tourism market?

Venice is a key test-case to study the effect of the orthodox idea of cultural heritage conservation and its consequences in the framework of a rapidly growing global tourism. Venetian heritage attracts a large number of tourists daily: in Venice, a substantial proportion of the population literally live by selling the uniqueness and beauty of the city. As archaeologists, we need to investigate the social and political value system put in place in relation to the archaeological research, heritage management policies, and the potential for future sustainable growth. The increasing touristic influence, and indeed, the commodification of local cultural heritage is increasing the pressure on the fragile Venetian ecosystem, largely affecting the fragile archaeological one.

How can archaeology help to safeguard the lagoon system?

05 CAN ARCHAEOLOGICAL TOURISM CONTRIBUTE TO THE SUSTAINABLE MANAGEMENT OF IMMOVABLE HERITAGE OF URBAN REGIONS? REFLECTIONS ON THE CASE OF MADRID

Author(s): Ruiz del Arbol Moro, Maria - García Basanta, Sonia (Institute of History, CSIC)
Presentation Format: Oral

The aim of this paper is to present our work within the R&I project "The heritage ensembles as tourist assets in the Community of Madrid. Problems and opportunities into a territorial perspective", coordinated by the University Complutense of Madrid and developed by five research teams from the aforementioned university, the Polytechnic University of Madrid and the Spanish National Research Council (CSIC).

The region of Madrid is one of the biggest tourist regions of the country, with an estimated influx of around 14 million tourists a year. As in other European regions, tourists make an intensive use of immovable heritage which responds to different origins and presents a wide range of typologies. Of particular interest to our work at CSIC are several elements of territorial character located in the rural areas surrounding the city of Madrid (such as cultural landscapes, areas of archaeological interest, historic sites and territories). This heritage acts as a reference of regional identity and provides a quality environment for the local population; moreover, it is required to become an asset for the development of the region through its tourist use.

Our research work within this project aims to develop innovative, locally oriented and culturally and socially sustainable strategies, for a better use of heritage ensembles, maximizing their participation in the touristic attraction of the region and, therefore, contributing to its development. We will present our approaches and results to contribute to the debate on the role of archaeological tourism in the territorial policies of urban regions.

06 SICULI - HELLENISTIC AND ROMAN SETTLEMENT AS A NEW ARCHAEOLOGICAL TOURISTIC DESTINATION

Author(s): Kamenjarin, Ivanka-Katya (Muzej grada Kastela)
Presentation Format: Oral

Siculi is an archaeological site in the western part of Kaštela Bay, Croatia. It is an ancient settlement which can be dated from the second century BC to the fifth century AD. It used to have a harbour, city walls and an orthogonal street layout in its first phase, which is also the best preserved and most analysed phase of the settlement (2nd-1st century BC). The site is considered important not just for the local history, but also as a possible key element in understanding the final phase of the Hellenistic colonization on the eastern coast of the Adriatic Sea.

The Museum of Kaštela has been researching this site with a varying intensity for more than 25 years. Thus far, approximately 2.000 m2 have been uncovered. Today, the hotel complex 'Resnik' is located in the area.

All these factors have led to the idea of establishing an archaeological park. Part of the excavated site is on display, while the other part is covered. One of the steps towards founding the park is associating the hotel complex with the archaeological site. Therefore, the Museum of Kaštela joined forces with a travel agency in order to bring people (primarily students of archaeology and similar disciplines) to the site during the excavation season. They are allowed to do a bit of excavation on the site, under the supervision of professionals, and experience what it is like to be an archaeologist. Furthermore, tourists are introduced to all aspects of archaeological fieldwork and the work done in museums. Another workshop is addressed to schoolchildren and includes an old wooden ship from the 19th century, the museum and a site where pupils 'excavate' replicas found at Siculi.

This paper will present both good and bad experiences that came out of these two workshops.

07 ARCHAEOLOGICAL PARK EMONA: MANAGING HERITAGE IN A MODERN CITY

Author(s): Zupanek, Bernarda (Museum and galleries of Ljubljana)
Presentation Format: Oral

In the centre of Ljubljana, the capital of Slovenia, are several remains of a Roman colony Emona. Those remains, on several unconnected locations in the modern city, are since 1960ties organised as Archaeological park Emona. During the decades, the park has become a part of the urban landscape of Ljubljana, with some recognisable monuments, and several almost unnoticable.

During the project of renovation and revitalisa¬tion of the Park in 2011-2012, several key changes and im¬provements have been made. We emphasized the importance of heritage interpretation, communication and accessibility, key tools for involving the broadest section of the public with the in situ heritage of Roman Emona, and for tourism development, in accordalnce with the Municipality of Ljubljana long-term programme.

When renovating, and now, almost a decade later, we are encountering several key questions for Archaeological park Emona, and, we believe, for urban archaeological parks as whole. How to make an archaeological park, conceptually rooted in 1960-ties and 70-ties, meaningful today? How to balance the desires of different stakeholders (Municipality of of Ljubljana, Institute for Heritage protection, different cultural institutions,...)? How to become a part of a sucessful touristic destination that Ljubljana now is? How to gain visitors' interests with all the concuring events and attractions in the capital?

740 GLOCAL IDENTITIES - DIFFERENT VALUES OF CULTURAL HERITAGE SITES

Theme: Archaeology and the European Year of Cultural Heritage
Organisers: Loew, Carmen (Kuratorium Pfahlbauten - UNESCO World Heritage Prehistoric Pile Dwellings around the Alps) - Dworsky, Cyril (Kuratorium Pfahlbauten - UNESCO World Heritage Prehistoric Pile Dwellings around the Alps) - Veranič, Dejan (UNESCO kolišča na Igu,JZ Krajinski park, Ljubljansko barje) - Granier, Fanny (Ministère de la Cutlure, DRAC Auvergne-Rhône-Alpes)
Format: Regular session

Archaeological cultural heritage sites may embody an interesting range of roles in society beyond their purely scientific value. Besides the historical worthiness mostly the touristic value is looked at. Albeit more and more it is recognized that heritage sites have an immediate significance for the people who live in their environment beyond the economical valorisation. E.g. culture as driving factor for identification is one of the main policies of the EU for structural cohesion amongst the member states. In the framework of UNESCO World Heritage sites, a local significance of heritage is being broadened by a global claim of importance and responsibility. In line with the UN's organizational objectives, the World Heritage Program was designed to connect people across borders and make an active contribution to solidarity on all levels.

The purpose of this session is to present examples of how cultural heritage sites express their meaning beyond their economic impact within their local community and in particular reach out on a transnational level to overcome cultural and language barriers to invite people to share their common heritage. Amongst others, it shall be discussed which are the preconditions for a suitable site management so that cultural heritage can fulfil this function. To which extent can local communities contribute to this goal themselves? Which barriers should be removed in the future and which bridges already facilitate transnational exchange?

01 HERITAGE SHALL BE OUR LEITMOTIF!

Author(s): Dworsky, Cyril - Loew, Carmen (Kuratorium Pfahlbauten)
Presentation Format: Oral

The interpretation and communication of our shared heritage is a major challenge for many UNESCO World Heritage sites. There is a fundamental contradiction between the wish of an increased „meaningfulness of heritage" on a personal level and a global perspective and intergovernmental policies. Both approaches comply with the agenda of organizations like the UNESCO or also the European Union for sustainable development of civil society. But still personalization and localization on one side and the valuing and linking of a shared heritage beyond boundaries of language, borders and regions on the other side are difficult to match.

The aim of this paper is to evaluate how a bottom-up empowerment of individual people and a top-down narrative and communication can resolve this contradiction. Is this a promising strategy or do we need more refined concepts and a more multidimensional approach involving different methodologies and a new thinking about cross-cutting themes beyond heritage?

To establish a comparability and foster mutual learning from already existing approaches for the conveyance of the common cultural heritage we will look on various sources of information. For this reason we designed an online survey and questionnaire to assess the concepts and management structures of heritage sites around the globe. The results of this survey with a first focus of transnational UNESCO World Heritage sites and also based our own experience in a network of various organizations and stakeholders within the management of the World Heritage of Prehistoric Pile Dwellings around the Alps will be analyzed and presented. We will specifically focus on well proven concepts and the available tools in the communication of our shared heritage and assess the transferability in other heritage contexts.

02 WARHORSES TO BE PROUD OF

Author(s): Soeters, Gilbert (Municipality of Maastricht)
Presentation Format: Oral

In 2010 during a large excavation at Maastricht-Borgharen (NL) a mass grave of 65 horses was found. It is still the largest grave of horses ever found in Europe and scientifically speaking a real "Fundgrube"! The grave dates to the 18th century and is part of the military history of one of the many besieges of the fortification of Maastricht. On one afternoon over 1000 people visited this spectacular find. The media was of course also very interested and there were broadcasts on local, regional and national television and radio, but also on the regional radio from the neighboring countries of Belgium and Germany. There was even a little article in the Washington Post about it! For a short moment in time the little village of Borgharen was in the focus of the world press! The people of the village of Borgharen became very proud about "their horses" and wanted to express this pride in a proper and sustainable way. The "Buurtraad Borgharen", a local committee, started to write letters and e-mails to the local politicians and all the other parties involved in this excavation. Several ideas were launched to commemorate this important find. Some of the ideas were rather unrealistic because of the immense costs involved. But the locals never gave up….started fundraising and a charm offensive and eventually found a way to express their pride in a satisfying way.

03 IF ROME COSTS THE PRICE OF A TICKET, HOW MUCH WOULD YOU SPEND?

Author(s): Facchin, Giulia (University of Roma Tre) - D'Eredità, Astrid (High Institute for Conservation and Restoration - ISCR MiBACT)
Presentation Format: Oral

The contribution aims to reflect on the state-of-art of cultural planning in Rome, no matter whether on a public, private or volunteer basis, on the behavior of locals and tourists, and on communication, media and digital, to play a role as a facilitator. Rome is one of the most visited cities in the world, though the local heritage has a different impact on visitors, whether they are locals or tourists. Besides the most famous sites, like the Colosseum and the Pantheon, the rest of the city suffers for a lack of interest and investments. Astonishing places, like the Appian Road and the Suburbs, need special events to gather together vast bunches of people and then to reach visibility. These events are normally organized on a volunteer and individual basis, lacking a long-term cultural project and planning. Even though they reach a vast visibility in one day, for the rest of the year their daily lifes endure serious problems in providing proper maintenance and even mere opening times. On the other side, there is an increasing importance given to the digital communication, which nowadays represents the appropriate tool to reach any kind of public. The reflection opens to the evaluation of empowering this tool and the design of specific strategic communication plans as a mean to instruct proper cultural plans.

04 EAST MEETS WEST - THE SEARCH FOR COMMON ROOTS

Author(s): Duran Kremer, Maria de Jesus (Institut of History of the Art/FCSH/University NOVA Lisbon)
Presentation Format: Oral

As Europe celebrates the European Year of the Common Heritage, it is at the same time confronted with a very strong migratory phenomenon, mainly coming from countries overwhelmed by a war caused not only by political but also ideological and religious reasons. This is the case in Germany, where in the last three years more than one million refugees from Syria, Iraq, Iran and Afghanistan have registered as refugees and asylum seekers. With its nine world heritage sites and a world document heritage (Codex Egberti) Trier,

the ancient Augusta Treverorum, still a city marked by its Roman past, was not an exception, sheltering between its walls more than two thousand refugees, mainly Syrians. The question of the integration of these men and women into a society that is alien to them, allowing them to participate in the social life of the society is a very complex and long-term task.

In this paper we will focus on two groundbreaking actions that point the way to the direct role that archeology can play in the integration of refugees from the Middle East:

1- A film / a thriller, with refugees, based on the legend that Trier was founded by Trebeta (the son of the legendary Assyrian king Ninus and a Chaldean queen). It plays in the present.

2- A pilot project for single women and mothers, during which a number of cultural diffusion actions are carried out. One of them is the search for common roots, first with the analysis of photographic material (from Syria, Turkey, Irak), then with visits to the National Museum and to the roman monuments in and around Trier.

Both actions underline the role of the archeology to call the attention of this target group to a past that determines our common history.

05 SPATIALISED EXPERIENCES AND SOCIAL IMAGINARIES: NEOLITHIC CULTURAL HERITAGE IN THE EASTERN MEDITERRANEAN

Author(s): Souvatzi, Stella (Hellenic Open University)
Presentation Format: Oral

This paper explores Neolithic archaeological sites as indices of cultural values, identities, meanings and histories as constructed in the realms of cultural heritage. It focuses on Greece and Turkey, whose rich and historically deep heritage has always been used to address questions about cultural origins and identity of a European significance, and uses selected major sites as case-studies, several of which UNESCO-listed. It builds upon research conducted during recent critical economic or political situations in the two countries.

Questions to do with heritage, archaeology and politics have become fundamental across all the humanities and social sciences. However, research has rarely incorporated prehistoric evidence, much less the Neolithic past, particularly in the Eastern Mediterranean, where, with few exceptions, the glorious Classical past has monopolised attention. I am particularly interested in the relationship between space, heritage, identity and history. Space or place can be a powerful social imaginary, while debates about the value and meaning of archaeological sites are fundamentally debates about the meaning of place and histories of spatiality. Control of archaeological spaces and their presentation is tantamount to control of the past, and therefore of history itself. Thus, it is a source of power in the present. The paper aims to show that spatial and temporal relationships and metaphors can be subject to a variety of manipulations at different times and by different interest groups in order to construct collective memory and to 'naturalise' identity claims that rest on understandings of the past. Important questions include: conflicting interpretations of sites between archaeologists, state, public media and other interest groups; and archaeological spaces as loci of contradictory identities and histories. My central argument is that archaeological sites are not neutral and static; they are always culturally, historically and politically contingent, and thus themselves subject to change.

06 HOTSPOTS, HYBRIDITY AND HERITAGE

Author(s): Paludan-Muller, Carsten (Independent)
Presentation Format: Oral

The words "Heritage" and "Conflict" are increasingly associated in public awareness. Heritage is an element in identity related conflicts that seem to have increased their relative global frequency. The weaponisation of heritage may happen when it's diverse origins are denied or simplified in order to exclusively ascribe a particular heritage to a postulated monolithic identity. However, many places in Europe and beyond, where heritage is particularly rich and innovative are places where cultures, religions, and languages have engaged in particularly intense interaction. This has resulted in a hybridisation of culture and heritage. But in a political context that favours setting up identities against each other, hybridity is awkward. And exactly in these areas where different identities have lived together, the breakdown of political order, when it happens, often entails focus on and instrumentalization of difference in order to split, create confrontations, culticide, and even ethnic cleansing. Can we discern geopolitical patterns that characterise regions in which such lethal developments take place? How can we as archaeologists engage in order to work with hybrid heritage and counter the weaponisation of the past? What is at stake, when we work in volatile regions and with agents that do not necessarily share our ideas about human rights, political and academic liberties and open dialogue?

07 ARCHAEOLOGY, CULTURAL LANDSCAPES AND INTERCULTURAL DYNAMICS AT A UNESCO WORLD HERITAGE SITE; THE CASE OF EPHESUS

Author(s): Ganciu, Iulian (Österreichisches Archäologisches Institut; University of Applied Arts Vienna)
Presentation Format: Oral

Cultural heritage is fundamental to the identity and human dignity of communities and is an integral feature of every landscape that we as archaeologists explore, excavate study and redevelop. The way we engage with communities and stakeholders to protect and manage the heritage of archaeological sites and landscape greatly affects the quality of our relationships with those communities

and other stakeholders.

Considered one of the most important archaeological site in Turkey (according to Turkish Cultural Foundation), Ephesus attracts annually millions of visitors for its diverse values (be it a Greco-Roman, Christian or Ottoman monuments), but has also represented an important center of archaeological research. Included on the World Heritage List in 2015, has enjoyed the attention of tourists for more than half of a century and the attention of scholars for more than a century.

Global, regional, national and local actors emerged and have actively interplayed and influenced over power politics between the state and the international community, between groups within the state, between regional parties, and increasingly between the state and local actors, In the process of the World Heritage making at Ephesus. Interactions between these actors have influenced not only the politics, but also the economic aspects, values and the cultural representation of the site.

The study focuses on the role of the excavation and of the impact of a world heritage site in the daily life of the local community. It explores the effects of cultural heritage on processes of local identity formation and on the meanings attributed by local people to the site's cultural heritage.

08 CONNECTING WORLD HERITAGE SERIAL PROPERTIES: A CASE-STUDY OF "LOCAL TO GLOCAL" TRANSITION DYNAMICS

Author(s): Brancelj, Ana (Laboratoire EDYTEM - UMR5204, Université Savoie Mont Blanc; Laboratoire IREGE - EA 2426, Université Savoie Mont Blanc) - Duval, Mélanie (Laboratoire EDYTEM - UMR5204, Université Savoie Mont Blanc)
Presentation Format: Oral

The idea of collective global responsibility inherent to the concept of World Heritage, is further emphasized within the category of serial World Heritage sites, that is of inscribed properties with serial components. For these composed sites, notions of collectivity, solidarity and co-responsibility are strongly enhanced and formalized through a common management plan, stipulated by the Operational Guidelines.

The protection and conservation, but also the presentation and transmission of heritage to future generations (Convention on World Heritage, 1972) should be commonly coordinated as the Outstanding Universal Value is only guaranteed by the ensemble. In order to achieve this, networking and cooperative projects are encouraged, on the scale of the inscribed property and beyond.

Based on the case of serial Unesco World Heritage Prehistoric Pile Dwellings around the Alps, this communication will analyse the process of cooperation and networking within this property. In 2011, six European alpine countries inscribed their pile-dwelling sites to Unesco World Heritage list and developed an innovative valorisation practice: an itinerant regatta of prehistoric-like logboats.

Firstly, this communication will trace the setting-up of this itinerant event, from local initiative to its international embracement. A positioning of actors and stakeholders will be considered in order to understand the eventual trajectory. Secondly, it will analyse the resource-creating potential of such events. In the case of archaeological pile-dwelling sites, this goes beyond solely economical commodification and towards multiscalar social and spatial identity- and heritage-making. Finally, the communication will question to what extent, in the case of an itinerant event, the transmissions of roles within the complex management system reveal the "local to glocal" transition.

09 A PILE DWELLERS' TALE: SHARED HERITAGE AND THE ROLE OF ARCHAEOLOGY; THE CASE OF PILE DWELLINGS IN SLOVENIA

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

This year it is a 10. Pile Dwellings' day in Ig (Slovenia). The event presents the cultural heritage of the early farming communities that lived along Alpine lakes shores. Each year it attracts several hundred people, around a hundred volunteers and international guests. It is a result of a cooperation between archaeologists and local communities that leans on 143 years tradition of research and heritage valorisation. Event in Ig is just one of many events around the Alps that promote the same heritage and values. Recently, in 2011, Prehistoric Pile Dwellings around the Alps have been inscribed in a world heritage list as a serial transboundary site, stretching over six Alpine countries.

The heritage of pile dwellings has developed into a vehicle for strengthening the trans Alpine identity. The heritage is used in popular culture and goes beyond scientific and economic value. During evets like the one in Ig, that are organised in a bottom up approach, communities own the heritage and use it.

Religious and political neutrality of the prehistoric pile dwellings heritage makes it a good study case for identity development. Paper will explore how can heritage initiate a local identity and what role has archaeology in the process. Furthermore, what motivates local communities to start using heritage that is neither part of their religion nor ethnic origin. Finally, we will tackle the challenge how can we connect UNESCO Outstanding Universal Values to already formulated local narratives.

a. KNOWING, OBSERVING AND IMAGINING IN THE SACRED CITY OF CARAL-SUPE (PERU)

Author(s): Barreiro, David - Varela-Pousa, Rocío (Institute of Heritage Sciences - Spanish National Research Council) - Leyva-Arroyo, Carlos Alberto (Caral Archaeological Zone)

Presentation Format: Poster

The Caral Archaeological Zone (ZAC) is made up of numerous archaeological sites located in the Supe Valley, Peru. It is considered the oldest civilization in America, developed more than 5,000 years ago, almost simultaneously to those of Mesopotamia, Egypt and India; and on June 2009 the Sacred City of Caral-Supe was included by UNESCO on the World Heritage List. One of the main archaeological sites of the area is Áspero, located on the coast, close to the town of Supe Puerto (Barranca province, Lima district).

In 2016, the Institute of Heritage Sciences (Incipit) of the CSIC, within the framework of the NEARCH project (New Scenarios for a Community-Involved Archeology; funded by the Culture Program of the European Commission), carried out a series of activities in the area, aimed to know how the local communities perceive their archaeological heritage and if its inscription in the World Heritage List affects in any way that perception.

Specifically, the poster reflects the result of an activity carried out in collaboration with the ZAC and the Pedro Ruiz Gallo-Leticia Educational Institution of Supe Puerto, in which 15 students between 13 and 15 years old participated. Individually, each student showed the past though a drawing, present or future of their locality; explaining later to their companions the reason for that vision. Then, based on these drawings and visions, students identified, in a joint debate, the positive and negative aspects of the existence of this heritage for their community, as well as its declaration as a World Heritage Site, to then propose measures with which the identified problems could be solved. The drawings show us, by themselves, some significant elements in order to understand how heritage spaces are lived and perceived by the population.

b. PROJEKT NAVIS - PRESENTATION AND PROMOTION OF CULTURAL (ARCHAEOLOGICAL) HERITAGE THROUGH THE CONSTRUCTION AND USE OF HISTORIC VESSELS

Author(s): Draksler, Matej (Skupina STIK; Institute for Underwater Archaeology)

Presentation Format: Poster

In 2016 we have begun with the realization of the long-term project of the reconstruction of historic vessels. Each year a vessel that once sailed along the Ljubljanica River (central Slovenia) is reconstructed and presented to the public (schools, the professional public, the general public). Since the beginning of the project students of archaeology and other volunteers constructed two Roman logboats under the guidance of experts. The building site was opened to the public and anyone was able to observe or participate as we encourage the visitors to join in and experience life in the past in a original way. We use mostly reconstructed tools as our goal is not only to construct the logboat but also to understand, learn and use the techniques that were used in the construction of such vessels. Each construction was followed by launching of the boat on the Ljubljanica River and promotional paddling with the intention to revive the use that was typical for such a vessel and also contribute to the revitalization of the former waterway.

Levels of the implementation of the project:

Education: In cooperation with the Department of Archaeology, Faculty of Arts, University of Ljubljana we carried out the practical training for 3rd year students.

Promotion: In cooperation with the Museum and Galleries of Ljubljana we presented the heritage of the Ljubljanica River and the pilot project of the recently opened experience and exhibition site in Vrhnika »The Ljubljanica River« to the local and general public.

Tourism: We organised and promoted various events since our goal was also to encourage the use of archaeological heritage in the development of new tourism services.

742 SOUTH-EASTERN ANATOLIA AT A CROSSROADS: A MULTICULTURAL MEDITERRANEAN AREA FROM THE HELLENISTIC TO THE EARLY BYZANTINE PERIOD

Theme: Mediterranean seascapes

Organisers: Borgia, Emanuela (Sapienza Università di Roma) - Polla, Silvia (Freie Üniversität Berlin - Institut für Klassische Archäologie)

Format: Regular session

The session will focus on a particular area, the region south of the Taurus range (Cilicia, Pamphylia and the neighbouring regions) facing the Mediterranean and being, throughout its history, in contact with the island of Cyprus to the south and with the coast of northern Syria to the east. South-eastern Anatolia was actually a key crossroads of people and cultures, in a crucial point between East and West. Due to its strategic geographic position connecting (by maritime and terrestrial routes) Anatolia and Syria and to the facility of contacts with the eastern Mediterranean, the region lived many processes of mobility, migrations, cultural interchanges.

The analysis will cover the period from the Hellenization to the advent of the Arabs, concentrating on how various cultural identities (Persian, Luwian, Anatolian, Syrian, Greek, Roman, Byzantine) interacted, contributing to the formation of a peculiar Mediterranean identity. Reciprocal contacts with Syria and Cyprus will be also considered, so as to examine the process of interchanges from both directions.

This region will be studied upon a multidisciplinary perspective and theoretical analysis will be carried out on the following topics:

- Local identities, foreign inputs and mobility of people
- Societies, languages and interconnected traditions
- Religion, rituals and cult places: an evidence of cultural identity and cultural transfers
- Coastal settlements and urban layout: communication, trade and subsistence
- Transfer of concepts and mutual influences in building and architecture
- Artistic manifestations as indicators of interacting traditions
- Material culture as mirror of local and transmediterranean contacts

ABSTRACTS

01 CILICIA : TWO DIFFERENT LANDSCAPES, ONE PROVINCE BETWEEN TAURUS AND MEDITERRANEAN SEA

Author(s): Sayar, Mustafa (Istanbul University)

Presentation Format: Oral

With its own peculiar geography located between Anatolia and Mesopotamia, Cilicia has influenced the course of historic events for centuries. It was not only isolated between the Taurus Mountains and the Mediterranean but also a region of acculturation establishing the sociocultural communication between the Near East and the Aegean/Mediterranean world via Anatolia. Cilicia is divided into two geographic sub-regions:the mountainous western part is called Rough Cilicia in English, Kilikia Tracheia in ancient Greek and Cilicia Aspera in Latin while the eastern part, now Çukurova in Turkish, is called Smooth Cilicia, or the Cilician Plain in English, Kilikia Pedias in ancient Greek and Cilicia Campestris in Latin sources.Both Rough Cilicia and Smooth Cilicia feature opposite geomorphological and geographic properties. Through the ages, various pathways emerged according to what the natural fabric allowed in accordance with political and commercial developments. North-south pathways across Rough Cilicia followed the courses of rivers, for instance, the ancient Kalykadnos (modern Göksu) river, or the ancient Lamas (modern Limonlu) river connecting the Anatolian plateau with the Mediterranean coast. The east-west connection following the coastline, and mountain passes are well described by the ancient sources accounting the historical campaigns. Also, Cicero mentions various roads in the letters written during his governorship in Cilicia in 51 BC. However, it was not before AD 72 that the emperor Vespasian started to build the roads which were usable all year round between Asia Minor and Syria, as well as between major cities.

02 CILICIAN CITY-COINS AS MIRROR OF HISTORICAL AND CULTURAL CHANGES (V C. BCE - III C. CE)

Author(s): Dabrowa, Edward (Jagiellonian University in Kraków, Institute of History)

Presentation Format: Oral

In antiquity Cilicia was a small but important area. The geographical setting, between the Taurus Mountains, the Mediterranean Sea and Anatolia, and the fact that territory of Cilicia was crossed by several routes connecting Anatolia with the Mediterranean sea shore and Syria decided about its strategic significance for everyone who controlled it. Geography of the area held importance also for its cultural development. The northern part of Cilicia, called Cilicia Aspera was mountainous, not well populated and miserably urbanized; cities were few and located mainly on the sea shore. The southern part, called Cilicia Pedias, had a completely different face, it was much more prosperous and intensively urbanized. Its location made it a bridge for various cultural and religious influences coming from neighboring countries, but also an object of their expansion, making history of ancient Cilicia both very complicated and fascinating. Both parts of Cilicia experienced governance of many powers: the Achaemenid Persia, local rulers, Hellenistic kings, the Romans. Each of them left own political and cultural imprint on the area. Effects of this cultural mixture are clearly visible in archaeological excavations and in many types of artefacts. For researchers there is also available yet another type of evidence which reflects the complicated past of Cilicia - the numismatic evidence. There are a few Cilician cities in which coins were minted from the Achaemenid times to the Roman Empire. This paper is an opportunity to look into iconography of their coinage and to analyse political and religious symbols, and subjects of depiction. The aim of this analysis is to find how specific powers ruling over mentioned cities influenced local traditions, what were the remnants of those and how they eventually evolved over time.

03 THE DORIC ORDER IN SOUTH-EASTERN ANATOLIA: LOCAL IDENTITIES OR CULTURAL INTERACTIONS?

Author(s): Fochetti, Beatrice (Università di Pisa)

Presentation Format: Oral

In the multifaceted context of the South-Eastern Anatolia cultural interactions, local traditions and mutual influences in building and architecture had played a relevant role in the definition of the architectural decoration. Taking the Doric Order as a case study, the purpose of this paper is to discuss the formal characteristics and tendencies of the Doric architectural decoration in South-Eastern Anatolia between the Hellenistic period and the early Imperial age.

Main focuses will be made on Pamphylia, Cilicia and the neighbouring regions and the analysis of the evidences will be used to define

the general trends in the employ of the Doric Order, with particular regards to the evolutionary process of the architectural decoration.

To this end, the formal solutions adopted in the Doric buildings will be compared to outline common features on a regional scale as well as phenomena of mutual influences in the architectural design. Furthermore, a comparison with the Western Anatolian evidences will be taken into consideration to analyze elements of interchanges and /or divergence. As well, the use of the Doric Order will be analyzed both in the context of public buildings and in private architecture, through some case studies that are particularly significant for the understanding of the general trends.

04 URBAN NETWORKS IN ROMAN CYPRUS AND CILICIA

Author(s): Summerer, Latife (University of Kastamonu)
Presentation Format: Oral

Although Cypro-Anatolian relations are a much discussed topic for earlier periods from Neolithic to Bronze Age the classical archaeologists have hardly drawn attention on it. In ceramics, sculpture, architecture, mosaics and jewelry various evidences which indicate to exchange of goods, techniques and other cultural traits between Cyprus and the Hellenistic/Roman cities of Asia Minor are published, but studies towards understanding patterns of such links lack.

This paper will focus on the role of Cilicia as mediator of Cypro-Anatolian contacts by comparing urban developement of Roman cities in both regions. Amathous, Kourion and Salamis are major cities in Cyprus, while Soli/Pompeiopolis and Elaiussa Sebaste are two realtively well researched centers in Cilicia. Under the Romans these cities prospered and enjoyed large urban designs. Numerous large-scale public buildings temples, gymniasia, baths and colonnaned streets were built and the cities were fully romanized in the 2nd century. While local workshops followed common Roman prototypes some regional style emerged depending on availabilty of material and craftmen. Cilicia retained its position as a bridgehead in the main maritime route between Anatolian centers and Cyprus. This paper will center on the question how the Roman cities in Cyprus developed by increasing contacts to Anatolia and especially to Cilicia.

05 LOCAL PATTERNS AND SYRIAN INFLUENCES IN THE COLONNADED STREETS OF ROMAN CILICIA AND PAMPHYLIA

Author(s): Borgia, Emanuela (Università di Roma Sapienza)
Presentation Format: Oral

Colonnaded streets, whose Syrian origin is well known, are a monumental feature recurring in several Roman cities of south-eastern Anatolia, both in Cilicia and in Pamphylia. These expensive infrastructures were at the same time monumental buildings, contributing to the decor of ancient cities, and functional structures whose utilitas has often been underestimated. Starting from the oldest attested case, that of Antioch on the Orontes dating back to Augustan-Tiberian age, colonnaded streets were constructed in most Syrian cities, mainly from the late 1st or early 2nd century A.D., but also in many urban centres of Asia Minor.

This paper aims at analysing how mutual influences between Syria and Asia Minor affected the diffusion of colonnaded streets in Cilicia and Pamphylia and if these regions, because of their position at a crossroads, played a key role within this process. Moreover the specific characteristics in building and architecture of colonnaded streets in south-eastern Anatolia will be taken into account, with the aim of trying to outline how and at which extent they referred to Syrian models or, on the contrary, to peculiar regional features. For instance, the presence in some Cilician sites of consoles for statues inserted in the column drums (which is quite unattested elsewhere) seems to be a clear imitation of Syrian monuments, such as those of Palmyra and Apamea. But other elements point to a local adaptation of an imported model.

06 TINY KINGDOMS OF PROPHETIC IDEALS

Author(s): Tevdovski, Ljuben (University Goce Delcev - Shtip)
Presentation Format: Oral

The impact of the melting pot of Roman-dependent South-Eastern Anatolia on the theological and political concepts of the late Roman and early Byzantine world.

Transcending from the ideologically and culturally unified Hellenistic world into the two-worlds reality of the Roman Levant and Parthian inland, South-Eastern Anatolia has successfully reinvented its own role, positions, capacities and prospects. The once centrally located area in the globalized Hellenistic world became an important border zone, crucial for contacts and transfers of ideas in the new divided world. Even more, caught in-between the new global powers, their policies, worldviews and agendas, the local leaders and emerging puppet entities of this region were existentially obliged to use their full potential in reinvigorating the traditions and identities, as well as making them most suitable for the new world realities. These reinvented identities, forms, ideas and concepts that provided new synergy between the local traditions and old and new global influences will transform these border lands into experimental laboratory of future universal concepts and tendencies.

While specific traditions, related cults and concepts associated early with this region, and spreading later throughout the Roman world, have been frequently treated separately in different scientific analyses, I would argue that South-Eastern Anatolia has its specific place and role in the transfer of the concepts of cultic, religious and political universality of the Hellenistic world, that will

dramatically transform the Roman empire in the later centuries.

07 ANTIOCHIA AD CRAGUM IN WESTERN ROUGH CILICIA: FROM PIRATE BASE TO IMPERIAL CITY

Author(s): Hoff, Michael (University of Nebraska)
Presentation Format: Oral

In the mid-first century CE, Antiochus IV of Commagene founded several cities along the coast of western Rough Cilicia. One of these foundations was Antiochia ad Cragum, a city whose territory was once occupied by the infamous Cilician pirates. Few traces of the site's pirate past survive. More information of the city's later history is becoming known as a result of 12 years of excavation. Ceramic and scientific dating of several of the large, still well-preserved public structures, such as a Temple, Bath and Bouleuterion indicate construction dates from the late first century CE into the early third century CE. The seeming tranquility of the city was interrupted in 260 by Sasanian raids led by King Shapur I. Many of the cities along the Rough Cilician coast were affected by the razzia, including Antiochia. We observe that these Cilician cities—Antiochia among them—become fortified in the later third century likely as an afterthought following these raids, and the architectural fabric of the city appears to have changed as well.

This paper traces the history of the site, from its pirate origins in the late Hellenistic era into Late Antiquity, and also documents the 13 years of archaeological investigations, including the major discoveries of the Great Bath Mosaic and the Civic Bouleuterion.

08 THE NORTHEAST TEMPLE AT ANTIOCHIA AD CRAGUM

Author(s): Townsend, Rhys (Clark University)
Presentation Format: Oral

Since 2005, members of the Antiochia ad Cragum Archaeological Research Project (ACARP) have been engaged in the excavation, reconstruction, and study of the Roman temple at Antiochia ad Cragum in western Rough Cilicia. A concrete core with marble veneer forms a podium on which stands the marble cella and Corinthian tetrastyle prostyle porch.

Located in the northeast section of the city, it commands a view over much of the rest of the site: the city propylon, colonnaded street, bath complex, bouleuterion, and acropolis. Ceramic evidence points to a date in the late Antonine or early Severan period. Although the dedicatee is still in question, an imperial association appears plausible.

Until ACARP undertook its study, little was known about the temple other than the dice oracle inscribed on two of its wall blocks, published by George Bean and Terence Mitford in the 1960s. The temple is now the most closely examined of the various temples of the region. This paper will present the findings regarding the structure, including its precise plan and elevation, which have not appeared before. It will also describe aspects of construction technique and architectural style in the context of the region as well as more distant contacts. Possible plans for its conservation and restoration will also be considered.

09 THE BATH BUILDINGS OF CILICIA AND PAMPHYLIA IN ROMAN TIMES. CHARACTERISTICS, LAYOUT AND PECULIARITIES

Author(s): Casagrande Cicci, Emanuele (Sapienza University of Rome)
Presentation Format: Oral

Cilicia and Pamphylia were two Roman territories located in the southeastern part of Anatolia (modern Turkey). The archaeological investigations within the two provinces, primarily those situated along the coast, are increasing our knowledge about broader historical, architectural, and social developments of the two areas under Roman rule.

The present speech reasses the most recent researches about the bath buildings of the Roman provinces of Cilicia and Pamphylia.

The research starts asking different questions like why baths are specifically rich sources of information for these areas; why do baths help us understanding technological urbanism? Changes in socio-economic structures? Information about the political status of inhabitants? The analysis takes into account also the topographic position and the dimensions of the structure compared with the settlement.

The paper describes the baths of Cilicia and Pamphylia highlighting the structural and the architectural specificities of each complex. This research attempts to utilize case studies in order to illustrate some of these concepts. Specific layouts and architectural elements will be analyzed highlighting the regional construction trends and the imperial building models. Substructures and the hypocaust system are two of the best examples of the Roman imports in the territories. However, regional adjustments will be taken into consideration.

The new excavation of the so-called "Little Baths" of Elaiussa Sebaste (province of Cilicia) will be widely presented in spite of the overall building category. The provenance of the workers and the building materials used for the structures analyzed, as well as the relationship between the structure and the water and the dimensions and the layout of the baths will be fully presented.

Bath buildings represent one of the most crucial categories of public architecture for understanding the impact and dynamics of Rome rule in peripheral territories of the Empire.

10 MARBLE IN SOUTH-EASTERN ANATOLIA: AN EVIDENCE OF IMPORT OF BUILDING-MATERIAL AND ARCHITECTURAL INTERACTION

Author(s): Spanu, Marcello (Università degli Studi Roma Tre)
Presentation Format: Oral

Pamphylia and Cilicia are regions without marble quarries. For many centuries, their tradition in architecture was strongly connected with the local stones, especially limestone, frequently of bad quality and difficult to be worked. This situation changed totally in imperial times, when imported marble arrived widely in these regions. The new material was massively employed in the magnificent programs of architectural renewal and surely it caused a real revolution from many points of view. Surely, the introduction of this building-stone corresponds to the general trend of the "marble-style" occurred in all the provinces of the Roman Empire and specifically in the Anatolian provinces, but this new availability implied a deep impact and a radical cultural interaction. The first consequence was the tendency of adopting an architectural common language, employing the same most significant elements, like bases, shafts and capitals of columns and, often, to other architectural components. But it wasn't a "passive reception", since a continuous development of local architecture occurred in these regions. Since the most part of marble architectural elements arrived in a partially-worked level, the workmanships were obliged to complete and to follow these models, but in this situation they were able also to propose new trends in the architectural decoration.

11 BUILDING TECHNIQUES AND PROCESSES IN ROUGH CILICIA FROM HELLENISTIC TO EARLY BYZANTINE PERIOD

Author(s): Fornace, Chiara (Sapienza Università di Roma)
Presentation Format: Oral

The study of building techniques is a powerful tool to achieve the historical reconstruction of an archaeological site. This can shed light on the building procedures adopted as well as on the technical knowledge underlying the construction of different structures. Furthermore, the thorough analysis of building techniques can be very revealing to understand the cultural, social, financial and environmental context.

In this paper a case-study area will be taken into account: the region between the Kalykadnos and Lamos rivers, within Rough Cilicia, during the historical period ranging from Hellenistic and Early Byzantine age. The area reveals to be particularly significant for what concerns the numerous and varied buildings evidences of autochthon, Hellenistic and Roman traditions. The area, under study, will be compared with the eastern part of the province and the neighboring provinces, in order to identify and comprehend the circulation of materials, skills and external technological contributions.

The search method is based on the direct analysis of monuments and architectural evidences, and intends to achieve an analytic analysis of building techniques, through the study of the stone material employed for wall facing so as for mortars, it is necessary, also, to check and to understand the whole volume of each technique used in the constructions. The study is aimed at assessing the technical environment, local knowledge and local traditions, so as to identify the links or the differences with the technology products of the allochthon derivation. The ways of building are linked to technical knowledge, which tend to remain unaffected in the absence of an external contribution. The technological contributions allow to identify the presence of foreign workers, but also to determine the degree of assimilation of a new technical knowledge, sometimes reinterpreted according to the needs of the place.

12 TRADING NETWORKS OF LATE ROMAN CYPRUS AND CILICIA. REVISITING THE EVIDENCE OF AMPHORAE PRODUCTION

Author(s): Soyluoglu, Mehmetcan (Eastern Mediterranean University)
Presentation Format: Oral

Eastern Mediterranean hosted busy macro trade networks during the Late Roman Period. Due to its privileged position, the island of Cyprus also took a part in this macroeconomic model together with its neighbours Cilicia and Syria. The administrative status of Cilicia and Cyprus during the Roman period also caused the already established interactions between the two regions to be stronger and closer than before. This trade network and its cultural interactions were reinforced by various archaeological studies which conducted in Cyprus.

On the other hand; despite its proximity to Cilicia, the position of the northern coast of Cyprus within this trade network is still uncertain and unstudied. However, the geographic position and fertile landscape of the northern littoral of the island offers valuable information to the researchers.

This paper will focus on the amphorae production and commercial potential of the commodities of these amphorae, in the perspective of macro economical networks of Cyprus. Late Roman Amphora 1(LRA1) type generally linked with Cilicia and Cyprus by scholars will be assessed in the context of the study. The results of material analyses will be evaluated together by the means of theoretical base studies for a better understanding of the trading bonds between the northern coast of Cyprus and Cilicia during the Late Roman period.

744 THE WOMEN DIMENSION IN ARCHAEOLOGY: BETWEEN POLITICS AND SOCIAL CONSTRAINS

Theme: Archaeology and the European Year of Cultural Heritage
Organisers: Magno, Laura Matilde (Université Catholique de Louvain la Neuve) - Ruiz, Carmen (Universitat Oberta de Catalunya; International Education for Students)
Format: Discussion session

In the archaeological community topics such as gender roles and opportunity, bias and sexual harassment are currently widespread. However, when it comes to gender discrimination, many disparities are still present within the majority of the European countries. Some of the problems related to implied gender roles and career development also overstep national boundaries. Furthermore, issues associated with working women in the field of archaeology tend to be seemingly resolved or smoothed according to local cultural preconditions and are often tied to political commitment rather than taken as a matter of equality. Nevertheless, the impact such circumstances have on professional career development strongly affect research as much as a number of personal life choices.

Within this session we would like to discuss problems concerning the women dimension in all aspects of archaeology as a profession, spanning from field-work to the academia. Moreover, we aim to discuss specific working conditions and to open a debate on different forms of sexual and work harassment as well as related issues covering the lack of standard when it comes to gender-defined social needs like maternity leave and working guarantees. The general goal of the session is to share experiences and ideas, openly or anonymously, and to consider specific measures that could be taken to fight gender-inequality.

ABSTRACTS

01 SILENCING WOMEN'S POINT OF VIEW: SOME SOCIOLOGICAL DATA ON THE EXCLUSIONARY PRACTICES OCCURRING IN THE FIELD OF ARCHAEOLOGY

Author(s): Magno, Laura Matilde (Université Catholique de Louvain la Neuve) - Nenova, Denitsa (UCL, Institute of Archaeology)
Presentation Format: Oral

This contribution aims to address some problematics related to different forms of sexual and work harassment from a sociological prospective. Unfortunately, gender exclusionary practices are spread in the field of archaeology and they may cause severe consequences in the career of a female archaeologist, from a limitation in the opportunities due to discomfort, distress and functional difficulty to a self-exclusion of the subject from the field. These problems constitute a phenomena complex that are not only strictly linked to the field of archaeology but that have their basis on more general social and behavioral dynamics and, for this reason, it might be useful to approach the issue from a sociological prospective: Is archaeology indeed a field hostile to women? Is the problem an underrepresentation of women in the field of archaeology or an underrepresentation of women's point of view? What is the women's point of view and what are the issues related to that?

This contribution aims to introduce some of the problematics related to gender disparities and harassment using a sociological approach. It will explain how the women's point of view has been silenced and therefore disempowered by practices of denial, justification, diminution and trail. A phenomenon that doesn't occur only in the field of archaeology but in many organization around the world and that strongly affects all the career path from work arrangements to pay and reward practices.

02 INVISIBLE VIOLENCES IN ARCHAEOLOGY: FROM GENDER AS A SUBJECT MATTER TO EXAMINE GENDERED PRACTICES

Author(s): Ruiz, Carmen (Universitat Oberta de Catalunya; Universitat Internacional de Catalunya)
Presentation Format: Oral

According to several statistics the number of women professionally involved in archaeology is growing in many European countries, in addition the question of gender as a research topic has increased in the last couple of decades, and yet archaeology remains a chilly place for women. Though in the last months the #Metoo movement has made visible how harassment permeates several and diverse arenas of professional women, archaeologists are still too silent to openly talk about the multiplicity of ways gender discrimination affects our lives, practices and learnings. In this presentation we will explore several aspects that in the context of Spain could explain the complex dimension of women in archaeology. Moreover, we claim that beyond sexual harassment there are multiple forms of violence that remain invisible in archaeology and need to be openly discussed. Based on empirical data from Spain, the presentation pretends to open a space of discussion to address several aspects that we consider can be accounted as invisible violences in the field of archaeology We argue that in order to explore how violence operates not only in the form of sexual harassment, which is undoubtedly a common and often silenced act of violence, but also in a multidimensional way we should consider also other invisible violences that operate in our profession: narratively, symbolically, performatively and in terms of identity. Therefore inspired by feminist concerns in this presentation we separate the question of gender as a research subject (that is, the focus on women) from the study of gendered practices and their relation to violence.

03 WE ARE NOT INVISIBLE, BUT YOU MIGHT NEED PURPLE GLASSES TO SEE US

Author(s): Perez-Juez, Amalia (Sección de Arqueología del Colegio de Licenciados de Madrid; Boston University) - López, Lourdes - Cuesta, Marta - Benito, Laura - García, María Luisa - Sánchez, Helena (Sección de Arqueología del Colegio de Licenciados de Madrid) - Torija, Alicia (Sección de Arqueología del Colegio de Licenciados de Madrid; Tufts University)

Presentation Format: Oral

"Making women invisible throughout History is another form of gender violence." This motto was on the banner carried by a group of archaeologists (consisting of both men and women) during the demonstration of March 8, 2017. For a number of years, this group has been defending the need to fight the invisibility of women in Archaeology, not only as a topic of research, but also as a profession. At the end of that same year, 2017, the group decided to become an organized, legal entity, as part of the Professional Association of Archaeologists of the region of Madrid, Spain (Colegio de Licenciados de la Comunidad de Madrid). "Arqueologas Feministas," the official name of the newly created group, is open to anyone interested in defending its values. We want to share the goal and projects of this group, and the initiatives carried out to make women become more visible in History and today. We have started to re-write some of the Wikipedia entries to make them less biased and more accurate, created new entries about women, and carried out talks and lectures in schools and other venues. Little by little, we are seeing some results, but there are still serious concerns about underrepresentation, career opportunities, the pay gap, and the biased interpretation of the archaeological record.

04 MAKING GENDER DISCRIMINATION VISIBLE IN ARCHAEOLOGY IN TIMES OF NEOLIBERAL CHANGE

Author(s): Camus, Celine (Institut Milà i Fontanals - CSIC, MSCA-IF) - Nieto Espinet, Ariadna (Institut Milà i Fontanals - CSIC, ERC-StG ZooMWest) - Campanera Reig, Mireira (Universitat Rovira i Virgili - RRV)

Presentation Format: Oral

The present paper addresses the situation of women archaeologists facing the glass ceiling in academia. Despite decades of high enrollment, contemporary data still indicate that women scientists remain largely under-represented (She Figures 2015). Within this paper, we delineate the specificity of gender discrimination within archaeology, as well as explore some practices implemented within and outside academia to reduce them. We pay particular attention to sexual harassment and the current transformation of higher education and research organizations (related to budget cuts, a growth of precarious work, hike in tuition fees, increase in competitiveness and fierce production, etc.). We argue that the patriarchal system embedded in current neoliberal politics increases the possibility for women to be in vulnerable situations, especially when they are employed on a short-term status.

In regard to the issue of sexual harassment, we ask the following questions: do women renounce to pursue an academic career today in archaeology because of sexual harassment? At what point of their profession are they in a more vulnerable situation? How do the universities tackle sexual harassment and misconduct on campuses? Which support and guidance do feminist initiatives provide to help those who have been affected?

By and large, we hope to contribute to the visibility of the current impact of aggression against women in the field of archeology. We shed a light on various feminist initiatives located in different European countries and show how women collectively resist against sexual harassment today.

05 I WANT MY PORTA-POTTI: THE #METOO MOVEMENT FROM AN ITALIAN ARCHAEOLOGICAL PERSPECTIVE

Author(s): D'Eredità, Astrid (High Institute for Conservation and Restoration, ISCR MiBACT)

Presentation Format: Oral

The contribution aims to outline a critical analysis of the working conditions of women archaeologists in Italy.

According to the censuses made since 2006 by the two main Italian professional associations, 70% of the archaeologists of the peninsula are female. This data reflects with a good approximation the percentages of female students enrolled in academic courses that allow access to the profession. The percentage of women in management positions (in universities and in the Ministry of Cultural Heritage and Activities and Tourism) drops drastically. The surveys also reveal a high percentage of abandonment of the profession usually after the thirtieth year of age.

What happens in the first ten years after the end of the academic studies?

What are the main difficulties for an archaeologist woman in Italy?

Furthermore, unpublished data from a survey intentionally carried out for this paper will be presented. The essay reports in addition witnesses released - anonymously and openly - by a heterogeneous group of female archaeologists belonging to different age groups and playing very different roles: sexual harassment or abuse from university staff, difficulty of balancing work and family life, interruption of pregnancy due to unsatisfactory working conditions, workplace dynamics (entirely male teams who destinate improper attention to women archaeologists colleagues).

The goal is to provide a contribution to open discussion, outlining the profile of specialized professionals who are struggling to find an adequate location, in constant conflict with gender biases typical of a strongly sexist country.

745 GRAVE GOOD BIOGRAPHIES OF PRE-METALLURGICAL EUROPEAN SOCIETIES

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Little, Aimée (BioArCh, Department of Archaeology, Environment Building, University of York) - Masclans Latorre, Alba (Institució Milà i Fontanals - CSIC-IMF, Consejo Superior de Investigaciones Científicas, Departament d'Arqueologia i Antropologia, Barcelona; Fondation Fyssen Postdoctoral Fellow, UMR 8215 - Trajectoires. De la sédentarisation à l'Etat, Paris) - Rigaud, Solange (CNRS, Université de Bordeaux, UMR 5199-PACEA)

Format: Regular session

Given the wealth of scientific approaches increasingly being applied to the study of grave objects belonging to pre-metallurgical (Palaeolithic, Mesolithic, Neolithic) societies in Europe it seems like the right time to critically reflect on whether we have developed an appropriate analytical framework to study such artefacts. In recent years, more precise and robust chronologies alongside an increasing volume of archaeological data has strengthened and extended our knowledge of prehistoric forager and farmer death rituals. In the Palaeolithic, Mesolithic and Neolithic periods, changes in funerary rites and burials through time and at the landscape scale are evident. Mobility, cosmology and social organisation are often seen as key drivers of these changes, with the emergence of vertical social stratification also frequently emphasised. Beyond the various treatments of the body, how we understand the mechanisms and meanings behind these changes mostly relies on studies of grave goods. This session aims to bring together researchers who are investigating the various meanings of grave goods (e.g. tools, personal ornaments, pottery, animal remains, figurines, ochre, etc) through different scientific techniques (e.g. provenance studies, functional analyses, including microscopic, biomolecular, experimental, and digital imaging etc.). In doing so, we hope to highlight the impact these methods are having on our practical and theoretical understandings of the relationships that existed between objects and people (the living and the dead) as part of the burial rite.

ABSTRACTS

01 THE ORNAMENTS OF THE GRAVETTIAN FUNERARY SITES OF SERINYÀ (NE IBERIAN PENINSULA)

Author(s): Rufí, Isaac - Coromina, Neus - Soler, Joaquim - Solés, Alba (Institut de Recerca Història, Laboratori d'Arqueologia i Prehistòria, Universitat de Girona) - Masclans, Alba (UMR 8215 Trajectoires. CNRS - Université Paris 1, Maison de l'Archéologie et de l'Ethnologie) - Soler, Narcís (Institut de Recerca Història, Laboratori d'Arqueologia i Prehistòria, Universitat de Girona)

Presentation Format: Oral

The Reclau Caves from Serinyà (Girona, Catalonia) consist in a series of archaeological sites found along a travertine cliff of waterfall origin. Although their frequentation started at Middle Palaeolithic, it was in the Upper Palaeolithic when humans used them in a more intensive way. By the end of the Gravettian, communities of hunter-gatherers practiced cadaver depositions in Reclau Viver and Mollet III caves, where the most ancient Homo sapiens remains of the north-east of Iberian Peninsula have been discovered (directly dated by 14C between c. 25.000 to 27.000 cal BP).

Together with the anthropological remains, ancient and recent excavations have provided artifacts related to symbolic or aesthetic functionalities. Among those of marine origin, the most abundant are perforated gastropod (a.o. Homolopoma sanguineum and Nucella lapillus), scaphopod (Dentalium) and bivalve shells. The ornaments of terrestrial origin are composed mainly by pierced canines of red deer (Cervus elaphus) and carnivores (a.o. Lynx pardinus). Of a particular interest are the five perforated cervid femur heads from the Reclau Viver whose unique parallels are only found in the Protomagdalenian from Abri Pataud.

In this communication we introduce the ornaments from the Gravettian levels from the Reclau Viver and Mollet III caves and we interpret them in relation to those provided by the Gravettian funerary contexts from Western Europe.

02 NEW INSIGHTS ON THE LATE CASPIAN EPIPALEOLITHIC SYMBOLS: THE KAILYU BURIAL SITE

Author(s): Rigaud, Solange (CNRS, University of Bordeaux) - Shnayder, Sveta (Institute of Archaeology and Ethnography Siberian Branch of RAS, Novosibirsk) - Berezina, N. - Buzhilova, A. (Research Institute and Museum of Anthropology, Lomonosov Moscow State University)

Presentation Format: Oral

Central Asia is one of the main migration routes for Paleolithic societies moving into North and East Asia. The Eastern coast of the Caspian Sea represented a key area for human migration and many forms of contacts and exchanges occurred with neighboring regions. The pioneer investigations conducted by Soviet archaeologists during the mid-20th century in the Eastern Caspian region allowed A.P. Okladnikov the discovering of the burial site named Kailyu, located in western Turkmenistan. Kailyu rockshelter is one of the few sites of the region (with Jebel and Dam Dam Cheshme 1 and 2) with stratified deposits encompassing the transition from the Epipalaeolithic to the Neolithic. Despite his primary importance, the site is remained almost undescribed and unpublished to this day.

The re-evaluation of the burial, including chrono-cultural reattribution, anthropological study and analysis of the material associated to the human remains, offers an opportunity to explore new aspects of the regional Epipalaeolithic.

This presentation focuses on the hundreds of shell beads discovered in the burial. The method includes the sourcing of the material and morphometric and microscopic analyses in order to explore the strategies developed by the group of Kailyu to acquire, trans-

form, and use the beads. We will provide new insights on the relation developed by the Late Caspian Epipaleolithic communities with their physical and social environments. We will also discuss the methodological and interpretative limits we face for inferring cultural and social behaviors from this particular category of data within a poorly documented region.

The analysis of the human remains is supported by the Russian Foundation of the Basic Research (RFBR). project grant number #16-06-00420 'Hunter-gatherers during the final Paleolithic and Mesolithic'. Shell beads analysis is supported by the project 'Multidisciplinary Research in Archaeology and Ethnography of the Northern and Central Asia' grant number #14-50-00036.

03 FROM THE USE OF THINGS TO THE STATUS OF THE DEAD: TÉVIEC AND HOËDIC (BRITTANY, FRANCE)

Author(s): David, Eva (Centre National de la Recherche Scientifique) - Little, Aimée (University of York) - Marchand, Grégor - Rigaud, Solange (Centre National de la Recherche Scientifique)

Presentation Format: Oral

When discovered in the 1920s and 1930s in southern Brittany (France), the cemeteries of Téviec and Hoëdic were immediately attributed to a Mesolithic phase predating the "dolmen builders". The great variety of objects that accompanied the skeletons, assembled in complex rituals, have significantly enhanced our understanding of these coastal communities.

Based on the distribution of objects in the various single and multiple primary burials, previous works attempted to assess the social status of individuals, exploring gender differentiation and evidence for social hierarchy. The disturbance of material within each grave inevitably placed limitations on this research. Since then, critical examination of earlier radiocarbon dating combined with new direct dating has demonstrated the scale of bias that absolute chronology has created. The new phase of research on these sites, presented here, includes a revision of the funerary goods.

Slightly modified anatomical parts of deer, antler knapping-tools, tooth pendants, bone points, flint blades and arrowheads, stone pebbles or hammers, as well as shell beads, all are common objects found in association with the skeletons in the recorded 23 burial pits of Téviec and Hoëdic. Such variety in grave offerings has made it possible to address their social, technical, economic and/or symbolic meaning. Prior use of some objects contrasts with the commissioning of others: information that has been obtained thanks to a new programme of technological and functional studies. By establishing the biography of each object through such analyses, and by integrating results from across different classes of artefacts, new perspectives have emerged on the links between the dead and the living at the end of the Mesolithic.

04 ART REPRESENTATIONS AS GRAVE GOODS FROM ZVEJNIEKI BURIAL GROUND, LATVIA

Author(s): Zagorska, Ilga (Institute of Latvian History, University of Latvia) - Iršenas, Marius (Vilnius Academy of Fine Arts) - Meadows, John (Centre for Baltic and Scandinavian Archaeology - ZBSA, Schleswig-Holstein State Museums Foundation; Leibniz Laboratory for Radiometric Dating and Stable Isotope Research, Christian-Albrechts University, Kiel)

Presentation Format: Oral

Zvejnieki burial ground, so intensively researched in recent years (Back to the Origin, 2004; Nilsson-Stutz et al., 2013; Meadows et al., 2016; Zagorska, 2016; Tõrv et al., 2017) still offers the potential for new interpretations of the recovered archaeological material. This also applies to the art representations found as grave goods. This material is now being investigated through renewed examination of excavation diaries, field drawings and photographs, supplemented with new radiocarbon dates.

The burials in the cemetery are quite well furnished with various grave goods: animal tooth-pendants, bone inventory, stone and flint artifacts (Zagorskis, 1987, 2004). Only the number of items of art is small – they occur only in 11 graves (out of a total of 330 interments). The graves containing art pieces are distributed in different areas of the burial ground, forming three groups – Late Mesolithic, Early Neolithic and Middle Neolithic (approximately 6000–3300 cal BC). In all three periods the anthropomorphic and zoomorphic figurines similarly depict birds, cervids and human beings, providing evidence about the prehistoric environment and forager lifestyle. New observations regarding gender relations are obtained. But there is variation in the position of the art finds within the grave, also allowing different interpretations of their functions. The conditions of preservation of the grave goods in the coarse gravel layers over the millennia have not been so good, and marks of their preparation have partly disappeared. However, examination of these artifacts and their survival status more closely permits some conclusions about their "life stories" and special role in the Stone Age funerary rites.

05 PRACTICES OF DECORATING AND DEPOSITING THE DEAD: A CASE OF STONE AGE HUNTER-GATHERER BURIALS FROM SAAREMAA, ESTONIA

Author(s): Kask, Silvia-Kristiin - Torv, Mari (Institute of History and Archaeology, University of Tartu)

Presentation Format: Oral

We present a reanalysis of the mortuary practices of two Stone Age graves discovered and excavated in the late 1970s and 1980s at Kõnnu, Estonia. Kõnnu is one of the oldest annually settled dwelling sites on Estonian islands. The site is situated at the Litorina Sea coast, Saaremaa. Several structures, incl. hearths and sunken floor houses together with large quantities of quartz artefacts, stone adzes and faunal remains were found there. Overall, the remains of at least eleven individuals were recorded. These date to the mid 6th – mid 5th millennium cal. BC. In the scope of the present study we focus on two primary burials (I, and II/IIa) that were richly adorned with animal tooth pendants, and one of them was covered with red ochre.

Based on the reanalysis of archival documentations, osteological and archaeological collections we present (1) an archaeothanatological description of the mortuary practices, and (2) a biography of the tooth pendants accompanying the dead from the selection of species to their use in the mortuary rituals. By bringing these two lines of inquiry together a more meaningful picture of the past mortuary rituals, and the role that artefacts and ochre might have played in them, is drawn.

06 HIDDEN GOODS: NEW METHODS FOR IDENTIFYING PERISHABLE MATERIALS IN BURIALS

Author(s): Zemour, Aurélie (Ausonius UMR 5607 LabEx Sciences Archéologiques de Bordeaux)
Presentation Format: Oral

The archaeological approach of sepulchral contexts has seen several stages throughout the 20th century. First, attention focused on architecture and grave goods and then turned to human remains. This approach finally generated a separate discipline that has evolved toward a full interpretation of the burial. This is what has come to be known as archaeology of death or archaeothanatology, now relates to all periods and all types of human remains deposits, aims among other things at reconstructing and interpreting burial gestures, in connection with all other archaeological data. As the burial is perceived as a "system", and no longer as juxtaposed elements, it becomes a field of multiple investigation and interdisciplinary. This is having a significant impact on our understanding of grave goods, including perishable elements such as ochre. For example, the nature of the accompanying goods is better known as well as their relationships with the deceased. Innovation like 3D recording and modeling also plays an important role, especially to better identify the former presence of perishable elements by providing a major support for the taphonomic analysis. To illustrate, I will present an overview of accompanying remains in mortuary practices during the early Neolithic in the south-western Europe and detail some specific cases.

07 BIOGRAPHIES OF BEADS: RETHINKING THE INTERPRETATION OF NEOLITHIC GRAVE ASSEMBLAGES IN TURKEY

Author(s): Baysal, Emma (Trakya University) - Miller, Holly (University of Nottingham)
Presentation Format: Oral

Studies of prehistoric beads from Turkish burial assemblages, often not separated contextually from the rest of the site assemblage, have focussed on issues of typological classification, technology and raw material procurement. Based on the assumption of aesthetic value the reasons behind the placing of ornaments within the grave and the choice of ornaments for each individual have not been given priority. As a result, this area of ornament studies is both under theorized and under recorded. In reconsidering how such assemblages can be approached we suggest ways to trace and record the life history of each bead with a view to accounting for both length of use and relationships between different materials thereby creating a biography for individual artefacts and a history of their associations. Understanding the dynamic nature of the artefacts with which people were buried through attention to use wear as well as contextual information and association allows the construction of a nuanced view of how materials were chosen and used as well as their human and material relationships. We use a range of case studies taken from early and late Neolithic sites across Turkey to assess how bead deposition in burials related to region, individual identity and time period.

08 INTERPRETING NEOLITHIC PIT BURIAL'S SEXUAL DIVISION OF LABOUR THROUGH GRAVE GOOD ANALYSIS

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Presentation Format: Oral

Much has been written about the economic and symbolic meanings of prehistoric grave goods through different and every day more varied scientific techniques. In this presentation we want to bring all them together in order to shed light on the detection of sexual division of labour and possible patriarchal relationships among north-eastern Iberian Neolithic communities.

In the framework of the project "Approach to the first north-eastern Iberian Neolithic communities through their funeral practices (Ministerio de Ciéncia e Innovación HAR2011- 23149)" we proposed an integrated approach as a way of providing grave goods with sociological sense, so that social objects and subjects (grave goods, women, men and children) could give meaning to each other when they are linked. In this sense, a suggestion of grave good categorisation was elaborated as a result of the grave goods' use-wear and technological analyses, as well as from raw material determination. All these allowed converting the buried artefacts into representatives of different productive processes assigned to sexually determined bodies. In crossing that data with that of taphonomic, architectural and bioarchaeological studies, we improved our knowledge about Neolithic people's ways live, as well as about the symbolic ritualization of their social norms frozen as Grave Good Biographies.

09 OLD METHODS NEW STORIES: HOW STUDIES ON SHELL ORNAMENTS FROM NEOLITHIC BURIALS IN POLAND CHANGED ARCHAEOLOGICAL INTERPRETATIONS

Author(s): Sobkowiak-Tabaka, Iwona - Kurzawska, Aldona (Institute of Archaeology and Ethnology PAS) - Roffet-Salque, Mélanie (Organic Geochemistry Unit School of Chemistry University of Bristol) - Wysocka Mrozek, Małgorzata (Adam Mickiewicz University, Faculty of Geographical and Geological Sciences, Institute of Geology) - Szczepaniak, Katarzyna (Polish Academy of Sciences Museum of the Earth in Warsaw)

Presentation Format: Oral

Shell ornaments appeared in large quantities for the first time in Poland in burials associated with the Neolithic period in the beginning of the 5th millennium BC. Among them outstanding are women graves referred to as "princesses burials", in which thousands of beads were found. However rich and spectacular shell ornaments found in burials in the area of Poland were previously not systematically studied. Our research base on well-known methods in archaeology however they were applied for the first time all together to this category of artefacts. We identified species of mollusc the ornaments were made of, in the case of few artefacts with the help of Strontium isotope analysis 87Sr/86Sr. We determine their source of acquisition, in the case of fossil shells through comparative taphonomic studies, and in the case of freshwater shells through stable isotope composition (values of carbon δ13C and oxygen δ18O were measured and compared). All residues preserved on shells initially recognized through microscopic studies were initially observed in scanning electron microscope (SEM) with EDS capability. Animal fibres as well as entomological remains were recognized. Lipid residue analyses were carried out on the samples in order to identify the organic compounds present in the substance covering ornaments.

In our paper we would like to present how the multiple analyses of shell ornaments influenced our understanding of the burial environment and changed our perception of shell ornaments in the Neolithic and Early Bronze Age burial practices.

10 BEADS AND BATTLE AXES: MICROWEAR ANALYSIS AND THE INTERPRETATION OF NEOLITHIC BURIAL PRACTICES

Author(s): van Gijn, Annelou (Faculty of Archaeology, Leiden University) - Wentink, Karsten (Faculty of Archaeology, Leiden University; Sidestone Press)

Presentation Format: Oral

Microwear analysis, in combination with experimental archaeology, can nuance and even drastically alter our interpretations of burial practices. In this paper we will present two case studies from the Dutch Neolithic to demonstrate that a holistic microwear analysis of grave goods is fundamental to the study of past burial practices.

The first case study focuses on the life histories of beads from a range of sites spanning from the Middle Neolithic to the Bell Beaker period. Although these objects may look similar at first glance, it will be shown that they actually had very different life-histories. The meaning these objects had, both in life and in the context of the burial event must have been very different in each period studied: from depositing a person with his or her personal ornaments, to a collective event incorporating various communal craft activities, to a display of Bell Beaker signature objects showing a belonging to a particular widespread social identity

The second case study concerns the battle axes from the Corded Ware or Single Grave culture. These objects have always been interpreted as weapons and seen as the first indication of (male dominated) social hierarchy. Upon closer inspection however these "battle axes" show clear and extensive traces of wear and tear indicating an intense use-life. Could this really be the result of their use as weapons or should these traces be attributed to other activities instead? Experimental research in combination with microwear analysis pointed towards a completely different function for these objects. This outcome drastically alters our view of these "invaders from the east", and fits well with the analysis of other grave goods from the same period.

11 QUESTIONING THE ANALYTICAL FRAMEWORK OF FUNERARY ORNAMENTS IN DIFFICULT ARCHAEOLOGICAL CONTEXTS: THE MEGALITHIC MONUMENTS OF ARLES-FONTVIEILLE (SOUTHERN FRANCE, FINAL NEOLITHIC)

Author(s): Viel, Laurine (Aix Marseille Univ, CNRS, Minist Culture, LAMPEA, Aix-en-Provence) - Bonnardin, Sandrine (Univ Nice Sophia Antipolis, CNRS, CEPAM, Nice) - Bailly, Maxence (Aix Marseille Univ, CNRS, Minist Culture, LAMPEA, Aix-en-Provence)

Presentation Format: Oral

Personal ornaments discovered in a funerary context have been the subject of research for several decades. The accumulation and deepening of this research allowed us to build a solid methodological framework. The practice now seems to be well established, especially for optimal archaeological contexts (preserved connections, individual burials, fine chronologies). It has gradually provided a methodological basis on which archaeologists have relied to interpret the status of objects and individuals, funeral practices, ...

However, the complete set of these provisions seems to be more questionable in certain cases where the particular and constraining archaeological context (ancient excavations, no fine chronology or connection between objects and bones) can influence interpretations. Thus, in Arles-Fontvieille (Southern France, 4th and 3rd millennium B. C.), for a century and a half, hypogeums and dolmens have been seen only from the angle of their monumentality. In the eyes of the researchers, this funeral complex is described as exceptional and this qualification is transferred to the grave goods and notably the personal ornaments. But does the exceptionality of one necessarily lead to the exceptionality of the other? How does this bibliographic corpus influence our theoretical understanding

of these objects?

What is the meaning of the term "exceptional"? Without calling into question the exceptional nature of these monuments, is this the term that archaeologists must adopt to designate these archaeological facts? Can anthropology help us define this kind of fact? Does the word mean something to subactual and today's cultures? Does it also characterize ornaments?

In our paper, we will take a critical look at how archaeologists grasped difficult contexts and the vocabulary they used to interpret the status of these funerary contexts and the furniture found in them.

12 WHAT IS CONCEALED IN THE GRAVE

Author(s): Larsson, Lars (Department of Archaeology and Ancient History)
Presentation Format: Oral

The representation of material culture in graves gives insight into the way objects were treated before the burial, during the burial and in later events. A well-known category consists of those which are perceived as ordinary grave gifts. In addition there were objects with the character of grave gifts in the external parts of grave pits and at different levels in the filling of the graves, marking that depositions also took place during rituals performed after the burial proper. The relationship between these categories of object will be examined on the basis of studies of cemeteries from hunter-gatherer societies at Skateholm, southernmost Sweden, and from Zvejnieki, northern Latvia.

The presentation will focus on the tooth beads. How the root was shaped provides information about the age of the grave. An analysis of the trace wear of the perforation offers an interesting perspective on when a member of the society was given or was allowed to receive new adornments. Another aim is to trace the origin of these beads. Do they come from animals hunted in the neighbourhood of the site or are they trade goods? A comparison will be made between teeth found in the refuse and those used for beads.

13 BURIED STORIES IN A MALE GRAVE FROM THE 5TH MILLENNIUM BC AT POLGÁR-CSŐSZHALOM (NE HUNGARY)

Author(s): Anders, Alexandra (Institute of Archaeological Sciences, Eötvös Loránd University, Budapest) - Borel, Antony (Muséum National d'Histoire Naturelle, Paris; Institute of Archaeological Sciences, Eötvös Loránd University, Budapest) - Faragó, Norbert - Tóth, Zsuzsanna - Raczky, Pál (Institute of Archaeological Sciences, Eötvös Loránd University, Budapest)
Presentation Format: Oral

Polgár-Csőszhalom is one of the most significant Late Neolithic sites in north-eastern Hungary. The settlement complex is made up of a tell, a multiple enclosure system ringing the mound, a single-layer settlement and another double enclosure system. During the almost 100 years of archaeological investigations at the site, a total of 145 burials were uncovered among the settlement features.

In our presentation, we describe one of these burials, the grave of a middle-aged man, excavated in the single-layer settlement. His burial was furnished with grave goods made from different raw materials: Spondylus, red deer canines, wild boar tusk, flint and schist taking various forms: beads, pendants, blades and an adze. The artefacts of this grave have different biographies from their birth to their final deposition. We follow these biographies from their presumed "place of birth" through their life with the help of microscopic wear analysis and provenance studies.

We can add to the biographies of the grave goods the life story of the man based on the bioarchaeological examinations (physical anthropology, pathology, MSMs). Weaving together the strands of these different biographies and interpret in the context of the grave, we gain an insight into whether these artefacts were special in some respect, and if so, how, as well as into the intricate relationship between the deceased and the artefacts accompanying him, into what these artefacts signed, what was their role in the creation of the identity, whether they had some special meaning and whether this changed during the funerary rite.

The project is financed from the NRDI Fund (K 124326).

14 ADORNED WITH STRINGS OF BEADS: BURIAL RITUAL OF THE MIERZANOWICE CULTURE OF SE POLAND

Author(s): Winnicka, Kinga (Institute of Archaeology, University of Wrocław)
Presentation Format: Oral

Mierzanowice culture (MC) is not widely known outside of Polish archaeology. It has been regarded as functioning at the peripheries of the Early Bronze Age world because of its local character and – primarily – due to not participating in the bronze-centred economy of the new era. Metal finds are restricted to copper artefacts: small tools (e.g. 'awls') and decorative items (willow leaf-shaped earrings and round plaques) found in graves. In that regard MC resembles Neolithic cultures of the region (Corded Ware, Bell Beakers) and not contemporaneous Únětice culture. Burial ritual was standardised (although some deviations occurred) with fixed gender-determined position of the dead and typical grave goods: ceramics – usually amphorae; bifacial flint artefacts, e.g. arrowheads; small tools such as bone awls and ornamental/symbolic items: animal teeth pendants (e.g. boar tusks, wolf/dog/fox), bone tubes (bird, wildcat), decorative plaques and clothing pins and – the most spectacular – strings of beads. Beads are often found in the thousands; they were made mainly of shell, (prehistoric) faience and bone/antler. Some arrangements were recorded in situ – it can be presumed that different beads were combined to form headdresses, necklaces, belts, bracelets and even appliqués. There

are several aspects of MC that can be investigated based on these specific grave goods. In my presentation I will concentrate on: (1) technology (bone technology and faience production) and use-wear; (2) social costume/roles/stratification (sex/age correlation, richly furnished graves); (3) symbolic meanings (raw material significance, hunter ideology). I will provide examples from my work on bead assemblages from MC cemeteries of SE Poland. Another objective of this presentation is to showcase which aspects of prehistoric life can be gleamed from studying the human-object relationship reflected by the grave goods.

15 DEADLY GIFTS

Author(s): Kufel-Diakowska, Bernadeta (Institute of Archaeology Wrocław University) - Wilk, Stanisław (Institute of Archaeology Jagiellonian University)

Presentation Format: Oral

Arrowheads made from lithic raw materials have been attributed to the various Eneolithic and early Bronze Age cultures in central Europe. Trapezoidal, triangular or heart-shaped points are found in both the settlements and cemeteries. The fact that arrowheads are frequently deposited in graves is noteworthy due to the practical function of the tools as well as the symbolic dimension of that utilitarian aspect, expressed through the transfer of weapon to the realm of the sacred. Use-wear and spatial analysis of the lithic artefacts discovered in one of the biggest prehistoric cemeteries in SE Poland help us to understand why these tools ended their lives in the burial pits.

The Site no. 2 in Książnice is a multi-cultural settlement-and-burial Eneolithic and Early Bronze complex (Wilk 2013, 312). In this paper we present the analysis of the projectile points that came from the graves of the Lublin-Volhynian culture (30 trapezoidal microliths), the Złota culture (5 triangular points) and the Mierzanowice culture (10 triangular or heart-shaped points). They were made from various types of lithic raw materials, such as Chocolate, Świeciechów, or Gościeradów flint and were deposited in various positions in respect to the body parts. Also, the types and amount of use-wear recorded on the tools vary, what suggest different tools histories and more or less dramatic biographies of the buried men.

Wilk S. 2013. A Złota Culture Cemetery at Książnice site 2, Świętokrzyskie Province. Sprawozdania Archeologiczne 66, 311-338.

a. IDENTIFICATION OF THE CORDED WARE GRAVE POTTERY FROM SOUTH-EASTERN POLAND

Author(s): Rauba-Bukowska, Anna (Institute of Archaeology and Ethnology, Polish Academy of Sciences) - Szczepanek, Anita (Institute of Archaeology and Ethnology, Polish Academy of Sciences) - Jarosz, Paweł (Institute of Archaeology, Adam Mickiewicz University in Poznań) - Włodarczak, Piotr (Institute of Archaeology and Ethnology, Polish Academy of Sciences)

Presentation Format: Poster

Microscopic analysis of pottery concerns the Corded Ware populations which occupied the southern Poland in the 3rd millennium BC. Two settlement regions, first near Cracow in the Upper Vistula River Valley, second near Rzeszów in the Subcarpathia were subjected to analysis. The distance between them is about 200 kilometers so the daily contacts were not possible. Both populations respected similar funeral behaviors. They buried their dead in niche graves with arrangement and equipment depended on their sex and age. Petrographic study of the pottery was focused on differences and similarities in clay preparing in this two region. The objective of petrographic examination of thin section was 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. 50 fragments of two main type of vessels: amphora and beaker was subjected to analysis.

The goal of these examinations was to set the rate of utilisation the local raw materials to the production of similar vessels appeared in various settlement regions. Conducted analyses enabled to verify hypotheses concerning transmission of cultural patterns by the origin and mobility of the creators and place of pottery producing. The project is currently realized (National Science Centre, Poland, NCN 2015/19/B/HS3/02149).

747 ARCHAEOLOGY OF VISIGOTHIC AND CAROLINGIAN EUROPE (5TH-9TH CENTURIES)

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Ollich, Imma (Universitat de Barcelona, GRAMP; Museu Arqueològic de l'Esquerda) - Paardekooper, Roeland (EXARC) - Pratdesaba, Albert (Museu Arqueològic de l'Esquerda; Universitat de Barcelona-GRAMP)

Format: Regular session

The session proposes to present and update the knowledge, material culture and landscapes about Visigothic and Carolingian archaeological sites in Europe, analyzing and comparing several cases. We would propose a discussion between recent discovered sites in Europe, particularly in Central and East-Europe for Carolingian times and Southern Europe for Visigothic times, to clarify the status of the issue. We should invite some researchers that are working on in some sites in Europe, to expose their research about new sites, material culture, and displacements of Visighotic and Carolingian boundaries through our continent.

As the Visigothic-carolingian site of l'Esquerda (Roda de Ter, 70 km northern Barcelona) is pro-grammed by the EAA for a half-day excursion, we are speaking with the EAA Organisers in Barce-lona about the possibility of to continue the discussion there. We also could use the assembly

hall of the Museu Arqueològic de l'Esquerda to hold this session.

ABSTRACTS

01 CAROLINGIAN HORIZON AT SLOVENIAN SITES

Author(s): Karo, Špela (Zavod za varstvo kulturne dediscine Slovenije; Narodni muzej Slovenije)
Presentation Format: Oral

In the last few decades, numerous finds from Slovenian sites have revealed a rich cultural horizon that shows links with the Carolingian Europe and the political entities forming in the borderlands of the Frankish kingdom. Geographically speaking, the territory of present-day Slovenia was predominantly transitive in character. In the 8th and 9th centuries, parts of it fell under the jurisdiction of different political entities, which is reflected in material culture. The most common artefacts in the so-called Carolingian horizon are weapons, pieces of military gear, horse tack, tools and other small objects. The majority of these artefacts comes from high-elevation sites, less frequently they were found in cemeteries, rivers, and hoards. They were made of quality iron, lavishly decorated, some gilded and others tinned.

While some Slovenian finds do date to the early Carolingian period, most of them are from the 9th century. Some were discovered in cemeteries, but larger numbers were found in Late Antique hilltop settlements. The presence of these objects in what was probably already half ruined buildings can indicate only a short-term stay. In some of the hillforts (e.g. Gradišče above Bašelj, Ljubična above Zbelovska Gora, Gradišče above Trebenče) the Carolingian cultural horizon is much more pronounced, clearly indicating that these settlements had a special significance in the 9th century, perhaps even as late as the beginning of the 10th century. With architectural remains remaining unexplored and the context of the finds unclear, a more precise interpretation is currently not feasible. Dating is based on typology and chronology, some radiocarbon dates, and analogies from the neighbouring areas.

02 BORDERS, MARGINS AND PEOPLING PROCESSES IN MOUNTAIN AREAS (5TH – 9TH CENTURIES): THE STUDYCASE OF REVENGA (BURGOS, SPAIN)

Author(s): Travé Allepuz, Esther - Álvaro Rueda, Karen (Universitat de Barcelona) - Domingo Ribas, Guillem (University of Edinburgh) - López Pérez, María Dolores (Universitat de Barcelona)
Presentation Format: Oral

The study of peopling processes is a complex issue to deal with, particularly with regard to border and marginal areas. The Iberian Peninsula exhibits a heterogeneous landscape and the processes of Romanization and Christianization have had different degree of impact throughout the Peninsula. This will be a relevant factor of influence to assess the impact of Visigoth or Carolingian power and their chances to successfully control the territory. Within the territories under Visigoth or Carolingian rule, some areas seem to remain as outsiders, particularly in mountain and rough spaces.

Our contribution is focused on a clearly delimited mountain area, the Upper Arlanza Basin, and the interpretation problems arising from the study of the early medieval site of Revenga. The archaeological site of Revenga (Comunero de Revenga, Burgos) is a challenging settlement to get better knowledge about the period between 5 – 9th Centuries AD. Recent works at this archaeological site revealed a stratigraphic sequence featured by the uninterrupted occupation of space and intense reuse of structures. This correlates with the settlement transformation and the changes occurred within its internal structure between 5th – 9th Centuries. Results obtained through fieldwork must be considered with regard to the landscape organization and the presence of autochthone communities inhabiting and exploiting natural resources in a marginal area not directly controlled by those existing political powers.

03 MONASTIC COMMUNITIES IN THE VISIGOTHIC PERIOD: PYRENEES MOUNTAINS. THE EXAMPLE OF ELS ALTIMIRIS

Author(s): Sancho, Marta (Universitat de Barcelona; Institut de Recerca en Cultures Medievals - IRCVM) - Alegría, Walter (Walvia) - Coso, Júlia (Universitat de Barcelona)
Presentation Format: Oral

After the disintegration of the Roman Empire, much of the population linked to cities, seek alternatives in not controlled environments for the new emerging elites. In our case related with visigothic power.

Organized in communities, often monastic, endowed with knowledge from classical culture and stimulated by the need to survive, they create a new adaptive model. The mountain offers them vegetal, animal and mineral resources to meet their basic needs, allowing the development of a silvo-pastoral economy. Church gives them the organizational model and religion the ideological base.

From these realities, the landscape is perceived as both a wild environment and as a source of essential resources. The population must try to protect themselves from this situation and develop production techniques to exploit the available resources. This is what we try to discover through mountain archaeology. The beauty of the mountain landscapes contrasts with its harsh living conditions. However, in specific historical contexts, the mountain becomes an alternative for communities with adaptability.

In this context we show you the archaeological site of Els Altimiris that we interpret like a visigothic monastic establishment. This archaeological site is situated in Montsec range, long away to the three most important bishoprics, -Ilerda, Osca and Urgellium- and

close to the transhumance routes.

04 SITE TRANSFORMATION AND CERAMIC REVIEW AT THE ARCHAEOLOGICAL SITE OF SANTA MARGARIDA (MARTORELL, BARCELONA) (6TH – 12TH CENTURIES)

Author(s): Travé Allepuz, Esther (Universitat de Barcelona; Centre d'Estudis Martorellencs) - Farreny Agràs, Montserrat - Navarro Sáez, Rosario (Centre d'Estudis Martorellencs) - Socorregut Domènech, Josep - Fresno Bernal, Pablo (Sistemes de Gestió de Patrimoni SCCL) - Mauri Martí, Alfred (Centre d'Estudis Martorellencs)

Presentation Format: Oral

The archaeological site of Santa Margarida (Martorell, Barcelona) was uninterruptedly occupied since 5th to 20th Century. The most ancient evidence is the Early Christian church with tripartite apse and its extensive necropolis. During the period between the 6th – 12th Centuries this site will undergo a great transformation in accordance to the surrounding landscape articulation and the refurbishment of the church, transformed into a Romanesque building. The distribution of habitat structures gathered around the temple exhibit a changing layout in accordance with successive occupation phases. The particular location of this site in one of the most transited areas in medieval Catalonia.

Recent fieldwork allowed duplicating the extension of the excavated area and the radiocarbon dating of bone remains contributed to precise the chronology of these occupation phases. In addition the presence of a great amount of silos with greyware ceramic material allows deepening into the knowledge of these productions and to characterize the ceramic register of the main phases of the site.

Throughout this contribution we aim to offer an updated state of the art considering the evolution of the site from a diachronic perspective for the period between the 6th – 12th Centuries, and to offer preliminary results of work carried out during the latest years, building upon new research hypotheses and focusing on the ceramic register.

05 THE CAROLINGIAN ORIGINS OF A MEDIEVAL VILLAGE NEAR CAP DE CREUS (CATALONIA): SANTA CREU DE RODES

Author(s): Ollich, Imma (Universitat De Barcelona-GRAMP; Museu Arqueològic de l'Esquerda) - Mataró, Montserrat (Generalitat de Catalunya; Universitat de Barcelona-GRAMP) - Puig, Annamaria - Travé, Esther (Universitat de Barcelona-GRAMP) - Díaz-Carvajal, Antònia (Universitat de Barcelona-GRAMP; Museu Arqueològic de l'Esquerda) - Agustí, Bibiana (Universitat de Barcelona-GRAMP)

Presentation Format: Oral

The medieval deserted village of Santa Creu de Rodes (El Port de la Selva, Alt Empordà) is stra-tegically placed at 500 m high by the sea, near Cap de Creus, where the Pyrenees dive into the Mediterranean Sea. Therefore, the site offers a large overview on the coast and the Emporitan plain, guaranteeing the effective control of the communication routes through the Pyrenees. Ar-chaeological fieldwork in this settlement has been undergone since 2006 improving the current knowledge on the site.

The medieval village, crossed by a main street flanked by two door-towers, was grown around the church of Santa Helena. Houses were built using local stone and most of them even had two floors. Their inhabitants were peasants and fishermen, but the particular needs of the adjacent monastery of Sant Pere de Rodes required some of them to be tradesmen or artisans who built great lodgings to accommodate pilgrims.

Although the main remains are from 11-15th Centuries, our presentation explores the Carolingian origins of this site. Below the medieval buildings, a great necropolis of anthropomorphic tombs has been found, and a rich layer of burnished pottery was discovered during the latest fieldwork. These sherds exhibiting some of the ceramic features of the Carolingian frame are under analytical exam-ination and some results will be provided. Current hypothesis suggests the presence of Frankish Carolingians taking advantage of this strategic place in northern Catalonia at the end of 8th-early 9th Centuries.

06 THE ARCHAEOLOGY OF GRAIN STORAGE IN SILOS IN THE NE OF PROVINCIAL TARRACONENSIS DURING THE LATE ANTIQUITY

Author(s): Prat, Marc (Universitat de Girona)

Presentation Format: Oral

After the Fall of the Western Roman Empire at the end of the Fifth century AD, the social and economic structures of the NE of the Tarraconensis province suffered profound changes and ultimately collapsed. The abandonment of many uillae and the emergence of new models of land use have been archaeologically recorded. Such domestic units, either reoccupying old uillae or as completely new settlements, adopted somehow 'new' economic strategies, both productive and of storage management. The main storage systems from the Roman imperial period, based upon ceramic containers and horrea, were replaced by silos which, rather surprisingly, had been widely used several centuries before.

The aim of this paper is to provide some clues to better explain the reappearance of such silos in a completely distinctive archaeological background. Namely, as opposed to the Iron Age extensive fields, only relatively modest groups of silos -rarely over ten and belonging to both urban and rural contexts–seem to have been recorded in the Late Antiquity. Both in Girona and Empúries, the only two ciuitates still surviving in the region, silos most likely served the Visigoth comes. On the other hand, when a rural atmosphere is concerned, silos are frequently located in isolation in the middle of fields and in small caves. Likewise, they seem to be closely related

to small rural settlements formed by groups of buildings. Although the silos themselves have been severely damaged, a thorough study of the archaeological remains still preserved will certainly provide some new information regarding their filling process. To sum up, as a case study, this paper will present new archaeological evidence in order to dig deeper on a phenomenon which on the one hand reflects the obvious disturbances of a troubling period and, on the other, was most probably not exclusive of this region.

07 NEW DATA ON THE PUIG ROM VISIGOTHIC CASTRUM (ROSES, ALT EMPORDÀ)

Author(s): Subias, Eva (Universitat Rovira i Virgili; Institut Català d'Arqueologia Clàssica) - Puig Griessenberger, Anna Maria (UB) - Codina, Dolors (URV) - Fiz, José Ignacio (Institut Català d'Arqueologia Clàssica; Universitat Rovira i Virgili)

Presentation Format: Oral

In the last 4 years the excavations have been resumed in the Puig Rom's Visigothic castrum, in order to adjust the chronology of occupation and to prepare a global presentation project to the public. In this sense, the chronological difficulties persist due to the scarcity of materials in stratigraphy. Thanks to the excavation of a new sector at the northwestern angle of the site we have been able to discover and document a new access and find out that it responds to a modification of the original construction project. Therefore, we can deepen into the idea of two or more phases in the life of the site that help to assess the hypotheses about its functionality. Now we can begin to follow with some precision the perimeter of the wall of the north face despite the modern reconstruction that hide it and we can add three towers that were not yet visible to the eastern façade of the fortification. Thanks to the photogrammetry and aerial photography of the site, we can also sense that the number of towers can still increase. Finally, we have consolidated the walls of the old excavations of Folch i Torres and Pere de Palol that had been lost throughout this century.

08 TORRE DE LA MORA, A FORTIFICATION OF THE 9TH CENTURY (SANT FELIU DE BUIXALLEU, LA SELVA)

Author(s): Tura, Jordi (Museu Etnològic del Montseny) - Mataró, Montserrat (Servei d'Arqueologia - Girona (Departament de Cultura, Generalitat de Catalunya)) - Font, Gemma - Mateu, Joaquim - Pujadas, Sandra (Museu Etnològic del Montseny) - Rueda, Josep Manel (Museu d'Arqueologia de Catalunya)

Presentation Format: Oral

La Torre de la Mora is located on top of a 350 meters hill at a point of visual control over a large part of the la Selva plain and the Montseny - Montnegre corridor (Via Augusta), as well as the paths leading to Arbúcies valley, Montseny and Osona.

The archaeological excavation carried out by MEMGA documented a tower with Roman origin, seated on the remains of the adjacent Iberian site, constructed with cyclopean blocks with blostered and squared face.

The excavation of the lower levels of this structure, allowed to reveal the remains of carbonized wooden beams and rafters made of oak (Quercus caducifolis). Below them, occupation levels appeared, containing ceramics artefacts, such as oxidized-reduced pottery that could be located between the end of the 8th century until the beginning of the 10th century. The construction technique used in the tower -in wood- could hardly exceed the first half of the 10th century. The calibrated radiocarbon dating of the beams and rafters situate the chronology of the construction in an end of the 9th horizon (cal AD 891).

Between the end of the 8th and the 9th centuries the boundary between the Carolingian empire and Islam changed from the Montseny-Montnegre axis to the Llobregat-Cardener valley, although the campaigns and raids in these lands did not end virtually until at the end of the 10th century, with the actions of Al-Mansür on Girona (982) and the looting of Barcelona (985). Therefore the visual control of la Torre de la Mora remained in force. Archaeological evidence seems to indicate that the hypothesis of its destruction would be a fire related to some warlike action. From the end of the 10th century onwards, the role of control and territorial domination was developed by the castle of Montsoriu, built on a nearby hill.

09 L'ESQUERDA: A MILITARY SITE IN PREPYRENEAN AREA THROUGH VISIGOTHIC AND CAROLINGIAN TIMES

Author(s): Pratdesaba-Sala, Albert - Ollich, Imma (Universitat de Barcelona; Museu Arqueològic de l'Esquerda) - Rocafiguera, Montserrat - Pujol-Camps, Àngels (Museu Arqueològic de l'Esquerda) - Amblàs, Oriol (Escola d'Art i Superior de Disseny de Vic; Museu Arqueològic de l'Esquerda) - Subirana, Ocaña (Museu Arqueològic de l'Esquerda) - Díaz, Antònia (InSitu SCP) - Serrat, David (Universitat de Barcelona)

Presentation Format: Oral

L'Esquerda is a fortified settlement located in Roda de Ter, Catalonia. Dating evidences recovered from this site had revealed a long-term human occupation since Late Bronze Age till Late Middle Age (8th BC–14th AD). The strategical position of this settlement allows controlling the pathways to the north and the coast from the inner lands.

Settled on a steep peninsula and surrounded by 50m cliffs with the river Ter over them, the only accessible way was the northern face. Here, the archaeological works had found various defensive structures, from the Iberian to medieval times.

This paper focuses on the structures and material evidence found in site recent excavations, concretely a 150m long town wall dated from the Visigothic period (7-8th centuries), refurbished in the Carolingian period (9-10th centuries) and the Feudal period (11-13th centuries) and finally destroyed in the 14th century. The archaeological works had revealed that the wall had a minimum of three square towers, two entrances and the rests of a ditch. These elements helped to defend and protect the wall and the town behind. Some more archaeological finds related to the wall are the silos and the burials of the Visigothic period and the bare-rock bases remains from the wood Carolingian watchtowers.

10 THE CAROLINGIAN SILOS OF GIRONA: THE EXAMPLE OF A COUNTY CITY DURING 8 AND 9TH CENTURIES AD

Author(s): Prat, Marc (Universitat de Girona) - Nolla, Josep Maria (Universitat de Girona)
Presentation Format: Oral

The incorporation of Girona and its territory in the Carolingian Empire implied important changes for the city. From one day to next, Girona became the border with Al-Andalus and the first bastion in front Muslims' attacks. As a cornerstone of the defence of the territory and the road to north, Carolingians decided to reinforce and consolidate the old walls and to build a considerable number of defensive towers. The works, which concerned the entire perimeter of the walls, also implied the construction of Girona's first expansion district.

The new district, situated near to the cathedral and called "La Palestrina" during the 12th century, was excavated in 2001 and 2004-2005. The both excavations, which showed a continuous occupation of the site since the foundation of the city ex nouo during 1th century BC until now, brought to light a large number of Carolingian silos that, for their situation, were associated with the cellarium of the cathedral.

Not too far from "La Palestrina", there is the Cathedral' square, which was excavated in 2003. Among others things, its excavation found a building interpreted as the count's palace and, as "La Palestrina", a big number of Carolingian silos. Despite the similarities among both places, the silos of Cathedral' square, as opposed to the silos of "La Palestrina", were associated with secular authority and they belonged to the Carolingian count.

The presence of silos is not strange during that period. Excavations in other places like Barcelona or Empúries also found silos related with the authorities of that period.

To sum up, as a case study, this paper will present the example of Girona, a county city, to show a reality very widespread during Carolingian period.

a. THE 'IMITATIO IMPERII' IN THE VISIGOTHIC KINGDOM OF TOLEDO: AN ARCHAEOLOGIAL OVERVIEW THROUGH NUMISMATICS

Author(s): Sales-Carbonell, Jordina - Buenacasa Pérez, Carles (Universitat de Barcelona)
Presentation Format: Poster

The 'imitatio Imperii' historical phenomenon has been studied and explained mainly by means of written sources, even if in its time the episode was expressed essentially through iconographic means (at last, iconography can be considered as the main or only archaeological remain of the 'imitatio').

Until the reign of Leovigild, Visigothic numismatics did its best to imitate Byzantine coinage, despite significant technical shortcomings. As such, the Visigothic state made it clear how unprepared it was to accept the succession of the Empire in the Western lands they had conquered; in particular, whether they held on to Arianism in a mostly Catholic Hispania.

Leovigild nonetheless took it upon himself to coat the Visigothic monarchy with all the trappings of imperial power: a royal seat and throne, imperial clothing, a Latin titlehood along lower Imperial lines (dominus noster), a sceptre and headband with finished in pearl tips. This iconography is the norm in coins minted from kings Leovigild to Roderic.

This poster aims to an eminently visual summary of the concept of 'imitatio Imperii' reflected in the iconography –that is, the process by which Visigothic kings learnt to portray themselves in coins as Byzantine emperors. It will display the different stages and the chronological evolution of such coinage.

b. LATE ANTIQUITY MONASTERIES IN THE IBERIAN PENINSULA: AN ARCHAEOLOGICAL SUMMARY

Author(s): Sales-Carbonell, Jordina - Sancho i Planas, Marta (Universitat de Barcelona)
Presentation Format: Poster

One of the most controversial and also least studied aspects of the Late Antiquity period in the Iberian Peninsula has been the archaeological identification of its first monasteries. Although scarce, written sources are particularly eloquent and explicit in this regard, leaving little doubt on how the urban and rural landscape at the time was littered with monasteries arisen during the Late Roman Empire (admittedly, these archaeological traces are too 'domestic' to be classed as 'monastic') and which thoroughly spread during the Visigothic centuries (in many cases, providing an early indication of the architectural outline which would become common and easily identifiable in the Middle Ages).

Nevertheless, monastic archaeological traces refuse to appear. Or, as has been proven over the past few years, they consistently fail to be identified and singled out among other vestiges of Late Antiquity which have been overwhelmingly attributed to lay villages, or else identified as basilicas with attached buildings with no monastic significance. This is the result of methodological issues which are impossible to explain at length here, and also because of a certain interpretative caution which is not only widespread but, at times, excessive.

For this reason, we believe it is a good idea to create a poster, which visually and conceptually summarizes this issue, featuring the layout of the archaeological sites in Hispania which are currently susceptible to being classed as monastic in character. Such tool could be useful in the future identification of new ancient Iberian monasteries.

748 'ARCHAEOLOGY AND…' - INTER-DISCIPLINARY WORKING IN PLANNING AND DESIGN

Theme: Theories and methods in archaeological sciences
Organisers: Dixon, James (Wood) - Molla, Nevila (University of Siena) - Williams, Gwilym (Rio Göteborg Natur- och kulturkooperativ)
Format: Regular session

Across Europe, archaeologists work alongside ecologists, architects, master-planners and more, but also find ourselves engaging with artists, politicians, academics and others as part of the multi-disciplinary environment that planning and design create. Those common enough processes that bring different disciplines together don't always survive intact as they move from project direction to 'boots on the ground' site investigation.

This session will investigate opportunities for creative engagement with other disciplines that take us beyond simply doing the things existing policy and guidance tell us to do. We will identify different kinds of archaeology that take advantage of working with other disciplines to do something more than what might ordinarily be expected and contribute to the development of archaeological practice more widely.

How does multi-disciplinary working differ across Europe? How can we create strategies to help each other develop? Should we aim to be more consciously inter-disciplinary as individuals or does it work best at project management and curation levels? Is there an archaeology-ecology practice that differs from an archaeology-architecture practice? Should these different cross-over practices be the work of specialists or should we all be thinking differently?

This session will examine the potential for multi-disciplinary exchange and working in planning and design to change the way we approach sites and landscapes. We welcome papers from practitioners and theorists interested in new ways of doing archaeology in tandem with other disciplines. We welcome equally papers from practitioners of other disciplines who work alongside archaeologists and think we could be doing something different.

ABSTRACTS

01 RESEARCH THROUGH CREATING AN IMMERSIVE EXPERIENCE AT A ROMAN TOWN

Author(s): Bowden, Will - Bedwell, Ben - Harlow, Natasha (University of Nottingham)
Presentation Format: Oral

This paper discusses using the creation of immersive VR experiences as an iterative process at the Roman town of Venta Icenorum (Caistor St-Edmund - UK). A new project funded by the AHRC/EPSRC is developing an immersive visitor experience at the Roman town to be accessed by mobile devices. An interdisciplinary team from the Department of Classics and Archaeology and the School of Computer Sciences at the University of Nottingham is working with an external industry partner (Jam Creative Studios) to create a populated VR model that allows visitors to experience the Roman town in summer and winter and to meet and interact with the human and animal inhabitants of the town.

The process of creating this experience has opened up a range of research questions that are often neglected by archaeologists or not considered in more traditional interpretations (virtual or static). The project demands that we consider a range of new questions such as how the buildings of the town are used in different seasons, what languages were spoken by the inhabitants, how the people would dress in different seasons and other aspects of their appearance such as hairstyles. We need to consider how animals and people would interact with each other and how this would affect the environment of the town. The paper will also examine whether envisaging the creation of such experiences as a key aspect of dissemination strategies could usefully inform the planning stages of future research projects.

02 LONDON MITHRAEUM: ACCOMMODATING ART AND AUTHENTICITY

Author(s): Fowler, Louise (MOLA)
Presentation Format: Oral

London's Roman Temple of Mithras lies next to the 'lost' river Walbrook, close to the Bank of England, at the heart of the city's financial district. The discovery of the temple on a bombsite in the 1950s provoked intense public interest, and was followed by a national debate about the preservation of archaeological remains discovered during construction work. The site's owners eventually offered to dismantle the temple and reconstruct the remains elsewhere on the site. Though they demonstrated some reverence for the site's rich archaeological past through artwork and design references within the new office building, a lack of authenticity in the reconstruction disappointed many of those involved with the original excavation.

Recently, the demolition of the mid-20th century office block and the construction of Bloomberg's new European headquarters on the site presented an opportunity to address some of the shortcomings of the initial reconstruction and to move the temple back to the location of its discovery. The planning brief from the City of London included the condition that the new reconstruction should 'provide an evocation of a mithraeum as it might have been used', and working towards this aim has involved close collaboration between exhibition designers, archaeologists, architects, artists, stonemasons and conservators, resulting in a complex weaving together of different approaches. This paper will explore some of the ways in archaeologists from MOLA have been working with the

rest of the project team to bring the site's rich past to life for a new generation of visitors.

03 THE SPECTRE AT THE FEAST. TOURISM AND THE WIDER USES AND ABUSES OF INTERDISCIPLINARY STUDIES IN ARCHAEOLOGICAL PRACTICE

Author(s): Gilkes, Oliver (Mr Gilkes - Specialist Journeys)
Presentation Format: Oral

The vexed question of who owns the remote past is nowhere more evident in the relationship between archaeological practitioners and the tourist industry which they, in part, service. Increasingly this sector is divided into producers of archaeology and those who its consumers, these groups interfacing at the fracture points of excavations, sites, museums and exhibitions where a hierarchical gulf separates the adepts and peons.

This is a phenomenon which has developed during the steady demarcation between professional archaeological and cultural heritage management interests and the increasingly regimented consumers; the results of which can be seen all over Europe at archaeological sites which are simultaneously economic hot spots. The steady growth of the latter has necessitated progressively more controlled and restrictive opportunites for consumers to appreciate the reality of their archaeological past, to its great detriment.

However, the question of producer and consumer, the growth in regulatory pressures on the former group throughout Europe and the ongoing appreciation in numbers of the second should be seen as an instead as an opportunity to redefine the relationship between them.

In this paper I will take the uses of interdisciplinary practice from the point of view of an archaeological tour operator to explore the potential for synergies and mutually beneficial proximity cooperation in the scientific and commercial presentation of the archaeological past.

04 VISUALISING UNCERTAINTY – THE VISUAL REPRESENTATION OF UNCERTAIN KNOWLEDGE IN ARCHAEOLOGY FOR MULTIDISCIPLINARY RESEARCH AND EXCHANGE

Author(s): Lengyel, Dominik - Toulouse, Catherine (BTU Cottbus-Senftenberg)
Presentation Format: Oral

Visualising Uncertainty is a research method at the intersection of architecture, archaeology and art history. If focuses on translating the inherent uncertain knowledge of archaeological or art historical hypotheses regarding spatial content. The background of this approach is the usual gap between verbal description of hypotheses, that clearly address uncertainties, and the common way of visually representing them in rather certain, seemingly realistic ways. The approach takes the verbal uncertainty of the hypotheses and uses methods of architectural design to design spaces, that take over the inherent abstraction of the verbal hypotheses to make them visible and explicit. The aim of illustrating hypotheses through visualizations is to make these hypotheses accessible for visual thinking as a complementary addition to verbal thinking. Mainly through the design of geometrically abstract forms, the uncertainty is preserved, and the resulting illustration transports content as well as its degree of uncertainty simultaneously. As these illustrations do not only translate text into images but also arise new questions, they create a multidisciplinary environment. The advantage for archaeologists is that they encounter possible historic yet architectonic intentions whereas architects investigate former architectonic ideas from a scientific perspective. This way both disciplines help each other to develop new strategies in solving open knowledge or design issues. The paper demonstrates the presenters' own projects in academic and professional circumstances to examine the different methods and tools. Projects shown are among other the authors' theorist's Chair's projects Ancient Metropole of Pergamon, developed in cooperation with the excavation director on site during the last decade, and The Sasanide Residence of Ktesiphon, developed with the Museum of Islamic Art in Berlin, both projects funded by the Excellence Cluster TOPOI by the German Research Foundation DFG, and the authors' practitioner's office's projects Cologne Cathedral and Bern Muster, developed for the respective Cathedral administration.

05 RESHAPING ARCHAEOLOGICAL PRACTICE IN PRESENT-DAY ALBANIA: CHANGING PERSPECTIVES AND CHALLENGES

Author(s): Molla, Nevila (University of Siena)
Presentation Format: Oral

For most of the second half of the past century, Albanian archaeology operated as a centralised, state-controlled discipline that was largely based on Marxist and positivist theories. With the exemption of its close links to and collaboration with history, multidisciplinary was a non-existent concept, and scholars worked in almost complete isolation from other sources and disciplines. The country's opening up to the West from the early 1990s inevitably led Albanian archaeology to distance itself from tradition, and face up to contemporary perspectives and challenges: from the need to adapt to new theoretical approaches to deploying up-to-date field methodologies to founding new institutions and private structures in order to fit the country's new realities - particularly urban development and an open-market economy.

In discussing its recent history, this paper will focus on the major changes Albanian archaeology has had to undergo over the past 25 years. It will present the series of internal and external factors at play in shaping Albania's current archaeological practice, and estimate the impact that, in particular, wide collaborations with international institutions and schools of thought have had on reshaping

the discipline on a theoretical and methodological level. Lastly, it will ask whether Albanian archaeologists have taken an active or passive role in this process.

06 SPATIAL DATA PROMOTING INTER-DISCIPLINARITY

Author(s): Jansen, Jane (National Historical Museums The Arcaheologists) - Lund, Karin (Intrasis)
Presentation Format: Oral

The Achaeologists at National Historical Museums in Sweden work multi-disciplinary in almost every archaeological project. Specialists as paleo ecologists, osteologists, geologists, and geo chemists have traditionally analysed and reported findings from their discipline and added them separately to the archaeological report. During the last decade we have worked hard to integrate, not only their results, but also their data with the archaeological record. The value of combining interdisciplinary results in spatial analysis has been proven important in archaeological research.

Most effective use of interdisciplinary data can only be achieved if the data itself is interdisciplinary and easy accessible and combinable. Intrasis, from National Historical Museums in Sweden, has that capability. Intrasis unique way of handling in-site relations makes it possible. You can store and register data for any discipline related to archaeology. Each discipline can register their information as they wish, and at the same time have access to all other data from the site.

We will in this paper explore interdisciplinarity in archaeology with emphasis on GIS and databases. We will show how the workload of data analysis can be minimized by Intrasis combination of database and GIS. By the possibility to immediately take all information into account – better understanding and new ideas and interpretation of the individual site can arise. Showing your result contextual on a map or in a GIS environment can also make it more accessible for the reader. Interdisciplinarity is combination of data!

07 DIGGING TOWARDS THE FUTURE. THE CHANGING ROLE OF ARCHAEOLOGY IN URBAN PLANNING

Author(s): Davies, Tom - Smith Wergeland, Even (Oslo School of Architecture and Design)
Presentation Format: Oral

This article looks at the changing role of archaeology, the contribution it has made to the field of urban planning and the returns from this to development and society. Archaeology has become an intrinsic part of European and Scandinavian planning in recent decades, informing and determining the outcome of development and through documentation, providing a wealth of knowledge concerning our notions of common heritage and sense of place. New fields of interest have emerged, such as Industrial archaeology, providing new insights into our recent material culture, and a clear focus on the human-story through intangible heritage. New methods and technical innovation, such as 3D-modelling and GIS, have an increasing influence on the planning process and through multidisciplinary practice, are providing shared learning opportunities with other disciplines. As part of this, we are building our understanding of how sensitive design can reduce impact to heritage and costs and the ways in which the archaeological story can ground development in the history of a place and contribute to the local area. This article looks both at how archaeology provides solutions to development and the contributions made in the intersection between archaeology and planning. Consideration is made of both the technological and methodological aspects and the broader cultural perspective, including notions of the underground as a vision of future, as Rosalind William discusses in Notes on the Underground (2008). Even in the case of very utilitarian tasks such as roundabout planning there is an interesting convergence of subterranean myth and reality, through archaeological investigation, which provide new ways of looking at and understanding the relationship between the underground and the surface level of cities. Like Fredric Jameson before us (Archaeologies of the Future, 2005), we direct an archaeological lens at the utopias that lie ahead, digging towards the future of urban undergrounds.

08 MULTI-DISCIPLINARY ENVIRONMENTAL ASSESSMENT AND THE CASE FOR HYBRID PRACTICE

Author(s): Dixon, James (Wood)
Presentation Format: Oral

This paper will present a case study of how historic environment professionals work with other disciplines within one environmental assessment business. Typically, any site or project will involve practitioners of a number of different disciplines, each looking at the same place in their different ways and feeding back to people who weigh up those different perspectives and use them to create or refine aspects of planning and design. Although I admit that this paper will not provide a critical case study as such, I will present thoughts arising from engagement with different disciplines in my own workplace to address the following issues: whether we can work better (or at all) with each other's data; whether, or in what circumstances, we should stand alone as consultants, and when should we overtly collaborate; what realistic scope there is for the evaluation of different disciplinary concerns at much earlier stages of design projects; and how far it is practically possible, or even desirable, to cross-skill individuals on a meaningful scale.

To conclude, I will address the question of whether we might more regularly diversify our working practices to consider using inter-disciplinary 'hybrid archaeologies' to suit different kinds of sites and projects. If we can conceive of these different, experimental hybrid archaeologies and think they might be useful, who will be the hybrid archaeologists?

749 FROM STRATEGIES TO PRACTICE IN THE PROTECTION AND PROMOTION OF ARCHAEOLOGICAL LANDSCAPES

Theme: Archaeology and the European Year of Cultural Heritage
Organisers: Jerem, Elizabeth (Archaeolingua Foundation) - Črešnar, Matija (University of Ljubljana) - Potrebica, Hrvoje (University of Zagreb)
Format: Regular session

New technologies and methodological advances of the past few decades have radically changed the potentials of archaeological research. The focus has shifted from the investigation of single sites to studies on broader archaeological landscapes. In particular, remote sensing technologies and geophysics have yielded vast amounts of new archaeological data, opening new avenues to the better understanding of archaeological sites, landscapes, regions and beyond.

However, this process has raised two important issues, which call for discussion: (1) the often (too) superficial interpretations of the data, and (2) the long-term impact of the new data on decision-making processes in European heritage management. Both issues are closely connected. The lack of depth in interpretation often means that we fail to realise the broader potentials in the use of the collected data. A lack of awareness of these possibilities also constrains the process of developing new, more efficient heritage management tools. Moreover, the lack of closer cooperation between archaeological scholarship, heritage protection and politics also hinders more profound advances. As a response, several initiatives now focus on developing new approaches and strategies to tackle the present situation. Unfortunately, these strategies are often solely restricted to a project's research area and/or its duration, and are not implemented on any political or legislative level.

In this session, we would like to hear about your positive as well as negative experiences and practices in the strategic planning and implementation processes dealing with the management of archaeological landscapes in the broadest sense.

ABSTRACTS

01 FROM SITE TO LANDSCAPE: INTEGRATED APPROACH TO IRON AGE LANDSCAPE STUDIES (CASE STUDY POŽEGA VALLEY)

Author(s): Potrebica, Hrvoje (Center for Prehistoric Research; University of Zagreb) - Rakvin, Marta (Archaeological Museum in Zagreb)
Presentation Format: Oral

The discovery of a burial mound cemetery with richly furnished burial mounds and princely graves near the village of Kaptol gave the Požega Valley a prominent place on the map of the Hallstatt cultural complex. Prestigious items originating from Central Europe and the Alpine region as well as from the Balkan Peninsula suggested the existence of a unique community living on the south-eastern fringes of the Eastern Hallstatt Circle. Seventeen years of continuous Iron Age research in the valley has generated a vast amount of data regarding the material culture as well as the spatial distribution of archaeological features. Kaptol was recognised as a complex site with two burial mound cemeteries and a hillfort. Based on these results, a hypothesis was constructed that Kaptol functioned as a sort of a central place in the area and that it was part of a hierarchical network together with the other EIA sites identified in the valley. Modern research methods involving LiDAR scanning and extensive geophysical surveys, introduced to the research agenda by the ENTRANS project, have completely changed our perspective and interpretation paradigm, both in the spatial and diachronical sense. We now know that the contemporary site of Kagovac in Kaptol's immediate vicinity is also a complex site with two burial mound cemeteries and a large fortified settlement, and that its status was comparable to Kaptol. We also became aware of more Iron Age sites in the valley and gained information indicating the existence of additional burial mound cemeteries beyond its natural borders. This shows that in order to understand the Iron Age, we have to shift our interpretative focus from individual sites and direct it to the landscape and its specific features. It is necessary to extend the research perimeter to the areas between "sites", previously perceived as empty space in the cultural sense.

02 PUBLIC INTEREST ROLE IN THE LANDSCAPE HERITAGE MANAGEMENT: KAPTOL CULTURAL LANDSCAPE CASE STUDY

Author(s): Balen, Jacqueline - Bertol Stipetić, Anja (Arhaeological Museum in Zagreb)
Presentation Format: Oral

The European Landscape Convention states that landscape has an important public interest role and constitutes a resource favourable to economic activities, whose protection, management and planning can contribute to job creation and to the well-being of the local community. When discussing landscape management, one of the crucial problems is its long-term sustainability and incorporation into the public/communal tissue. In most cases, the local population's insufficient knowledge about the importance of cultural heritage is the cause of its poor/inadequate use.

Because of their specific features/characteristics, landscape heritage sites require a special action strategy to promote and to achieve these goals. Local governments, tourist boards and educational institutions should primarily be reached when making efforts to achieve these goals. They will further provide information or work on creating frameworks for residents, local entrepreneurs and other stakeholders.

As part of the Iron Age Danube project, the Archaeological Museum in Zagreb undertook a series of activities to promote these ideas and to motivate the stakeholders in the Kaptol micro-region. The cultural landscape of Kaptol is made up of EIA tumuli cemeteries and hillfort settlements.

Schools as well as the general public were targeted through series of lectures, workshops and open day events. In cooperation with local governments and tourist boards, plans were made for new tourist routes and 3D visualisations, alongside proposals for landscape revitalisations projects. The implementation of these project activities should serve as stepping stones toward a more sustainable management of Kaptol's cultural landscape.

03 IRON-AGE-DANUBE INTERREG DTP IN JALŽABET: RE-IMAGINING ARCHAEOLOGICAL LANDSCAPE AND RE-THINKING ITS PROTECTION

Author(s): Kovacevic, Sasa (Institute of Archaeology, Zagreb)
Presentation Format: Oral

Jalžabet is a well-known Early Iron Age site in the river Drava Valley region in NW Croatia. Together with nearby Martijanec, it belongs to the eastern Hallstatt culture zone. The Jalžabet landscape is also in the focus of the Iron Age Danube Interreg DTP project implementation by the Institute of Archaeology in Zagreb as a project partner. During 2016 and 2017, several geophysical surveys and archaeological excavations of the archaeological landscape in Jalžabet were carried out. It was the first archaeological investigation at Jalžabet after a research gap of almost 30 years. Brand new data regarding the chronology and the cultural profile of the Jalžabet landscape were collected and will be preliminarily presented for the first time in this lecture.

During the implementation of the Iron Age Danube project in September 2017, it was discovered that Jalžabet-Gomila, one of the biggest and best preserved un-researched prehistoric tumuli in Central Europe, had been heavily damaged during well planned looting. After the looting, which is described as the most extensive peace-time culturocide in the history of Croatia, a complex rescue excavation of the gigantic tumulus in Jalžabet was begun. The lecture presents the case Jalžabet and, while stressing the serious consequences of the shortcomings of cultural heritage protection, it again raises the question of whether we are tragically failing in the protection of archaeological heritage.

04 MONUMENT PROTECTION: PROS AND CONS IN THE MICRO REGION STRETTWEG (STYRIA/AUSTRIA)

Author(s): Tiefengraber, Susanne (University Graz Austria)
Presentation Format: Oral

One of the highlights of the Austrian archaeological heritage, the Cult Wagon of Strettweg, was discovered 1851. Significant research activities have taken place in the Strettweg area, ever since, which pointed out its special significance within the Iron Age.

The position of the settlements and the burial mounds in and around a large fertile inner alpine basin, the proximity to important trade and communication routes as well as to natural resources provided the basis for the wealth and cultural development of the Strettweg community, leading to the emerge of a high-ranking and powerful elite, whose remains attract pothunters up to the present.

Strategies to avoid their destructive activities consisted of both preventive procedures and the use of detailed archaeological research methods. We applied the analysis of ALS data and aerial images, we employed geophysical methods, field-surveys and excavations, all with the objective to acquire a range of diverse datasets about this complex landscape. Although parts of the area are currently under monument protection, the problem of pothunters could not be truly resolved. On the one hand, the property owners are not aware of the cultural and historical importance of this area, while, on the other, they did not know that it is forbidden to search and dig for archaeological artefacts. Another factor that makes the prevention of illegal excavations difficult is that it is virtually impossible to supervise the huge forested areas.

In addition to federal monument protection, one of the best ways to preserve the archaeological heritage in the long run is to inform and raise the awareness of local residents. We tried to enhance their relation to cultural heritage and thereby connect their past with their present and future, and link it to our research and other activities in a way as to enable them to get an idea of the meaning of the past for the present and the future.

05 CHANGING LEGAL AND SOCIAL ENVIRONMENT: NEW RELATIONSHIPS BETWEEN INVESTOR, LOCAL COMMUNITY AND ARCHAEOLOGISTS IN THE 21ST CENTURY

Author(s): Wollak, Katalin (Independent heritage expert; Expert in Iron Age Europe INTERREG project and in FRE The Danube Limes world heritage nomination)
Presentation Format: Oral

In order to contribute to strategic thinking regarding archaeological and built heritage protection, we have to be aware of the changing role of protection, in other words, of the present function of scheduling/listing archaeological heritage elements or sites of outstanding value. Before the "La Valletta era", the implementation of the Council of Europe Convention on the Protection of Archaeological Heritage (1992), protection was the only measure to avoid construction/investment in several countries. The ratio of the formally protected sites is around 5% on average in European countries. In recent decades, with the adaptation of the Convention, the focus has shifted from the protection to the preservation of the archaeological heritage through the exploitation of scientific information.

The number and variety of legal instruments for the preservation of important sites in situ has increased. The paper will present the possibilities within the framework of EIA (environmental impact assessment), the role of heritage impact assessment and preliminary archaeological documentation, as well as other new initiatives in national legislation.

The legal measures themselves can never guarantee the preservation and maintenance of major sites. A complex approach is required to achieve this goal. Although all project partners of the Iron Age Danube INTERREG project have ratified the Council of Europe Framework Convention on the Value of Cultural Heritage for Society, it yet remains to be seen whether these state parties are willing to apply real measures to adapt the progressive element of the convention, e.g. whether there is a shared responsibility and public participation in the preservation of the cultural/archaeological heritage. The paper will present recent experiences in addressing local communities/local governments in connection with the participation in heritage-based touristic tenders.

06 FROM ARCHAEOLOGICAL PARK TO ARCHAEOLOGICAL LANDSCAPE PROTECTION AND PROMOTION

Author(s): Magdolna, Vicze (Matrica Museum)
Presentation Format: Oral

It is not mere chance that this year has been announced as the year of Cultural Heritage. The 21st century has already seen profound changes and shifts regarding the awareness and understanding of immaterial values. Managers of cultural heritage sites face difficulties on several levels. It is increasingly crucial to be able to secure the understanding, acceptance and support of politicians and stakeholders. At the same time, people working in the fields related to cultural heritage such as archaeologists, historians, environmentalists, etc., also need to recognise the importance of tourism and promotion in the presentation and interpretation of their research findings. It is important to reach the widest possible audience, as public awareness and acceptance can be one of the avenues for influencing strategy developers and politicians. The Archaeological Park at Százhalombatta was opened some 20 years ago, to protect, preserve and present 10% of the well-known Hallstatt period cemetery. However, over the decades – thanks to modern archaeological research – it became evident that the protection of the entire archaeological landscape (cemetery and settlement) as a unit needs to be considered and managed together. This paper will give an overview of the insights gained during the past 20 years, where we stand at present, and what this means for the future.

07 FROM NEW TECHNOLOGIES, TO STRATEGIES IN RESEARCH, PROTECTION AND PROMOTION OF CULTURAL HERITAGE. CASE STUDY EARLY IRON AGE SLOVENIA

Author(s): Cresnar, Matija (University of Ljubljana; Institute for the Protection of Cultural Heritage of Slovenia)
Presentation Format: Oral

Although the "myth" that the Early Iron Age in Slovenia consists of nothing else but hillforts and barrows is now a thing of the past, these are still the most dominant monuments of prehistory. However, there are many more sources that offer us new data. New technologies and methodological advances of the last few decades as well as various European projects that offered ample opportunities to undertake interdisciplinary research have radically changed the way we see archaeological finds and sites.

On the one hand, the research focus shifted from single sites to broader archaeological landscapes, while on the other, almost every single find can be broken down into particles and analysed from several viewpoints. So, what can be done with the data? We can publish academic articles on very specific subjects and complex research decisions. However, at the end of the day, we have to come back to earth and realise that archaeology and archaeological science are not islands. So, is what we do important for the big picture? Do we know more about and have a better understanding of our archaeological past? Moreover, what of this is applicable in the heritage protection sector, which is under greater pressure than ever before, and in the world of exponentially growing cultural tourism?

Focusing on our research in Slovenia, we will sum up our experience in research and heritage protection as well as its promotion, and tackle the difficult hurdle of how to proceed from individual case studies to a system or strategy, which would work in most cases. How far have we come and what is still to be done before we can come forwards and shout "Eureka!"… (as if that day will ever come)?

08 ARCHAEOLOGISTS AND DATA-COLLECTORS – THE AUSTRIAN PERSPECTIVE

Author(s): Hellmuth Kramberger, Anja - Mele, Marko (Universalmuseum Joanneum)
Presentation Format: Oral

Archaeological research projects are often linked to the creation of comprehensive data collections in the form of databases. The content can be generated from archival data and publications as well as unpublished excavation records, which are tailored to the respective project goals. On the other hand, all databases – especially those used for researching archaeological landscapes – usually also contain geographical, administrative and chronological information, which can or could be used across projects and borders. However, in practice, it can be seen, starting from the example of Austria, that even publicly accessible archaeological databases are still predominantly faced with a project-internal "island life" and that very often, there is little knowledge and information flow about their existence in the academic community. An incomplete or unbalanced picture also arises with respect to the comparison between such project-related databases and institutional data collections/databases such as those assembled by Cultural Heritage institutions. Another dimension represents the cross-border comparison, which may reveal significant differences in the management strategies of project-related and institutional data collections.

On the one hand, our contribution seeks to approach the problem with concrete examples and, on the other, to encourage a dialogue

on possible solutions, especially with respect to the steadily increasing transnational cooperation between the research institutions of the different European countries.

09 HISTORIC ENVIRONMENT RECORDS AND THE CHALLENGES OF HERITAGE DATA MANAGEMENT SYSTEMS

Author(s): Delaney, Liam (Herefordshire Archaeology - ALGAO-HER) - Ramsey, Eleanor (City of Wolverhampton Council - ALGAO-HER)
Presentation Format: Oral

In heritage management, there is a need for systems that translates complex site data from archaeological investigations into easily recognisable information. This can be used by heritage professionals in site management, legislation or in public outreach, in order to make decisions and draft laws.

These systems are required to fulfil the needs of a variety of specific stakeholders. In the UK, Historic Environment Records (HERs) have filled that niche, attempting to act as a conduit between archaeological site records, research hubs, strategic data archival and public information dissemination. Unfortunately, this can be an uncomfortably difficult task, often oversimplifying data; a sometimes inability to accurately portray vast landscape archaeology to fit regional boundaries or simplified narratives. The databases have also often evolved at a slower pace than the technology of archaeological investigation, and the manual task of data entry has often meant that large data backlogs exist. This has resulted in vast amounts of heritage data remaining invisible to people drafting strategy, legislation and making decisions on planning.

What challenges are faced by HERs (and comparable systems throughout Europe) in a changing digital world? The open-data and big data revolutions threaten to greatly impact upon an already strained system. Can we future proof this and start designing systems that will allow for better interconnectivity across regions? Are there implementation processes that can be improved upon from site to digital archive that will allow a faster and more complete picture to be complied? How can interconnectivity help with improving management of heritage assets? Is there a need for a new system? This paper hopes to investigate issues around HER's and comparable database systems and explore the positive and negative aspects of them and the often overlooked, but important, role they play in modern heritage management.

10 BALTICRIM: A NEW EUROPEAN PROJECT FOR THE INTEGRATION OF THE BALTIC SEA'S UNDERWATER CULTURAL HERITAGE IN MARITIME SPATIAL PLANNING

Author(s): Zwick, Daniel (ALSH - Archäologisches Landesamt Schleswig-Holstein; BalticRIM-Project)
Presentation Format: Oral

With an intensifying economic use and exploitation of coastal and offshore areas, the underwater cultural heritage of the Baltic Sea is coming increasingly under threat. The necessity to integrate the latter into the planning process was acknowledged in the 2014 EU Directive on Maritime Spatial Planning and shall be implemented by the recently launched INTERREG-funded BalticRIM-Project ("BalticRIM" stands for Baltic Sea Region Integrated Maritime Cultural Heritage Management). The project provides a forum for archaeologists, spatial planners and other stakeholders, principally from Denmark, Estonia, Finland, Germany, Lithuania, Poland and Russia, to devise and implement the integration of the underwater cultural heritage as a discrete "asset" in maritime spatial plans in order to ensure a sustainable in situ protection and site management. This paper will discuss the challenges faced in the early stage of the project, which requires a rethinking process from point-based find-clusters to polygon-based sectors, with the potential of identifying coherent underwater archaeological landscapes. Additionally, strategies to bridge data gaps by predictive modelling and by the use of environmental and geomorphological proxy data will be addressed, illustrated by case studies. Within the framework of the project, each country/state has defined pilot regions for the planning case. Additionally, management areas were designated to test cross-border cooperation cases and to actively explore cross-sectoral synergy effects with other stakeholders, primarily from the nature protection, scuba diving and tourism sectors. The tangible outcome of the project will be maritime spatial plans with designated archaeological areas, albeit these will not be ultimate, as planning is a continuous process. Therefore, more importantly perhaps, the BalticRIM-Project has the potential to set impulses in the way(s) in which the underwater cultural heritage can be integrated into maritime spatial planning, and can thereby become an exemplary case for future implementation in other parts of Europe and the world.

750 ANCIENT AND MEDIEVAL HARBOURS – GATEWAYS BETWEEN CULTURES AND COMMUNITIES

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Pydyn, Andrzej (Institute of Archaeology, Nicolaus Copernicus University, Torun) - Oniz, Hakan (Division of Underwater Archaeology - Selcuk University)
Format: Regular session

From prehistory until modern ages harbours played an important role as places of interregional contacts. They allowed communities and individuals to exchange products, ideas, beliefs, services and general know-how. On one hand harbours were a safe haven for ships and their

crews, on the other hand they were places use for economic, political and military expansions.

Harbours were important already for early civilisations and cultures of the Mediterranean and the Near East. They played significant role in the Classical World and they were crucial for changes that took place during the Byzantine time. North European harbours were essential for interregional contacts that took place in the Early Medieval and Medieval Times.

Spatial and technical organizations of harbours were often an expression of political and economic influence or power. Phoenicians and Romans located their harbours not only in geographically attractive places but also in locations that were close to settlements of local communities. In the Early Medieval and Medieval Times local harbours located on the Baltic and North Sea served both local communities and the Scandinavian visitors.

ABSTRACTS

01 EARLY MEDIEVAL HARBOUR IN PUCK, IN NORTHER POLAND AND ITS RECONSTRUCTION.

Author(s): Pydyn, Andrzej (Institute of Archaeology, Nicolaus Copernicus University, Torun) - Pomian, Iwona (National Maritime Museum, Gdańsk) - Popek, Mateusz (Institute of Archaeology, Nicolaus Copernicus University, Torun)

Presentation Format: Oral

The Puck harbour was discovered in late 70'. The regular archaeological research was carried on in 80' and mainly in 90'. During this survey, about 16 ha of the submerged archaeological site was documented. The main part of this archaeological site are remains of the platforms and bridges. In addition to that 4 medieval shipwrecks and one logboat were found. First wreck P1 is dated on 14th century. P2 the most interesting wreck was dated on 10th century. It is unique because it has both Scandinavian and Slavic features. The P3 wreck is dated on 12th century and P5 is dated on 18th century. The dendrochronological analysis suggests that wooden construction of the harbour were erected in the Early Medieval and Medieval periods. Despite the years of the research, only a few percent of the whole site was investigated. For this reason, in 2018 the Department of Underwater Archaeology from Nicolaus Copernicus University plans new non-invasive survey of the harbour. This planed survey is a part of the project: Virtual Arch - for better utilization of hidden archaeological heritage in Central Europe. New accurate bathymetric map of the harbour and photogrammetry of platforms and bridges remains will be a base for virtual reconstruction of the site After that mobile application will be created for tourism to virtual sightseeing of Puck harbour.

02 TRUSO - VIKING PORT OF TRADE ON THE SLAVIC-BALTIC BORDERLANDS

Author(s): Jagodzinski, Jakub (The Institute of Archaeology and Ethnology Polish Academy of Sciences)

Presentation Format: Oral

Truso, the early medieval port of trade, located in present Janów Pomorski, Northern Poland, is an example of settlements founded by the Scandinavians in Baltic Sea basin. Truso, as well as other scandinavian ports of trade (Seehandelsplatz), functioned mostly during Viking Age period, especially since late 8th to early beginnings of 11th century. More than thirty years of excavations and scientific development of Truso and its hinterland resulted the clear picture of great phenomena – scandinavian settlement located on the slavic-baltic borderlands. Furthermore the port of trade itself, beyond archaeological sources recognized as scandinavian, included a slavic and baltic objectual correlates of culture. Range of contacts indubitably shows highly developed network of cultural and economical contacts. Meaning of the discussed settlement was unique – I would like to prove that, it was a part of a larger system, which achieved economic success in whole Baltic Sea area. Scandinavian influence on the east of Elbe river was significantly different than on the west. While Scandinavians on the western and northern part of Europe based their activity on broadly speaking conquests, the central-east part, was a place of peaceful contacts adjust to bring material profits. In terms of Wallerstein's world system analysis theory we can assume that Truso was a core while slavic and baltic territory lead the role of the periphery. Common image of Vikings as a cruel warriors in case of Truso inhabitants should be rather considered as a ingenious traders.

03 CENTRAL ARENA OF NORTHERN EUROPEAN TRADE - THE SCHLESWIG WATERFRONT

Author(s): Rösch, Felix (Institut für Kunstgeschichte und Archäologien Europas, Seminar für Archäologie des Mittelalters und der Neuzeit, Martin-Luther-Universität Halle-Wittenberg)

Presentation Format: Oral

The town of Schleswig is located at the inner end of the Schlei fjord, where the smallest part of the Jutland peninsula between the North Sea and the Baltic Sea is situated. Due to this favorable topographical situation large amounts of the goods have been transferred via this spot for over a half millennium. The extensive interaction can be traced back to the early Viking-age, when the emporium of Hedeby was established. During the course of 11th century Schleswig takes over.

The transition process and the foundation of Schleswig have recently moved into the focus of new investigations. The analysis of almost 9000 wooden features resulted in an image of a complex and rapidly developing waterfront in the transition from Late Viking Age to the High Middle Ages. Within a time span of just 25 years, large areas were systematically occupied. Starting out with a plot layout and a street infrastructure, the building activities quickly reached out into the Schlei fjord where large dams were erected in alignment to the plots. On those structures properties with buildings, pens, wells etc were developed as well as a large public mar-

ketplace. While the major initiative behind these actions must be traced back to the Danish kings, most structures have been established individually by different actors who were engaged in the long-distance trade. Compared to other medieval ports in Northern Europe this development was of an outstanding intensity and rapidness.

The Schleswig waterfront is most notably to be understood against the background of the emerging professional merchant seafaring which accompanies with increasing amounts of cargo, larger trading vessels and the consolidation of trade networks. Thereby the investigations on the Schleswig waterfront provide detailed information on the specific infrastructure of a high-medieval town whose economic power relied to large amounts on its far-ranging connections.

04 NEW RESULTS FROM DANA ISLAND SHIP YARD: 2018 FIELDWORK

Author(s): Oniz, Hakan (Division of Underwater Archaeology - Selcuk University)
Presentation Format: Oral

An ancient shipyard complex has been discovered on Dana Island of the Silifke District of Mersin Province in 2015. This shipyard contains about 276 rock-cut slipways and many other buildings behind of them such as work-shops, fortifications walls, houses and other buildings which the functions of them are still unknown. At least five churces and other archaeological materials such as amphorae and coins show that the island has been used until 7th Century AD. Archaeological materials from the surface such as stone tools, obsidians and ceramic remains also show the human presence during the Neolithic and Bronze Age. Surface materails and buildings which were found during the survey from 2015 to 2017 also show the richness during the Iron Age, Hellenistic and Roman periods. . Bronze and Iron Age anchors have been found during the underwater research at the coast of the Island in the same years. The information obtained gives rise to the thought that the structure of the shipyard here may have been in uninterrupted use from probably Late Bronze Age until the Byzantine periods. Concrete archeological evidence for the early periods has not yet been flourished as excavations have not begun on the island. During the presentation, results from the Dana Island Shipyard in 2018 will be shared first time to the audience.

05 HISTORICAL GEOGRAPHY OF THE ANCIENT HARBOURS ON NORTHERN SHORE OF PROPONTIS IN SOUTHEASTERN THRACE AND ON THRACIAN CHERSONESSOS

Author(s): Sayar, Mustafa (Istanbul University)
Presentation Format: Oral

The first signs of permanent settlements in Thrace occur in 7th-6th centuries B.C. as a consequence of the colonisation movement which also affected the shores of Marmara and Black Seas. The poleis which are founded at the northern coast of Marmara Sea and western coast of Black Sea are the first settlements where Thracians lived together in a small space, along with the market place called emporion. The most important examples of Northern Propontis Coast city-states and market places are Bisanthe and Perinthos which are colonies of Samos. To the east of the northern shores, there are Selymbria and Byzantion which are colonies of Megara and in between them, there are market places which were fortified with walls. Since the 6th century B.C., the number of these city-states increased to 12 in the Thracian Chersonessos. The biggest problem of these cities was the Thracian attacks coming from the north. To prevent the Thracian attacks, Athenian statesman Miltiades constructed a wall to the narrowest part of the peninsula, starting from Kavak River, extending from east to west. The wall starting from Marmara shores went up to the Aegean Sea by the Saros Harbour. At the end of 4th century B.C., when the Persians were completely out of Asia Minor, a new city emerged in Gelibolu peninsula, which is an important area for urbanization in Thrace. This city was founded by Lysimachos, one of the generals of Alexander, and it was called after him Lysimacheia. It is understood by the latest works that the location of Lysimacheia was Bolayır. This Hellenistic capital was destroyed in 144 B.C. by Deigylis, a Thracian king and it was not reconstructed. During Roman Imperial times, the area was administered by a Roman procurator as it was considered to be the private property of the emperor.

06 IASOS HARBORS

Author(s): Baldiran, Asuman (Selçuk University)
Presentation Format: Oral

Ancient settlement was established on the rocky peninsula in a deep and long cove called as the Gulf of Iasos. The legend has it that the colonists who came from Argos established the settlement. Iasos ancient city has a reputation for the harbors right across the Gulf of Güllük. Two counterforts that were found under the sea in our day closed the west harbor of Iasos. These counterforts correspond to the early emperorship period, namely to the east harbor residuals. A tower was added to the small counterfort in the east of the harbor. According to the comparisons made with similar retaining walls in Cyprus and specific historical arguments, the year of built corresponds to 12th-13th centuries AD when the Byzantine Empire was in a downturn and the defense system was strengthened for the hazards from the sea. Underwater works were performed by four stages. The first stage was analyzing the ancient settlement from the shore to determine the areas to dive. The aerial photographs were taken in the second stage. The third stage included sonar works and finally, the fourth stage was performed as the underwater works. The first stage sonar works were done in the west harbor and on the mole. Amphora neck, handles, and the vesselbottoms belong to different periods were found in investigations actualized at the right end out of the mole. It is thought that these belong to at least two submerged. The second part sonar work was performed in the peninsula, East Harbor and around the Gulf of East Harbor. Block stones were observed under the sea in some of the areas during the works done in East Harbor region.

07 ARCHAEOLOGICAL EVIDENCE FOR THE HARBOURS OF THE BYZANTINE TAURICA

Author(s): Tymoshenko, Mariia (Taras Shevchenko National University of Kyiv)
Presentation Format: Oral

The maritime communication along the Crimean coast was active throughout the centuries. In the medieval period system of coastal policy was supported by the Byzantine government for trade, diplomatic and military purposes.

The general scheme of navigation was based on the hydrological features and depended on the climatic conditions. This indicates continuity of the main sea routes, however, changes in the geopolitical situation should be taken into account. Archaeological data from underwater and terrestrial sites allows determining the main features of the maritime landscape on the cabotage distance between Cherson and Bosporos. This system of navigational facilities designed for several days journey and included the strategic observation points and sheltered anchorages required for specific weather conditions, repair abilities, access to goods and water springs.

Noteworthy is the high level of port organization in the main urban centers of the Taurica (Cherson, Sougdaia and Bosporos) in the Byzantine period. Natural protection of the harbor basin had been the designative criterion for the location of the port facilities. The artificial installations in the harbor basins of the Taurica are rarely observed. In most cases the network of the functional bays had been used for the definitive purposes of roadsteads, shelters etc. The city harbor was closely connected with defense and commercial facilities at the level of the spatial organization of the urban landscape. The sigillography collections came from underwater assemblages are a distinct feature of the city ports of Cherson and Sougdaia.

Evaluation of the archaeological evidence gives the crucial data to consider port through its economic, administrative and fiscal (customs) meaning, as the dominant body of the maritime activity.

08 IL PORTUS AUGUSTI E IL SESTERZIO DI NERONE

Author(s): Di Michele, Dario (Università di Bologna, Scuola di Specializzazione in Beni Archeologici)
Presentation Format: Oral

In the last two decades numerous geo-archaeological investigations, conducted by various Italian and foreign institutions, have helped to outline the contours and the orientations of the portus Augusti. Now the extension, the tracks of the two piers and the location of the island-lighthouse are clearer. The famous sestertium of Nero was often used as a model for reconstructive hypotheses. The coin represents a basin with two converging arms and the lighthouse island in the middle surmounted by a colossal statue. The left pier seems to be in opus pilarum, a long arched bridge, while the left pier is a continuous foundation on which a portico building, a statue (?) and a temple towards the end are founded. In recent times, this representation has recently been discarded as a reliable document because the known features of both piers have a continuous foundation. However, we know only a part of the northern pier, composed of three sections, and we ignore a good part of the building that lies under the Leonardo da Vinci Airport. Furthermore, there are cases in which the terminal part of the dams ended with cementitious pylons, where, at least in the case of the piers of the access channel to the lacus Lucrinus, they were connected by arches. As far as the southern wharf is concerned, the various investigations have found a continuous foundation pier; traces of two buildings were found above the level of the pier. In Nero's coin there is a porticoed building with two gabled entrances, which could be traced back to the found structures. The structure could be identified in a series of warehouses such as those that have been discovered above the internal pier of the portus Iulius in the lacus Lucrinus at Baia, equipped with a portico along the front.

752 GENDER IN MOVEMENT

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Tremeaud, Caroline (UMR 8215 Trajectoires) - Belard, Chloé (UMR 8546 AOROC) - Koch, Julia (Christian-Albrechts-University Kiel)
Format: Discussion session

For several decades, mobility and migration are one of the main research topics in archaeological works, considering acculturation and material contacts between two populations and more. However, they have been rarely considered according to a gendered point of view.

The aim of this session is therefore to question gender through mobility and migration in archaeological data into diverse geographical contexts.

Firstly, communications should include a methodological approach: how detect mobility or migration in archaeological data (through material data? technical gestures? isotopic analysis?) ? What aspects of mobility can we bring up from each of these data sources? What are their contributions and limitations to understand mobility of men and women in the past?. All these questions should be related to a common issue on gender.

Secondly, this session aims for comparing different cultural frameworks on how perceive and question mobility and, more importantly, tries to go further with a gendered approach: who are concerned by mobility and migration? How mobility impact men and women? Where these men

and women came from, and where did they go? Causes and consequences of a movement are similar for each sex? "Marriage" for women and "war" for men are traditionally taken for granted to explain mobility. What are archaeological evidences for these hypotheses?

This session will also be a good opportunity to question the impact of our current gendered representations of migrations/mobility causes in archaeological works.

ABSTRACTS

01 GENDER INTERPRETATIONS OF MOBILITY IN IRON AGE ARCHAEOLOGICAL RECORD

Author(s): Tremeaud, Caroline (UMR 8215 Trajectoires) - Belard, Chloe (UMR 8546 AOROC)
Presentation Format: Oral

The starting point of this presentation is the recurrent gendered interpretations of mobilityin the past: women would have mostly moved because of marriage, and men for war.However, to what extent these assumptions can be proved from the archaeological record? How migration can be concretelytraced and interpreted?

Using several cases studies of the Iron Age, the aim of this paper is twofold:1) deconstructing gender stereotypes in order to question mobilityand its social motives; and 2)questioning how to perceive mobility through archaeological data.

Thus on the one hand, this paper will question the archaeological evidences used to conjure up mobility. For instance, it is still mostly assumed that a foreign bodily ornament or weapon buried with a dead person indicates his/her foreign root, but foreign ceramics is not usually used in that way. Similarly, foreign artefacts in a "simple" grave will lead to the idea of a "foreign person". However, it is not the same with foreign artefacts in Iron Age "princely" burials. Very different archaeological approaches of buried foreign objects exist in order to prove mobility, depending on the nature of objects and funerary contexts. It is critical to analyse them in order to question their validity.

On the other hand, this paper will question traditional interpretationsof women and men mobility.It will emphasize how using a gendered approach could change and renew some hypothesis. They cannot be assumed anymore if they are not based on archaeological and anthropological proofs, the rise of DNA analysis becoming a significant part of this new approach.

02 TRACING GENDERED MOVEMENT WITH ANCIENT DNA – METHODOLOGY, INTEGRATION AND PERCEPTION

Author(s): Mittnik, Alissa (Department of Archaeogenetics, Max Planck Institute for the Science of Human History, Jena; Department of Genetics, Harvard Medical School, Boston)
Presentation Format: Oral

In the past three decades ancient DNA research has supplemented and even revolutionized archaeology with numerous insights, often pertaining to massive population turnovers in prehistory, connected to major changes in material culture and technology. Now, ever advancing and more cost-efficient methods usher in a refined focus on microregional time transects and high-resolution studies of social dynamics. Thus, also the examination of males and females in a population or community as entities with partially distinct roles and expected life histories has caught increased interest of geneticists.

In this communication, I present an overview of current genetic methods that are utilized for the study of gendered movement, such as molecular sexing, the detection of sex bias in population admixture and the reconstruction of ancient family pedigrees. The application of these methods will be discussed in the context of recent genetic and interdisciplinary studies of prehistoric Western Eurasia and Oceania. I will spotlighthow interdisciplinary work and integrationof archaeological, isotopic and linguistic research can inform and expand the insights gained through genetic analysis.

Finally, the narratives around gendered movement shall be examined, from interpretations put forward by the study authors, the communications spun by the popular science press to the reception of the public audience.

03 SPREAD OF AGRICULTURE IN EUROPE THROUGH MIGRATION AND INTERBREEDING: A GENDER ISSUE?

Author(s): Bon, Celine - Thomas, Aline - Delon, Solene (Museum National d'Histoire Naturelle de Paris; Centre National de la recherche scientifique; Université Denis Diderot)
Presentation Format: Oral

The spread of agriculture in Europe is an emblematic episode of prehistoric migrations. While the material data from the early Neolithic testify to an "off-ground" culture from exogenous origin, the paleogenetic data record the displacement of Anatolian populations to the western reaches of the European continent. The modalities of this miscegenation between the last hunter-gatherers and the migrant farmers remain an issue of current research. In particular, taking into account local cultural specificities, the uniparental genetic markers (mitochondrial DNA and Y chromosome) make it possible to discuss the relative share of men and women in the interbreeding between local population and migrants.

We focus in the Cerny culture (5th mill BC, Paris Basin) which evokes on a material and funeral level a late acculturation of hunter-gatherers according to a number of graves exhibiting items linked to the Mesolithic world. Our study is based on a set of 20

individuals through the sequencing of mitochondrial (mt) genomes, compared to forty European and transchronological populations derived from paleogenetic literature.

On a mitogenetic point of view, our results show that Cerny population is similar to other Neolithic farmers population, with a limited amount of introgression of genetic markers from "Mesolithic" origin. Moreover, at the individual scale, the dead buried with grave goods referring to Mesolithic are not those who present "mesolithic" mt genetic markers, excluding thus any inheritance of such social trait by the biological maternal way. While the female descendent of local Mesolithic populations have apparently made little contribution to the Cerny's genetic heritage, the exacerbation of hunting and the wild world in the funeral world of the group could be linked to the paternal lineage. This hypothesis is supported by a funeral organization extremely codified, putting in the center of the device some men "hunters" and making women an entity quasi-invisible.

04 WOMEN ON THE MOVE? A DIALECTIC APPROACH OF MALE / FEMALE MOBILITY IN PROTOHISTORIC CAMPANIA

Author(s): Esposito, Arianna (Université de Bourgogne; UMR 6298 ARTEHIS Archéologie Terre Histoire Sociétés) - Desiderio, Anna Maria (Université Paris Nanterre, UMR 7041 ArScAn - Equipe ESPRI; Università degli studi di Salerno - Dispac)

Presentation Format: Oral

This paper aims to address the issue of mobility and migration through an archaeological approach to the funerary contexts of two protohistoric centres of the Campania region - Pithekoussai and Pontecagnano. From the published data, we will outline a framework for the synthesis of the mobility processes that affected the region during the Iron Age by considering the specific example of non-indigenous individuals and their integration. The observation of a marked funerary variability seems, in fact, to point to the existence of a plurality of ethnic components attracted by the exchange opportunities aroused by the development of establishments such as Pontecagnano or Pithekoussai. Above all, this reflection aims to measure the potentials and limits of the archaeological reconstruction of such phenomena through the reading of material culture, not considered as a direct expression of ethnic identity, but as an active element in its negotiation. In this perspective, the presence of specific indicators in the selection of material culture should not be interpreted as an index of ethnic relevance.

In the context of this vast phenomenon of geographical and social mobility that is triggered in the indigenous world of southern Italy towards the development poles of the Tyrrhenian coast, what archaeological markers should be used to distinguish women's mobility? How relevant are they? What is the heuristic value that we must recognize them? Is women's mobility linked to different forms of male mobility? The examination of the male / female dialectic in the chosen contexts, also reflecting on the different level of recognition in the funerary context of the male and female components, will allow problematizing the traditional interpretative models of mobility and migration phenomena.

These questions will be an opportunity to integrate a gender perspective to the mobility phenomena of ancient Campania.

05 BECOMING EUROPEAN.THE MAKING OF VIKINGS?

Author(s): Dommasnes, Liv Helga (University of Bergen)

Presentation Format: Oral

In this presentation I shall discuss mobility between Western Scandinavia and the European continent and how such contacts may have changed the existing Early Iron Age ways of life in the North into what should eventually become Viking culture.

The presentation is based on a study of burial customs and the absence/presence of weapons in West-Norwegian male graves. Although sometimes huge mounds were built during the pre-Roman and Early Roman periods, the primary burials seldom contained what we can recognize as valuables. During the first centuries AD, these customs changed slowly, as foreign objects, e.g. glass drinking vessels, were sometimes imported and added to the traditional grave gifts of simple bone artefacts. New burial rites were now introduced, including weapons in men´s funerary equipment, and new kinds of jewellery in women´s. By the beginning of the Viking Age, these new customs, evidently inspired by European cultures, seem to have become the standard in the upper strata of West Scandinavian society, reflecting new ideologies and ways of life.

Skeletal remains are only occasionally preserved in Western Norway. Gender determination therefore has to be based on grave gifts. While gender assignment is sometimes difficult to determine in earlier burials, some standard rules regarding grave gifts seem to have been applied in the upper strata of Viking society. In North Scandinavia, Viking funerary equipment tends to include sets of tools in addition to weapons/jewellery, maybe reflecting the skills and work tasks of the deceased.

753 INTERPRETING ANCIENT METALWORKING

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Wärmländer, Sebastian (Cotsen Institute of Archaeology, UCLA; Division of Biophysics, Stockholm University) - Sholts, Sabrina (Department of Anthropology, National Museum of Natural History, Smithsonian Institution, Washington, DC) - Saage, Ragnar (University of Tartu) - Paavel, Kristiina (University of Tartu) - Jouttijärvi, Arne (Heimdal-archaeometry)
Format: Regular session

Archaeometallurgy has benefited massively from the availability of new or improved scientific methods during the last decades, but the technical data provided by the natural sciences do not in themselves give clear answers or superior knowledge about ancient people or their crafts. Data from e.g. isotope and trace element analyses, microstructure studies, and 3D models must be interpreted in combination with a range of other information, such as our general understanding of past societies, the specific social aspects of metalworking, the skills and sensory experiences of individual smiths and artisans, the context of the excavation site, and much more.

In this session we welcome papers on ancient metalworking in a broad sense. We particularly welcome papers that address questions or provide examples on how to integrate technical metallurgical data into archaeological narratives. How can the interpretations of archaeometallurgical data be taken to the next explanatory level, i.e. from answering technical how-questions to why-questions? A problem with interdisciplinarity can be underestimating the complexity of the discipline whose results are being used (sometimes for sensationalist interpretations). What are the best practices for avoiding such pitfalls? How should research questions be formulated to actually solve the problems intended to be solved? Can the apparent divide between material scientists and archaeologists be bridged by e.g. experimental archaeology, by demonstrating how things could have been done but also how things were NOT done?

ABSTRACTS

01 THE IMPACT OF THE 13TH CENTURY CRUSADE ON METALWORKING IN ESTONIA

Author(s): Saage, Ragnar (University of Tartu)
Presentation Format: Oral

The conquest of Estonia by the Danish and German crusaders in the early 13th century brought forth a rapid transition into a Medieval society for the local population. Western immigrants settled into the newly founded towns and among them metalworkers of varied specialisation. I will look at the varied evidence to find out how and to what extent this affected the local metalworking practice.

Crucibles and casting moulds were analysed to study the specialisation and craft level of copper alloy, precious metal, and pewter casting. The casting copper alloys and precious metals was influenced the most. Imported crucibles from refractory materials allowed to cast larger objects and achieve more predictable results. Although there are few preserved furnaces, the quick emergence of flat bottomed crucibles indicate that large and stable furnaces were built in the workshops.

For iron working, smithies and smelting sites were in the focus. The conquest of Estonia does not reflect in the iron smelting evidence. Large scale bog iron smelting continued for more than 100 years, until the Swedish iron took over the market. The local smiths benefited from the initial town building boom as their services were in demand. However, as the number and influence of the urban German craftsmen grew, the local smiths were seen as competition and the market was fought over with the help of the town legislation.

02 ANALYSIS OF A BYZANTINE WEIGHT FROM HIPPOS SHEDS LIGHT ON THE TRANSITION FROM CHRISTIAN TO THE ISLAMIC RULE

Author(s): Eisenberg, Michael - Shalev, Sariel (University of Haifa)
Presentation Format: Oral

A unique Byzantine brass weight found in Antiochia Hippos (Sussita), bearing a concealed cross and an unfamiliar feature on its reverse, helps reveal some of the changes that occurred in Hippos during the transition between the Byzantine and Early Islamic periods. The weight illuminates the local Byzantine and post-Byzantine metrological weight systems as well as the administrative and religious relationships between the Christian city of Hippos and Umayyad Tabariya, the capital of the region. Discovered in the debris of a church destroyed in the earthquake of 749 CE, it is among the first archaeologically dated Byzantine weights used during the Umayyad period.

The high degree of craftsmanship involved in producing the weight, in particular its finely elaborated inlay and its findspot in a central church at Hippos are, in our opinion, factors that may attest to its having served as an official weight of Hippos. Such a weight, kept in the hands of church officials at Hippos, must have been under a more rigid urban standardization than any other weight. One should bear in mind that the Northwest Church was located in the center of the city.

The weight discussed here is a unique and important artifact that provides an invaluable glimpse of the missing narrative for the transition between Christian Byzantine and Islamic Umayyad rule, let alone the metrological system in Umayyad Syria.

03 FUNCTIONAL ANALYSIS OF METALPRODUCTION TOOLS FROM THE LATE BRONZE AGE OF EASTERN UKRAINE

Author(s): Zagorodnia, Olga (Institute of Archaeology of National Academy of Sciences of Ukraine) - Mimokhod, Roman (Institute of Archaeology of Russian Academy of Sciences)

Presentation Format: Oral

Archaeological sources indicate that in certain communities may be concentrated all the metalproduction processes or only some of them (mining, ore processing, metallurgical and metal-working). The objects are metal wares, some types of tools and ancient pits which are the kind of modifications of structure of geological strata and landscape. For a long time archaeology has been focused on metal wares and casting molds. Vague tools usually drew attention according to archaeological context which points to possibility of their relation to metalproduction. Situation changed after discovering the method that identified and explained the nature of manufacturing and wearing.

The study includes systematization of rock, bone and ceramics artifacts from Kartamysh archaeological district of Berezhnovka-Maiovka Srubnaya Culture (BMSC) of the LBA located in Donbass. The database contains 1091 objects. They have been processed using structural, technological, functional and contextual analysis.

Leather-processing, stone working, woodworking artifacts are presented in a small volume. The most representative is metalproduction tools. They are mining (mattocks, hacks, hammers), ore processing (pestles/grinding handstones, mortars/grinding slabs), metal-working (moulds, hammers, anvils, abrasives, scraper) instruments. Most of them are made of copper sandstone and quartzite sandstone. Bone tools which mix ore in gravitational process are made from ribs, vanes, tubular bones. They are until now notionally interpreted as leather-processing because of similarity of ribs-workpieces. Traces on the artifacts are identified in comparison to experimental wares involved in dry ore process, gravitational process, metal-working.

Kartamysh assemblage is specific since there are evidences of all metalproduction process stages. Functional analysis of tools reveals important aspects of technology and work organization of BMSC metalproduction. The stone tools from Kartamysh and other well-known Eurasian ancient pits are generally similar. Raw materials were pebbles and nodules, modified or unmodified. The difference is clear at the level of a combination of different types of instruments.

04 WALKING ON RUSTY NAILS—THE CHALLENGES OF RETRO-FITTING A METALS ANALYSIS STRATEGY

Author(s): Mazis, Matasha (Technische Universität Kaiserslautern)

Presentation Format: Oral

Technical advances in modern analysers promise to improve our capacity to explore metal artefacts efficiently and in some cases non-destructively. Understanding these tools and their capabilities can help realise the potential of integrated research in archaeology and materials science. Ideally the scope of analytical enquiry is factored into the project design, and is based on a sound knowledge of the tools available. Prospective analyses are thus an integral part of the research questions. They help shape the quality of contextual recording, conservation and storage of artefacts, as well as the selection or sampling of objects for analysis. Metallurgical analyses are not only accessible but integrated with the broader archaeological narrative.

Of course, this is the ideal. More often than not, the reality is that analytical inquiry is an adjunct to fieldwork. Analyses can take place years after excavation, risking disconnection with prime contextual information, a lack of cohesion with project aims, and even unworkable samples. This paper presents the experiences and challenges of working with a large data set of metal objects excavated over a 30-year period from the site of Jebel Khalid in Syria. The lack of a metals strategy in the foundation years of the project, coupled with the outbreak of war in 2010, led to complications with the data set. The paper outlines the challenges of working in a decades-long project involving different actors, with different procedures and objectives. It examines the role of planning, storage, recording and conservation on the success of analysing material, and its integration with the broader archaeological narrative. The experience provides some "lessons learned", as well as an appreciation of the later strategies used to address the issues. This was particularly critical in handling the urgency of the untimely end of the project, just before the war.

05 THE ANALYSIS OF SLAGS FROM THE METALWORKING WORKSHOP IN THE GNEZDOVO SETTLEMENT'S FLOODPLAIN

Author(s): Ruzanova, Svetlana (State Historical Museum) - Bronnikova, Maria - Shishkov, Vasiliy (Institute of Geography, RAS)

Presentation Format: Oral

Excavation in the Gnezdovo settlement's floodplain area has provided evidence of continuous metalworking. Gnezdovo archaeological complex (late IX – early XI centuries) is situated at the Western Russian border at about 13 km from one of the most ancient Russian town Smolensk. It is known as one of the largest archaeological site of the period of State formation in the Eastern Europe. The abundance of slags, fragments of melting pots and shell moulds, handicraft tools, workshop waste in the excavated area are indicative of smithing and silverworking activity. The archaeological study of the area has shown that certain heterochronous structures followed an established pattern, thus being part of a constantly renovated production complex. The workshop existed approximately from 925 to 1000 A.D. Initially the slag samples were identified as smithing hearth bottoms and furnace lining's fragments. But a recent study of the entire slag collection has shown that some specimens could be interpreted as ore fragments or metallurgical slags. Samples have been investigated using X-ray fluorescence spectroscopy (XRF) and scanning electron microscopy (SEM)

to characterize their microstructure and determine their elemental and mineral composition. This paper presents results of the preliminary study of such slags. The investigation is supported by the Russian Foundation for Basic research (Project 16-06-00380).

06 THREE CASE STUDIES OF ANDEAN METALWORKING

Author(s): Wärmländer, Sebastian (Cotsen Institute of Archaeology, UCLA; Division of Biophysics, Stockholm University)
Presentation Format: Oral

The history of South American metalworking still presents a number of unresolved questions, despite decades of archaeological and historical research. This is especially true for the Andean region, where in prehistoric times alloys of copper as well as precious metals were crafted into intricate objects of both decorative and utilitarian use. In this work, analytical metallographic techniques such as imaging and elemental compositional analysis with scanning electron microscopy (SEM), chemical characterization with X-ray diffraction (XRD) and infra red (IR) spectroscopy, and optical microscopy analysis of polished and etched cross sections, are used to investigate different aspects of Andean metalworking in three case studies. The first case study investigates the technology used to produce gold wire in the pre Columbian Quimbaya culture, located in modern-day Colombia. The second case study concerns Inka period copper and silver production in the Tarapacá valley, located in the northern part of modern-day Chile. The third case study characterizes the composition, manufacturing technology, and deterioration of various pieces of metal embroidery from church objects dating to the colonial period and originating from modern-day Chile and Peru. The broad geographic and temporal ranges of these case studies illustrate the diversity of the outstanding research questions that we face in South American archaeometallurgy.

07 METALLURGICAL ANALYSIS OF THREE SILVER SHEETS FROM A MEROVINGIAN GRAVE – WHAT CHEMICAL FORMULAS CAN TELL (AND WHAT NOT)

Author(s): Werner, Michael (Archaeological Institute, Dept. of Early Medieval and Medieval Archaeology; University of Freiburg)
Presentation Format: Oral

During our examination of a group of two newly discovered Merovingian graves in Southern Germany we stumbled upon what seemed to be a somewhat odd collection of three re-used silver strap ends. Each was decorated by a different looking animal style interlace. All three were found next to what could be the remains of a wooden bowl.

Looking closer, looking at the make-up of the three silver sheets has shown a similar construction. All three consisted of a decorated pressed sheet enclosed with a frame, which was fixed by several rivets. Metallurgical analysis of the silver alloys revealed, that the chemical composition varied between sheets, frames and rivets, but did not vary between the three objects. Thus suggesting a connection between the objects; maybe origin from a single workshop or even production in one batch or maybe even a very specific fabrication, already with the aim to be used as exactly the decoration elements on a specific bowl?

However, using the metallurgical data on an explanatory level is not so straight forward. The particular silver alloys seemed to be most appropriate for their specific tasks, being an easy to decorate sheet, a supporting frame or adequate for rivets. So answering the question if the three silver sheets were indeed specifically produced as decorations for a wooden vessel or as first suspected a collection of re-used objects is not possible just from the metallurgical analysis. 'Traditional' archaeological methods like examining the context, looking for comparable objects and patterns is necessary in addition.

On a very concrete example, three silver sheets from a Merovingian grave, opportunities and challenges of interpreting technical archaeometallurgical data are vividly shown. Specially the difficulties to arrange the insights into a narrative.

08 NOT EVERYTHING THAT GLITTERS IS GOLD: RECONSTRUCTING TWO GOLDSMITHING RECIPES FROM THE CODEX PARISINUS GRAECUS 2327

Author(s): Hanning, Erica - DaSilva, Sayuri - Engelmann, Josef (Römisch-Germanisches Zentralmuseum Mainz; KB Experimentelle Archäologie) - Prinzing, Günter (Johannes Gütenberg Universität Mainz) - Patscher, Stephan (Römisch-Germanisches Zentralmuseum Mainz; KB Restaurierung & Konservierung)
Presentation Format: Oral

The Byzantine Treatise "About the Highly Esteemed and Famous Art of the Goldsmith" is an anonymous Byzantine-Greek treatise with 57 recipes pertaining to gold and silversmithing. The text of the treatise, which originally dated to the 11th century or earlier, survived as a copy in an manuscript written in 1478 and can be found today in the Bibliothèque Nationale in Paris (Codex Parisinus graecus 2327). The text was first published as a French translation at the end of the 19th century (Berthelot/Ruelle 1888), which was then re-translated in 2004 from French into German with the addition of a goldsmith's commentary (Wolters 2004). Unfortunately many details were literally "lost in translation", leaving many recipes incoherent and unreproducible. As a part of the Leibniz-WissenschaftsCampus Mainz (a cooperation between the Johannes Gutenburg-Universität Mainz and the Römisch-Germanisches Zentralmuseum Mainz), the treatise is being translated from the Greek original into German and evaluated by an interdisciplinary group of philologists, historians, art historians, material scientists and gold- and silversmiths. A unique feature of this project is the involvement of experimental archaeology to verify the theoretical findings.

After a short overview of the project as a whole, two of the recipes (nr. 50 and 55), which deal with making copper look like gold, will be presented together with their new translations and experimental reconstructions.

09 ACCORDING TO THEOPHILUS – THE MAKING OF A MEDIEVAL CHALICE AND THE VALUE OF WRITTEN SOURCES

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.

This will be illustrated by some examples of metallurgical studies where the interpretation was dependent on written sources. Modern reconstructions of the production of medieval chalices, has been made on the basis of sheet silver, and the parts have been soldered together. In Theophilus' description of the 11th century, the raw material is thick, molded slices of silver, and the joining takes place mechanically. This proved to fit better with the investigation of a chalice from Odense than the modern reconstruction.

Another example is a casting technique, which seems to have been used between the 14th and 16th centuries. Glazed fragments of clay with copper traces were first 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, which were made of plain clay in an open basket of iron. The heating took place as it is known from the Bronze Age, by burning the coal in and on top of the crucible, and not, as it is normally known from the Middle Ages, by the charcoal lying around the crucible. The interpretation might not have been possible without the written source.

10 ALLOYS ON DISPLAY: THE USE OF BRONZE, BRASS AND GUNMETAL FOR DECORATIVE METALWORK IN CAROLINGIAN AND HIGH MEDIEVAL COASTAL FLANDERS

Author(s): Deckers, Pieterjan (Department of History, Archaeology, Art, Philosophy and Ethics, Vrije Universiteit Brussel; Centre for Urban Network Evolutions - UrbNet, Aarhus University) - Van Ham-Meert, Alicia (Earth and Environmental Science, Centre for archaeological Science, KULeuven; Analytical, Environmental and Geo-Chemistry, Vrije Universiteit Brussel)

Presentation Format: Oral

The later part of the Early Middle Ages is a pivotal period in western Europe as far as copper metallurgy is concerned. After centuries of technological and commercial stagnation, during which copper alloys were mainly recycled from, ultimately, Roman-period stock, raw material extraction and production as well as long-distance exchange flare up in the 8th and 9th centuries. However, in contrast with the substantial numbers of metalwork artefacts from burial contexts dating to the preceding, Merovingian/Early Saxon period, the introduction of Christian, unfurnished burial rites means that metalwork from this period is much rarer.

The present study concerns compositional (pXRF) analysis of over 150 8th- to 11th-century copper alloy brooches, other decorative dress items and equestrian gear from the coastal region of Flanders (Belgium), assembled from numerous metal-detected collections. This small area is situated on the interface between Frankish, Frisian and Anglo-Scandinavian spheres of influence, and thus provides an interesting cross-section of wider trends as well as localized developments.

Our study considers material choice from a technological and economic point of view, also acknowledging that a metal's sensorial qualities are an integral part of the socio-cultural significance of artefacts, as constituent elements of processes of (self-)identification and differentiation within and between early medieval communities. Consequently, material analysis and more traditional typological studies need to be integrated into an interdisciplinary study of the interplay between aspects of craftsmanship (raw material availability, technology, stylistic and iconographic repertoire, …) and consumer choice (exchange of finished products, social regulation, identity, …).

11 THE IMPLICATIONS OF BRONZE AGE BRONZE REMELTING IN THE BALTIC REGION

Author(s): Paavel, Kristiina - Kriiska, Aivar - Kirsimäe, Kalle - Paiste, Päärn (University of Tartu)

Presentation Format: Oral

Around 60 Estonian Bronze Age (1800–500 BC) objects of tin bronze were sampled for compositional analyses with inductively coupled plasma mass spectrometry (ICP-MS) of major, minor and trace elements (Cu, Sn, Pb, As, Ag, Al, Au, Bi, Co, Fe, Mn, Ni, Sb, Zn). The tin content and the trace element composition are both partly related to chronology: the Early (1800–1100 BC) and the Late (1100–500 BC) Bronze Age artefacts appear to have relatively separate trace element signatures. Pb isotopes will be analysed as the next step, and future work will involve also samples from neighbouring countries. Although the lead content in the analysed sample is generally low, the higher lead contents occur during the Late Bronze Age. This coincides with the emergence of local bronze working centres in the eastern Baltic, where scrap metal of presumably Scandinavian origin was remelted. The settlements have yielded remarkable amounts of mould fragments for casting bronze rings that have been sometimes interpreted as standardised ingots. The presentation will discuss the part of Estonian Late Bronze Age bronze working settlements within the wider bronze manufacturing and consumption network, the centre of which was in southern Scandinavia. Who were the rings meant for? How far were they transported to? What implications does the existence of such large-scale remelting have for determining raw material origin?

12 TECHNOLOGICAL INNOVATION, KNOW-HOW TRANSFER AND ADAPTION BY THE EXAMPLE OF PREHISTORIC COPPER PRODUCTION IN THE OBERHALBSTEIN (GRISONS, SWITZERLAND)

Author(s): Reitmaier-Naef, Leandra (University of Zurich)
Presentation Format: Oral

In recent decades the precise mode of operation of Bronze Age copper smelting process in the Alps has been subject to ongoing scientific debate, dominated mainly by natural scientists.

A new, transdisciplinary study in the Oberhalbstein aims to shed a new light on these old questions from a new perspective: besides the common mineralogical and geochemical investigations, also a detailed typological and morphological examination of the main information carrier, the smelting slag, has been carried out. A joint interpretation of the results of these natural scientific and archaeological approaches lead to a less one-sided reconstruction of the smelting process. The proposed model shows parallels as well as significant differences compared to the east alpine "Mitterberg-process".

Furthermore, intensive field survey resulted in a good knowledge of the mining area and its organisational structure with a total of approximately 100 sites, consisting of a couple of (pre)historic mines, dozens of smelting sites and a few prehistoric settlements connected to copper production by the finds of smelting slags and beneficiation tools. Furthermore, a significant improvement of the previously limited dating of these sites clearly shows the peripheral location of the copper production area under investigation – both from a geographical and a chronological point of view. While most of the (south)eastern and western Alpine mining districts flourished during different periods of the Bronze Age, the Oberhalbstein in the central Alps did not reach its production peak until the Early Iron Age.

Precisely for that reason, however, a comparison with other districts is of great interest. This paper aims to trace know-how transfer, innovation and adaption processes throughout the Alps from Bronze Age to Iron Age by comparing smelting structures, smelting remains and raw material sources in order to achieve a more dynamic, overarching understanding of the prehistoric copper production in Central Europe.

13 METAL SUPPLY BETWEEN CENTRAL EUROPE AND THE CARPATHIAN BASIN IN THE EARLY AND MIDDLE BRONZE AGE

Author(s): Nessel, Bianka (Institute of Earth Science, Heidelberg University; Department of Prehistory, Protohistory and Near Eastern Archaeology, Heidelberg University) - Pernicka, Ernst (Curt-Engelhorn-Centre Archaeometry gGmbH)
Presentation Format: Oral

Bronze Age Communities in the Carpathian Basin were involved in wide ranging networks, which is shown by strong typological influences in bronzes and pottery, but also evident in the exchange of raw material.

The Central European Early Bronze Age saw significant changes in the supply of metal to different regions. Some sources were almost abandoned in favour of others. This raises questions about the manufacture of items such as Apa-Hajdúsámson type swords. If we accept that these swords have their origin in Transylvania or Eastern Hungary and they are locally made, why was copper from the distant Mitterberg region used to produce them? We have to consider a scenario where smiths in the Carpathian Basin either mixed Mitterberg copper with tin from elsewhere, or that they obtain already made bronze alloy. An alternative explanation would be that semi-finished blades were traded eastwards instead of raw copper or bronze metal. If this is a possible scenario we would deal with a highly specialised production, as well as trade and consumption strategies. This would also imply a strong division of labour and a much higher degree of specialisation in the Middle Bronze Age than hitherto assumed.

The presentation focuses on aspects of the exchange of raw metal, finished and semi-finished objects between the Alpine Region and the Carpathian Basin. Using archaeological and natural science methods such as trace element patterns and lead isotope analysis, it is discussed which copper was preferred in various regions and how the copper trade might have worked in the Early and Middle Bronze Age.

14 METAL WEAPONS OF "WARRIORS' BURIALS" FOUND IN THE MIDDLE BRONZE AGE II SOUTHERN LEVANT – ECONOMICAL AND SOCIAL ASPECTS

Author(s): Kan-Cipor- Meron, Tal (The University of Haifa)
Presentation Format: Oral

Hundreds of copper-based weapons including battleaxes, daggers, and spearheads from the Middle Bronze Age II (MB II; c. BCE- c. 1900-1600 B.C.E.) have been unearthed mainly in burials found in the southern Levant. These defined as "Warriors' burials" and refers to humans buried with a kit of weapon placed in their graves and were dated mainly to the first half of the MBII period - the Middle Bronze Age IIA – (MBIIA- 1950 – 1750 B.C.E) and decrease in the Middle Bronze IIB (MBIIB - 1750-1550 B.C.E.).

The archaeological and metallurgical analyses of these metal weapons done recently, make it clear that in the beginning of the period, in the MBIIA period decorated weapons were made of tin bronze with and without arsenic while during the MBIIB period we can see a decrease in the number of weapons found in graves as well as changes in the metallurgical composition into the usage of tin bronze, arsenic copper and copper with tin and arsenic.

In order to explain these results, there is a need to look further on the possible social- economical context of the "Warriors' bur-

ials" phenomenon using metal weapons made of copper, arsenic, and tin, which are unavailable metals in the southern Levant at this period. Therefore the use of copper and tin bronze required well-established international trading routes. These trade routes through land and sea connected Mesopotamia with Anatolian and Syrian-Lebanon manufacturing and trade centres and connected the Northern Levant with the Southern Levant. Through these trade routes, social concepts of the "Warriors' burials" could penetrate into the southern Levant, as burials of high-rank members in the society with elevated status. Thus the "Warriors' burials" phenomenon may imply the northern origin of the social significance of this elite group in the MBIIA society in the Southern Levant.

15 BRONZE RELIQUARY CROSSES WITH NIELLO DECORATION FROM NORTH-EASTERN RUS': NEW ASPECTS ON TECHNOLOGY AND SOCIAL CONTEXT

Author(s): Zaytseva, Irina (Institute of Archaeology Russian Academy of Sciences)
Presentation Format: Oral

Pectoral crosses should be regarded as a meaningful phenomena of Medieval Rus' culture. Resent investigations revealed that the small smooth pectoral crosses with niello with Crucifixion and Virgin Orans were introduced in Rus' at the end of the XI cent. Their manufacture developed on the basis of the Byzantine and Balkan traditions, following the shape and the size of the objects and the iconography of the images.

The paper presents the results of studies of the niello composition and the technique of its application on the 12 reliquary crosses from Suzdal region in the Volga-Oka interfluve. All the leaves of crosses were cast from a multi-component copper-based alloys. The complex of X-ray synchrotron methods, the methods of scanning electron and optical microscopy were employed to study the niello composition. The data point that niello was made by melting of the multi-component copper-based alloys with sulphur. For the one type of artefacts niello was used as inlays, whereas for the second one may receive decoration from rubbing of heated material.

70 comparable items are known on all territory of Medieval Rus'. Strong similarity of artefacts indicates that they could have been the products of several workshops. The appearance of the niello technique in bronze objects in Rus' is related to the beginning of manufacturing the reliquary crosses. The technology of the non-silver sulfides involvement for the manufacture of the niello decoration on bronze items seems to be innovative.

11-th century is regarded as the time of the intensive spread of Christianity in Rus'. The production of standardized reliquary crosses in pilgrimage centers and their wide dissemination could have been an important issue in the translation of the new religion to the wider groups of the Rus' society.

The study is performed with support by the Russian Foundation for Basic Research, 17-29-04129.

16 ROLE OF ARCHAEOMETALLOGRAPHY IN INTERPRETATION OF ANCIENT SMITHING ARTIFACTS

Author(s): Zavyalov, Vladimir - Terekhova, Nataliya (Institute of Archaeology Russian Academy of Sciences)
Presentation Format: Oral

Method of archaeological metallography is the main one on studying of the problems of ancient metallurgy and metalworking. The interpretation of metal structure lies on the basis of archeometallographic method. Our research group working in the Institute of Archaeology of the Russian Academy of Sciences carries out the systematic investigation of ancient iron artifacts. As a result the unique bank of metallographic data including more than 13000 analyzes was created.

Generalization of the analytical data allowed the authors to reconstruct the history of the development of ironworking in Eastern Europe. It was established that becoming of ironworking took place long chronological period of the late 8th c. BC – 8th c. AD. The different kinds of steel, carburization and heat treatment were learned at this time. Cardinal changes in the East European smithing craft occur at the turn of the 1st and 2nd millennia AD. They are associated with the formation of urban craft, connecting to craft differentiation. The basis of smithing craft became various options of welding technologies at this time.

Special importance is the problems related to the mechanisms of tradition formation and their interaction with innovations. To consider the raised problem we turn to the spectacular materials obtained from the medieval sites of Ancient Rus'. As we have established on the archaeometallographic data the Russian ironworking based on interaction two traditions: in one case Scandinavian, in another – Slavic. Scandinavian technological impulse associated with three-fold welding technology. The Slavic technological tradition based on using welding-on schemes. The introduction of the Scandinavian tradition followed an explosion-like model, but it had not any substantial effect on the further development of the Russian ironworking. Slavic-Russian technological tradition spread gradually and turned to be much stable.

17 THE APPEARANCE AND DEVELOPMENT OF EARLY IRON METALLURGY IN THE WESTERN SIBERIA

Author(s): Vodyasov, Evgeny - Zaitceva, Olga (Tomsk State University)
Presentation Format: Oral

The report is devoted to the chronological and cultural features of the appearance of iron metallurgy in the Western Siberia. The earliest evidence of ironmaking in the Irtysh Region dates back to the VII-V centuries BC. It is associated with the development of the Itkul metallurgical Centre. The oldest iron smelting site in the Ob River Region is discovered on the fortification-sanctuary Ust-Polui and dates back to the turn between the Eras. Today only five iron smelting sites of the Early Iron Age in the taiga Ob-Irtysh River Region are known.

The large iron smelting centres in Western Siberia in the early Middle Ages also did not form, and local iron ores were not developed, but the smithing technologies in the second half of the 1st millennium AD were spread widely on the whole territory of the Western Siberia. Most likely, during this period, iron was imported to taiga zones in the forms of blooms and iron bars. In a similar way, the ancient Siberian people for thousands of years imported bronze in the form of finished products, because there are no copper ores in Western Siberia. In this regard, an external impulse was necessary for the emergence of new iron technologies there.

The first large ironmaking centres are formed in Siberia only at the turn of the I-II millennium AD. In X-XIII centuries the hundreds of iron smelting sites appeared suddenly in the different regions of Western Siberia. In our opinion, they were associated with the movement (migrations) of high level technological cultures from «Steppe world» of Central Asia.

Acknowledgment

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754 INTEGRATIVE APPROACHES TO THE STUDY OF ANIMAL HUSBANDRY, PLANT RESOURCE MANAGEMENT AND THEIR IMPACT ON THE LANDSCAPE

Theme: Theories and methods in archaeological sciences

Organisers: Dal Corso, Marta (Institute for Prehistoric and Protohistoric Archaeology, Kiel University; CRC1266 Scales of Transformation, Kiel University) - Égüez, Natàlia (Instituto Universitario de Bio-Orgánica Antonio González, Universidad de La Laguna, Tenerife; Institute for Prehistoric and Protohistoric Archaeology, Kiel University) - Gillis, Rosalind E. (Institute for Prehistoric and Protohistoric Archaeology, Kiel University)

Format: Regular session

Human communities and their subsistence practices adapted to and shaped landscape components such as vegetation, water resources, soil etc. Archaeozoological, biomolecular, archaeobotanical and paleo-environmental datasets offer, separately, important insights into animal husbandry, foddering strategies and how these changed the landscape and influenced the socio-economic organisation. How did different modes of pastoral practices impact the environment? And how can we detect these modes in the fossil record? Integrating different datasets provide us greater insight into animal husbandry, such as the use of space and plant resources, on different scales both geographically and chronologically. This can be methodologically challenging, but also lead to increased resolution in our understanding of past human societies and pastoral activities. We seek contributions from researchers integrating multiple lines of evidence, particularly combining archaeobotanical, archaeozoological and organic chemical analyses for characterising husbandry practices in different ecological settings and temporal frameworks within Europe. We wish to stimulate discussion on how to overcome methodological challenges and we aim for a session that moves beyond traditional methodologies, overcoming discipline boundaries, and that integrates the work of archaeologists and specialists together, in order to generate a greater understanding of past human populations lifeways.

ABSTRACTS

01 THE ISOTOPE ECOLOGY OF EARLY FARMING ON CROATIA'S DALMATIAN COAST: INTEGRATING PLANTS, ANIMALS, AND HUMANS IN A NEOLITHIC LANDSCAPE

Author(s): McClure, Sarah (The Pennsylvania State University) - Reed, Kelly (University of Warwick) - Podrug, Emil (Sibenik City Museum) - Zavodny, Emily (The Pennsylvania State University) - Ebert, Claire (University of Pittsburgh) - Triozzi, Nicholas - Welker, Martin (The Pennsylvania State University) - Jovic, Jelena (Sibenik City Museum) - Kennett, Douglas (The Pennsylvania State University)

Presentation Format: Oral

Carbon, nitrogen, and oxygen stable isotope analyses of plants, animals, and humans are providing new insights into shifts in dietary breadth, land use, and species interdependence among Dalmatia's first farmers. We present the results of archaeozoological, paleobotanical, and stable isotope analyses on materials from Neolithic village sites in northern Dalmatia, spanning over 1300 years of human activities. Multi-proxy datasets include animal species compositions to identify herd constituents and sizes, carbon and nitrogen stable isotopes of human and animal remains to assess changes in diet, oxygen isotopes of sheep and goat teeth to identify seasonal movements of animals as a management strategy, and high resolution chronology to pinpoint the timing of past human activities. Our data indicates shifts in plant and animal management practices over the course of the Neolithic that likely had long-term ecological implications for local environments and subsequent sociocultural and economic developments. These findings complement observed changes in settlement locations, pottery, and lithic technology, along with long-distance exchange relationships visible in flint and obsidian. This work integrates multiple datasets to assess the timing, nature, and effects of early farming societies in northern Dalmatia and highlights the implications and limitations of such datasets in understanding the Neolithic ecology of a region.

02 A MULTI-PROXY APPROACH TO THE MULTIPLE EPISODES OF ANIMAL PENNING AT CAN SADURNÍ CAVE (NE IBERIA) DURING THE POSTCARDIAL NEOLITHIC

Author(s): Gascón, Mireia (CIPAG - Col▪lectiu per la investigació de la prehistòria i arqueologia de Garraf, Begues; ERAAUB, Dept. d'Història i Arqueologia, Universitat de Barcelona) - Bergadà, M.Mercè (SERP, Dept. d'Història i Arqueologia. Universitat de Barcelona) - Antolín, Ferran (Integrative Prehistory and Archological Science, University of Basel; CIPAG - Col▪lectiu per la investigació de la prehistòria i arqueologia de Garraf, Begues) - Albert, Rosa Maria (ICREA; ERAAUB, Dept. d'Història i Arqueologia, Universitat de Barcelon) - Martínez, Héctor (SERP, Dept. d'Història i Arqueologia. Universitat de Barcelona; CIPAG - Col▪lectiu per la investigació de la prehistòria i arqueologia de Garraf, Begues) - Saña, Maria - Piqué, Raquel (Departament de Prehistòria, Universitat Autònoma de Barcelona) - Martínez, Pablo (SERP, Dept. d'Història i Arqueologia. Universitat de Barcelona; CIPAG - Col▪lectiu per la investigació de la prehistòria i arqueologia de Garraf, Begues) - Edo, Manel (CIPAG - Col▪lectiu per la investigació de la prehistòria i arqueologia de Garraf, Begues)

Presentation Format: Oral

The site of Can Sadurní Cave (Begues, Barcelona, NE Iberia) is one of the most representative examples for the study of the Neolithic period in Catalonia given its extraordinary stratigraphy. It is during the Postcardial Neolithic (or Middle Neolithic I) when two phases in the cave, the NP0 phase with the 11b and 12 levels (ca 4735-4501 cal. ANE) and NP1A phase with the 11a4 and 11a5 levels (ca.4567-4368 cal. ANE) seem to show that the cave was used as a stable. As a result, organic accumulations were produced inside the cave and some were eventually burned to clean the space for the next usage. This management produced a characteristic stratigraphy with different ashy layers with charred residues (the so-called fumiers). Fumiers XIV (NP1A), XII, XVII and XVIII (NP0) are the deposits that will be analysed in this work.

We present the results obtained with a multidisciplinary analysis: phytoliths, infrared spectroscopy, calcite pseudomorph, sperolites, diatoms, sponges, charred seeds and charcoal, together with animal remains and soil micromorphology will be used to characterize the activities carried out in the interior of the cavity, as well as the management of biological resources at this stage and its potential effect on the surrounding landscape.

03 BONE DIAGENESIS IN FUMIER CONTEXTS: ASSESSING POSTDEPOSITIONAL PROCESSES

Author(s): Del Valle, Héctor (Universitat Rovira i Virgili - URV) - Cáceres, Isabel (Universitat Rovira i Virgili - URV; IPHES, Institut Català de Paleoecologia Humana i Evolució Social) - Tornero, Carlos (IPHES, Institut Català de Paleoecologia Humana i Evolució Social; Universitat Rovira i Virgili - URV) - Burguet-Coca, Aitor (IPHES, Institut Català de Paleoecologia Humana i Evolució Social) - Vergès, Josep Maria (IPHES, Institut Català de Paleoecologia Humana i Evolució Social; Universitat Rovira i Virgili - URV)

Presentation Format: Oral

The El Mirador site is located in the southern part of the karstic complex of the Sierra de Atapuerca (Burgos, Spain). The stratigraphic sequence spreads out from the Upper Paleolithic and early Neolithic to Bronze Age. For at least 4000 years, the cave was used for various activities from funerary burial to habitation as well as livestock enclosure. A high sedimentation rate has allowed a clear record of the different chronological episodes.

Due to these livestock activities, the deposit contains a fumier formation. They are mainly composed burned and unburned layers of dung and organic remains to clean and to sterilize spaces. This process results in similar sedimentary features (facies) identified in any fumier context. On account of this, the conducted studies are characterized by a multidisciplinary approach to understand the genesis of the archaeological sequence.

We propose a taphonomic study focused on diagenetic aspects related to the nature of fumier and their influence on the conservation stage of the remains in this context.

A total of 45 bone fragments and their surrounding sediment sample from 4 different facies -a, r(m), tf and v- has been analyzed. Among the bones, it has been selected burnt, boiled, and cooked remains. Three diagenetic parameters have been chosen to represent the state of bone diagenesis: Organic matter content (% type I collagen), crystallinity index (CI) and C/P ratio.

We conducted a first taphonomic approach to fumier contexts assuming that the taphonomic history prior to burial determines its diagenetic history, and that bones buried in different facies had different diagenetic histories.

04 LOOKING INTO A NEOLITHIC-BRONZE AGE FUMIER AT ABRIC DEL XICOTÓ (SPAIN): A MICROMORPHOLOGICAL AND BIOMOLECULAR INVESTIGATION

Author(s): Égüez, Natalia (Archaeological Micromorphology and Biomarkers -AMBI Lab, Universidad de La Laguna; SERP. Dept. of History and Archaeology, Universitat de Barcelona) - Sánchez De la Torre, Marta (UNIZAR. Dept. of Sciences of Antiquity, Universidad de Zaragoza; SERP. Dept. of History and Archaeology, Universitat de Barcelona) - Oms, Xavier - Martínez Grau, Héctor - Mangado Llach, Javier (SERP. Dept. of History and Archaeology, Universitat de Barcelona)

Presentation Format: Oral

The Xicotó rock shelter (Alòs de Balaguer, Catalunya, Spain) is a site that have yielded evidence, so far, for continuous anthropic occupations dating from the Early Neolithic to the Bronze Age. A little fumier was excavated during the 2016 fieldwork season, showing a very well stratified layered deposit with a burnt black top layer and a rich organic appearance. As fumiers are ancient burnt dung, they provide an important source of information on animal husbandry systems and use of dung in past societies. The combination of micromorphological and biomolecular investigation of dung deposits brings new perspectives into past landscape land use and

animal husbandry strategies by providing high resolution information on livestock dietary intake as well as intensity of dung deposition in the penning space. Here, we conduct microstratigraphic analyses, lipid identification and carbon isotope analysis (δ13C) of plant n-alkanes of the ovicaprine dung deposit in order to explore the diet origin of the ingested plants by the livestock. Preliminary results indicate that burning episodes, foddering, intensity of corralling, and dietary composition of domesticates are identified in the archaeological dung samples recovered from the rock shelter with this micro scale multi-proxy method. Understanding animal husbandry through the micro scale give us the opportunity to understand the regional evolution of Neolithic societies in the Iberian Peninsula.

05 MICROARCHAEOLOGY AS A TOOL TO RECOGNIZE HUSBANDRY PRACTICES DURING THE NEOLITHIC IN THE NORTH OF THE IBERIAN PENINSULA

Author(s): Alonso-Eguiluz, Mónica (ERAAUB, Dept. d'Història i Arqueologia, Universitat de Barcelona) - Albert, Rosa María (Catalan Institution for Research and Advanced Studies, ICREA; ERAAUB, Dept. d'Història i Arqueologia, Universitat de Barcelona) - Fernández-Eraso, Javier (IT622/13 Facultad de Letras, Departamento de Geografía, Prehistoria y Arqueología, Universidad del País Vasco UPV/EHU)
Presentation Format: Oral

Enclosure of cattle in caves and rock shelters periodically throughout the year has been a common practice in the Mediterranean area since the Neolithic to the Iron Age. After and/or before reusing the site, the dung and rubbish previously generated are burnt in order to clean the site, producing a particular deposit known as fumier. Despite this a very spread phenomenon, little is known on the microarchaeological record that forms them, and which can help to shed more light on herding practices between sites and through the Neolithic and, to detect possible changes in these activities. With this aim, we report here a multi-proxy microarchaeological study including FTIR, phytoliths, faecal spherulites and ash pseudomorphs analyses applied to two archaeological sites, Los Husos II and San Cristobal (Álava, Spain), which were used by local populations since the early Neolithic (5700-4700 BC) up to the late Neolithic (4200-3600 BC). The results show strong similarities between them with abundant presence of phytoliths, faecal spherulites and ash pseudomorphs. The phytolith record indicates that cattle was foddered with local plants, during the summer-spring season, namely with C3 pooideae grasses. No evidence of complementing the diet with crops has been detected. The identification of phytoliths from dicotyledonous plants, more abundant in the ashy layers, associated to ash pseudomorphs point to their use as fuel for the fire to burn dung heaps. This is confirmed by the FTIR showing wood-ash calcite as the main component of the sediments along with clay. The identification of melted phytoliths in some of the samples also indicates that temperature was high enough to melt silica. Overall, the microarchaeological analyses show that, transhumance practices, which implied taking the cattle from the valleys to the mountains, during the spring-summer season, with fresh grasses all year-round, remained a common practice along the Neolithic.

06 A COMBINED PHYTOLITHS AND STABLE ISOTOPIC APPROACH TO STUDYING CATTLE FODDERING PRACTICES DURING THE LINEARBANDKERAMIK.

Author(s): Gillis, Rosalind (Institut für Ur- und Frühgeschichte, Christian-Albrechts-Universität; CNRS – Muséum National d'Histoire Naturelle – Sorbonne Universités, Archéozoologie, Archéobotanique: Sociétés, Pratiques et Environnement, UMR 7209) - Dal Corso, Marta - Makarewicz, Cheryl (Institut für Ur- und Frühgeschichte, Christian-Albrechts-Universität)
Presentation Format: Oral

The earliest Neolithic culture of central and northern Europe, the Linearbandkeramik (LBK), is often associated with initial settlement in a densely forested landscape. Livestock, in particular, cattle were an important commodity of these communities and would have required a constant source of fodder and pasture essential for herd survival dependant on resource availability. Forest fodder is often a source of fodder during periods of the year when other sources are scarce and was widely practised during recent times, with earliest evidence found in prehistoric contexts from Swiss lake villages. Identifying forest pasturing in the prehistoric environments of continental Europe has so far relied largely on low δ13C values present in skeletal tissues to indicate ingestion of plants/trees from under a dense canopy. However, the range of carbon isotope ratios associated with a 'canopy effect' remains loosely defined. Direct evidence of fodder sources will help Identify forest fodder contribution to LBK livestock diet. Dental cement developed during the animal's lifetime and can trap phytoliths and other microfossils derived from fodder. Despite being widely used for the identification of plant remains in palaeoenvironmental archives, phytoliths from cattle dental cement are scarcely studied. These siliceous microfossils have the potential be used to identify animal diet, especially when based on grasses and sedges. While stable carbon isotopic ratios from incremental samples of high crown teeth can provide a signature of fodder consumption over the period of the tooth development. Integration of these proxies will provide further information about foddering practices during prehistory and help answer questions such as: what was the role of forest fodder during LBK and was it a seasonal contribution? And were animals pastured in open areas? Here we present a multi-proxy examination of cattle foddering practices during the LBK and discuss the potential for phytoliths as proxies for foddering.

07 ANIMALS, PLANTS, AND LANDSCAPE IN THE POLISH LOWLANDS NEOLITHIC

Author(s): Marciniak, Arkadiusz (Adam Mickiewicz University)
Presentation Format: Oral

Different proxies of problematic heuristic potential, such as settlement location, lithics and stone implements, ethnographic anal-

ogies, species composition have been used until very recently to reconstruct the character of the Neolithic farming. Recent developments in archaeological sciences, advancements in faunal and paleobotanical studies, and theoretically deepened reflection of the complex nature of human-animal and plant relations offer unprecedented possibilities to reconstruct the complex character of the Neolithic populations lifeways.

The paper aims to present a comprehensive overview of different facets of husbandry and arable farming in the Early and Middle Neolithic in the Polish lowlands. The reconstructed aspects of these practices comprise birthing place and season, diet, foddering, manuring, pasture location, seasonality of grazing, movement of domesticates across landscape as well as profile of production. This in-depth reconstruction of the nature of these practices was possible thanks to the implementation of a multi-proxy approach, involving integrated analysis of stable isotopes of carbon, nitrogen, oxygen and strontium, advanced faunal studies, in particular age-at-death profiles, new method of paleobotanical studies as well as aDNA and lipids analyses. An impact of the differentiated status of successive domesticates, such their position in folk taxonomy, role in the process identity construction or position in feasting practices, upon the character of their exploitation will be explicitly addressed.

08 UNDERSTANDING THE EARLIEST NEOLITHIC FARMING IN SOUTHERN SCANDINAVIA

Author(s): Gron, Kurt (Durham University)
Presentation Format: Oral

Recent research is starting to clarify the reality of the earliest Neolithic agriculture in southern Scandinavia. New environmental archaeological data and research in the archaeological sciences, when coupled with the substantial corpus of previous research, is allowing for the first time even rudimentary observations to be made regarding the character of the earliest agricultural practice. One of the main obstacles to be overcome is one of the most basic; that sample sizes are, in general, far too small to adequately characterize almost certainly variable and widespread practice. In this paper, I review the available evidence regarding the earliest period of the Funnel Beaker Culture (ENI TRB, 4000-3300 cal BC) in order to contextualize the earliest farming in the region, its potential variability, and how Neolithisation progresses from the first introduction of domestic plants and animals. To do so, I review the available information coming from applications of environmental archaeology, particularly archaeobotany and zooarchaeology, and consider factors such as biogeography, mobility, and variation across the landscape. Together with recent stable isotope results, I will describe the earliest Neolithic of Southern Scandinavia as a transitional period, but one that is characterized by evidence consistent with a frontier agricultural setting. This case study serves to illustrate the value of revisiting even well-researched topics at a finer chronological scale.

09 HUSBANDRY, CULTIVATION AND LANDSCAPE IN THE TRB OF WESTERN SWEDEN. RESULTS FROM RECENT WORK IN FALBYGDEN.

Author(s): Sjögren, Karl-Göran - Axelsson, Tony (Dep of historical studies, Göteborg university)
Presentation Format: Oral

Within the project Neolithic Lifeways, MN TRB settlements have been excavated since 2012 in the region of Falbygden in western Sweden. Here we focus on two settlements, Logården and Godegården. These have revealed a large number of animal bone finds as well as macrofossils. Direct datings of bone and cereal samples indicate a parallel use of the two settlements at ca 3200-2900 BC.

The animal bones will be presented in a separate talk by Maria Vretemark. In this talk we present the macrofossil and pollen data, and discuss the results of isotopic analyses of both cereals and animal bone. 13C and 15N analyses of various species now give us insight into the isotope levels through the food chain, for the first time in the Swedish Neolithic. This in turn leads to a reinterpretation of human diet. Notably, cereal 15N levels at both sites are elevated, but also very different from each other. This suggests variation in cultivation practices between these nearby and contemporary sites, possibly with varying access to manure, and also suggests the integration of husbandry and cultivation into a common system. Sr isotope studies on cattle teeth suggest cattle were elements of a wide-ranging circulation system. Finally, the spatial structuring of the landscape with visual and spatial separation between megalithic tombs and settlements has long been recognized. To this we can now add insights into vegetation and land use patterns, through pollen, land mollusc and charcoal evidence.

a. SOIL MICROBIOLOGICAL INDICATORS OF PREHISTORIC AND MEDIEVAL CATTLE CORRALS

Author(s): Chernysheva, Elena - Borisov, Alexandr (Institute of Physicochemical and Biological Problems in Soil Science RAS) - Korobov, Dmitry (Institute of Archaeology RAS)
Presentation Format: Poster

Soils of stone corrals of 1st Millenium BC – 1st Millenium AD in the subalpine zone and in the Kislovodsk Basin (North Caucasus, Russia) and soils of modern pens were studied. The traces of corrals are numerously found in the mountain regions and well visible on the aerial and space images.

The aim of this work was investigation of microbiological properties of soils in stone corrals to find the soil indicators of animal husbandry at archaeological sites. All studied cattle pens have well preserved stone walls. But cattle pens could have wooden walls that were completely destroyed after abandonment. In this case we may establish the fact of animal husbandry only on the base of soil properties. The cattle keeping is known to results in an increase in phosphate content due to dung input into the soil, so in cattle

pens should observe high phosphates content. However, income into the soil any organic materials also result in an increase in the levels of phosphates. For this reason we used methods of soil microbiology such as urease activity and abundance of thermophilic microorganisms which were developed under dung composting.

Comparative analysis of phosphate content, urease activity and abundance of thermophilic microorganisms allowed us to separate places of cattle keeping and human living area. Cattle pens were characterized by high levels of the above-mentioned parameters. In soils of modern and medieval cattle pens were revealed high abundance of thermophilic actinomyces, whereas in soils of prehistoric ones only thermophilic bacteria were found. In soils of living area thermophilic microorganisms were not found.

So the first results of our studying have allowed establish the soil microbiological indicators of cattle keeping at archaeological sites.

This study was funded by the Russian Science Foundation grant 17-78-10207.

756 THE LIGHT FANTASTIC: THE ARCHAEOLOGY OF ILLUMINATION

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Morrison, Wendy (University of Oxford; Oxford Archaeology, Ltd) - Franconi, Tyler (University of Alberta)
Format: Regular session

Light is a powerful force in our lives and in our discipline., We 'shed light' on a past world that lies in shadows, due to the fragmented nature of the materials we study.

This session brings together diverse aspects of 'LIGHT' in archaeological contexts. From simple domestic illumination, to the landscape-scale use of signal lights and mirrors, from the abstract role of light in the inspiration of ancient art forms and display to the harnessing of light through the earliest refracting lenses, we will explore the many and varied ways that light has shaped the human experience.

For this session we welcome papers that innovatively explore

the relationship between material culture and light, in particular, papers that present new research and illuminate new ways of thinking about the light as a sensory element.

ABSTRACTS

01 ILLUMINATING THE WORLD IN PREHISTORIC TIMES.

Author(s): Higginbottom, Gail (Australian National University; University of Adelaide) - Mom, Vincent (Digital Preservation Projects)
Presentation Format: Oral

"The true joy of a moonlit night is something we no longer understand. Only the men of old, when there were no lights, could understand the true joy of a moonlit night." — Yasunari Kawabata, Palm-of-the-HandStories

Our work focuses on the visual displays afforded at megalithic monuments in Scotland, in particular standing stones. This long-running project is based upon quantitative methods that tested the probability of whether or not certain views associated with standing stones were due to chance factors. Findings included support for the deliberate alignment of monuments to the Sun and the Moon at varying times in their cycles and the deliberate choice of the shapes of the horizons surrounding the standing stones sites. This current paper moves beyond these works, as well as beyond Higginbottom's work on 2D, 360-degree landscape profiles with 3D rendering ('individual immersion models'), where the latter demonstrated how and where the Sun and Moon's paths travelled in relation to the shape of the horizon, as viewed from the monuments.

Following on from these, then, this presentation uses the astronomical software 'Stellarium' to make 360-degree views of photo-realistic night skies combined with real landscapes of standing stones monuments, as could be viewed 3,500 years ago. Significantly, these initial observation exercises are turned into cinematographic-like experiences. By examining a series of sites in Britain, we demonstrate that the Moon and the Sun were used to light up specific parts of the landscape at specific times of the year and times of day. Spectacularly, these same light shows are seen across the country at all the monuments. The apparent complexity of these views is further highlighted when see that a number of other astronomical bodies were set-up to be viewed from the standing stones, marking time and the light over the World.

02 FACING THE SUN? UNIFORM ORIENTATION OF THE LBK AND POST-LBK LONGHOUSE REVISED

Author(s): Vondrovský, Václav (University of South Bohemia)
Presentation Format: Oral

The longhouse represents one of the iconic item of the Linear Pottery culture (LBK) as well as succeeding post-LBK cultures (e.g. Stroked Pottery, Grossgartach, Rössen, Villeneuve-Saint-Germain). Elementary principles of architecture were shared within the wide area of LBK and post-LBK milieu – among others also the unified and deliberate orientation of house longitudinal axes toward the

cardinal directions. The roots and origins of this phenomenon were addressed by several scholars. So far, prevailing wind streaming, or orientation to the 'land of ancestors' were discussed, but possible role of the sun and illumination remained omitted.

The recently increasing number of excavated ground plans, especially in the regions of Eastern Europe, allows to investigate this issue in an appropriate spatial and chronological framework. The spatial analysis based on the assemblage of 1,546 buildings shows strong, however, not strict, tendency to orient the house entrances toward the south or south-east. The inclination of entrances toward the eastern direction, which emerged during the LBK expansion westwards, is considered to be a regionally limited pattern, as no analogical shift was observed in the eastern areas of longhouse distribution. Thus, the widely accepted theory of house alignment toward the 'land of ancestors' is challenged here by a new hypothesis, which sees orientation governed by the celestial path of the sun and illumination. Using 3D-modelling of light-and-shadow interaction and solar impact rate, sun alignment is discussed as an integral element of the longhouse concept already present by the time of its genesis.

03 ILLUMINATION MATTERS: TELLING THINGS OF THE PAST IN A NEW LIGHT

Author(s): Campanaro, Danilo (University of Lund)
Presentation Format: Oral

Illumination played a fundamental role in Roman houses, where daylight and flames represented the only sources for lighting and heat. With this regard, ancient texts have stressed the importance of good lighting in house design. Apart from those basic needs, light (and darkness, as a consequence of the absence of light) deeply informed other aspects of Roman society and urban houses in particular, eventually acting as social agents. Illumination, for example, would have strongly affected the 'social atmosphere' and the quality of the message delivered to the guest - about the wealth and the power of the owner - by decors (wall painting, mosaic flooring, luminaires, etc.). To date, despite the central role played by light and darkness in ancient times, few researchers have addressed the question of the illumination in the Roman houses, which still results in a largely neglected area of inquiry. Building on the assumption of light being a powerful social agent, the presented inquiry intend to investigate, by means of historically based and physically accurate lighting simulation and analyses, the extant entanglements between spatial and social patterns of circulation, in order to infer novel insights about the social and spatial behavior in the Roman house. In specific, the proposed study will focus on the case study of the house of the Greek Epigrams (V1,18.11-12), situated in the northern part of the Insula V1 in Pompeii.

04 ILLUSIONS OF LIGHT: A NEUROARCHAEOLOGICAL AND PERFORMATIVE APPROACH TO THE ETRUSCAN TOMB SPACE

Author(s): Ortoleva, Jacqueline (University of Birmingham)
Presentation Format: Oral

Analyses of performative events illustrated on Etruscan tomb walls have often focused on social organization, presenting incarnations of performance, such as ritual, dancing and musical performance as symbolic of gender, status and the general identity of the deceased. Alternatively, such scenes have been approached as symbolic of the Etruscan afterlife. Without textual sources elucidating each tomb's iconography, the underlying meaning of Etruscan tomb paintings may forever be lost to scholars. However, perceptual adaptations to light and space involving performative tomb paintings are accessible but have received little scholarly attention.

This paper focuses on the role of light in the experiencing of tomb paintings depicting performance. A selection of late fifth century BCE tomb paintings from Tarquinia are examined to illustrate two modes of performance that involve coordinated and repetitive movement: ritual scenes and dance. Drawing on performance theory as well as neuroarchaeology, patterns for interaction with the tomb painting are highlighted in the movement through the tomb, and the production of the interment context. The analysis sheds light on the potential engagement of tomb paintings depicting performative events. Furthermore, it re-contextualizes the use of light and the resulting visual dynamics of funerary ritual as originally performed in the Etruscan tomb space.

05 ARTIFICIAL LIGHTING AND PUBLIC SPACES IN ROMAN CITIES

Author(s): Canino, Dario (Universitat Autònoma de Barcelona - Sapienza Università di Roma)
Presentation Format: Oral

During antiquity, in Roman cities there was not a real public illumination, in the sense in which we mean it nowadays. The ancient literary sources do not give us many information on this topic and today we have a rather obscure vision of the ancient cities during the night. We know, however, that some villas put a lanterns at their entrance and also that, in the cities, some houses and tabernae had, at their entrance, niches in which to put oil lamps. Some urbanistic elements, together with some references in ancient sources, allow us to hypothesize that in the imperial cities certain public areas, and especially the forum plazas, could use some form of artificial lighting, probably during the night or perhaps during certain events. In the forum, after all, there were buildings of great religious importance, like the temples, but also of economic and administrative importance, like the aerarium and the tabularium, places that it was certainly necessary to keep safe even during the night. After all, the problem of the bandits and of the latrones has never been resolved, even in the period of the much proclaimed Pax Augustea. It is plausible to assume that already in the imperial age, it was decided to improve the security and the night visibility of the fora and that this phenomenon could be linked, in some way, to the condition of isolation and closure typical of the fora of the imperial age. Moreover, such lighting systems, inside the monumental imperial

complexes, may not have had only a utilitarian function, since the same positioning, in certain points of the complex, could serve to catch the eye of the citizens and direct it towards the correct internal path, expected by the complex

06 MIRRORMASK: REFLECTING LIGHT IN IRON AGE BRITAIN

Author(s): Morrison, Wendy (University of Oxford School of Archaeology)
Presentation Format: Oral

Iron Age mirrors in Britain have received much academic scrutiny (e.g., Joy in Garro), both for their decoration as an iconic exemplar of La Tène style art and for their possible uses as status-markers and tools of divination. For all the discussion on what Celtic Art is meant to do, versus what it may mean (Garrow & Gosden, amongst others, channelling Gell), there has been little exploration into what the Iron Age hand mirror was intended to do, apart from enchant and bedazzle the beholder. Perhaps there is much more than meets the eye, and indeed is intended to literally meet the eye.

Following some experimental work with reconstructed etched mirrors, this paper briefly explores the possibility that the reflective characteristics of the polished bronze artefacts may have had further uses.

Garrow, D., & Gosden, C. (2012). Technologies of Enchantment?: Exploring Celtic Art: 400 BC to AD 100. Oxford University Press.

Garrow, D, Gosden, C. & Hill, J.D. (2008) Rethinking Celtic art. Oxbow Books: Oxford

Gell, A. (1992). The technology of enchantment and the enchantment of technology. Anthropology, art and aesthetics, 40-63.

Joy, J. (2008). Reflections on Celtic art: a re-examination of mirror decoration. In (Garrow, Gosden, Hill eds) Rethinking Celtic art, 78-99.

07 MIRROR REFLECTIONS IN ANCIENT EGYPT: SOME PRELIMINARY OBSERVATIONS ON LIGHT AND MATERIALITY

Author(s): Matic, Uros (Westfalische Wilhelms-Universitat Munster)
Presentation Format: Oral

Mirrors and reflective surfaces are in many cultures interpreted as elusive objects with their own peculiar agency and personality. This is probably because of their quality to produce duplicate images of their beholders. These images appear almost identical, but are actually reversed in the direction perpendicular to the mirror surface. Bronze mirrors are known in Egypt since the Old Kingdom (c. 2686–2181 BC) and are in use throughout ancient Egyptian history. The studies of mirrors in Egyptology have so far concentrated mostly on handle typology, iconography and the use of mirrors in later Graeco-Roman temple rituals. The rich textual and iconographic data was so far not juxtaposed to objects themselves in a more nuanced manner and one key element, namely light, is missing in previous approaches. Light is an element without which mirrors cannot fulfill their primary role as reflective surfaces and image producers. This paper explores the ways light as a sensory element has shaped the experience of mirror use in ancient Egypt. Mirrors do not only produce images but also change the light distribution in the half-space in front of and behind the mirror. This phenomenological observation can illuminate some aspects of mirrors found in ancient Egyptian textual and iconographic sources in bringing us closer to materiality of reflection. It will be argued that focusing on light and reflection is crucial for understanding not only the use of ancient Egyptian mirrors but also the motifs used in they decoration.

758 HUMAN-WATER INTERCONNECTIONS IN THE DRY ENVIRONMENTS OF THE NEAR EAST AND CENTRAL ASIA

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Bulawka, Nazarij (University of Warsaw, Faculty of History, Institute of Archaeology, Department of Near Eastern Archaeology) - Arciero, Roberto (Leiden University, Faculty of Archaeology, Department of World Archaeology, Archaeology of the Near East) - Holguin, Leah (University of Southampton, Faculty of Humanities, Department of Archaeology) - Al Karaimeh, Sufyan (Leiden University, Faculty of Archaeology, Department of World Archaeology, Archaeology of the Near East) - Mantellini, Simone (University of Bologna, Department of History and Cultures - DiSCi) - Markofsky, Steven (Universitat Pompeu Fabra, Barcelona)
Format: Regular session

Water has always been a critical agent in the rise, development, and collapse of ancient civilizations. This was particularly true in the arid environments of the Near East and Central Asia. In the last decades, human-water interconnection has been analyzed in various ways. The analysis and reconstruction of ancient irrigation systems were essential steps in researching settlement development in regions where rain-fed agriculture was insufficient for basic subsistence.

Although Wittfogel's theory on the political centralization of water management has been largely dismissed today, he fostered substantial research into the relationship between irrigation systems and social complexity. Since the 1990s advances in field data recording techniques, remote sensing, aerial photography and drones have all contributed to a significant development in studying the archaeological landscapes of the Near East and Central Asia. This multidisciplinary approach signed a new perspective in this field of study and made it possible to grasp

the landscape in a digital form.

This session aims to better explore and expand our current knowledge about the different aspects related to water in dry-lands of Near East and Central Asia. We welcome papers that relate to water management and different methodological and theoretical approaches for both regions. The session may include (but not limited to) hydrogeoarchaeology; agent-based model for irrigation system; irrigation as a proxy in evaluating the multi-temporal environmental evolution; remote sensing; marshland environments; water as path-deterministic agent; social complexity; human niches construction; ethnoarchaeology and heritage study that takes into account all the aspects of the human-water relation.

ABSTRACTS

01 HUMAN-WATER INTERCONNECTIONS IN THE DRY ENVIRONMENTS OF THE NEAR EAST AND CENTRAL ASIA

Author(s): Arciero, Roberto (Leiden University)
Presentation Format: Oral

The local environmental conditions have always been shaped by many factors, such as the different gradient of terrains, precipitation and temperature, together with the different characteristics of water resources and technology in specific periods. Besides, agriculture and irrigation cannot only be considered as simple use of water in dry environments. The aim of the session is to consider the presence of hydraulic (infra-)structures in the archaeological record and any possible interconnection with past human agents. In this session, we encourage and promote new perspectives in order to set up a discussion of current and future trends in the landscape studies in Near East and Central Asia where water management is a key topic.

In the introduction, we broader discuss the current research perspectives and methods/approaches in water resources and irrigation studies in the dry environments of the Near East and Central Asia. The differences and similarities of both regions will be clarified and an overview of geographic coverage of submitted papers and general information about them will be given. Likewise, the presentation order of papers in the session will be explained.

We are confident that both presentations and discussion in this session will be a constructive moment to broaden the research in Near Eastern and Central Asian regions and be beneficial also for a wider audience.

02 THERE'S SAND IN THE SENSOR! REMOTE SENSING APPROACHES TO INTERPRETING DELTA-DESERT TRANSITIONAL ENVIRONMENTS

Author(s): Markofsky, Steven (Independent researcher)
Presentation Format: Oral

The complex boundary regions between deltas and deserts pose particular difficulties for archaeological enquiry. In these regions, the dynamic interactions between aeolian and alluvial processes result in continuously changing hydrosocial landscapes that manifest over a range of spatio-temporal analytical scales.

The wealth of tools, methodologies and theoretical approaches offered by the burgeoning field of remote sensing can help to deconstruct complex and often visually obstructed human geographical landscapes. Arid-margin EO approaches have increasingly incorporated multispectral imagery, thermal IR imagery, synthetic aperture radar (SAR), and high-resolution UAV-based photography and photogrammetry to deconstruct marginal and transitional landscapes, and to highlight the implications for those societies who inhabited them, as well as the modern-day researchers who seek to understand them.

This paper presents a set of remote sensing techniques to examine hydrosocial landscapes in the distal zone of the endorheic Murghab delta in Turkmenistan, and explores the potential for the deconstruction of these types of environments using aerial as well as satellite-based sensing techniques. Using an integrated approach, the paper evaluates the effectiveness of multispectral analysis, thermal imagery, landscape morphometry, UAV based imagery, classification algorithms and SAR data to develop an effective and transferable set of methods for examining these unique transitional zones.

03 HOW TO COPE WITH DESERT ENVIRONMENTS. THE MANAGEMENT OF THE WATER RESOURCES IN THE MURGHAB (TURKMENISTAN) DURING THE BRONZE AGE

Author(s): Arciero, Roberto (Leiden University)
Presentation Format: Oral

Today the tension between humans and water resources continues to intensify in many parts of the world, especially in desert climates where limited water must be balanced against societal demands. In the last decades, the investigation of the human adaptation to the arid environment, such as the Near Eastern and Central Asian deserts, has been critical to the archaeological investigation. The Karakum desert in modern Turkmenistan, with its 150 mm of precipitation per year, constitute one of the main remote deserts of Central Asia. However, between the Middle and Late Bronze Age the Murghab inner delta region (south-eastern part of the Karakum) was the cradle of the Oxus Civilization. During the Bronze Age, the region started to develop a complex system of settlement patterns in association with - as the archaeological evidence suggests - a system of natural and man-made channels for

irrigation. Therefore, given the limited rainfall precipitation, it has for a long time been suggested a direct relationship between the control of the channels system and the Bronze Age settlement patterns. However, although channels system occurred in the region, many research questions remain poorly investigated. How and where the channels were located, and to what extent they influenced the distribution of farming settlements of the region, are questions that have only been minimally researched. The present paper presents the preliminary results of the channels system analysis of two local areas of the Murghab: Togolok and Ojakly. The local areas have been extensively surveyed to verify the relative water system, previously detected by remote sensing techniques, while a first relative chronology of the channels system was obtained. The project aims to investigate how the local communities coped with the arid environment and how they managed and exploited the water resources in one of the harshest deserts of Central Asia.

04 CLIMATE CHANGE AND THE SOCIOCULTURAL EVOLUTION OF THE OXUS CIVILIZATION: AN OVERVIEW

Author(s): Luneau, Elise (Deutsches Archäologisches Institut, Eurasien-Abteilung)

Presentation Format: Oral

The Bronze Age proto-urban and sedentary cultural entity located in southern Central Asia (ca. 2300-1500/1400 BCE) – known as the Oxus civilization or Bactria-Margiana Archaeological Complex – underwent major social transformations around 1800/1750 BCE before disappearance in the middle of the 2nd millennium BCE. Among the different possible reasons of these sociocultural changes, the hypothesis of global climate change in Central Asia at the beginning of the 2nd millennium BCE, especially connected with an aridification, has been emphasized by different scholars. Climatic causes are often suggested in the case of the disappearance of civilizations or cultural entities in different areas. However, the issues of the variability of the climatic system and its impact on the transformations of societies often drift into environmental or anthropic determinisms. The crossing of the disciplines and approaches – environmental studies with anthropology – enlightens on the contrary the reciprocal interaction between Human and Environment, and offers to encompass the natural processes as well as to highlight the constant adaptations of societies and environments.

In this paper, we will examine the current paleo-environmental studies and review the hypothesis of climatic change in Central Asia at the beginning of the 2nd millennium BCE. We argue that the present data do not support a drastic climatic degradation during the first half of the 2nd millennium BCE as a responsible factor for the fall of the Oxus civilization, although local environmental modifications can also not be underestimated. Whereas it remains difficult to define precisely the motives of this evolution, a critical assessment of the interplay between ecological and social factors stimulates the discussion anew.

05 IT'S ALL ABOUT LOCATION... THE WATER ADAPTATIONS IN THE OASES OF TEDJEN RIVER IN THE IRON AGE (TURKMENISTAN)

Author(s): Bulawka, Nazarij (University of Warsaw, Faculty of History, Institute of Archaeology, Department of Near Eastern Archaeology)

Presentation Format: Oral

The oases of Tedjen River located in Turkmenistan, the river's delta and Serakhs oasis, are examples of palimpsest landscapes formed in different periods. The studied region share many common features with other main test areas of irrigation studies. Similarly to Near East, characteristic landscape features present here are levees, which are an evidence of long-term irrigation practice in the region. The problem is, however, whether their presence always inform us of water adaptations existing during the Iron Age (ca. 1300-300 BC)?

The Iron Age of Central Asia is deeply connected with the study of irrigation since 1940s. Nowadays, most scholars agree that in the last phase of the Iron Age (Yaz III period) the complex irrigation networks were built. This period is chronologically close to the reign of Achaemenids (ca. 550-330 BC) – famous of large irrigation systems. The types of water adaptations practised in the early and middle Iron Age (Yaz I-II), however, is still a matter of discussion.

The results of Polish team in the oases of Tedjen River give new insight into the issue of water adaptations that could exist in the Iron Age. Thanks to recent surveys new sites have been discovered in both oases. Also, a new phase of irrigation studies in the region was possible due to availability of new digital elevation model, which offers a greater detail when used for automatic extraction of irrigation network.

The paper concentrates on GIS methods that could be used to study water adaptations in dry environments. The main issue of the paper is the recognition of alternative agriculture practices and artificial irrigation and defining its scale in the region.

06 WHERE YOUR MEANS ARE LIMITED: WATER MANAGEMENT IN STEPPE OF THE SOUTHERN UZBEKISTAN

Author(s): Stanco, Ladislav (Charles University)

Presentation Format: Oral

Study of settlement patterns in dry or semi-arid environments is inevitably connected with a research of accessibility of water sources and its artificial supply. Simple equation says that the better preserved landscape, the easier reconstruction of water-bringing systems of the past and their changes. What if the landscape in question for whatever reason does not provide much traces of the original components of such a system, and at the same time legal limitations or restrictions – which is frequently the case of the

modern Near Eastern and Central Asian countries – do prevent using of most effective ways of relevant archaeological investigation, such as Lidar, drons or traditional means of aerial archaeology? Having studied the settlement patterns of the Sherabad Oasis in southern Uzbekistan in various historical periods, we encountered such a problematic case, since we dealt with specific landscape affected significantly by human – especially agricultural – activities in the recent past. Our reconstruction of the network of archaeological sites and historical irrigation canals is based on the correlation of the sites distribution on one hand, and on testimony of the rare source of data from the period that predates the extensive agriculture of the 20th c. represented by old maps, and corroborated by accidental remaining terrain features, on the other. The resulting reconstruction helps to understand dynamics of the settlement in the research area and to explain some peculiar features of the settlement distribution. This case study, even if it needs to be further tested, changes substantially previous scholarly view biased to certain degree by aforementioned – modern – interventions in the cultural landscape.

07 EVALUATION OF HOLOCENE HUNTER-GATHERER LAND USE ALONG PALAEOHYDROLOGICAL CORRIDORS IN THE ULAAN NUUR REGION OF THE GOBI DESERT, MONGOLIA

Author(s): Holguin, Leah (University of Southampton)
Presentation Format: Oral

In arid and semi-arid environments, hydrological networks are conduits that facilitate movement, where water may be used as a proxy variable in which to examine how people move within these networks and corridors, particularly during periods of environmental uncertainty and unpredictability. This creates a better representation of the spatial patterns in human movements across varying scales, where landscape becomes accessible to spatial interpretation, including analysis of geospatial imagery and GIS based analysis that identifies key hydrologic and geomorphological processes, combined with field survey that identifies key areas of archaeological activity in relation to these environmental processes.

The Ulaan Nuur (Red Lake) palaeohydrological complex in Omnogovi province of southern Mongolia was active during the Holocene and provided diverse ecosystems for various landscape activities. However, increasingly arid conditions at the onset of the Late Holocene changed the landscape to a more marginal one. The research presented here combines geomorphological analysis and hydrological modelling, and field survey to identify several archaeological areas of local Gobi Desert hunter-gatherer activity dating between the Mesolithic (13500-8000 cal B.P.) and Late Neolithic/Eneolithic (5000-3000 cal B.P.). These sites are all centred along key palaeohydrological corridors of Ulaan Nuur, particularly highlighting a significant potential route of movement between the Gobi Altai Mountains and Bayanzag. Based on this, a model of movement of local Gobi Desert Holocene hunter-gatherers constructed around hydrological corridors is presented.

08 EXPLORING EARLY WATER MANAGEMENT IN CENTRAL ASIA THROUGH ARCHAEOBOTANY

Author(s): Spengler, Robert (Max Planck Institute for the Science of Human History)
Presentation Format: Oral

As new scientific methods move into Central Asian archaeology, archaeobotanical studies are becoming increasingly more prominent. Through these new studies, scholars are recovering an increasingly impressive array of domesticated plant remains from all regions of Central Asia spanning several millennia back in time. While scholars have extensively focused on studying the earliest spread of domesticated crops across this broad geographic area, less discussion has gone into understanding what these farming systems looked like. In this talk, I synthesize the evidence for agricultural activities across different regions of Central Asia, focusing on arid regions or areas where farming activates would have taken increased labor investment. Then I discuss the role that these crops played in the development of multi-cropping systems, rotation cycles, and irrigation works. Many of the archaeobotanical assemblages in Central Asia contain long and short-season crops as well as drought-tolerant and water-demanding crops. The prominence of certain-water demanding crops in arid regions of Central Asia illustrates that irrigation was necessary in the past; notably, cotton was cultivated across southern Central Asia by the mid-first millennium A.D. and rice by the late first and early second millennia A.D. Collectively, these plant remains portray a rich and dynamic farming system through time.

09 WATER MANAGEMENT IN PAST PASTORALIST SOCIETIES ON THE TERRITORY OF ARMENIA - A LOOK ON HUMAN-ENVIRONMENT INTERACTION AND SOCIO-CULTURAL MEANING

Author(s): Kasperkiewicz, Kornelia (University of Warsaw, Institute of Archaeology)
Presentation Format: Oral

The creation of water management is highly dependent on the social structure of any given past society. The specific theoretical implications for pastoral societies and water management and its social and symbolic meaning will be elaborated and discussed on basis of the case study of archaeological material from the territory of Armenia.

In the early 20th century, the archaeologist Ashkarbekh Kalantar documented and published his observations on the main mountain ranges in Armenia, which he describes as “highly complex snow fed irrigation systems”, which supplied the settlements in the lowlands with water. He dates those structures to “pre-Urartian” times, with no indications to support his hypothesis. Clearly, these features, that incorporate natural streams and human modified channels and reservoirs, are linked to a network of settlements reaching from the Early Bronze Age up to the Early Iron Age. At the end of this time span the Armenian region beyond the Araxes River

was conquered by the Urartian Kingdom, which itself managed to build its own water supply for its new capitals. In this context it is also important to address one important source of evidence, which consists of rock carved motives of channel systems that can be revealing in regard of the perception of the landscape surrounding these societies. Although the dating of all these features remains unclear, it is important to point out, that throughout the Bronze and Early Iron Age, these past societies where characterized by different degrees of pastoral lifestyle. In order to understand this material, the interconnection between these water management features and the rock reliefs with the socio-cultural implications has to be elaborated. Therefore, the main focus of this paper will be on the interrelation between pastoral habitus and water management. In conclusion, the main factors in studying these relations should be presented.

10 RAINWATER HARVESTING SYSTEMS IN SOUTHERN TRANSJORDAN: THE SITE OF SELA

Author(s): Marsal, Roser (Department of History and Archaeology, University of Barcelona; Water Research Institute - IdRA, University of Barcelona; PROA-GRACPE)

Presentation Format: Oral

Despite the paucity of studies on historical systems of water management, there are plenty of archaeological evidences for the study of Jordan's past populations and their adaptation to arid landscapes. Recent research has demonstrated that the inhabitants of southern Transjordan developed sophisticated water supply systems based mainly on rainwater harvesting. In this context, the archaeological investigations carried out by a team from the University of Barcelona at the site of as-Sila/Sela near Tafila in present-day Jordan have yielded important data on water management and usage of rainwater resources from the Iron Age to the Medieval and Ottoman Periods. This paper aims at presenting an overview on Sela's highly sophisticated network for collecting, storing, transporting and distributing rainwater, which forms the core of my doctoral thesis. Several hydraulic structures have been identified, described, catalogued and contextualized in the course of two archaeological seasons (2015-2016) at the site of Sela. The outcome data have revealed an extraordinary system of rainwater management, which includes a considerable number of water structures with a great variability of typologies, dimensions and building techniques. These findings highlight the importance of Sela and the scientific value of studies on water culture. We also believe that research on rainwater management would provide a better understanding of population dynamics in southern Transjordan over the longue durée.

11 FALAJ AL-MUTARIDH AND ITS IRRIGATED FIELDS

Author(s): Al Karaimeh, Sufyan - Düring, Bleda (Leiden University)

Presentation Format: Oral

Oman is well known for its falaj systems. Throughout these systems, water was conducted for long distance where oases were initiated and people settled. Falaj al-Mutaridh or Mulayyinah is one of the finest irrigation examples in Oman because its social organization and technology that were used to construct and maintain the system. Archaeological evidence shows that the region had flourished during the Islamic Era and the system was intensively used during the same period. The falaj runs from the high mountains to the coastline and because the harsh and difficult landscape of the area several methods and techniques were used to convey water from the source in Wadi al Jizzi to several villages in Sohar region. Furthermore, several methods were used also to protect the system from damage such as floods in the wadis during the winter time.

It is one of the longest systems in Oman and it is estimated to be approximately more than 70 km long with the full length of all branches. Water was divided among the farmers which had enabled them to irrigate their fields for centuries. This system shows a high level of organization between the farmers who lived in the villages and a system satisfy for this purpose.

760 '...IN WITH THE NEW!': THE FUTURE OF ARCHAEOLOGICAL RESEARCH IN MEDIEVAL EUROPE

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Busset, Anouk (University of Glasgow; Université de Lausanne) - Heinonen, Tuuli (University of Helsinki) - Johnson, Catherine (University of Glasgow)

Format: Regular session

This session, proposed by MERC, is aimed at postgraduate students and early career researchers whose interest focuses Medieval Europe. It offers a platform for speakers to present ongoing and upcoming projects, as well as connecting with a wider community of early career researchers. Following the theme of this year's conference 'Reflecting Futures', this session will offer opportunities to discuss new and promising research avenues that will shape tomorrow's medieval archaeology. 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.

01 THE POLITICAL AND SOCIAL COMPLEXITY OF LUCCA IN THE EARLY MIDDLE AGE: NEW STUDIES ON CERAMICS FROM URBAN EXCAVATIONS (ITALY)

Author(s): Grassi, Francesca (University of Siena)
Presentation Format: Oral

The contribution presents the first results of a research work within the ERC Advanced Grant 2014 projects: "Origins of a new economic union (7th-12th centuries): resources, landscapes and political strategies in a Mediterranean region (http://www.neu-med.unisi.it/it/)".

The research focusing on the study of the ceramic contexts coming from the excavations of the city of Lucca, carried out from the 70s of the past century to the present day. The objective is to analyze, through ceramics, the social complexity of this city that in the VI-VII century was the seat of a ducal curtis of the Lombard kingdom and from the VIII century was into the Marca of Tuscia. Ceramics will be used as a tool to highlight the political and social complexity of the early medieval city, observing their differences in the urban areas and crossing the data with the corpus of written sources.

The preconditions for this use of ceramics were encouraged by authors such as C. Wickham, for carrying out analysis in certain regions of continental and mediterranean Europe. He considers pottery one of the most eloquent marker for the analysis of both trade and social complexity, offering an alternative approach for the reconstruction of historical societies. According to the author, most of the demand would have been generated by the elites, the circulation of ceramics reflecting the scale of the economic system, while the demand of the mass would have been too insignificant to affect the mechanisms of production and circulation. The aim of this research is to expand geographically and chronologically the available data, in order to establish a global approach to the study of the formation and development of central and local powers during the Middle Ages.

02 THE STUDY OF THE FORMATION OF THE SOCIAL STRUCTURE OF ANCIENT RUSSIAN CITIES BASED ON ARCHAEOLOGICAL, ANTHROPOLOGICAL AND GENETIC DATA

Author(s): Tarasova, Anna - Vasileva, Elena (Institute of Archaeology Russian Academy of Sciences) - Alborova, I. - Matsvai, A. (Historic Genetics Laboratory of Moscow Institute of Physics and Technology) - Engovatova, Asya (Institute of Archaeology Russian Academy of Sciences) - Mustafin, Kh. (Historic Genetics Laboratory of Moscow Institute of Physics and Technology)
Presentation Format: Oral

The founding of Early-Medieval Rus's urban settlements and their populations is an issue that was the subject of discussions for several decades. Discussion circles around identifying the primary population groups. There are issues of whether cities were founded primarily by locally-living rural people, or whether this process also involved large groupings who had followed some Prince to the area, including the Prince's guardsmen, servants, craftsmen, their families, and others from differing regions of Rus and its neighbouring states. Excavations of mass graves, undertaken in Yaroslavl by the IA RAS, headed by Dr Asya Engovatova, offered a unique opportunity to obtain an overview of the entire urban population spectrum living in the city prior to the ransacking of the city by Batu-Khan's army in 1238 AD. Their remains were studied using classical techniques of osteometry, along with cranial analysis based on geometric morphometric methods (IA RAS: A.A.Tarasova, M.B. Mednikova). The results displayed a strong morphological heterogeneity of the city's population during the first quarter of the 13th century. Genetic studies conducted by specialists from the Historical Genetics Lab (I.E.Alborova, A.D. Matsvai, & Kh.Kh.Mustafin) gave more nuanced insight into the morphology of the individuals from the mass graves. This was the first time in Russian history that genetic material was successfully obtained from a Medieval Russian population. The work carried out by paleogeneticists confirmed the population's heterogeneity, while also underscoring a new perspective in migration studies of the period of Russia's pre-Mongolian urbanisation.

03 REDEFINING EPIGRAPHY: EXPLORING THE MEANING OF 'TEXT' ON EARLY MEDIEVAL INSULAR PORTABLE INSCRIBED OBJECTS

Author(s): Johnson, Catherine (University of Glasgow)
Presentation Format: Oral

This paper acknowledges one of the key complications within the study of early medieval portable inscribed objects from Britain and Ireland: Differentiating between text, symbol, and decoration. Countless numbers of these objects have been described as 'possibly' having text, or having a 'rune-like', 'ogham-like', or 'pseudo-Latin' inscription. Many objects, described as having an inscription, and even given an interpretation, leave other scholars unconvinced. A single rune, for instance, on an early Anglo-Saxon sword pommel may be interpreted as a maker's mark, a symbol, a decorative element, a casual doodle, or simply an abrasion mark. An ogham inscription set round a Pictish spindle-whorl may only be a decorative design with no linguistic intent. A series of vertical marks round a Viking-Age spindle-whorl may resemble runes, but instead may be a design meant to imitate them. All of these scenarios beg the following questions: What constitutes as text and what does not? Is illegibility an indicator of illiteracy or intent in regards to the artist, and how can we confidently determine that a set of markings were or were not intended to carry semantic meaning? When is an inscription not an inscription, and where do we draw the line between text and decoration? All of these questions highlight the difficulties in determining the legitimacy of inscribed objects, and whether to include them or not in a corpus. This paper will provide

theoretical approaches towards this issue, as well as a discussion and insight into the questions listed above.

04 PARCHMENT PRODUCTION IN MEDIEVAL SCANDINAVIA

Author(s): Strid, Lena (Lund University)
Presentation Format: Oral

Parchment production was extremely important for medieval society; the backbone upon which the bureaucracy of the state, the records of the merchants and the estates, and the religious life of priests, monks/nuns and the laity rested. Despite this, parchment production is an understudied area, possibly related to scarcity of both archaeological finds and historical records indicating parchment workshops.

The aim of this project is to explore the use of parchment in Medieval Scandinavia through biochemistry, zooarchaeology and artefact studies. Important topics include how the choice of species for parchment relates to economic decisions regarding animal husbandry strategies, both between regions and over time. The interplay between volume of parchment production, diachronic increase in literacy and the introduction of paper in the late Middle Ages will also be examined.

This preliminary report will discuss the results from the first parchment sampling, where non-destructive electrostatic Zooarchaeology by Mass Spectrometry (eZooMS) peptide mass fingerprinting was used to identify species-specific protein signatures in the parchment. The samples were taken from early 13th-early 16th century charters written in three towns and four monasteries in Sweden. Previous studies on parchment from Britain and continental Europe have shown spatial and temporal variation in the species used for parchment, where sheep and goat are common in Italy, calf in France, and calf and sheep in England.

05 ANIMALS IN BURIAL CONTEXTS - AN INVESTIGATION OF NORSE RITUALS AND HUMAN-ANIMAL RELATIONSHIPS

Author(s): Strehlau, Hannah (Uppsala University)
Presentation Format: Oral

The deposition of animals in graves was an essential aspect of burial practice in Scandinavia during the Vendel Period and Viking Age (550-1050 AD). While this rite occurs in many different regions, it is most clearly observed in the boat-graves from the famous cemeteries in Swedish Uppland, such as Vendel and Valsgärde. Former studies have tended to interpret faunal remains from burial contexts as food offerings, diplomatic gifts or simply as sacrifices. These explanations place an emphasis on the importance of the human dead and imply that grave assemblages mainly served to accompany the deceased as a provision for the afterlife, or to illustrate power, status and identity among the living.

The master's thesis presented here, comprises an analysis of animal depositions from both cremation and inhumation burials in Uppland. By applying the theory of agency, this study focuses on grave assemblages as a means of understanding human-animal relationships. Instead of only paying attention to the type of bones and the animal species, I believe that it is equally important to consider the condition of the bones and especially their placement inside the grave in relation to the human dead. This is not only essential to decoding human-animal relationships as evident in burial practices but also to understanding the many different processes that culminated in the deposition of animal bones in graves. In addition to the study of the purpose of animals in burial contexts, the analysis reveals to what extent this custom relates to different social factors such as the age, gender and social status of the deceased. This leads to a greater awareness of different degrees of ritualization and increases our comprehension of the overall burial ritual.

06 'PEOPLE. PLACES. THINGS.' CHALLENGING THE PROBLEMATIC APPROACHES OF (LATER) MEDIEVAL ARCHAEOLOGY

Author(s): Dempsey, Karen (School of Archaeology, Geography and Environmental Science, University of Reading)
Presentation Format: Oral

Our stories of the medieval period are often static and two dimensional accounts of the past. The archaeology of the central and later Middle Ages is overwhelmingly concerned with architectural histories or landscape composition and many debates in scholarship are topologically-orientated, where morphology is prioritised over interpretive analysis. People are almost absent, other than those associated with power (mostly patriarchs). Little is revealed of the practices, beliefs and identities of the people that shaped the wider (Norman) world; consequently, our view of this period often comprises static buildings detached from equally static objects and landscapes. This paper, with a specific focus on castle studies, highlights current problems and demonstrates how we can practice a more holistic archaeology by integrating people, places and things together in our future studies. One of the main impediments to this approach is that the story of 'the past' is largely told through the experiences of men. Explorations either implicit or explicit of the wide spectrum of gendered identities and ideologies that must have existed in the past are too few. Similar to the shifts in gendered roles in our world today, people have been (re)negotiated gendered identities for millennia. Yet, despite our acceptance of this there is a resistance (or an apathy?) towards investigating the ways people constructed and reinforced gender roles in the historic period. My arguments are a feminist response to the continued androcentrism of medieval archaeology (and modern world). We need to tell different more comprehensive and inclusive stories of the past.

07 THE IMPORTANCE OF WATERBIRDS TO CASTLE ECONOMY

Author(s): Kivikero, Hanna (University of Helsinki)
Presentation Format: Oral

The significance of waterbirds to the lives of people in prehistory and remoted sites is acknowledged, but the roll of the birds to the lives of people in the late medieval and early modern period is yet to be discussed. This paper aims to explore the economic possibilities of seabirds to castles Kastelholm and Raseborg in the northern Baltic Sea. The study is based on castle accounts from the mid-16th century and zooarchaeological assemblages. Kastelholm is situated in the Åland islands and has natural resources to the sea, as does Raseborg in the southwestern coast of Finland. Despite the easy access to water resources, the two castles had different economic interests and ways to obtain waterbirds to the castle, which can also be seen in the species representation. Raseborg had fishermen catching birds as Kastelholm relied on waterbirds as a tax payment from the local peasants. The birds can partly be seen as high-status foods in the castles, as most of the birds were consumed in the Bailiffs table. The waterbirds from Kastelholm were also transported to the castle of Stockholm, the Kings residence. The transportation of waterbirds meant that they were processed for preservation, not only for cooking purposes.

08 INTERPRETING RURAL IDENTITIES THROUGH ARCHAEOLOGICAL RECORD

Author(s): Heinonen, Tuuli (University of Helsinki)
Presentation Format: Oral

Farmers have often been thought to form a relatively uniform group in Medieval Finland, resulting from the way they are depicted in the first preserved tax records in the 1540s, in the beginning of the Early Modern Period. However, social reality in villages and hamlets has been more varied during Middle Ages and Early Modern period in Finnish rural areas. The scarce Medieval written sources indicate that besides owning and farming land, farmers have been engaged in trade and different handicrafts, and they have had contacts with other social groups. Archaeology offers a new possibility to explore the differences within the group through their material culture. The material gathered from excavations at rural settlement sites in Uusimaa, Southern Finland, offers an example of the possibilities of this kind of approach. The rich material shows clear differences especially on the pottery used in the villages in Uusimaa both between sites and over time. By studying the different pottery assemblages recovered from the sites excavated in Uusimaa, differences in farmers' wealth, contacts, and even identities can be studied. When the scarce written records are combined with the archaeological material, a new and more varied view on the social reality of rural villages can be gained.

09 POWER AND THE GLORY: MANORS AND CHURCHES WITHIN MEDIEVAL SETTLEMENTS

Author(s): Berryman, Duncan (Queen's University Belfast)
Presentation Format: Oral

Medieval settlement research In England often focuses on relationships between peasant houses and the arable fields. A geographical approach, such as that of Brain Roberts and Stuart Wrathmell, considers how settlements formed and evolved by looking at their morphology. However, the relationships between the peasantry and their lords are rarely considered in this spatial context. Castles, manorial curiae and churches were the main physical representations of the lords' authority over their tenants. Therefore, these structures had important influences over the lives of the peasants and their location within the village can reveal much about the relationship between the lord and the tenants. These buildings could have been side-by-side or at opposite ends of the village, they may have been integrated into the village or they may have been set some distance from it. These aspects are really considered by medieval archaeologists and have the potential to develop our understanding of settlement dynamics.

This paper will discuss current research into the relationships of the symbols of lordly authority and their relationship to the village and the tenants. A number of case studies have been selected to explore the layout of medieval settlements, all examples are from England and are mainly from the south. These have also been compared to previous surveys of deserted medieval settlements and excavations from across England. This paper hopes to create some discussion around future comparisons for this work within Europe.

10 RURAL RICHES: ON BEADS AND ANARCHY IN MEROVINGIAN NORTHWESTERN EUROPE

Author(s): Langbroek, Margareth (Faculty of Archaeology Leiden University)
Presentation Format: Oral

As a junior member of the new ERC research project Rural Riches, The bottom-up development of Post-Roman Northwestern Europe (450-640), at Leiden University, I am challenged to look at early medieval material culture from a radical and thought-provoking new perspective. One of the most important premises of the project is the idea that the early medieval economy developed bottom-up rather than top-down. The current paradigm in both history and archaeology maintains that the elite controlled the production and exchange of goods. However, we have a very hard time finding elites in 6th century Northern Gaul (the Benelux, western Germany and northern France) in both the archaeological and historical record. This disparity leads me to ask the following questions: What if the members of the 6th century population were in fact free to govern their own affairs? What if the early medieval society in Northern Gaul had in fact adopted a form of anarchy? How can I then explain the presence of vast quantities of exquisitely worked objects, often imported from overseas, that have been recovered from graves of the 6th century rural population? Contrary to what most peo-

ple think, the absence of a government is not unusual: self-organisation, voluntary association and mutual aid have been around as long as humanity (Graeber 2004). I would like to explore the ramifications of this idea when it is applied to a dataset of early medieval bead distributions in Northern Gaul. Thousands of beads, many of which were imported over large distances, have been deposited in inhumation graves across Europe dating between AD 450-640, making them the perfect material category to study early medieval exchange systems. How did these exchange systems operate and who had access to them?

Graeber, D., 2004: Fragments of an Anarchist Anthropology, Chicago.

11 A WORLD OF CLOUDS: INVESTIGATING THE IMPACT OF CLOUDS IN THE MARITIME LANDSCAPE

Author(s): Pelling, Robyn (University of Southampton)
Presentation Format: Oral

As pertaining to discussions on interactivity of seascape and landscape, the definition of what constitutes the maritime landscape has become more open with the recognition that land and sea are not definitive borders; although there is still an aspect of this system that is scarcely analysed. The atmosphere is a difficult theme to investigate historically, and the way in which a culture is influenced by the wind and sky has been discussed; however an often neglected aspect is that of the impact of clouds.

Clouds are an the visual representation of what weather is expected in the short term; it could be the difference between the steadily dissipating fluffy cumulus humilis clouds of a summers evening heralding more clear skies, or the chaotic multileveled sky forecasting rain. Knowing the meaning of these cloud types would have a direct impact on decision making. Those that made a weather dependant living would have had an understanding of the movements of the upper atmospheres and understood what the cloud movements inferred.

This talk focuses on the way in which clouds have had an impact on the maritime landscape. For example, this can affect navigation positively in helping to locate seascape features such as the Gulf Stream; or it can be a negative aspect by obscuring the stars, hindering navigation. It is hoped that by using historical records compared with known general atmospheric trends, such as the Medieval warm period, more light can be brought to the way in which these aerial formations have affected the growth of various cultures, how/ if they were used in the past, and how that is recognised in the archaeological record.

12 VISUALISING BUBBLES: PHOTOGRAPHIC FILTERS AND THE EXCHANGE OF EARLY MEDIEVAL GLASS BEADS IN SCOTLAND

Author(s): Christie, Heather (Glasgow School of Art)
Presentation Format: Oral

Glass beads in Scottish contexts are difficult to analyse spatially or chronologically. Many objects in museum collections were donated by an individual collector, and many from archaeological contexts were found in spoil heaps rather than a secure context. Furthermore, no published typological study of Scottish glass beads currently exists for the early medieval period. Chemical testing would allow for comparison between objects and assemblages, but such techniques are often both destructive and expensive. Yet, all pre-modern glass contains bubbles, which appear for a variety of reasons. The concentration and nature of bubbles in glass directly corresponds to the manufacture of either the object or the glass used to create it. There is evidence of bubbles being specifically controlled or added to produce specific designs, such as the marvered white trails in Campbell's Type C glass vessels. This paper analyses variations in bubble concentration in glass objects using visible-range photographic filters (400 – 700nm) to identify patterns in glass bead manufacture and trade in Scotland during the early medieval period, both between Scottish assemblages and further afield. These results significantly improve our understanding of glass beads in Scotland at this time, and could provide similar insights if applied to other glass assemblages worldwide.

13 DIGITAL DEMYSTIFICATION: ENCOURAGING RESEARCH-DRIVEN ENGAGEMENT WITH DIGITAL IMAGING RESOURCES

Author(s): Kasten, Megan (University of Glasgow)
Presentation Format: Oral

With the increasing availability of digital techniques in archaeology, it is important for researchers to begin to engage with these resources in new, research-driven ways, beyond their utilisation for curation, illustration, and outreach. However, to make this more accessible, it is necessary to demystify some of the "black-box knowledge" that surrounds the creation of three-dimensional models. In this paper, I will describe the different digital techniques I have explored throughout my PhD, highlighting the benefits and drawbacks of each approach. The research potential of these resources will then be demonstrated through their application to early medieval carved stones housed in Govan Old Parish Church in Glasgow, Scotland.

While there are many ways to create a three-dimensional model of an object, not all approaches are created equal. While some technologies involve a more automated mode of data capture, like structured light scanning or laser scanning, a more intimate knowledge of the carved stone and its motifs can be gained through the process of photogrammetry and Reflectance Transformation Imaging (RTI).

I have applied both photogrammetry and RTI to the collection of thirty-one 9th-11th century AD Govan stones. The files resulting from these digital processes can be copied, measured, and manipulated in ways that would be considered time-consuming or even

unethical if applied to the actual monuments. In my research, these digital resources have been crucial to answering questions about the Govan school of carving. The wearing of the three-dimensional models of preserved stones and subsequent comparisons with RTI files has allowed for the reconstruction of several worn monuments. By embracing and understanding these resources, we can open the door to new, innovative research applications.

14 SPOTEU: SUGAR POT MANUFACTURE IN WESTERN EUROPE IN THE MEDIEVAL AND POST-MEDIEVAL PERIOD (11TH-16TH CENTURIES AD)

Author(s): Mentesana, Roberta (University of Sheffield; University of Barcelona) - Buxeda i Garrigós, Jaume (University of Barcelona) - Kilikoglou, Vassilis (Laboratory of Archaeological Materials, National Center for Scientific Research "Demokritos")

Presentation Format: Oral

The SpotEu project 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 production and consumption followed the Islamic expansion in western Mediterranean and had a huge impact in 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 project focuses on Sicily and Spain, the two main regions for sugar production in western Europe in the 11th-16th centuries AD. Sugar pots from these regions will be assessed on a morphological, technological and performance point of view aided by instrumental analysis (Petrography, SEM, XRF, XRD, porosity, mechanical and thermal stress test) and software modelling (FEM). The comparison with reference ceramic materials and written records will allow to investigate the scale of ceramic production and exchange networks, as well as potters' technological choices in the construction of these on-purpose vessels.

This paper aims at introducing the project, which has been recently funded under the Marie Skłodowska-Curie actions, by showing its theoretical and historical background as well as the methodology of investigations. It will offer the opportunity to discuss about a hot topic in medieval studies and the ways in which a detailed technological analysis of sugar pots through an interdisciplinary approach can shed light on the role of craftspeople in the development of the first industrial activity in modern Europe.

a. AN ASSESSMENT OF INTRAGROUP CRANIAL VARIATION IN A MASS GRAVE SAMPLE FROM MEDIEVAL YAROSLAVL USING 3D GEOMETRIC MORPHOMETRICS (GMM) TECHNIQUES

Author(s): Tarasova, Anna (Institute of Archaeology Russian Academy of Sciences) - Evteev, Andrey (Research Institute and Museum of Anthropology Moscow State University) - Engovatova, Asya - Mednikova, Maria (Institute of Archaeology Russian Academy of Sciences)

Presentation Format: Poster

Since the last two decades of the XX c., human osteology has played an important role in the historical urboecological studies. For instance, studying some medieval cranial samples led N.N. Goncharova (2011) to important conclusions about the presence of different genetic components in the population of Ancient Russian cities which was most probably due to the mixed origin of its first settlers.

An influential study carried out by N.N. Goncharova on a sample from sanitary burials in Yaroslavl dated 1238 BC (the year of Mongolian invasion to the North-East Russian princedoms) has revealed increased standard deviations for some cranial metric variables in the sample. The author suggested that this can be explained by either small sample size or the genetically mixed nature of the sample. Some features of the sample, according to A.P. Buzhilova and N.N. Goncharova's opinion (2007), can point toward the presence of migrants from the lands to the South or West from Yaroslavl in this paleopopulation.

The intragroup variation in our own sample from several mass graves from Yaroslavl dated 1238 BC was assessed using GMM techniques and at least two morphological components were identified both in males and females of the sample. The presence of these components has never been shown in previous studies on cranial and skeletal metrics and non-metric traits.

This result shows the potential of GMM studies of Ancient Russian rural and urban cranial samples and calls for extending the reference base of 3D data on those samples

761 WHY ANCIENT LIPID ANALYSES IN ARCHAEOLOGY? A DISCUSSION AIMED AT WIDENING THE ARCHAEOLOGIST INTERPRETATION TOOLSET

Theme: Theories and methods in archaeological sciences

Organisers: Junno, Aripekka (University of Groningen; University of Stockholm) - Breu Barcons, Adrià (Autonomous University of Barcelona) - Holly Llewellin, Madison (University of Groningen; University of Stockholm) - Demirci, Özge (University of Groningen; University of York) - Suryanarayan, Akshyeta (University of Cambridge)

Format: Discussion session

The field of ceramic organic residue analysis has journeyed from the study of a handful of potsherds without proper knowledge of how and why lipids survived, to the establishment of large research projects focused on studying vessel usage across geographical regions in different periods of time. Today, we can draw on trends observed after hundreds of samples have been compared with reference materials, and results have been replicated in experimental studies. But, after almost 10,000 samples have been published since the development of this analytical technique, how have archaeologists integrated these results into their contexts, sites and wider historical interpretations?

This round-table aims at bringing together archaeologists to discuss and share, amongst others, the different strategies and approaches used to incorporate the identification and characterisation of ancient lipids into the interpretation of archaeological contexts (domestic spaces, burials and other ritual spaces, etc.) as well as the position pottery had in different prehistoric production activities and the acquisition of chronological data. By tailoring archaeologically specific questions with the possibilities offered by the analysis of the organic matter preserved in pottery, the session is expected to survey the value of studying ancient lipids using their natural origin and going beyond.

Brief presentations of concise analytical strategies or small case studies on the round table topic will be followed by a large discussion on both the wider significance of the presented ideas and their implications and the best strategies to implement such approaches in future archaeological research.

ABSTRACTS

01 THE ENIGMA OF ANCIENT ALASKAN POTTERY

Author(s): Admiraal, Marjolein (University of Groningen) - Lucquin, Alexandre (University of York) - Jordan, Peter (University of Groningen) - Craig, Oliver (University of York)

Presentation Format: Oral

Alaska is not a place where you would expect to find pottery. The cold winters and humid summers form a harsh environment for manufacturing and maintaining ceramic technology. Nevertheless, since 2500 years ago indigenous groups along Alaska's coastlines made and used pottery. The Norton people were the first to adopt the technology, followed by the later Thule culture that altered the manufacture of the pottery significantly around 1000 cal BP. This change in pottery manufacturing is intriguing, mostly because it did not seem to benefit the properties of the pottery. Thule pots are crude, very low-fired, with thick walls full of large mineral temper. While Norton pottery was relatively well-fired, thin-walled and tempered with organic material.

Alaska is a very interesting case study to investigate the appearance of pottery among hunter-fisher-gatherer societies. What made pottery so important in the first place, to make people in the (sub)Arctic go through the extensive trouble of manufacturing it? And more specific: why did they change their ways of making pottery so abruptly 1000 years ago? An extensive investigation of organic residues has been conducted on Norton and Thule pottery from the Alaska Peninsula and Kodiak Island in SW Alaska in order to reconstruct vessel function. What do the lipids tell us and how can they fill in the gaps of the archaeological story surrounding pottery adoption in Alaska? This paper will elaborate on the archaeological implications of Alaskan pottery function through time and space, based on the analysis of lipid residues from over 60 Alaskan pottery vessels.

02 INTEGRATING ORGANIC RESIDUES FROM POTTERY AND SPATIAL ANALYSES: A REVIEW OF CURRENT RESEARCH AND POSSIBLE FUTURE STRATEGIES

Author(s): Breu, Adrià (Autonomous University of Barcelona)

Presentation Format: Oral

Many prehistoric excavations nowadays follow the imperative to coordinate all archaeological remains recovered in the site. Therefore, each potsherd has an associated x, y and z local coordinates. By extension, organic residue samples also contain these three properties and can be located in the social space in the archaeological site. Many causes can explain the disposition of certain ceramic types or fragment shapes in the site. Artefact use seems one of the most important factors when post-depositional movements are not of major significance. Can we expect to find cooking and storage vessels in different places? Are thermal degradation products such as long chain ketones or APAAs associated with nearby combustion structures? In order to answer these questions, organic residues need to be described in a way that can be associated to relevant analytical space tools. Is the present standard lipid quantification approach accurate enough to yield relevant data? How can qualitative data on the presence of specific molecules be integrated with 3 dimensional spaces? What are the most effective sampling strategies in order to obtain a useful dataset for spatial analyses? In conclusion: how do food residues in pottery vary as a function of the vessels' distribution and archaeological context? A review of current research approaches will be presented along with an example of the integration of data from lipid results in GIS.

03 REGIONAL VARIATION IN THE USE OF EARLIEST POTTERY IN NORTHWEST EUROPE

Author(s): Demirci, Özge (York University - Bioarch)

Presentation Format: Oral

This research examines the different early ceramic traditions and the possible functional variation of pottery in the Swifterbant culture in intersite, regional, and interregional scale. Swifterbant culture is a Late Mesolithic-Early Neolithic (5000-2500 BC) hunter-gatherer-fisher society, located in the Netherlands and northern Germany (Lower Saxony), in the NW Europe. Traditional expla-

nations for the introduction of pottery into essentially hunter-gatherer communities consider a direct relationship between (ecologically related) sudden changes in food sources and social adaptation to this change through developing new food processing strategies. Recent studies on the ceramics from hunter-gatherer cultures, however, strongly suggest variance from this theory. Swifterbant culture demonstrates a continuation of hunter-gatherer subsistence strategies alongside a gradual shift towards agricultural cultivation and domestic food production, indicating a shift from the less sedentary life style of hunter gatherers towards the more sedentary life style of village communities that rely on cultivating the land and agricultural production. To illustrate this gradual shift of lifestyle on the pottery and its possible functional variation, this research will work on a selection of pottery from seven different archaeological sites and establish a broader comparetive context.

The methods utilized within this research will vary, the primary method will be residue analysis. This will examine the components that have been absorbed into the pottery and through this conclusions about diet, function and variation can be made. Other methods will include morphological and technological anlayses of the pottery which will enable a multifaceted understanding of this pottery culture.

04 REDEFINING POTTERY: THE ARCHAEOLOGICAL RECORD AS AN ESSENTIAL TOOL FOR HISTORICAL INTERPRETATION

Author(s): García-García, Alejandra - Vico-Triguero, Laura - Alarcón-García, Eva (Department of Prehistory and Archaeology. University of Granada) - Cantarero-Malagón, Antonio Samuel (Department Analytical Chemistry. University of Granada) - Mora-González, Adrián (Department of Prehistory and Archaeology. University of Granada) - Padilla-Fernández, Juan Jesús (Department of Prehistory. University Complutense of Madrid) - Moreno-Onorato, Auxilio (Department of Prehistory and Archaeology. University of Granada) - Martín-Peinado, Francisco (Department of Edaphology and Agricultural Chemistry, University of Granada) - Manzano-Moreno, Eloísa (Department Analytical Chemistry. University of Granada) - Contreras- Cortés, Francisco (Department of Prehistory and Archaeology. University of Granada)

Presentation Format: Oral

The union between organic residue analysis and archaeology is at the forefront of international research. This relationship would not make sense without the sum of a well known archaeological context to the equation. That fossilized moment of a community's life in the past provides invaluable information when interpreting the results. When faced with a research with such features, an important initial question arises: What and how do I choose it? What will be the criteria that I will use to sample a pottery vessel that provides historical information? What is the ideal number of samples needed to perform a relevant study? A lot of questions come to mind in the initial moment of facing this type of studies, but they do not end there. As research progresses the questions will become more numerous. The world of organic residues analysis is the mixture of all factors that occur in the life of a past population. The function of these vessels tells us about some habits and traditions carried out by a community in the past. We should treat them as living objects immersed in a world in which they had a meaning beyond the merely descriptive and physical. The vessels, their organic residues and the contexts in which they were found were part of the history of the past human groups we want to recover.

05 BRINGING HOME ANIMALS - OKHOTSK AND LATE JOMON SUBSISTENCE AND FOOD TECHNOLOGIES IN NORTHERN JAPAN

Author(s): Junno, Aripekka (University of Groningen)

Presentation Format: Oral

This study is concerned with the long-term human-animal interactions among 1st Millennium AD Okhotsk cultures in Hokkaido, northern Japan. The Okhotsk Cultures were maritime foragers and traders who expanded out from the Amur into Hokkaido and Sakhalin Island from about AD 600, with many of their distinctive traits and practices such as elaborate bear ceremonialism and other hunting rituals persisting into the historic Ainu Cultures. The study aims to understand the origins, spatiotemporal variability and long-term change in how communities living along the north coast of Hokkaido were 'bringing home animals' and subjecting particular terrestrial and aquatic species to specific processing and consumption practices. The primary method here is the analysis of ceramic containers for organic residues, namely lipids, to elucidate how different marine and terrestrial animals were treated, for example, according to a common set of procedures or in terms of more specific beliefs for each species. These biomolecular evidence are interpreted with emphasis on the archaeological context of the vessel, where the material culture is used to characterise the relation between a human activity and the resulting deposition of food residues. In line with the present session theme, the study thus employs a 'context-first' approach - where the excavation, i.e. recovery and documentation of samples, is given special consideration.

06 COOKING WITH CONTAMINATES: THE EFFECT OF CONTAMINATION ON FOOD RESIDUE ANALYSIS

Author(s): Llewellin, Madison (University of Groningen; University of Stockholm)

Presentation Format: Oral

Contamination is a significant issue in all areas of archaeological science and can severely affect the chance of clear and precise results. Contamination can occur before an excavation during deposition, during excavation and post-excavation during storage. Contamination can range from biological material to the sunscreen on excavators hands to the phthalates in plastic storage bags. All of these can significantly hinder the analysis of food residues and the analysis of any lipids within a ceramic matrix. The longer the time between excavation and analysis the higher the chance of contamination. Whilst working on Norwegian material from multiple

sites in Finnmark larger amounts of contamination were present in ceramic material excavated in the 1950s and 60s in comparison to material excavated in 2016, this not only affected the interpretation of GC-MS results but also the yield of fatty acids which prevented any further analysis. This is a seemingly obvious assertion however this case study will present quantitative evidence of such contamination and aims to stimulate the discussion to see how contamination affects all in the field of residue analysis. This case study will enable those present to critique the current methods surrounding excavation and storing artefacts and establish possible new procedures if needed.

07 ORGANIC RESIDUE ANALYSIS AS A ROUTINE METHOD IN ARCHAEOLOGY? OPPORTUNITIES, AVENUES, AND CHALLENGES

Author(s): Suryanarayan, Akshyeta (University of Cambridge)
Presentation Format: Oral

Most organic residue analysis in archaeology has been conducted in Western, North American or European contexts, with notable exceptions being East Asia and parts of Eurasia. There is also an overwhelming focus on the study of early pottery within the discipline, with limited focus on later prehistoric and historic contexts. This presentation will give a brief overview of the development of the field within archaeology and evaluate the potential of its application to other regional contexts. What questions has it been used to answer, and how can these be extended to address archaeological and social questions of relevance today? Using South Asian archaeology as an example, this presentation will discuss the vast opportunities and avenues that lipid analyses may reveal in under-explored dimensions of South Asia's history. It will also highlight the challenges that arise in the logistics involving collection and preparation of samples, the implementation of appropriate analytical procedures, and finally, the potential issues with interpretation of the data obtained. Can lipid analyses become a regular feature of not only European or Western archaeology, but also around the world? How can archaeologists and specialists work together in making organic residue analysis more accessible and applicable to the archaeological community and goals of archaeology today?

08 RESULTS OF LIPID ANALYSIS OF THE NEOLITHIC AND ENEOLITHIC MATERIALS OF THE LOW VOLGA REGION

Author(s): Vybornov, Alexander (Samara State University of Social Sciences and Education)
Presentation Format: Oral

The materials of the Low Volga region are important to resolve the issue of the appearance of producing economy in Eastern Europe. A number of researchers suggested that cattle breeding in the Lower Volga region appears at the late Neolithic complexes. The basis for this hypothesis was the bones of domestic animals in the late Neolithic layers of the Varfolomeevskaya and Dzhangar sites. An indirect argument was the age of the Late Neolithic (4 900 BC), which characterizes the cultures with the presence of cattle breeding. However, the re-examination showed a controversial character of the conclusion about the domestication of animals. New dates showed a great antiquity (5500 BC) of the late Neolithic. Lipid analysis of the food crust from the ceramics of the Neolithic supporting monuments of the Lower Volga region showed the presence of only meat and plant food. There are no dairy products. The most reliable data on cattle breeding were for the Khvalynskaya Eneolithic culture. The faunistic definitions were confirmed by a lipid analysis of the food crust from the ceramics from the sites of this culture. Numerous dates for various materials defined the time of existence of these complexes - 4800 - 4400 BC. The study of the monuments of the Caspian Sea region culture of the Low Volga region made it possible to obtain reliable evidence of cattle breeding in the period of 5200-4900 BC. These data were confirmed by the lipid analysis of the food crust from the ceramics of this culture. Thus, the lipid analysis facilitated the establishment of bearers and the time of appearance of the producing economy not only in the Low Volga region, but also in Eastern Europe.

Implementation of the project 33.1907.2017 / PCh

763 CULTURAL PROPERTY: FROM LOOTING AND ILLEGAL TRADE TO RESTITUTION

Theme: Archaeology and the European Year of Cultural Heritage
Organisers: Kairiss, Andris (Latvian Academy of Culture) - Borș, Corina (National History Museum of Romania) - Bernard, Elisa (IMT School for Advanced Studies Lucca) - Munawar, Nour (University of Amsterdam - UvA) - Musteată, Sergiu (Institute of Archaeology, Romanian Academy, Iasi branch)
Format: Regular session

Large parts of new prominent archaeological finds and a vast number of mundane ones do not derive from archaeological excavations but have their origin in organized looting and metal detecting. While only a small number of such objects remains with their finders (even less objects are handed over to entitled institutions), most of these objects are traded through online platforms, cost sharing applications, auction houses, unscrupulous antiquity dealers and other channels. Higher valued objects are additionally whitewashed with fake papers. Little or no attention is paid to the provenance of the objects. All the aforementioned, and the frequent inability of states to claim illicitly excavated objects as stolen, or prove that they were looted on their territory, hinders the restitution process. However, recent cases as the Roman sarcophagus restituted

from Switzerland to Turkey in 2017, or the Euphronios Krater from the MET to Italy, give hope. In our session, we would consequently focus on:

1) Strategies for preventing and fighting looting and illegal trade of antiquities

2) Raising public awareness regarding illicit and fake antiquities on the market and the need for provenance studies

3) Inventorying and clarifying the provenance of doubtful objects in museums and private collections

4) Principles of stewardship of looted and/or threatened antiquities

5) Application of (inter)national and regional legal instruments for successful restitution

6) Practical ways for cooperation with (non)governmental institutions concerning restitution

7) Publishing objects of doubtful origin without 'whitewashing' them

8) Restitution policy in peace and conflict times

ABSTRACTS

01 INTER-INSTITUTIONAL COOPERATION IN PROTECTION OF ARCHAEOLOGICAL HERITAGE: LATVIAN CASE STUDY

Author(s): Kairiss, Andris (Latvian Academy of Culture)

Presentation Format: Oral

The protection of cultural-historical, incl. archaeological, heritage from crime threats is a complex issue that requires active action at both strategic and tactical levels. Although the effectiveness of archaeological heritage protection depends on many factors, inter-institutional cooperation is one of the most important, since no institution alone can solve all issues related to this field. Co-operation concerns a broad range of areas, including the development of a legal base; prevention of heritage protection regulation breaches; training of cultural, law enforcement, and other controlling institutions in cultural heritage related issues; information sharing issues; combating illegal obtainment, transportation, and trade of antiquities; restitution; as well as the identification and evaluation of wanted and seized antiquities, etc.

The quality of inter-institutional cooperation also impacts implementation of international legal instruments, including those dedicated to the protection of cultural heritage. Latvia is currently on its way to ratifying the UNESCO 1970 and UNIDROIT 1995 Conventions, so the development of effective cooperation among the institutions concerned is of significant importance.

Presentation will mainly address Latvia's national situation regarding inter-institutional cooperation in the afore-mentioned field. Attention nevertheless will also be paid to cooperation with foreign and international institutions, since offenses threatening cultural heritage are often of transnational nature.

02 CRIME AGAINST ARCHAEOLOGICAL HERITAGE IN POLAND – NEW STRATEGIES FOR PREVENTING AND COMBATING LOOTING AND ILLEGAL TRADE

Author(s): Byszewska, Agata (Narodowy Instytut Dziedzictwa / National Heritage Board Of Poland)

Presentation Format: Oral

Over the last years the private metal detecting has become a very popular hobby. It`s resulted in a significant increase in archaeological material devoid of basic information and it`s cultural context, which makes determining their provenance difficult, and the possibility of using them in the research process is very limited. Polish legislation provides the amateur search of artefacts, but the permit is needed. The number of legally conducted searches is small compared to illegall actions carried out with no permit. It is estimated that there is around 100 000 of active illegal detectorists. According to the polish law, every archaeological artefact is owned by the state, it can`t be private, inherited, traded or collected. Most of these illegally acquired artefacts are auctioned online or sold on the black market. A small part is in private (illegal) collections. Few of them are reported as accidental finds and passed on to authorities or museums. The Polish legislation provides a reward for the finder for reporting an accidental finding of an archaeological artefact, which creates opportunity to whitewash illegally found antiquities. It`s hard to prove that a subject originates from metal detecting and not from accidental discovery. Another problem is that in polish legislation museums don`t have the right to repurchase archaeological artefacts directly from detectorists, it may be treated as fencing. Tightening the rules doesn`t guarantee success in combating looting and illegal trade. Most important is working out principles of cooperation with detectorists and social education. The media has promoted the positive silhouette of the illegal detectorist as a person who cares for heritage. Widespread acquiescence for illegal metal detecting in Poland is the result of ignorance about the real goals and methods of archeology and the principles of protection of the archaeological heritage.

03 INTERNATIONAL AND NATIONAL LAW FOR THE PROTECTION AND RESTITUTION OF LOOTED ART – THE GERMAN CASE

Author(s): Weiler-Esser, Julia (HerA - Heritage Advisors)
Presentation Format: Oral

The 1970 UNESCO convention was an important starting point for the creation of international standards for the protection and restitution of illegally exported cultural goods. So far it has been ratified by 131 party states. Germany was amongst a number of countries that took the longest in ratifying it. Only in 2007 – and after a hasty debate – was the German Act on the Protection of Cultural Property instituted. Those in the art market, as well as collectors and museums, especially feared the difficulties in buying and importing cultural goods. Meanwhile, sceptic archaeologists found the new regulations to not be strict enough, and therefore useless.

A 2013 report by the Federal Government on the protection of cultural property in Germany proved the sceptics right. The implementation of international law to German law had been an overly-generous interpretation of the UNESCO treaty, especially regarding the interests of the market and its many collectors. Not one piece of art had been restituted on the grounds of the Act, though several requests had been made. Worse, Germany became known for its lax legal regulations and turned into a market for cultural goods of doubtful provenance, causing further pressure on a diplomatic level internationally.

This presentation will give a short overview of the international law regarding the protection of cultural goods. The German case, being a contemporary example of changes in cultural policy and law, will be examined regarding the actual changes and events that took place since the institution of the new Act in July 2016. It will evaluate different legal strategies to promote the protection and restitution of looted artworks as well as the outcome, exemplified by experiences made in Germany in comparison to other European strategies.

04 WORLD HERITAGE SITES BETWEEN PRESERVATION, LOOTING, AND ILLEGAL TRAFFIC. A CASE FROM ROMANIA

Author(s): Musteata, Sergiu (Institute of Archaeology, Romanian Academy, Iasi branch)
Presentation Format: Oral

Since 1972 UNESCO established a frame of protection for cultural and natural heritage (Convention concerning the protection of the World Cultural and Natural Heritage) and the "World Heritage List", which it considers as having outstanding universal value. Romania signed the UNESCO Convention in 1990 and has eight properties included in the World Heritage List (two natural and six cultural sites). Another fifteen properties are included in the Tentative List. The World Heritage Sites are attractive for various types of visitors, including for treasure hunters.

During last three decades, the World Heritage Sites from Romania are part of many conflict situations concerning preservation, fitting black archaeology, and illegal traffic. In this context, the issue of metal detecting is debated too, because most of the treasure hunters are using metal detectors. The Romanian legal framework is not enough explicit for using metal detectors. The „Dacians' Gold" is only one case among many other of looting artifacts from one of the World Heritage Site from Romania - Dacian Fortresses of the Orăștie Mountains. So, in my presentation, I will discuss the legal issues of using and abusing metal detectors in Romania followed by examples of criminal cases (looting artifacts and illegal trade). Also, will be discussed the issue of redemption and repatriation cultural goods by the National Museum. In this context, I will also discuss the normative contradiction, when all goods belong to the state and those who „accidentally discover them" are paid for the handing over of the goods to the museums. This issue is actual for Romanian society and was hardly debated last year. But, the situation in this area is still uncertain.

05 WHO OWNS THE PAST AND WHO CARES ABOUT IT? ABOUT THE ROLE OF A MUSEUM FOR PROTECTING THE CULTURAL HERITAGE

Author(s): Bors, Corina Ioana (National History Museum of Romania - MNIR)
Presentation Format: Oral

The question addressed by the paper's title is not at all a rhetoric one, but expresses a deep concern about how should act a national museum when is witnessing an increasing number of illegal actions (looting by metal detecting and illegal trade) against the archaeological heritage. There are the international regulations and best practice standards, as well as the national legislation that set the framework for a public museum to operate about the protection of the cultural heritage. However, are these laws effective? Do they genuinely contribute to the safeguarding of the archaeological heritage? A series of events and facts demonstrate that one have to put these regulations under serious scrutiny. And, especially while celebrating the European Year of Cultural Heritage one have to ask ourselves if looting and illegal trade of archaeological heritage goods have (only) a national impact or in fact are part of a much wider phenomenon. The presentation will provide an insight on the activity of the National History Museum of Romania concerning the protection of the archaeological heritage, namely:

- cases of institutional cooperation with other public bodies for recovering a series of ancient artefacts looted from archaeological sites, by applying of (inter)national and regional legal instruments for successful restitution;

- the role of the experts in determining the significance and values of the looted archaeological objects and good practice standards for inventorying and clarifying the provenance of doubtful objects in museum's collections;

- certain actions aiming to protect the archaeological heritage but failing to achieve this objective.

- how can a (national) museum determine the amend of relevant national legislation, along with developing strategies for preventing and fighting looting and illegal trade of antiquities.

06 HERITAGE FOR SALE! THE ROLE OF MUSEUMS IN PROMOTING METAL DETECTING AND LOOTING IN ROMANIA

Author(s): Ganciu, Iulian (Österreichisches Archäologisches Institut; University of Applied Arts Vienna)
Presentation Format: Oral

Looting refers to the act of digging up artifacts without the recording of the excavation, context or other activities related to archaeological documentation, with the purpose of collecting or sale. This kind of practice is popular all around the world, and Romania is not an exception. The legislation concerning heritage protection in Romania is relatively new (2000) and still has a lot of imperfections, having loopholes that are easy to manipulate to avoid repercussions.

In Romania, the phenomenon of metal detecting is growing rapidly, with more and more cases being registered every year. In a context where the state cuts almost all the financial support offered to the systematical archaeological investigation, while the museums have to enrich anually their patrimony, the discoveries made by metal detectorists come to complete the museums' collections, but create a gap between the professional and the amateurs archaeologists. This situation encourages the practice and, in time, will have irreversible damaging effects on the archaeological heritage of Romania. This paper presents the current situation of protecting archaeological heritage from looting in Romania. I am looking into the current state of looting activities and what actions are undertaken by experts and institutions that prevent or encourage looting. In addition, presents the extent to which the activities of metal detecting are hindering the protection of archaeological sites and whether those activities are illegal in terms of national or international legislation framework.

This paper aims at creating a policy to protect the archaeological sites of Romania by using a multidisciplinary approach: ethical, legal and anthropological. Starting from understanding the positions of all stakeholders involved at the national and local level, the change of values of archaeological objects, as well as, understanding the way the national and international legislation concerning heritage protection is enforced in Romania.

07 MORGANTINA 1977-2017. ILLEGAL EXCAVATIONS AND RESTITUTIONS BETWEEN THE UNESCO AND THE FARO CONVENTION

Author(s): Raffiotta, Serena (Independent researcher)
Presentation Format: Oral

Morgantina, a very well preserved Sikel Greek settlement in the centre of Sicily, the province of Enna, has a place of honor among the world archaeological sites damaged by illicit excavations and illegal trade of antiquities. Over and over sacked by 'tombaroli', during the last ten years Morgantina has been very much in the international news because of the restitution of a group of original astonishing Greek art masterpieces looted in the late Seventies and illegally acquired by collectors and museums, today on display in the Aidone Archaeological Museum. We refer to the two Archaic acrolitic statues repatriated in 2009, once in a private collection in New York; to the Hellenistic silver treasure given back by New York Metropolitan Museum in 2010; to the Late Classical statue known as "the Getty Aphrodite", repatriated in 2011 from Getty Museum in Los Angeles, and to the so called 'Hades head', a terracotta head belonging to a cult statue, once in the Getty Museum collection and repatriated in 2016. As a result of more than twenty years of complex criminal investigations and diplomatic negotiations, these repatriations today are symbol of the victory of legality on the international illicit traffic of looted antiquities. They also prove the new trend of some museums for antiquities acquisitions and collection management, that's a direct result of the 2005 criminal trial in Rome where the former curator of antiquities for the Getty Museum, Marion True, was indicted by an Italian court for conspiring to acquire stolen art. Our paper will focus on these troubled stories, discussing about the importance of the UNESCO Convention for these restitutions and trying to show the great value these artworks acquire once recontextualized, expecially in terms of affirmation of local identity as declared in the Faro Convention.

08 MAGIC MOMENTS (IN ARCHAEOLOGICAL HERITAGE PROTECTION)

Author(s): Karl, Raimund (School of History, Welsh History and Archaeology)
Presentation Format: Oral

For the last c. 5 decades, as a profession, in much of Europe, we have been dealing with looting, illicit trade of archaeological finds, non-reporting of finds, and ultimately restitution by, mainly, legal prohibitions. Yet, this approach has abysmally failed: instances of looting have become more frequent as technology (especially metal detecting technology has improved), as has illicit trade; and while there are a few successful cases of restitution and prosecutions, cases as often, if not more often, fail rather than end successfully. In this contribution, I will argue that for most of this, we have only ourselves to blame, not because we have not succeeded in making our laws tough enough; but because we have failed to make intelligent laws.

In this paper, I will argue – based on a new proposal I have submitted to the Austrian Minister responsible for matters of Heritage for new archaeological provisions for the Austrian Monuments Protection Law – that there are only two magic moments where heritage legislation matters: the moment an archaeological find is discovered, and the moment its finder decides whether to report it to the

authorities or not. I will argue that any laws, to be effective at preventing as much archaeological damage, and create as much archaeological good as possible, must be aimed at, precisely, these two magic moments; and encourage finders of archaeology to act in the ways most beneficial and least damaging to the archaeology as possible.

Blanket prohibitions against searching and trading archaeological finds, and treasure trove legislation, prevent only one outcome: that finds are properly recorded in the first and properly reported in the second magic moment. They ignore the psychology of finders, and thus, ultimately, are counterproductive.

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

Author(s): Nebbia, Marco - Leone, Anna (Durham University) - Belzic, Morgan (Ecole Pratique des Hautes Etudes; Mission Archéologique Française pour la Libye Antique) - Brennan, John - Roberts, Matthew (Durham University) - Hamdi, Rached (Institut National de Patrimoine de Tunisie - INP) - Hadia, Mahmoud (Department of Antiquities of Libya) - Obara, Boguslaw (Durham University)

Presentation Format: Oral

The International Council of Museums (ICOM) has published a "red-list" of Libyan antiquities at risk to alert customs officials of potential illicit trafficking of looted artefacts. The art market is full of artefacts coming from archaeological sites, storerooms and museums, but very few of those objects can have their provenance established if not documented or registered. With more than a hundred Cyrenaican Funerary Sculptures sold during the last ten years, recent research has proven that this illegal traffic moves very fast, but can be mapped and could be dismantled with the right tools.

Therefore, quick documentation of what can be looted and stolen is urgently needed. The project presented here, carried out in collaboration between Durham University, the Department of Antiquities of Libya (DoA), the Institut National de Partimoine de Tunisie (INP) and ICOM, has developed a system called HeDAP (Heritage Documentation and Protection) to record and catalogue mobile objects and artefacts, towards the compilation of a database for international customs and police to use as a reference to quickly identify Libyan and Tunisian movable objects. The system consists of a mobile application (App), for field recording, that feeds into a database integrated with image-recognition software. Each recorded object has a photo ID comprising a set of images that defines its unique physical features.

Although HeDAP is currently developed in cooperation with the Libyan DoA and Tunisian INP, a formal standardization of it, with the consultancy of ICOM, UNESCO, INTERPOL and WCO, could evolve into a wider toolset applicable in other MENA countries. Cooperation and data sharing between Libya, Tunisia and the international community have been fundamental in this process, especially for the development of a shared vocabulary, and represent the only sustainable way to discourage the wide and thick network of art criminals' activities at a worldwide level.

10 NO QUESTIONS ASKED - EMOTIONAL STORIES AND MONETARY VALUES IN THE TRADE OF ARCHAEOLOGICAL OBJECTS

Author(s): Modarress-Sadeghi, Mirette (University of Oulu, Finland)

Presentation Format: Oral

The trade on antiquities has contributed to an increase in the monetary valuation of archaeological objects, which in turn increases the looting of sites. Looting is followed by the disappearance of the objects into private collections, which reduces the possibility to learn about the past and its heritage. Moreover, the concept of heritage is also lost in the realm of trade, where monetary value is the priority.

World Wide Web sales have brought ancient artefacts from all over the world within easy reach of a wider public. "Finer" pieces or collections are sold at auction houses such as Christie's and Sotheby's, but thousands of objects are also being offered on countless Internet antiquities sales pages. My study, a periodical follow-up (since 2011) of the sales of ancient objects, particularly the so-called Luristan bronzes, demonstrates that only a small percentage of the sellers give any provenance information. In many cases the seller appeals to the buyers' emotions or the sales are often accompanied with an intriguing story of the historical context of the object. This information is given as an expert opinion giving the impression that the object was excavated scientifically and the results of excavations were available.

One way to fight the illegal trade is by raising the awareness of the wider public. This can be done by disseminating information through Internet venues as the traders do. A long-term strategy for promoting awareness could focus on the youth in the schools, to bring about a more aware public in the future.

765 KNOW YOUR PLACE: DEFINING THE ROLE OF GEOPHYSICS IN DEVELOPMENT-LED ARCHAEOLOGY

Theme: Theories and methods in archaeological sciences
Organisers: De Smedt, Philippe (Ghent University) - Hulin, Guillaume (INRAP - French National Institute for Preventive Archaeological Research) - Rensink, Eelco (Cultural Heritage Agency of the Netherlands) - Trinks, Immo (Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology)
Format: Regular session

Under the right circumstances, non-invasive geophysical prospection methods offer reliable and valuable information on the subsurface, but can also be seen as cost efficient means to investigate buried archaeology on large scales and at high resolution. However, despite the potential of these techniques most heritage agencies struggle to integrate these methods into development-led archaeology procedures, notably due to varying traditions in archaeological prospection. Issues that can be solved by geophysics are numerous and occur at different stages of a development-led project: from initial site evaluation to the excavation phase.

As sessions on archaeological geophysics predominately appeal to prospectors and practitioners 'co-confirming' the potential of such techniques, the needed critical review and discussion of the potential and pitfalls of the geophysical prospection approach – beyond pure academic research – is often missing. In this session, we therefore call on field archaeologists, geophysical surveyors and heritage professionals to critically address the integration of geophysical techniques in development-led archaeology. Suggested topics include:

- robust and cost-efficient strategies including geophysical techniques alongside other prospection methods;
- bias and emptiness in archaeo-geophysics: what remains undetected and (how) can this be addressed?
- the use of geophysical techniques in complex environments;
- geophysical methods in support of excavation practice;
- national trends in use and legislative framework for geophysical prospection development-led archaeology.

ABSTRACTS

01 THE INTEREST OF INTEGRATING GEOPHYSICS ON ARCHAEOLOGICAL INVESTIGATIONS: THE ROMAN SETTLEMENT CASE AT ARTZI (NAVARRE)

Author(s): Garcia-Garcia, Ekhine (ARANZADI Society of Science; SOT Archaeological Prospection) - Mendizabal Sandonís, Oihane (ARANZADI Society of Science) - Sala Bartroli, Roger (SOT Archaeological Prospection) - Mtz.-Txoperena, Juan Mari (ARANZADI Society of Science) - Ortiz-Quintana, Helena (SOT Archaeological Prospection) - Agirre-Mauleon, Juantxo (ARANZADI Society of Science)
Presentation Format: Oral

During the construction of a road, a known local archaeologist observed roman pottery on the displaced amount of sediment. In 2012 some archaeological trenches were performed. They revealed some roman materials but construction remains were not found. During the following years geophysical investigations were carried out using magnetic, electromagnetic (GPR) and electric devices. Geophysical results showed an elongated building with several rooms, some of them had strong magnetic signal and with an apse at the central room.

Archaeological trenches were conducted to verify geophysical results and they confirmed the existence of an apse an well preserved caementicium walls. Also they revealed a canalization not identified by the geophysical survey. Theese foundings, together with the material found, pointed to a thermal area or, at least, to a heated building.

Archaeologists pointed that such a building shouldn't be isolated, and other related constructions might be present at the surroundings. In 2017, after cleaning and clearing vegetation, more extension was able to be surveyed by geophysics. A combined magnetic and GPR survey was carried out and revealed unkown buildings and other interesting features. Nevertheless, the orientation and contrast range differed from the initial geophysical survey. To verify their chronology and preservation four trenches were excavated guided by the geophysical results. They all revealed materials from roman period, and different construction tipologies and preservation levels were confirmed.

Geophysical techniques were applied to support archaeological investigation. The obtained results were systematically verified by guided archaeological trenches. Thank to this approach, the settlement was characterized minimizing the use of invasive techniques. Archaeologists can now design the investigation for future campaigns and prioritize the most interesting places to excavate.

02 AN ITALIAN EXPERIENCE. INTEGRATING GEOPHYSICAL SURVEY AND STRATIGRAPHIC EXCAVATION FOR THE COMPREHENSION OF A MULTI-PHASE VENETIAN PALACE

Author(s): Strapazzon, Guglielmo (Laboratory of Geophysical - Satellite Remote Sensing & Archaeo-environment Foundation for Research & Technology, Hellas - F.O.R.T.H., Institute for Mediterranean Studies - I.M.S.)

Presentation Format: Oral

Geophysical survey in commercial archaeolgy is still a struggling reality in Italy. Far from being applied commonly, geophysical survey is usually promoted in specific project, usually under specific circumstances.

In 2014 a medium size GPR and magnetometry survey took place in the site of the XVIII century Villa Farsetti in Santa Maria di Sala (VE). The survey was promoted by the municipality in order to evaluate the archaeological deposit in the area of the historical garden of the Villa to plan a stratigraphical excavation.

The result of GPR survey integrated with the historical documentation were able to identify a multi-phase archaeological site, characterized by at least 4 phases of building that have occupied the area from the XVI century. Such results have been confirmed by an extensive excavation that took place in 2015. The excavation was also able to highlight some limit of the gephysical survey that fail to detect archaeological features deeper than 1.80m due to level of the water table in the area.

The case of study put in evidence how the integration in a GIS environment of GPR and magnetometry data alongside with historical documentation and excavation was able to give a complete comprehension of a complex archaeological site.

03 MOTORIZED GPR PROSPECTION AND TARGETED TEST TRENCHING: THE INTERCITY NYKIRKE–BARKÅKER PROJECT – A CASE STUDY FROM NORWAY

Author(s): Nau, Erich (NIKU - Norwegian Institute for Cultural Heritage Research) - Hill, David (Vestfold County Council, Department of Cultural HeritageVest) - Gustavsen, Lars - Kristiansen, Monica (NIKU - Norwegian Institute for Cultural Heritage Research)

Presentation Format: Oral

Within the framework of a planned high-speed rail-link between Nykirke and Barkåker (Vestfold county, Norway) archaeological survey in the arable areas affected by the project have been carried out using a combination of motorized GPR surveys and targeted test trenching based on the prospection results. The project was the first large scale developer-led survey project in Norway where archaeological geophysics served as the primary investigation method.

The planned rail-link stretches over 24 km and includes over 100 ha of arable land of which about 90 ha was surveyed using GPR over two seasons in 2016 and 2017. This was followed by several weeks of test trenching in autumn 2017 when a total area of 2.4 ha was investigated. The combined archaeological survey approach significantly increased the archaeological knowledge of the area concerned where few archaeological remains were previously known. The results demonstrated a high correlation between GPR and trenching results. The combination of these two methods allows for both a complete investigation of the areas affected and detailed archaeological information such as dating of single sites or structures.

A close collaboration between the different stakeholders (local and national heritage authorities, archaeological museums, contractors) was essential for this approach. Furthermore, it can be shown that the applied strategy leads to significant time and cost savings compared to the conventional archaeological registration approach.

04 SEE THROUGH A GLASS, DARKLY. COMPARISON OF LARGE-SCALE MAGNETOMETER SURVEYS AND PREVENTIVE EXCAVATIONS IN HUNGARY

Author(s): Stibrányi, Máté - Pethe, Mihály - Mesterházy, Gábor - Klembala, Zsombor Máté (Budavári Nkft.) - Dani, János (Déri Múzeum) - Nagy, László - Buránszki, Nóra - Kecskés, Bence Dániel - Somogyi, Ferenc (Budavári Nkft.)

Presentation Format: Oral

Apart from its numerous problems for the profession, recent years' changes in Hungarian Cultural Heritage Management has indeed made a good opportunity for archaeological prospection. Due to restrictions and legislative changes less time and resources had been made available for preventive archaeology overall, but that had been an obvious opportunity for non-invasive approaches. Successfully exploiting this potential, geophysical surveys had been implemented as an integral part of assessments for large-scale infrastructural projects since 2013.

Accordingly, during the last four years several hundreds of hectares had been surveyed with magnetometry measurements on the route of planned motorways and industrial areas followed by preventive excavations closely afterwards. This gives us a unique opportunity to compare the surveys with the data from the excavations.

In this paper we would like to examine one project from this regard. The archaeological sites intersected by the M35 motorway's 32 km long section in Hajdú-Bihar co., in Eastern Hungary had been surveyed in the spring of 2015, with thorough preventive archaeological excavations afterwards. During this survey 1 570 921 sqm area had been investigated. In this paper we would like to compare the results and examine the advantages and limitations of magnetic prospection in this environment.

While the authors believe that using geophysical survey is merely a tool with limitations to understand archaeological reality, so could be excavation as well, only with different (sometimes unspoken) limitations. In our view the best scientific approach should be to channel every possible approach of perception to understand and describe the archaeological sites, structures, phenomena.

05 HIGHWAYS TO HELL: ARCHAEOGEOPHYSICAL PROSPECTION AND DEVELOPMENT-LED ARCHAEOLOGY IN THE CZECH REPUBLIC

Author(s): Tencer, Tomáš - Milo, Peter (Department of Archaeology and Museology, Masaryk University, Brno) - Peška, Jaroslav (AC - Olomouc) - Prišťáková, Michaela - Vágner, Michal (Department of Archaeology and Museology, Masaryk University, Brno)

Presentation Format: Oral

In the light of the recent economic and construction boom in the Czech Republic, it becomes extremely difficult to conduct and manage archaeological excavation on the places endangered by the constructions. The need for an effective management, preparation and execution of the archaeological excavation in an overload time schedule, where human resources are a bigger issue than a financial one, have led to growing interest in archaeogeophysical prospection. Within last year Department of Archaeology and Museology at Masaryk University Brno made several of advance geophysical prospection surveys in the Czech Republic. Surveys carried out in cooperation with contract archaeological companies as well as road authorities clearly demonstrate the advantages of archaeogeophysical prospection conducted prior to the excavation itself. These surveys have significantly helped both field archaeologists as well as investors to plan archaeological excavation and construction work in advance and to create a convenient time schedule for both parties. Besides cost and time savings, integration of archeogeophysical prospection into the process of planning points out the several weaknesses of the traditional excavation method used in the development-led archaeology. In our paper, we would like to present results of large area magnetic surveys conducted prior to the archaeological excavations and construction of the highways in the Czech Republic.

06 NO PERFECT PLAN IN ARCHAEOLOGICAL GEOPHYSICS. ASSUMING THE UNEXPECTED IN SURVEY STRATEGIES

Author(s): Sala, Roger - Ortiz-Quintana, Helena (Sot Archaeological Prospection) - Garcia-Garcia, Ekhine (ARANZADI Society of Science; Sot Archaeological Prospection)

Presentation Format: Oral

The progressive increasing in the use of geophysical survey methods in archaeological research during the last two decades produced a significative mass of scientific literature about methodological aspects around archaeological geophysics. Thanks to this knowledge and experience, specialized research and commercial teams have enhanced the effectivity of geophysical surveys, but in some aspects, results remain as unpredictable as they have always been. The uncertainty around archaeological remains compositions and their particular tafonomic processes, the agricultural uses of landscape or even the local geology are not always completely known or predictable. Indeed, even taking into account the background information fonts to trace detailed survey plans at the measure to each site, the data produced usually bring 'surprises' or unexpected results. As a consequence, the application of geophysics in preventive Archaeology should observe that the benefits of using geophysics also implies the acceptance of a degree of uncertainity.

The communication illustrates through three cases how survey results frequently contradict the expectative of survey strategies. The survey of roman site of Fresno-Alhándiga (Spain) started as a GPR work to assess the cultivation risks for a supposed roman villa remains. The survey results produced clear images of a big building despite the rough surface and high soil humidity. A later phase of the survey used a gradiometer to trace the limits of the site, but it was unable to detect part of the building remains. The example of a GPR survey in the roman site of Vieux-La-Romaine (France) in 2017, reveals how two cultivation fields showed a contradictory response on a GPR survey despite to have similar soil proprieties. A third case, centred in the location of a defensive ditch in the site of Ullastret (Catalonia) shows how a massive ditch produced a weaker magnetic anomaly than expected.

07 WHAT IS THE LEGAL STATUS OF A GEOPHYSICAL ANOMALY? SITUATING ARCHAEOLOGICAL GEOPHYSICS IN NORWEGIAN CULTURAL HERITAGE MANAGEMENT

Author(s): Stamnes, Arne Anderson (NTNU University Museum, Department of Archaeology and Cultural History)

Presentation Format: Oral

The use of geophysical methods in Norwegian archaeology as increased in the last decade, but it is only within the last couple of years that there are more geophysical surveys initiated by developer-led heritage management projects rather than research initiatives. The results of such surveys are to be included in the cultural heritage management, where Cultural Heritage officials often lack knowledge and experience to critically assess the quality and applicability of the geophysical survey results, and how to use these results when making a professional judgement.

The consequence of this could be uncritical use and trust in the interpretations provided. No object is a cultural heritage object until it is sensed and interpreted as such. According to the Norwegian Cultural Heritage Act, an archaeological object is automatically protected by law if it is older than 1537 AD, and the interpretation of geophysical survey data can therefore get legal implications. This illustrates the large responsibility in being the provider and receiver of the archaeological interpretation of such data.

The geophysical survey results does, in this way, become a new element in the current heritage management regime in Norway, and its constituent parts of legislation, treaties, strategies and budgeting directives. This therefore makes it necessary to investigate, within the current legislation, who it is that decides when a geophysical anomaly might become an observation that is legally protected by law. This presentation will situate how geophysical survey results is becoming an increasingly active part in developer-led

archaeology in Norway, and investigate the responsibilities of the providers and receivers of the archaeological results derived from geophysical surveys. It will also increase the understanding of the role and position of geophysical survey results within the current heritage management framework in Norway.

08 GEOPHYSICAL METHODS AND DEVELOPMENT-LED ARCHAEOLOGY IN FLANDERS: STATUS AND PERSPECTIVES

Author(s): De Clercq, Wim - De Smedt, Philippe (Ghent University) - Meylemans, Erwin (Flanders Heritage Agency)
Presentation Format: Oral

The new heritage legislation in Flanders (Belgium) concerning preventive archaeology takes into account geophysical surveying as one of the means for archaeological site evaluation. Integrated within the wide range of non-invasive survey techniques, a recent amendment suggests broad interpretive potential for such methods as it details that 'if non-invasive site evaluation renders sufficient information to complete the archaeological evaluation (...), follow-up invasive evaluation becomes redundant' (translated and paraphrased from Chapter 5, Art. 5.4.2. Heritage Decree, Flemish Government, 16/05/2014*). While this statement is subject to additional practical guidelines, it recognizes and underlines the potential of non-invasive (>geophysical) techniques in archaeological prospection. However, in the current common procedure of preventive archaeological research, geophysical surveying is implemented only implemented marginally. Besides a general lack of sufficient technical and practical knowledge within the archaeological community, this is mainly due to:

- the fundamental uncertainties concerning the interpretive potential of geophysical datasets in the context of heritage management decision making;

- lack of sufficient guidelines, interpretative frameworks and expertise for evaluating archaeo-geophysical survey results;

- the absence of adequate surveying strategies and best practices taking into account the specific archeological and geological conditions in Flanders (the latter being often dominated by complex, heterogeneous sedimentary environments and wetland areas).

The presented paper seeks to evaluate geophysical prospecting for site evaluation in Flanders through an overview of the current state of the art. In addition, it is set to provide a framework for examining the validity and impact of the above statements on archaeological site evaluation in Flanders and their consequences for the integration of geophysics in preventive archaeology.

09 NON-INVASIVE APPROACHES IN HERITAGE MANAGEMENT? A NORWEGIAN PERSPECTIVE

Author(s): Schneidhofer, Petra - Tonning, Christer - Gansum, Terje (Vestfold County Council, Department of Cultural Heritage) - Nau, Erich (Norwegian Institute for Cultural Heritage Research) - Neubauer, Wolfgang (Ludwig Boltzmann Institut for Archaological Prospection and Virtual Archaeology) - Paasche, Knut (Norwegian Institute for Cultural Heritage Research)
Presentation Format: Oral

During the last decades, "non-invasive" or "minimal-invasive" has become an increasingly popular catchphrase in archaeology. Motorised prospection tools and advancements in computer applications hold enormous potential for the future of archaeology – or so they say. But do non-invasive approaches actually deliver on their promise outside of research? Or, to put it differently: Can non-invasive approaches be used efficiently in heritage management?

Since 2007, the county council of Vestfold in Norway has started to gradually implement geophysical prospection into their heritage management routines through collaborations with the Ludwig Boltzmann Institute for Archaeological Prospection and Virtual Archaeology and the Norwegian Institute for Cultural Heritage Research. This endeavour is particularly notable because of the complex environmental settings prevailing in Norway and their impact on different prospection techniques. The situation has been complicated by moderately successful geophysical surveys conducted in earlier years, whose poor results have seriously damaged the reputation of non-invasive approaches - to the point where they are completely rejected by parts of the archaeological community.

In this paper, we will give an overview about the current situation in Norwegian heritage management and introduce the County Council Vestfold's non-invasive approach to development from planning to protection status and/or clearance of areas. Special attention will be given to issues of data reliability and whether these issues are thoroughly understood by archaeologists and/or sufficiently addressed by archaeological geophysicists. We will also focus on the response of the archaeological community and how their concerns are addressed. Finally, we will present current and future activities which aim to further establish geophysical prospection as a primary investigation tool in Norway and elsewhere.

10 INRAP AND GEOPHYSICS: TOWARDS A SUSTAINABLE APPROACH

Author(s): Hulin, Guillaume - Simon, François-Xavier (INRAP - National Institute for Preventive Archaeological Research)
Presentation Format: Oral

Preventive archaeology policy is now well established in France. One of its main characteristics is to have trial trenching at the center of the archaeological process. With about 2000 archaeological studies carried out each year (1800 evaluations and 200 excavations), Inrap is the most renowned institute in France. In this context, the use of geophysics for archaeological evaluation has been very contentious. Some attempts to substitute all or part of trial trenching by geophysics have been made and all ended in failure. Indeed, if geophysics is seen as a step forward in most countries, in France, this technique is often seen as a step backwards concerning the evaluation phase for development-led archaeology.

Nonetheless, Inrap doesn't wish to be deprived of this scientific tool. Compared to most countries which use geophysics mainly for archaeological evaluation (often on large areas and without any prior information), the institute promotes a rational use of geophysics on very specific case studies with clear scientific and/or technical issues. In most of the cases carried out by Inrap, geophysics occurs after trial trenching or as a complementary tool for the excavation phase. Therefore, much archaeological and pedological information is known and leads to a greatly improved geophysics efficiency. This results in several different uses, ranging from the identification of site extension outside the excavated zone to the global integration of the site in its surrounding landscape or soil studies on stripped areas.

In 2015, Inrap decided to develop this activity. At present, a team of 2 geophysicists with 18 technicians specialised in data acquisition is fully operational. Using this well-reasoned approach, 86 geophysical surveys have been carried out since (41 of which were in 2017), and all the indicators show an expansion and a good integration of geophysics by archaeologists.

11 TOWARDS AN IMPROVED IMPLEMENTATION OF GEOPHYSICAL SURVEY IN UK COMMERCIAL ARCHAEOLOGY

Author(s): Crabb, Nicholas (Wessex Archaeology)
Presentation Format: Oral

In the UK, many development-led archaeological projects utilise geophysical survey as an invaluable method of assessing archaeological potential for planning requirements. Magnetic gradiometer survey is by far the most frequently used technique. Its widespread use is due to its ability to identify a broad range of archaeological features, whilst also providing rapid ground coverage. It is commonly deployed to corroborate desk-based research, help target archaeological remains and to inform subsequent investigations. However, with recent advances in technology, and the increasing scale of some of this work, there is a need to discuss both the failures and successes of these strategies.

This paper will present case studies where geophysical survey has been integral to archaeological mitigation strategies. In each case, the interpretation of magnetic gradiometer data was tested by subsequent intrusive investigations and was reviewed the light of this information. Rather than providing a simple correlation of anomalies and features, this paper will identify and present ways in which geophysical survey could be implemented better into archaeological strategies. Whilst this subject of archaeological feedback and the efficacy of geophysical survey in developer-led archaeology is not new, it is of continual importance as such methodologies are increasingly commonplace in advance of large nationally significant infrastructure schemes.

12 THE POWER OF WORDS. HOW MANIPULATIVE ARE SURVEY REPORTS?

Author(s): Meyer, Cornelius (Eastern Atlas GmbH & Co. KG)
Presentation Format: Oral

A picture is worth a thousand words? In survey reports on geophysical prospecting projects this is definitely not true. Geophysical data images and interpretation drawings do not tell an inherent story, there is always a human-made concept behind, whether intentional or unconscious. It's not about accusation or regret, but the manipulative power of texts, images, and maps should always be aware of every actor in the field. All participants - geophysicists, archaeologists, and developers - are exposed to forces that almost automatically lead them to gently or forcefully direct themselves, the reader, and the viewer in a desired direction. The contribution intends to name and characterise these forces and constraints and to shed light on the typical manipulative techniques found in survey reports. Of course, language and wording are the most important resources, from well-meant euphemisms to audacious distortion of facts. But the same applies to the creation of data images and maps. Especially maps and virtual reconstructions are very useful to take the recipient by the hand. They are intermediates of texts and pure images, and by definition symbolic depictions that emphasize relationships between spatially organised elements. The question is where emphasis ends and manipulation starts. At its core, it is about how we can construct history by means of geophysical prospection.

a. ARCHAEOLOGICAL FEATURES OF THE BRONZE AGE IN GEOPHYSICAL MEASUREMENTS AT THE SITE MANG DE BARGEN, NORTHERN GERMANY

Author(s): Schaefer, Stefanie (Institute of Pre- and Protohistoric Archaeology, CAU Kiel / SFB 1266) - Panning, Diana (Institute of Geosciences, CAU Kiel / SFB 1266)
Presentation Format: Poster

In this contribution we present our project-collaboration with the combination of archaeology and geophysics at the site Mang de Bargen in Schleswig-Holstein in the North of Germany. This site contains burial mounds, an urn cemetery, areas with cooking pits and settlement remains.

Our projects are dealing with the identification of transformations in the archaeological record of this site. These can be changes of settlement activities and burial rites. A particular concern is to examine the extent to which the previous measurement is compatible with the archaeological features that were subsequently excavated and whether we can use geophysics to avoid or to restrict archaeological excavations.

With the help of geophysical methods, we selected trenches for sondages and extensive excavations at Mang de Bargen. On the basis of the results of magnetic measurements, different areas were chosen, to conduct radar measurements in particular. The

measurements were taken before and during the excavation with the aim of comparing the different signals of in-situ and surface measurements. Finally, the results of the measurement were compared with the excavated features in order to create a catalogue to classify the signals of characteristic archaeological features.

Within the scope of our collaboration we were able to determine which method is most suitable for which type of archaeological feature. Furthermore, we could identify possibilities and limitations of geophysical methods with regard to the archaeological record.

b. SHEKSHOVO BURIAL SITE: A CASE STUDY OF GEOPHYSICS' INVESTIGATION OF MEDIEVAL CEMETERY.

Author(s): Krasnikova, Anna (State Historical Museum) - Fedorina, Anastasia (Institute of Archaeology, Russian Academy of Sciences) - Erokhin, Sergey (Moscow State University) - Makarov, Nikolay (Institute of Archaeology, Russian Academy of Sciences) - Modin, Igor (Moscow State University) - Pavlova, Alexandra (JSC Institute Hydroproject) - Pelevin, Andrey - Topilina, Tatiana (Moscow State University) - Zaytseva, Irina - Ugulava, Nani (Institute of Archaeology, Russian Academy of Sciences)

Presentation Format: Poster

Nowadays the Suzdal Opolie is one of the most studied regions of Rus' of the period of statehood. We know about the rapid growth of settlement systems at the time from materials of surface finds collections, as well as dwelling sites' excavation, but without new cemeteries' data we cannot estimate population size nor infer existing social problems. A significant part of the barrows had been excavated in the 19th century and now their remains are not visible due to centuries-long ploughing. The old documentation is largely lost, which forces us to re-examine the already studied sites, using archaeological, and other, methods. We will demonstrate the possibility of using geophysical methods to solve part of the problem on Shekshovo, one of the most important necropolises of the region in the X-XII centuries.

The aims of the geophysics were finding the barrows, mapping the cemetery structure, investigating the practical possibility of the level graves detection. We carried out a magnetic survey at 20×100cm, but neither the barrows nor the majority of the graves had a reliable magnetic signature. Then we focused on the electrical survey – 20080 m2 of pseudo-3D electrical resistivity tomography: 4200 m2 at 1×5m, 7700 m2 at 1×1m (both in two polarizations), 8180 m2 at 1×1m in one polarization. In special cases detailed survey was performed at up to 0.25×1m in two polarizations. Geophysics itself enabled to map the barrows (among 12 excavated 10 are obvious from resistivity maps), and one cemetery border (subject to verification). In contrast, the level grave identification can be done only using a geoarcheological approach, with the key role being the unified interpretation of the excavation results, the magnetic survey, as well as other scientific methods, which makes it possible to distinguish archaeological and natural objects, including agricultural activity, glacial period remains, soil heterogeneities.

c. THE ROMAN MUNICIPIUM MUNIGUA (SEVILLE SPAIN): A CHALLENGE FOR A GEOPHYSICAL PROSPECTION

Author(s): Brose, Kerstin (RGK - Romano-Germanic Commission DAI)

Presentation Format: Poster

Munigua, located in the southern foothill of the Sierra Morena (Seville), isn't full excavated. That's way a geomagnetic, a geoelectric and a ground penetrating prospection took place in the south part of the city. But there are some circumstances that don't make the geophysical prospection and interpretation such easy as expected. The Magnetogramm has a lot of high geomagnetic anomalies which complicated the interpretation. One reason for this is that one of the most important economic factors for Munigua was the mining industry. The presence of slag all over the roman city is an evidence for that. And that's a problem: slags have a high magnetisation. Other building materials are bricks and roofing tiles, both also huge distributed all over the site and have a high magnetisation, too. Another problem for the geomagnetic in Munigua was that stone building material was granite, which forms also the Bedrock on the site. This leads to a low geomagnetic contrast in the magnetogramm. For this reason a combination of geophysic methods has been applied. Geoelectric is not susceptible for magnetisation and good for the prospection of stone features in different depths. But the geoelectric measurement also didn't work flawless because of very dry soils resulting from the semi-arid climate. So at least ground penetrating radar was used because it is also good for the detection of stone-features in different depth with a high resolution and has no problems with dry soils or magnetisation.

In the end all results were matched together in one interpretation model which shows the location of streets and buildings. Because of the combination of geophysical methods in some cases the identification of material was possible. After all the results were analysed with a 3D surface model of the prospection area.

d. INTEGRATED PROSPECTION FOR BURIAL MOUNDS IN ECKELRADE, THE SOUTH OF THE NETHERLANDS

Author(s): Orbons, Joep (ArcheoPro, Eijsden; Saxion University) - Paulussen, Rob (ArcheoPro, Eijsden) - Amkreutz, Luc (National Museum of Antiquities, Leiden)

Presentation Format: Poster

In 1926-1928 a series of six burial mounds were surveyed and partly excavated. The burial mounds gradually disappeared in later years due to agriculture, forestry and open cast quarrying of gravel. In 2016 one of these burial mounds was identified on the high density LIDAR data. The site is not under threat but to organise a protection of the site and its surroundings, a survey of the burial mound and the surrounding was undertaken. An area of 1.2 hectares was selected for the survey.

A range of historical maps were studied to understand the changes and processes that worked on the study area. The full area was surveyed with multi-coil EM (CMD Mini Explorer) and with the Grad 601 magnetometer. One hectare of the area was surveyed with the RM15 resistivity instrument. The burial mound was surveyed with the RM15 in ERT mode.

One long row of augerings was carried out across the burial mound. Further augerings were carried out in several geophysical anomalies.

A second burial mound was identified in a field survey, this burial mound was totally destroyed and could only be identified by its surface remains.

The results of this combined survey is that the burial mound is clearly identified as an archaeological feature with intact archaeological layers. The area surrounding the burial mound seems to hold some structures that are partly natural but partly could be anthropogenic due to its regular nature that could not be explained with modern structures. These structures can only be further studied by excavations. Since the site is not under threat of development so there is no need for continued archaeological surveys.

The study is being used by the authorities to visualise the site for the general public and to protect the site from further deterioration.

767 RISK PREPAREDNESS IN ARCHAEOLOGICAL PRACTICE AND THEORY

Theme: Theories and methods in archaeological sciences
Organisers: Vargas, Amilcar (University of Barcelona) - Reza, Sharifi (Brandenburg University of Technology Cottbus-Senftenberg)
Format: Regular session

This session aims to highlight the importance of risk preparedness as a key element for archaeological practice. Archaeology as an empirical and theoretical discipline is threated by a wide range of risks and hazards, including looting, intentional destruction and climate change. In recent decades, cultural heritage, and archaeological heritage in particular, has been destroyed or irremediable harmed due to a lack of risk preparedness among stakeholders. Some initiatives for preventing threats have been implemented with different results. The session proposes a discussion about risk preparedness among archaeologists and professionals related disciplines such as conservationists, restorers and site managers. Issues for debate include the unequal level of awareness, the prioritisation of other issues –as restoration and material analysis– and the lack of risk-related courses in the academic curricula in universities.

ABSTRACTS

01 MANAGEMENT AND PRESERVATION OF BAMIYAN ARCHAEOLOGICAL SITE: A RISK-BASED APPROACH

Author(s): Sharifi, Reza (BTU Cottbus-Senftenberg)
Presentation Format: Oral

Comprehensive risk management and protection of archaeological heritage in the context of a post-conflict county, Afghanistan, depends highly on vivid risk assessment and identification of hazards to the heritage assets. In this regards heritage risk characterization (HRC) plays a vital role in the part of risk assessment to determine the vulnerability of cultural value and its potential damages. Therefore HRC needs to be properly introduced to the planning system and development project which are foreseen to implement in the site. This paper aims to extend the notion of risk characterization from their traditional disciplines, namely ecology and health, to the field of archaeology and heritage conservation which can provide a platform for combining the heritage value and risk management. The cultural landscape and archaeological remains of Bamiyan in Afghanistan is selected as a case study in this research. Here, the type of damages to the cultural heritage of the Site during past armed conflict will be studied, and we try to find out in what extent the existing trends of heritage risk management are applicable in the Site or can empower the resilience of local institution during the time of another conflict. Also, the paper tries to extend the definition of HRC to the area of archaeology for a better understanding of risk and the way to mitigate the damages in an archaeological site.

02 PARALLEL RISK-PREPAREDNESS FOR THE CONSERVATION OF THE ARCHAEOLOGICAL AND NATURAL HERITAGE, THE CASE OF PALENQUE, MEXICO

Author(s): Vargas, Amilcar (University of Barcelona)
Presentation Format: Oral

Insuficient management and lack of public awareness are among the most important threats for heritage conservation worldwide. Archaeological sites in natural parks can be seen as assets that need to be preserve by a multidisciplinary perspective and with a collaborative framework. However, sometimes the parallel management models may generate different visions of what risk-preparedness is and as a consequence, how to be prepared to deal with its causes. This paper will discuss the parallel management of the archaeological Mayan site of Palenque in Mexico, a site inscribed in the World Heritage List in 1987. This site has two Federal Governmental managers with a very distinct understanding of their role and responsibilities in the conservation of what they conceive as

heritage. Their institutional backgrounds, policies, legal framework and management model has not yet created a long term strategy for risk-preparedness. Despite that, some first steps has been done for a multilateral collaboration and the inclusion of local communities, at least in theory, in the context of a new management plan to be developed by the natural resource manager. Finally, this paper will conclude with some guidelines that may be useful for the inclusion of the risk-preparedness in a comprehensive strategy for heritage conservation.

03 THE WASTE LANDS – THE HISTORICAL LANDSCAPE OF PEENEMÜNDE AS AN ARCHAEOLOGICAL SITE

Author(s): Röhl, Constanze (Brandenburgische Technische Universität Cottbus)
Presentation Format: Oral

The former 'Heeresversuchsanstalt Peenemünde' had been established in 1936 on the island of Usedom in the Baltic Sea in order to provide research, production and testing facilities for the German rocket program. Peenemünde was air raided during WWII, reused by the Soviet Army and the Army of the German Federal Republic; and finally partially demolished in the 1950s.

The 'Peenemünde Fertigungshalle 1 Archaeological Investigation', a project situated at BTU Cottbus, approaches the site F1, the former industrial building dedicated to the assembly of the 'Vergeltungswaffe'/'Retaliation Weapon 2'. Due to its ruinous state, a profound evaluation of the place can only be achieved via the application of architectural survey and archaeological excavation alike. The object provides a sophisticated challenge though to the methodological repertoire of archaeology and conservation.

This paper wants to present several key aspects which are relevant in regard to risk preparedness. The assessment of potential health hazards caused by contamination with unexploded ordnance, ammunition from the site's subsequent use, toxic building materials and toxic substances from the assembly process of the V2 poses serious issues. Any intervention on-site will have to ensure that its status as nature reserve is being respected.The concept of 'waste' as part of the site's narrative must be redefined. There is a considerable amount of artefacts from the site's subsequent use after 1945 which must be considered an immediate part of its history. The persistent danger of looting as well as issues of preservation have to be conceptually addressed. The partial destruction of areas related to F1 additionally endangers the adequacy of its didactic mediation. Lastly, a major threat is being posed by the planned relocation of a dyke which would lead to the flooding of vast areas of archaeological interest.

04 EMPTY DIALOGUES: THE MOST POWERFUL RISK OF ARCHAEOLOGICAL SITE'S CONSERVATION

Author(s): Pastor Perez, Ana (University of Barcelona)
Presentation Format: Oral

In this paper, I will explore different dimensions, handicaps, and appliances of Risk Management (RM) at archaeological and paleontological sites. During the last years I have been working on preventive conservation applied to Archaeology. I have explored it seeking new ways to improve the role of the conservator-restorer in interdisciplinary teams. What I want to point out here – and debate in this session – is how difficult it is to apply those methods when there is a lack of dialogue among stakeholders (managers, restorers and conservators, archaeological workers…authorities). RM requires lots of [invisible] work and field work (heritagisated ethnographies) on the first stages of the process (e.g. Rapid Ethnographical Assessment Process, see Low 2003). The long-term character of RM confers it a very small field of application in a world that asks for immediate results to obtain an academic or political exit that leads into more budget, recognition, or fame. Over the last years I also tried to introduce new values in existing RM methods, exploring the social dimension of this work, integrating new types of risk regarding social aspects of heritage and analysing its integration in Cultural Policies on different levels. I will drive this paper explaining some case studies on two different ambits of research. First, on preventive conservation of archaeological remains embedded in the public space; and second, on field interventions. Both situations will bring theoretical and methodological examples (also touching an economic dimension to explore) that I would like to debate in this session, enriching our vision about RM, its application in archaeological restorations and its impact on current Cultural Management perspectives and dynamics. We will discover how, in the end, Cultural Managers, researchers and workers, become a risk ourselves, not being able to communicate or stablish an interdisciplinary dialogue…

05 WHEN LEGAL PROTECTION IS NOT ENOUGH. THE PARADOXAL CASE OF TANNERIES IN VIC (BARCELONA, SPAIN)

Author(s): Gomez Bach, Anna (UAB) - Rocafiguera, Montserrat (UB; Fundació Esquerda)
Presentation Format: Oral

Heritage is submitted to diverse and complex synergies. So, the mechanisms that ensure the conservation and survival of historical elements are variable and can change through time. Sometimes interests associated with State or regional policies can disagree with interests of owners and even of the rest of citizens.

Legal and politic protection can not to be the most effective solution if the problem is disregarded by the population, when it's time to deal with which are the critical challenges. We will try to promote a reflection of these elements through the example of the Tanneries quarter, in Vic (Catalonia). It is an ensemble protected as a BCIN (Cultural Good with National Interest) with a Cultural Heritage Protection for its ethnological value, situated next to the river in a singular space in the old city of Vic, that, despite or because its legal protection, is about to collapse. This architectural complex has other examples in other closer cities such as Lleida or Granollers, were traditional works has been rediscovered. With this paper we will try to promote a discussion in order to establish

the guidelines to face the main clues for heritage conservation, through research, preservation, diffusion and use of space beyond local or regional scope.

06 URBAN DEVELOPMENT AS HIGH-RISK FACTOR FOR CONSERVATION OF TEOTIHUACAN. CHALLENGES AND OPPORTUNITIES

Author(s): Vargas, Amilcar (University of Barcelona)
Presentation Format: Oral

The Prehispanic City of Teotihuacan, recently celebrated its 30th aniversay in the World Heritage List. However, since 1987, its population and urban expansion has covered hundreds of hectares of the buffer zone around the core of the archaeological site. This paper will present how the process of disaffection, among other factors, has affected the conservation of this vast area that represents more than 90% of the protected zone. This lack of connection between local inhabitants and their heritage may be seen as a reversible process that starts with the acknowledgement of this issue and will require a long-term strategy to link the next generation of locals with the values of the heritage below the land they see as a potential area for housing and urbanisation. This strategy may tackle a narrow materialistic vision of conservation and to include the re-affection process as part of a comprehensive risk-preparedness methodology that helps to preserve heritage for the following generations. Finally, this paper will introduce a proposal to follow up the current work done by the National Institute of Anthropology and History and has shown first results in the re-affection of young generations of local people in the municipalities of San Martín de las Pirámides and San Juan Teotihuacán.

769 ARCHAEOLOGY OF MATERIAL CULTURE AND TERRITORY WITHIN THE IBERIAN COLONIAL EMPIRES (15TH-18TH CENTURIES)

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Inanez, Javier (University of the Basque Country - UPV/EHU) - Teixeira, André (Universidade Nova de Lisboa)
Format: Regular session

Iberian kingdoms created vast colonial empires between the 15th and the 18th centuries, based upon maritime and commercial dynamics but also with the component of territorial occupation. Portuguese established settlements in the Atlantic islands, created the Brazilian colony and settled in parcels of land in both African and Asian continents. Likewise, Spaniards established themselves in the North of Africa, several Caribbean islands and in broaden spaces in America, along with settlements in Asia and the Pacific.

This symposium intends to analyze first globalization processes occurred by settlement processes, territorial occupation and technological change at the Portuguese and Spanish colonial empires throughout the archaeological record. In this regard, research focusing on urban spaces, rural structures or material culture from Iberian colonial period showing case-studies with strong interpretative and comparative perspectives are considered.

ABSTRACTS

01 IBERIAN CULTURAL CONTACT AND COLONIALISM IN THE ISLAND OF GUAM: THE ABERIGUA PROJECT

Author(s): Monton-Subias, Sandra (Universitat Pompeu Fabra) - Bayman, James M. (University of Hawai'i-Manôa) - Moragas, Natalia (Universitat de Barcelona) - Moral, Enrique - Peña, Veronica - Trelliso, Laura (University Pompeu Fabra) - Moore, Jacy - Alvarez, Anthony (University of Hawai'i-Manôa) - Quinata, Joe (Guam Preservation Trust)
Presentation Format: Oral

In this paper, we will present ABERIGUA, an archaeological project that investigates the impact that the incorporation of Guam and the Mariana islands by the colonial network of the Spanish empire had on the local Chamorro population. We are seeking to understand the changes, but also the continuities that survived through this general process. We are particularly focusing on all those changes and continuities that took place in: 1) socio-ecological systems; 2) socio-political systems (with special attention to gender and sexual politics); and 3) the sphere of maintenance activities (a set of practices that, grosso modo, include tasks related with care giving, food processing and cooking, weaving, socialization of children, hygiene and public health, and organization and maintenance of daily-quotidian residential spaces).

We will also present the preliminary results from fieldwork campaigns conducted in June-July 2017 and April-May 2018 at the church and cemetery of San Dionisio and the Palace of the Governor. Both sites stand as archaeological witnesses of the 17th, 18th and 19th century colonial processes. Conflating historical written sources and archaeological information, we seek to contribute a better understanding of the historical-archaeological legacy connected to Iberian cultural contact and colonialism in this part of the western Pacific.

02 CEREMONIAL DRINKING RITUALS AND THE TRANSFORMATION OF INDIGENEITY BEFORE AND AFTER THE SPANISH CONQUEST OF THE ANDES

Author(s): Beaule, Christine (University of Hawaii at Manoa)
Presentation Format: Oral

This paper brings together archaeological data relevant to the material culture of state and community drinking rituals from several Andean Prehispanic cultures (Tiwanaku, Wari, Inka) and colonial contexts, in order to better understand changes in community rituals and indigenous identity during the colonial period. The comparative perspectives offered through this broad approach draw on critical theories of colonialism, political economy, identity formation processes, and material culture. This theoretical background is used to contextualize the performance of private and public indigenous drinking rituals before and after the conquest, and to link those rituals to changing notions of indigeneity before and during the colonial period. The specific classes of material culture I use in this project include qeros (ceremonial drinking vessels made of ceramic or wood), public drinking spaces and chicha production features, that have been recovered from a variety of sites, including rural households and villages, public taverns in urban areas, and indigenous ceremonial spaces. I argue for a conceptual link between inclusive and exclusive notions of belonging in highland Andean indigenous cultures, and patterns in the production and distribution of chicha and qeros at various highland Andean sites. The roles that chicha shared in paired qeros played in each sociopolitical and cultural context I include reveal much about efforts to create, solidify, reorder or preserve indigenous identities by households within communities or by the state actors seeking to fold groups into larger polities.

03 CONNECTIVITY AND ISOLATION IN EARLY SPANISH COLONIAL NEW MEXICO

Author(s): Jones, Emily Lena - Gabe, Caroline (University of New Mexico)
Presentation Format: Oral

The New Mexican Spanish colony, established in 1598 under the leadership of Juan de Oñate y Salazar, existed at the extreme fringes of the colonial Spanish empire. The Camino Real (the main route connecting the New Mexican colony to Mexico City) was over 2,560 kilometers long. Travel between Mexico and New Mexico involved navigating both mountains and desert as well as passing through territory controlled by hostile indigenous populations. In addition, the initial Spanish colonists in New Mexico were few in number. Given this alongside the difficulties involved with travel along the Camino Real, trade caravans connecting New Mexico to the rest of New Spain arrived in Santa Fe and points north only irregularly: support wagon trains began around 1610, but were highly sporadic until 1631, and even then they arrived at best every three years. The 17th century New Mexican colonists were, in short, isolated from the rest of the Spanish world both physically and politically. In this remote location, how did the New Mexican Spanish colonists maintain (or fail to maintain) their connections to Spain? In this paper we use architectural, faunal, and ceramic evidence from early Spanish Colonial New Mexican sites as compared to the record from 17th century Mexico City to explore questions of Spanish identity on the edge of the 17th century Spanish world.

04 IBERIAN SETTLERS AND ANCIENT IRRIGATION SYSTEMS. EXAMPLES FROM THE KINGDOM OF GRANADA AND EARLY COLONIAL PERU (15TH-17TH C.)

Author(s): Retamero, Felix (Dept. Ciencies de lAntiguitat i lEdat Mitjana, Facultat de Filosofia)
Presentation Format: Oral

This presentation explores the transformation of water irrigation and water distribution systems in early colonial Iberian contexts through methods of historical archaeology. Either in the Iberian Peninsula, in the Atlantic islands or in the Americas, the construction of water mills and the new selections of cultivars made by the Iberian settlers tranformed the original designs and the former organisations of water distribution in different contexts more often than not. Also, native surviving populations could kept the management of their lands to different extents, in spite of the new colonial conditions. This was the case of some Morisco and Indian communities in areas of the Kingdom of Granada and the earlier Viceroyalty of Peru, respectively. No doubt, the presence and the uneven political capacity of these former peasant populations was a crucial aspect which determined both the variety of ways and the chronologies of the transformations introduced by the conquerors. On this respect, common issues emerging from different and coheval colonial contexts are discussed and compared in the light of textual and archaeological evidence. Among others, how and where the new colonists settled and possessed the irrigated fields; whether or not the new and the former irrigators shared turns of water and tracks of land; the different spatial patterns of field distribution resulting from the establishment of the new settlers among or besides native peasants, and the different balance between irrigated and non irrigated areas in the new colonial contexts.

05 THE TECNOLONIAL PROJECT AND THE 16TH CENTURY CITY OF VALDIVIA (CHILE) IN THE VICEROYALTY OF PERU. FIRST ARCHAEOMETRIC RESULTS

Author(s): Buxeda i Garrigós, Jaume - Pinto Monte, Mireia - Madrid i Fernández, Marisol (ARQUB-GRACPE, Universitat de Barcelona) - Urbina A., Simón (Universidad Austral de Chile)
Presentation Format: Oral

The research project Tecnolonial -Technological impact in the colonial New World. Cultural change in pottery archaeology and archaeometry (HAR2016-75312-P) is focused on the contact among different societies in a colonial context after the expansion of the

Crown of Castile after 1492. Among the different case studies in the Americas, the southernmost case is that of Valdivia (Chile) in the Viceroyalty of Peru, a town of a discontinuous life. The town was founded ca. 1552 and it was destroyed in 1599. Later on, from 1602 to 1647, it was recovered by the mapuche-huilliche indigenous population, but with a short period of Dutch occupation in 1643. Finally, the town was refounded by the Crown of Castile in 1647. To present, an archaeological project (Fondecyt num. 1130730) has identified several prehispanic and colonial evidences and it has also gathered the documentary sources from the 16th century onwards. All this efforts are now placed in the frame of the Tecnolonial project to further investigate the European pottery, but also the indigenous and colonial ceramics and their relation with the European and indigenous traditions.

In a first phase, 23 majolica and 7 glazed coarse ware individuals have been chemically characterized by means of x-ray fluorescence analysis (XRF) and mineralogically by means of x-ray diffraction analysis (XRD). According to the results, a subsample has been further investigated by means of scanning electron microscopy (SEM-EDX) in order to assess their sintering state and microstructure. All individuals were recovered at the Plaza de la República, within the foundation area of Valdivia. In the present paper, we will present the first results of this case study in relation with the whole Tecnolonial project.

06 RED IN COMMON: THE ARCHAEOMETRICAL CHARACTERIZATION OF ROJA BRUÑIDA POTTERY FROM PANAMA

Author(s): Inanez, Javier (GPAC, Built Heritage Research Group, Faculty of Arts, University of the Basque Country UPV/EHU, Centro de Investigación Micaela Portilla) - Guillermo Martín, Juan (Universidad del Norte, Barranquilla) - Glascock, Michael D. (Research Reactor Center University of Missouri - MURR) - Speakman, Robert J. (Center for Applied Isotope Studies, University of Georgia) - Buxeda i Garrigós, Jaume (Cultura Material i Arqueometria UB - ARQ|UB, GRACPE, Dept. de Prehistòria, Història Antiga i Arqueologia, Universitat de Barcelona)

Presentation Format: Oral

Panamá Viejo was founded in 1519 by the Spanish expeditionary Pedrarias Dávila. At the time, it was the first permanent settlement in the Pacific Ocean, becoming a city by a royal decree in 1521. Shortly after its creation the city became an important base for the trade with Spain. Unfortunately, in 1671, the English pirate Henry Morgan attacked and sacked the city, resulting in a fire that destroyed the entire city. Thus, a new settlement was built a few miles west, which would become the origin of the modern Panama City.

Roja bruñida pottery is a very characteristic typology of ceramic within colonial contexts in America that is distinguished by a red/brownish clay paste with a shiny reddish thin slip. This study accounts for the first archaeometrical characterization of the so-called Roja Bruñida pottery from Panama unearthed in recent archaeological excavations at Panama Viejo and Casco Antiguo. Forty-five ceramics have been characterized by means of Neutron Activation Analysis (NAA), XRD and SEM. The archaeometrical study of these wares will shed light into the understanding of the technological influence on Panama majolica by European and local potting traditions within the cultural frame of societies in contact in a colonial context. Additionally, the supply of raw materials for the potting industry in colonial Panama is assessed diachronically considering the important historical disrupting episode that eventually ended in the relocation of the city. Larger archaeological and historical implications of this important ceramic in the Spanish colonial market within the region are also assessed.

07 HOUSES IN KSAR SEGHIR (MOROCCO): ARCHAEOLOGICAL ANALYSIS OF THE URBAN HOUSE IN THE 15TH AND 16TH CENTURIES

Author(s): Torres, Joana (CHAM - Centre for the Humanities)

Presentation Format: Oral

Ksar Seghir was conquered by the Portuguese in 1458, after a long medieval Islamic occupation. After its abandonment in 1550, it remained as an unknown archaeological site, until the major work of Charles L. Redman and his team throughout the decades of 1970 and 1980. Their studies allowed the identification of the Portuguese and the medieval Islamic settlements, revealing their main buildings and public facilities, as well as the housing structures of their inhabitants.

This presentation aims to reflect on the transformations of the vernacular architecture in this Portuguese town, while looking into the evolution of its urban form. Besides the analysis of the remaining architectural structures in each occupation phase, we will be assessing the differences and continuities in terms of the type and model of construction, the materials applied and the construction techniques, according to the archaeological record and contemporary written sources. Our study will also include a brief approach to the material culture found in each housing complex and its compartments, in order to address their functional use and socio-economic framework.

Lastly, there will be a significant comparison between the houses and the urban organization in Ksar Seghir and other settlements in Portugal from the Late Middle Ages.

a. 'LAND THAT HAS NEVER BEEN USED BEFORE'. COLONIAL SETTLEMENT AND LAND CLEARING IN ANDALUSIA AND GRAN CANARIA (16TH C.)

Author(s): Díaz Sierra, Ignacio (Universitat Autònoma de Barcelona)

Presentation Format: Poster

The conquest of Andalusia and the Canary Islands by the Castilian Crown in the Late Middle Ages was followed by the immediate

establishment of thousands of settlers, who farmed the seized lands and defended the conquered territories. The creation of these colonial settlements implied the progressive transformation of the indigenous agricultural landscape that surrounded them, in order to adapt it to their economic objectives and productive strategies. One of the ways in which the transformation of the landscape took place was through the ploughing of uncultivated land to mass-produce cash crops, such as cereals, wine and sugar cane. The systematic clearing -and enclosing- of lands is a phenomenon closely linked to European settler colonialism, and it has been documented in many regions that were conquered before 1492 -such as the British Isles, Eastern Europe and Iberia- and after that date, and in both sides of the Atlantic Ocean. This poster presents two case-studies of indigenous settlements that were emptied and repopulated with colonists, one in Southern Iberia -Olvera (Cadiz)- and on another one in the Canary Islands -Agüimes (Gran Canaria). In both cases, the newcomers brought under cultivation hundreds of hectares of unfarmed land during the sixteenth century; land that, according to them, 'had never been used before'. We will analyse how these processes of land clearing were organised and how they actually reused, modified or destroyed the pre-existing landscapes.

770 SUSTAINABLE TOURISM IN WORLD HERITAGE LANDSCAPES: PROBLEMS AND POTENTIALS

Theme: Archaeology and the European Year of Cultural Heritage
Organisers: Davis, Stephen (University College Dublin) - Greaney, Susan (Historic England; University of Cardiff) - Cave, Claire (University College Dublin) - Smyth, Jessica (University College Dublin)
Format: Regular session

In the last decade cultural tourism has seen enormous increases worldwide; the commodification of heritage is exemplified by a 'bucket-list' or TripAdvisor-centric attitude towards World Heritage Sites, with cultural heritage subject to reviews alongside hotels and restaurants. This 'sixth C' (Commodification) has arguably led to a divide between site management at a state level and at least some of the '5 Cs' critical to the strategic objectives of the UNESCO World Heritage Convention: Credibility; Conservation; Capacity building; Communication and Communities.

This session seeks to explore both the problems inherent in managing WHS and the range of potential solutions to such problems. In particular we are interested in the landscape scale: in many such sites, even where landscape designations exist, the focus is drawn to specific monuments or sites within those landscapes. We are keen to explore how conservation thinking translates into areas of heritage and environmental research, policy and practice beyond the focus of key monuments and sites and to diversify the tourist experience of such sites while maintaining the 5Cs of the WHC. The World Heritage Convention stipulated the need for states parties to adopt policy 'which aims to give the cultural and natural heritage a function in the life of the community and to integrate the protection of that heritage into comprehensive planning programmes'. However, national governments have increasingly sought designation to stimulate tourism in the pursuit of economic development. This can lead to conflicting interests and concerns where designated sites are also living landscapes.

ABSTRACTS

01 BEYOND THE 'BUCKET LIST': HELPING VISITORS TO EXPLORE THE STONEHENGE LANDSCAPE

Author(s): Greaney, Susan (English Heritage/ Cardiff University)
Presentation Format: Oral

One of the aims of the 2010 Stonehenge World Heritage Site (WHS) interpretation strategy was to present a discrete and seamless interpretation scheme across the wider landscape, as part of the project to build a new visitor centre for Stonehenge. A series of interpretation 'hubs' and information panels were installed at key points, and a walker's map, a large map at the visitor centre and a downloadable audio guide were produced. These all had the aim of encouraging visitors to explore the wider landscape beyond just the famous stone circle, beyond the 'bucket list'. Before the visitor centre opened, we estimated that 6% of visitors (roughly 50,000 people a year) would explore the wider landscape as part of their visit. This presentation will examine the successes of this scheme in dispersing visitors and in helping them understanding the wider landscape and monument complex at Stonehenge. It will also explore some of the problems that have arisen and suggest improvements for the scheme. The project will be contrasted with similar aims for the other half of the WHS at Avebury, where the organisations that manage the sites also have the aim of dispersing visitors out beyond the central henge and stone circles. The different ways in which visitors need to be encouraged and given confidence in exploring an unknown landscape will be explored.

02 PUBLIC-PRIVATE COLLABORATION IN ARCHAEOLOGICAL HERITAGE MANAGEMENT WITHIN A WORLD HERITAGE SITE – A BRÚ NA BÓINNE CASE STUDY

Author(s): Ni Lionain, Cliodhna (Devenish Nutrition; UCD School of Archaeology) - Davis, Stephen (UCD School of Archaeology)
Presentation Format: Oral

The Devenish Lands at Dowth is one of the largest land holdings (c.174ha) within the core area of the Brú na Bóinne World Heritage

Site. With thirteen recorded monuments, ranging in date from the Neolithic to the later medieval period (13th/14th century), and a significant prehistoric and medieval landscape detected beneath ground level by a programme of remote sensing coordinated by UCD School of Archaeology, the estate also represents a significant archaeological landscape in its own right. Since 2013, the landowners have sought to better understand the cultural heritage and importance of their land, and have engaged a range of experts to advise during the design, implementation, and outworking of the emerging vision for the Devenish Lands at Dowth. Public-private collaboration has been essential to the development of this vision, in particular the research partnership with UCD School of Archaeology, as well as engagement with the Irish statutory authorities.

This paper will present the research that is being undertaken on the Devenish Lands at Dowth, in particular looking at the challenges and opportunities in adopting a synergistic, multi-disciplinary approach to the understanding of an archaeological and agricultural landscape. It will also explore the potential of public-private partnership in financing and furthering archaeological research within World Heritage Sites.

03 VISITOR EXPERIENCE OF EPHESUS MULTI-LAYERED ARCHAEOLOGICAL LANDSCAPE AS AN ANCIENT ROMAN CITY: A CRITICAL APPRAISAL FROM A MUSEOLOGICAL PERSPECTIVE

Author(s): Akture, Zeynep (Izmir Institute of Technology, Department of Architecture)
Presentation Format: Oral

"Ephesus" is inscribed on the UNESCO World Heritage List since 2015, as a serial property of four components: prehistoric Çukuriçi Mound; Ancient City of Ephesus; Ayasuluk Hill, Artemision and Medieval Settlement with the Basilica of St. John and Isa Bey Mosque; the House of Virgin Mary. This attests settlement continuity in a continuously evolving landscape.

All components are open for visitors except Çukuriçi Mound, though the Ancient City receives the greatest number, mostly from cruisers docking at Kuşadası and Izmir harbours. Rivalling agencies schedule at most two hours for guided tours starting from the upper and ending at the lower entrance of the archaeological site, along the main street of the ancient city with restored Roman period monuments.

Tours searched by engines such as the TripAdvisor-owned Viator are promoted through these monuments, with the great majority mentioning Library of Celsus and the Great Theatre at least once. The former also appears as the key visual in the majority of tour pages that may also list picture in front of the Library of Celsus among key activities. Although it is the most cited monument in the Viator-listed tours, the Temple of Artemis is loosely linked with the main tourist itinerary since it is usually visited before St John's Basilica, Isa Bey Mosque, and Efes Museum, which obscures the vital historic link between Ephesus and the Artemision, partially due to the latter's poor state of preservation.

In the modern tourist experience of the urban topography, the cumulative image of Ephesus is, therefore, one of a Roman city instead of a multi-layered archaeological landscape that owes its Outstanding Universal Value to this aspect. On this basis, the proposed paper will discuss the share of museological choices on popular images held of archaeological sites, emblematised for Ephesus by that of the Library of Celsus.

04 THE BRÚ NA BOINNE WORLD HERITAGE SITE RESEARCH FRAMEWORK – (NEARLY) 10 YEARS ON...

Author(s): Smyth, Jessica (University College Dublin)
Presentation Format: Oral

The 'Archaeological Ensemble of the Bend of the Boyne' (Brú na Bóinne), Ireland was inscribed on the UNESCO World Heritage List in 1993. In addition to the well-known complex of Neolithic passage tombs containing the largest concentration of megalithic plastic art in Europe, the site was also deemed important for the 'long continuity from prehistory to the late medieval period' (Criterion iii, UNESCO 1993). This, somewhat implicit, landscape designation was highlighted in the subsequent research framework for the Brú na Bóinne World Heritage Site (Smyth 2009), although to date research programmes and heritage planning initiatives remain more or less focused on the large, individual Neolithic monuments within the WHS. This paper provides an overview of progress within the Brú na Bóinne WHS since the publication of the 2009 research framework, the first undertaken for the WHS, and seeks to evaluate the document's success. What, if any, of the big research questions have been successfully addressed? Are we any closer to understanding the Brú na Bóinne landscapes, from prehistory to the present day, and to what extent are ongoing attempts at research frustrated by differently aligned heritage management objectives and the funding shortfalls all too common in an age of austerity?

05 CHALLENGES AND POTENTIALS IN WORKING WITH THE COMMUNITY AT THE BRÚ NA BÓINNE WHS, CO. MEATH, IRELAND

Author(s): Davis, Stephen (University College Dublin) - Lionáin, Clíódhna (Devenish)
Presentation Format: Oral

This paper seeks to expand upon a short presentation given at EAA2017 regarding problems and potentials regarding the management of the Brú na Bóinne World Heritage Site, Co. Meath, Ireland. Brú na Bóinne represents one of only two archaeological WHS in Ireland, most famous for its massive passage tombs and their megalithic art, as well as a settlement and agricultural history dating back to the early Neolithic. The paper will provide an overview of management policy regarding the WHS to date and discuss the impact the management history has had as regards local perceptions of and interactions with the WHS. This will be discussed from

the perspective of increased 'commodification' of heritage, particularly in the Boyne Valley, often seen as perhaps Ireland's most 'heritage-rich' landscape and an area which is actively encouraging increased tourist footfall. In particular, it is clear that there is increasing antagonism (from what was already a difficult situation) between local stakeholders, regional stakeholders and national stakeholders which make working in and managing the WHS especially challenging. This extends as far as actually defining who these groups actually comprise. By providing a precis of the situation as it stands, this paper also begins to offer suggestions as to how the current situation might be addressed going forward.

06 A VICTIM OF ITS OWN SUCCESS? SUSTAINABLE MANAGEMENT OF THE ICONIC SITE OF STONEHENGE IN THE 21ST CENTURY

Author(s): Sebire, Heather - Davis, Kate (English Heritage)
Presentation Format: Oral

The World Heritage site of Stonehenge, Avebury and Associated Sites was inscribed by UNESCO in 1986 for its complexes of outstanding prehistoric monuments. The recent Stonehenge Environmental Improvements Project has gone a long way to achieve the objectives of improving the landscape setting of the Stonehenge part of the site, by reducing noise and visual intrusion from inappropriate structures and roads; significantly enhancing the visitor experience through the provision of improved, environmentally sustainable, visitor facilities; improving the interpretation and improving access to selected monuments thereby enhancing the learning experience for visitors and increasing understanding of the whole World Heritage Site. A lot of this work was achieved by working closely with other heritage partners including the National Trust and Wiltshire Council. The success of the project coinciding with the rise in global tourism has brought a huge increase in visitors –many more than were envisaged when the scheme was drawn up.

The challenge now lies in conserving and managing the site while protecting its authenticity and outstanding universal value. Maintaining a vision for Stonehenge while ensuring Commodification does not occur but also addressing the World Heritage Convention's strategic objectives of Credibility; Conservation; Capacity Building; Communication and Communities is at the fore front of the conservation management and smooth operation of the site.

This paper will illustrate how these objectives are addressed while simultaneously offering the public access to a world class experience of the most iconic part of the site at Stonehenge in particular.

771 ARCHAEOLOGY & ANARCHISTIC THOUGHT – THEORETICAL STANDS AND DIRECT ACTION?

Theme: Theories and methods in archaeological sciences
Organisers: Grahn Danielson, Benjamin (Picea kulturarv) - Swedberg, Stig (Rio Kulturlandskapet) - Lerma Guijarro, Alma (Complutense University of Madrid) - Mejías García, Juan Carlos (University of Seville)
Format: Regular session

Is it possible that the education we all received has so warped our minds that the very notion of freedom ends up by being lost, and disguised in servitude?

Is it possible, that we, by re-using the same old theories and methods, repeatedly focus on hierarchies as an explanation for the archaeological material we observe?

Is it possible, that we could find other paths for exploring socially democratic and liberal communities in the past – to help build for the future?

We invite you to a session that explores anarchistic thought in archaeology. We welcome theoretical studies and practical examples. We also welcome examples that relate to the organization of archaeology itself, and studies of anarchistic societies of the past.

An anarchistic archeology provides an opportunity to interpret society from different perspectives: beyond the debate on the collapse of unequal and stratified systems, showing how past societies also rejected and resisted the emergence of the state (concentration of power and division of the social body), through more equal alternatives of sociopolitical organization, without power as a division strategy.

Understanding power as the central axis: both of the state and as a mechanism to possess, coerce and dominate communities and individuals. Anarchism promotes ideas of personal empowerment and responsibility, as well as renunciation of power and disempowerment from the bottom up, and challenge capitalism.

The aim with our session is to broaden the knowledge of anarchistic thought and archaeology, and form an arena for further discussion.

01 ANARCHISTIC ARCHAEOLOGY – THEORY IN ACTION

Author(s): Grahn Danielson, Benjamin (Picea kulturarv)

Presentation Format: Oral

Anarchistic Archaeology – Theory in Action. The session-abstract starts with a circumscribed quote from Peter Kropotkin (one of the most important anarchistic philosophers in the beginning of the 20th century). The quote itself questions the idea of the educational system, our way of thinking and organising the society. The circumscription questions parts of contemporary archaeology, but also opens for a new development of understanding today's archaeology.

After nearly a decade in a cooperative archaeology business(es), I have met an anarchistic way of organising archaeology on an everyday basis. This introduction will therefore start from a personal view, but it will continue in addressing other issues and highlight different ways of archaeology and anarchism.

Ideas, from Zeno of Elea to the Age of Enlightenment, revolutionary's during the 19th century, American utopias, and 20th century thinkers are all giving contributions to this non-homogeneous genre. But anarchistic theory is not wide spread at the faculties and archaeological institutions. Cultural historical archaeology, Processualism, Post-Processualism, Neo-structuralism was mentioned all the time at the universities, when reading about the historical structure of archaeology. Marxist archaeology was focusing on the materialistic part of the society meanwhile a nationalistic historiography explained the states view upon the ancient past, often visualised at museum exhibitions. Maybe anarchistic theory was forgotten, maybe it was hidden as its explanations often questions the one doing the archaeology and building the museums?

Weather you think you are going to attend a chaotic session (and get to work with your prejudices), aiming on re-organising your workplace, criticise university education or to describe past societies, this session will glimpse the door to anarchistic thought.

02 ARCHAEOLOGY AS ANARCHISM IN PRACTICE

Author(s): Carman, John (Ironbridge International Institute for)

Presentation Format: Oral

This paper will outline two ways in which archaeology can be considered a suitable model for the creation of an anarchic society. Anarchists deny the legitimacy of authority and of property and archaeology has the capacity to challenge both with an alternative vison.

Firstly, archaeologists can be seen to organise themselves in an anarchistic manner. The way in which archaeology as a discipline is divided into sub-disciplines and further into sub-sub-disciplines and so on until its lowest division is that of the individual archaeologist reflects the anarchistic ideal of the federation of federations in which the individual is the lowest decision-making unit. It can be argued that this drive towards division and separation paradoxically also provides the unity that is archaeology, but without the need for any kind of authoritarian control.

Secondly, it is widely accepted that the work we do is conducted on behalf of the wider community, so that (as Charles McGimsey put it in 1972) "there is no such thing as a 'private' archaeology". This being the case, the material with which archaeologists deal and the outputs they produce cannot be owned, presenting an alternative to the presumption of the existence of property rights. Archaeology provides the opportunity to demonstrate how a non-property regime can work in practice, offering a vision of very different economic relations.

Archaeology offers a prospect of anarchism in practice.

03 SOCIETIES WITHOUT RULE: A NORMALITY OF EUROPEAN PREHISTORY?

Author(s): Mueller, Johannes (Institut fuer Ur- und Fruehgeschichte Kiel)

Presentation Format: Oral

Did societies without rule exist? In contrast to the opinion that more complex societies are more stratified than others, ethnographic observations display a different social picture. Worldwide many examples exist, in which dense populated and technical advanced societies are organized without rule, sometimes directly beside extremely stratified societies with similar demographic and technological values. In conclusion, 'egalitarian societies' might be hidden in writing history as they contradict discourses that favour a link between the degree of complexity and of social stratification.

At all, for European prehistory, two models of the development of social inequality can be delineated: one model indicates a tendential increase as opposed to a second, which assumes a wave-shaped increase and decrease of social stratification. In the latter, rebellions and other forms of resistance against social differentiation are identified as one of many practices within societies to prevent social stratification. Within the scope of this paper I would like to focus on two examples, in which on the one hand, the development of hierarchies and, on the other hand, the balance of social differences as counter developments effect and mould societies. Funnel Beaker societies of Central and North Europe display clear aspects of balance and hierarchy as well as Trypillia sites of the Northpontic region (ca. 4100-2800 BCE). While in the north, relatively small populations of agriculturalists prevailed. North of the Black Sea proto-urban societies with immense population figures existed. Both were societies without rule?

04 FEMINIST ARCHEOLOGY - A NECESSARY ARCHEOLOGY

Author(s): Lerma Guijarro, Alma (Complutense University of Madrid)
Presentation Format: Oral

The Feminist perspective applied to archaeology reveals that the heteropatriarchy is at the base of the discipline's own development, having marked its own nature, its operating structures and the construction of discourses on the past generated by archaeologists, the long of the time. This gender bias relegate women to a secondary position, as in the professional performance of archaeology, as in the construction of historical discourses, as well as, in general, in their role in the past. This has created an unfair archaeology, at the service of sexist structures of domination and with which justified actions and attitudes that are not equal in the present.

We find these problems in the language, where studies speak of man as a reference for all humanity, leaving women as something non-existent in the past. Likewise, the material remains of the past are also interpreted, ordered and classified, giving little or no importance to the materials and contexts associated with women and the work carried out by them, and magnifying the importance of the work carried out by men.

Museums, informative magazines etc. can be armed allies, but they could also be dangerous, if not used with care. When people who do not study archaeology visit museums or read magazines they take what they see as a reality, without questioning what they are seeing, and what they see are representations of women in the background, when not, sexualized.

05 ESTE IRON AGE CULTURE (NORTH-EASTERN ITALY) AND BOURGEOISIE: A LONGUE DURÉE EMBLEM OF MIDDLE CLASS THOUGHT

Author(s): Vanzetti, Alessandro (University of Rome "La Sapienza")
Presentation Format: Oral

The discovery of the Iron Age culture of Este (10th -3rd cent. BCE), during the second half of the XIX century CE, brought to light impressive testimonies, mostly of cemeteries, multi-stratified and ordered, hosting carefully cremated deceased with their grave goods; in sanctuaries, dozens of bronze figurines and engraved sheets of bronze helped recognize male warriors and veiled women as worshippers.

An apparently stable and prosperous world was interpreted to be depicted, that the ancient sources helped to track in its destiny of fall under the Roman dominion without conflict.

The image of a society well organized, religious and respectful of authority came thus to the fore, and influenced the general attitude toward this cultural heritage, that came easily into the shared bourgeois imagination of the North-East of Italy. The connections of this image of the Iron Age life with the XIX and XX (and XXI) century ideology of Catholic Veneto region are impressive, and one comes to figure how far it is an effective case of longue durée bigotry and cultural obeisance to power structures or a modern Middle class construction, reinforcing the status quo.

This is a case in which anarchist deconstruction and questioning is particularly interesting, as a critical tool, an experiment in sociology of research and in cultural construction.

06 NEGATION, REBELLION, RESISTANCE TO THE STATE IN THE 3RD MILLENNIUM BCE. THE CASE OF THE CHALCOLITHIC SETTLEMENT OF VALENCINA

Author(s): Mejías-García, Juan Carlos (University of Seville)
Presentation Format: Oral

The settlements with ditches of the 3rd millennium BCE have become in recent times a battlefield in which different theoretical and ideological proposals try to gain control of the explanation of recent prehistory, especially in the SW of the Iberian Peninsula. Really, the new proposals try to combat the explanation that Marxism was doing previously, imposing the dictatorship of the archaeological record as a justifier and promoter of thought, and advocating ideological asepsis. In Valencina the archaeological record shows a process of State implantation that is aborted, denied, rejected, resisted by the community that was consenting to it. This is one of the few examples throughout history where the State has been able to be reverted to the previous situation of social indivision and devolution of power to the social body. That resistance could triumph and revert the incipient State, among other things, because the consensus that the dominant classes had up to now, granted by the dominated classes, could not be counteracted by the exercise of the imposing force by means of a coercive apparatus that they had not developed.

It's a disempowerment process that say "no" to everything that represented power, its concentration and the forms of expression of inequality and division into classes:

- No to the ditched enclosures.
- No to the population concentration in large settlements.
- No to the campaniform.
- No to discriminatory spaces for death.
- No to the difference in the diversity of the funeral containers.
- No to the grouping of production activities.

None of these elements, none of these phenomena, none of these activities are given in Valencina in the 2nd millennium BCE, and we dare to say that neither in the rest of the peninsular SW.

07 C.R.A.S.: ARCHAEOLOGY AND ACTIVISM

Author(s): Terol, Lidia (University of Alicante)
Presentation Format: Oral

Archaeology is a discipline that studies, with a scientific methodology, ancient societies through their material culture. This generates knowledge that is fundamental for knowing where humanity is going and for each individual what attitude to adopt within their community, having learned from the mistakes of the past. In recent years, it has begun to question its role, because the current situation of the archaeology at the informative level is poor and biased. It's true that people, who it's not related with this academic circle, could be closed to this information thanks to museums, but it's passive and the vision it provides is usually simplistic and partial, proving the mechanisms of oppression of capitalism (sexism, racism, classism...). For this reason, it's necessary to find another way for Archaeology to be a common good and not something exclusive to universities, and therefore, to the elite. Thus, Archaeology is born as a form of activism. In Spain, one of the examples of this new movement is Centro Revolucionario de Arqueología Social (C.R.A.S., in English, Revolutionary Center of Social Archaeology), a non-profit group of Archaeology and Cultural Heritage that defends an archaeology as a political activity, as well as a tool to promote critical thinking and create class, feminist, generational and cultural consciousness, among others. In this manner, it would allow for the creation of historical speech's outside of power too.

C.R.A.S. was formed in February 2017 with the aim of making an archaeology: 1) closer to citizenship, 2) more committed to the society in which it is developed, 3) that develops initiatives that promote reflection and self-criticism among archaeologists on the meaning of our activity, 4) that defends creativity and the playful thing as the best ways to participate and build the community.

08 ARCHAEOLOGY AS ANARCHY

Author(s): Swedberg, Stig (Kulturlandskapet)
Presentation Format: Oral

Anarchy can, as example, be defined as a philosophy, ideology, culture or as relationships. As these examples suggests it could be helpful to study archaeology, or the material culture of human societies, from an anarchistic point of view.

Most work done in this line of thoughts have dealt with the study of societies that can be described as anarchic or at least non-hierarchical. But humans, as Macdonald put it; need to interact but not to always form societies. When we study the interaction of humans with or without the society we study the temporal, the nongoverned parts of society. A place where anarchy is being practised within a hierarchical society could be described as a place beyond control. Can we actually find and understand a certain kind of material culture as an anarchic one?

In this paper I will try to explore how a place beyond control could be recognized by presenting a case study. The key element for this interpretation is the absence of monumental structures as they are conceived as hierarchical, but also that the activities was carried out at some distance from the assumed (power) center. Another important part in this interpretation is the use of long-term history. In this case about women's role in the farming society in Scandinavia and the specific role they executed when managing the summer farms.

09 QUESTIONING STATE'S TIGHT GRIP: CULTURAL HERITAGE IN THE REALM OF THE COMMONS

Author(s): Lekakis, Stelios (Newcastle University)
Presentation Format: Oral

In the current state of economic recess and the repurposing of social and political agendas in Greece and Europe, there has been a growing demand for economically efficient cultural products and various proposals for their sustainability in monetary terms. Hidden behind them is the omnipresent rhetoric of the "inability of the public bodies to manage" and the "need to support competitiveness and entrepreneurship to leverage the cultural capital" for the benefit of the national economies. These discussions can be easily associated with various attempts to further enclose other goods of the public/common sphere, as natural resources, Internet and information. On the other hand, various movements for the re-appropriation of public/common goods have been springing around Europe associated with anti-austerity, anti-fascism and ecology, demanding the return of the resources to their rightful owners, the people.

Within this context, in this paper we will be discussing the potential and dynamics of placing heritage in the realm of the commons in Greece, examining it as a Common Pool Resource and progressively as a Common. This process is quite complex and related with a number of legal and social issues and especially the role of heritage in modernity and the building of the contemporary nation-state. However, drawing from the current political context, the European cultural organisations' background (UNESCO, ICOMOS etc) and progressions in the realm of the social & solidarity economy, we will attempt to sketch a path towards the understanding and management of cultural heritage as a common that could potentially be applied in a European context.

10 DOING ANARCHY IN ARCHAEOLOGY?

Author(s): Meier, Thomas (University of Heidelberg, Institute for Pre- and Protohistory and Near Eastern Archaeology)
Presentation Format: Oral

What does – if it has a meaning at all – a single grave mean, which was excavated in Götting (Bavaria) containing a pot and a silver fibula both of south-eastern European „origin"? In the old days it was interpreted as a proof of the „Gothic migration" around the years 400 AD. But with the end of ethnic interpretations in early medieval archaeology it is void of meaning today. Nevertheless an anarchic interpretation in terms of resistance theory is widely rejected by most colleagues. Is a void better than anarchy and resistance?

Starting from post-anarchistic theories in general and especially from a Foucaultian understanding of power questions arise on power structures and anarchist concepts in archaeology. Today it is not that easy to fight power by simply fighting „those at the top" if power is embedded in discourses which are kept running by all participating in such an empowering discourse: experts AND „the public", teachers AND students, males AND females, Europeans AND Non-Europeans, reviewers and reviewed asf. Is it „anarchic enough" to follow the Foucaultian endeavour and lay open the working of discourses? A generation after Foucault we have realised that it does not break the power of a discourse, if it is made obvious, but that it simply leaves us alone with the responsibility for it (still) working …

Finally and from a Marxist perspective we may ask whether anarchist interpretations of the past are more than utopias to keep „the people" calm and stifle resistance to the ruling white middle-class – quite in a romantic tradition of the noble savage from Herodot and Tacitus down to Thoreau.

11 CHARCOAL PIT KILNS AS RESISTANCE

Author(s): Grahn Danielson, Benjamin (Picea kulturarv)
Presentation Format: Oral

Charcoal pit kilns are not the most impressive feature from times past. If you discover one when strolling around in the Scandinavian forests, you will probably see a 1,5-meterwide pit in the ground, with low earth walls surrounding it. That's it. The traditional (evolutional) research describes the charcoal pit kiln as the first feature to produce charcoal (the oldest one in Scandinavia is dated back to early Iron Age), followed by the laying stack during 1200 AD and the standing stack from the 1600 AD. Since the 1990s archaeology has changed the view on charcoal production, and now feature a more functionalistic explanation with charcoal pit kilns existing and being used at the same time as the larger, more industrial charcoal stacks.

Instead of looking at charcoal pit kilns as a more "primitive" way of producing charcoal or using theories about the area's ecological viability and market potential as an explanation for production, this paper focus on charcoal pit kilns as demonstration for a lack of power, or disempowerment in a society.

There were charcoal pit kilns, producing charcoal to a medieval blommery, at the same time as larger blast furnaces were in use nearby. The former features need less work but produce less. The latter need another type of organisation, by some or someone. The production from the latter also need a bigger market then the local society. Thus, the production method crosses the roads of power. From a compilation of all excavated and dated charcoal pit kilns in Sweden and their connection to late blommeries, I want to discuss the charcoal pit kiln as a way of resistance. A resistance to the power and the growing crown during medieval times as well as a resistance to power until early 1900s.

773 DOCUMENTING ENDANGERED HERITAGE SITES

Theme: Theories and methods in archaeological sciences
Organisers: Vágner, Zsolt (Archaeological Institute of Pázmány Péter Catholic University) - Gomez Bach, Anna (Universitat Autonoma Barcelona, Department of Prehistory)
Format: Regular session

Documentation plays a fundamental role when heritage is at risk. The current military conflicts lead to heritage being erased from memory. New methods and technologies let to work in recording, preserving and restoring but all of them involve interdisciplinary research and not always the projects can be accomplished. Altogether, contributions should enhance our knowledge about techniques and about identification, interpretation, preservation and restoration under risk.

In that context, aspects such as Under-Documenting and Over-Documenting play an important role in data management in a long-term and secure aspects. Best practices in 3D modelling, architectural reconstruction and interpretation can provide fundamental information to approach to cultural heritage.

Trough real examples and solid projects best practices will be underlined and reinforced for further field work operations.

01 WORKING IN SYRIA AND PREHISTORIC ARCHEOLOGY: REVIEW OF A LINE OF RESEARCH DURING A PERIOD OF INSTABILITY

Author(s): Molist, Miquel - Taha, Buchra - Cruells, Walter - Gómez, Anna (Universitat Autònoma Barcelona- UAB)
Presentation Format: Oral

In the broad Middle East, and upper mesopotamia and Syria in particular, a long period of archaeological research with excellent results took place since end XX century. This research has enriched all the historical periods, including prehistory.

In the last decades '90 of the XX century and '10 of XXI century, a number of field work and research within different archaeological teams and laboratories have been developed. From Early Palaeolithic to Chalcolithic several teams had the opportunity to enrich their theories with new data from well-stratified sequences from diferent sites. But, from the last 7 years the situation is totally unstable although scientific work has not stopped.

This contribution presents a detailed review of the work carried out by the SAPPO-UAB research group in different sites and diferent geographic areas of Syria during the period 1987-2016. Specifically, since early farmers to late Pottery Neolithic settled in the main rivers and strategical areas. Main sites such as Tell Halula (Euphrates valley), Umm el Tlel (Palmira oasis) or Chagar Bazar (Khabour valley will be revisited in a historiographical perspective. The interrelation between field work data, laboratory analysis, scientific research and social diffusion will be analyzed in a constructive criticism point of view.

02 DOCUMENTING THE WORLD HERITAGE SITE OF CRAC DES CHAVALIERS (QAL'AT AL HOSN) DURING TIME OF WAR

Author(s): Vágner, Zsolt (Pázmány Péter Catholic University Institute of Archaeology) - Vasáros, Zsolt (Budapest University of Technology and Economy, Budapest Hungary) - Hanna, Hazem (Directorate General of Antiquities and Museums, Crac des Chevaliers) - Alejji, Edmond (Directorate General of Antiquities and Museums, Damascus)
Presentation Format: Oral

Crac des Chevaliers (Qal'at al Hosn) is the symbol of the crusader military architecture and one of the most important heritage and touristic site of Syria. This World Heritage Site is one of the most important standing monument of the European medieval culture in Near-East. The first studies done by the most known French scholar Paul Deschamps at 1930's, and later a in the early years of 2000 German - Swiss - Luxembourg missions carried out who published the major monographs of the castle. The current project of Syro-Hungarian Archaeological Mission has started after the castle was a victim of the ongoing military conflicts of Syria and liberated at 2014. Several damages occurred by these sad events which caused the needs to start a complex documentation of the castle based on the most relevant digital technologies. Beside a general architectural survey most of the works are concentrated on the damaged parts of the castle to prepare a detailed documentation for the most needed conservation and restoration works. The new possibilities of the current 3D photo-scan technologies combining with the precise topographical surveying tools used for this work provided great results and several challenges. One of the most relevant question is how to optimize the data capture to have enough information but in a reliable format and size. Another important issue is to work out the scientific documentation not only a survey documentation.

03 HOW CAN REMOTE SENSING HELP IN DETECTING THE THREATS TO ARCHAEOLOGICAL SITES IN UPPER EGYPT?

Author(s): Chyla, Julia (Antiquity of Southeastern Europe Research Centre University of Warsaw)
Presentation Format: Oral

The analysis of contemporary and archival satellite images and archaeological documentations presents the possibility of monitoring the state of archaeological sites in the Near East (for example, Palmyra in Syria). As it will be demonstrated in the case of Upper Egyptian sites, the rapid growth of agricultural lands and settlements can pose a great threat to sites localized on the border of fields and the desert. As a case study, the Qena district was chosen, a region of significance for the history of ancient Egypt. To trace the expansion of agriculture and the development of modern settlements, a synthesis of archival maps (from the last 200 years), and archival and contemporary satellite images was created. By applying map algebra to these documents, it was possible to determine areas which may be marked as "Archaeological Hazard Zones". Additionally, a so called "comprehensive field survey", done with the use of mobileGIS, was conducted on one of the most threaten site - Gebelein. This method gave the possibility of fast and accurate verification of the threats in the field and additionally gathering surface data.

The analysis helped to trace the expansion of agricultural areas during the last 200 years and the influence of both—ancient Egyptians and the Nile—on the local landscape.

04 DOCUMENTATION OF DAMASCUS CITADEL AND ITS BUILDING HISTORY

Author(s): Alejji, Edmond (Directorate General of Antiquities and Museums Syria)
Presentation Format: Oral

Founded in the 3rd millennium B.C., Damascus was an important cultural and commercial centre. It's considered to be among the oldest continually inhabited cities in the world, the city exhibits outstanding evidence of the civilizations which created it; Hellenistic, Roman, Byzantine and Islamic. The earliest visible stone buildings evidences date to the Roman period are; the extensive remains of the Temple of Jupiter, the remains of various gates, an impressive section of the Roman city walls and certain decorated blocks within the walls and towers of the citadel. Damascus citadel occupies the northwest corner of the old city, dating back to the Islamic period in general, but many of the theories and discoveries suggest the date of its foundations to the Roman period.

As most synthesis done on the architectural history of Damascus Citadel has been started a century ago where, at that time the site was crowded with late Ottoman buildings or building dating from the French mandate, so researchers were unable to verify the theory of the citadel being rooted in the pre-Islamic period. Based on the research we conducted over the last two decades and the analytical study we conducted on the old publications, in addition to the excavations carried out over many places within the citadel (its courtyard, towers and galleries …etc.) all these results outbalance the hypothesis of the older roots of the Islamic citadel. This is what we will try to explain though this worksheet.

05 DOCUMENTING OF MEDIEVAL WATER MANAGEMENT SYSTEM OF THE CRAC DES CHEVALIERS (QAL'AT AL HOSN) WORLD HERITAGE SITE

Author(s): Csoka, Zsofia - Vágner, Zsolt József (Pázmány Péter Catholic University Institute of Archaeology)
Presentation Format: Oral

The World Heritage Site castle Crac des Chevaliers (Qal'at al Hosn) in Syria is one of the most important symbol of the European medieval military architecture. The castle built by the military order of the Hospitalers (Knights of St. John) with a very sophisticated water management system. The 3 hectare size castle had no natural water source on the top of a basalt plateau. All rain waters were collected in several cisterns and a complex ecological system was built out from the drinking water through the bathes until cleaning the toilets. The main reason of this study was to help to prepare the architectural restoration planning for the ongoing reconstructs. The region is famous about the intensive winter and spring rain-showers so one of the big challenge is all the time evacuate all the waters from the roofs reusing most of the original water canals, tanks and cisterns and toilets. A general non-invasive geophysical survey with GPR carried out in the inner castle and a detailed classical 2D and a 3D photo-scan has been done survey done in the last sessions in the frame of the Syro-Hungarian Archaeological Mission. Several parts were excavated in the last year. The final aim of the project is work out a detailed documentation of all possible structures of the historical water canalisation and to understand its management to help to reconstruct it as much as possible.

06 DOCUMENTING LEBANESE MEDIEVAL CHURCHES

Author(s): Vágner, Zsolt (Pázmány Péter Catholic University Institute of Archaeology) - Kahwaji-Janho, Hany (Holy Spirit University of Kaslik)
Presentation Format: Oral

The Lebanese medieval churches constitutes a large complex of several hundred monuments located mainly in the northern side of the country. Most of them were built between the XI.th and the XV.th centuries and belongs to three main types: the mononaved type, from far the most common one, the basilical type, which includes not more than 20 monuments and finally the double churches type, a particular one that constitutes a corpus of around 50 churches. As some of these churches are still in use, some others, especially located in rural or abandoned areas are falling into ruin due to lack of maintenance. Thus a large program of surveying these churches as well as of restoration and preserving some of them was implemented by the University of Holy Spirit of Kaslik (USEK) in partnership with the Pazmany Peter Catholic University of Budapest (PPCU). This program of restoration, funded by the Hungarian government aims for a sustainable conservation of some of these monuments as well as for undertaking archaeological works in order to better understand the sites of these churches which are most of the time previously occupied by antique monuments, mainly Roman temples. This program, which will be involving professionals and students from the architecture, restoration and archaeology domains, will include the use of traditional modern techniques of surveying and restoration. A website to promote the project as well as the preserved heritage will be also produced.

07 SUBMERGED SITES UNDER THREAT: DEFINING NEW STRATEGIES FOR THEIR MONITORING AND PRESERVATION

Author(s): Landeschi, Giacomo - Nilsson, Björn - Sjöström, Arne (Lund University)
Presentation Format: Oral

According to UNESCO, threatening impacts of climatic, geological or other environmental factors must be included among those issues that might affect the preservation of a Cultural Heritage site, constituting a major source of danger.

In recent years, archaeological sites dated to Mesolithic, 9000 Cal. BP, have been identified and partially-located in what is nowadays a submerged area of the Baltic Sea, in Southern Sweden. They consist both of isolated artifacts and more articulated settlement

areas that now are under threat due to the erosive action exerted both by environmental and anthropic factors.

The Blue Archaeology project is a recently-established collaborative research framework whose ultimate scopes include the monitoring and management of the submerged archaeological sites in the southern Baltic Sea. To reach this goal, a digital work pipeline has been developed and a combination of advanced methods of data acquisition and analysis are proposed and possibly, extended to a wider range of case studies. This paper will try to shed new light on the contribution that high-resolution digital datasets can play in monitoring and assessing the state of preservation of submerged archaeological sites. In addition, some preliminary results illustrating the combination of complex 3D information and GIS-based analytic tools in support of data collection and analysis will be presented. On a more theoretical level, the present case study aims also at discussing new directions towards the use of three-dimensionality as an additional instrument to improve strategies of preservation of endangered cultural heritage sites, with a special focus on threatened submerged archaeology.

08 USING GIS CLOUD SERVICES AND STRUCTURE-FROM-MOTION PHOTOGRAMMETRY TO SURVEY AND MAP THE CONDITION OF RUNESTONES IN UPPSALA COUNTY, CENTRAL SWEDEN

Author(s): Lucas, Robin (Upplandsmuseet)
Presentation Format: Oral

Uppsala county harbours a total of 519 runestones and runic inscriptions. The stones were erected during the 11th and early 12th centuries, mainly by early Christians in the Mälaren basin, then a largely pagan region. Being among Sweden's earliest written documents, they functioned as memorials, inheritance claims, and statements of Christian mission. Some stones were incorporated into churches in the 12th–15th centuries, but more than 470 remain outdoors, many still in their original locations.

Runestones were among the first of Sweden's ancient monuments to be studied by antiquarians, with treatises and sketches appearing in the late 16th century. However, no comprehensive survey has been conducted since the publication of a national encyclopaedia of runic inscriptions in the 1940s and 50s. Sixty years on, our knowledge of the present condition of individual stones vary. While some stones are maintained and kept in immaculate condition, others have fallen into obscurity, been overgrown or vandalised.

Upplandsmuseet is currently conducting a two-year project surveying the current state of the stones. The survey has two aims: one is to collate a comprehensive database of the status and condition of the county's runic heritage, the other to make the stones more accessible to the general public. The project involves detailed inspection of each stone and documenting it using an ArcGIS application. The method utilises ArcGIS online services to upload the data in real time, for efficient data retrieval and analysis. Another aspect of the survey is the systematic documentation of the stones using structure-from-motion photogrammetry, creating and publishing 3D-images on the Sketchfab community website. While the survey itself is an exercise in heritage preservation, the subsequent online presentation of the monuments serves to present the stones to an international audience.

09 DIGITISING MEGALITH - THE POTENTIAL OF DIGITAL PRESERVATION FOR ARCHAEOLOGICAL RESEARCH

Author(s): Klinke, Leo (Commission for Westphalian Antiquities) - Schierhold, Kerstin (LWL)
Presentation Format: Oral

Since 19th century archaeological ground monuments have been cataloged and documented to preserve knowledge of these sites in Westphalia, Germany. Each documentation is determined to human subjectivity, but it's possible to reduce these to a minimum due to the technological progress. Today the monuments are documented in high-resolution, captured as digital copies in bits and bytes and thus preserved for posterity. This digital preservation is detached from the real material and allows a global storage of the external form, the hyle.

The project "Megalithic in Westphalia" documents and preserves various megalithic tombs each with more than 370 million measuring points using image-based modeling. Because the monuments are exposed in publicly accessible landscape areas they are endangered by erosion and vandalism. In addition to conservation high-resolution surveying also provides the opportunity for new archaeological research without interfering with the original substance. By this way it's also possible to virtually reconstruct megalithic systems whose stones are completely postponed today. For this purpose the individual stones first are clipped virtually of the digital preservations 3D-model for free movement. At their contact points and bearing surfaces the stones aren't documented and consequently they have virtual holes in the digital model. However, the corresponding surfaces can be correctly reconstructed and closed using a special algorithm. Based on the current position of each stone the original locations of the boulders can be investigated and proven. In particular, new insights regarding the well done statics and construction of the Neolithic structures as well as their architectural concepts are presented.

The paper presents best practice examples of digital preservation and further processing of digital 3D data in exemplary differentiated workflows which can certainly be applied to other archaeological reconstruction projects.

10 FITTING A ROUND PEG INTO A SQUARE HOLE: THE APPLICATION OF HBIM TO THE DOCUMENTATION AND CONSERVATION OF HISTORIC STRUCTURES

Author(s): Corns, Anthony - Shaw, Robert - Devlin, Gary - Deevy, Aaron (The Discovery Programme) - Murphy, Maurice (Virtual Building Lab; Dublin Institute of Technology) - Cahill, John (Office of Public Works - OPW) - Pybus, Cailen (CIMS - Carleton Immersive Media Studios, Carleton University) - Gallant, Martine (CIMS - Carleton Immersive Media Studios, Carleton University)

Presentation Format: Oral

Building Information Modelling (BIM) is a process and methodology which enables the both the information and graphical components of the built environment to be structured in a way to enable efficient and collaborative building construction and management practices. The application of BIM to historic structures and buildings has formulated a subset entitled Historic Building Information Modelling (HBIM).

The process of developing a HBIM involves several processes including:

- The survey and automated data capture of existing structures and sites using geospatial imaging methods (photogrammetry, laser scanning, mobile mapping)

- Mapping of parametric and information rich objects onto a geometric framework developed from survey data. The parametric objects which represent the architectural elements are graphically constructed or coded and are based on architectural rules and shape grammars.

- Incorporation of intelligent objects (multi sourced social, historic and engineering data) within the HBIM

- Presentation and sharing of resulting HBIM with a range of stakeholders and sectors.

The resultant HBIM can then be used for automatically producing conservation documentation and for information and knowledge extraction in addition to visualisation. As a multi-disciplinary and evolving system, researchers from computing, architecture, archaeology, engineering and other heritage areas are improving the process for efficiency and for creating more open systems.

This paper explores the experiences and methodologies developed during the creation of a HBIM for Leinster House; a Georgian Mansion constructed between 1745-47, which now houses the Oireachtas (Irish Parliament). Specific points of discussion include:

- Methodology for the collection, organisation and presentation of high volume laser scan data of historical structures within BIM environment.

- Development of protocols for the modelling of historic building features and the ability to represent conservation information within HBIM

- Exploring the value, benefits and challenges in the incorporation of HBIM within the management and conservation of historic buildings.

774 THE MISSING WOODLAND RESOURCES: APPROACHES TO THE TECHNOLOGICAL USE OF PLANT RAW MATERIALS

Theme: Theories and methods in archaeological sciences

Organisers: Berihuete-Azorin, Marian (Institute of Botany, University of Hohenheim) - López- Bultó, Oriol (Departament de Prehistòria, Universitat Autònoma de Barcelona) - Martín- Seijo, María (Universidade de Santiago de Compostela) - Piqué- Huerta, Raquel (Departament de Prehistòria, Universitat Autònoma de Barcelona)

Format: Regular session

Woodlands have been one of the main suppliers of raw materials for many purposes all along history. Wood, bark, resin, leaves, fibres, fungi, moss, tubers, has been gathered to fulfil many different human needs. Therefore, many societies developed specific technologies to acquire, manage, transform and use these resources. Forests provided raw materials to cover a wide range of necessities: food, buildings, clothes or tools, but they also provided other more perishable materials employed for waterproofing, dying, tinning, medicine, adhesives, among many others. All these technological processes and uses are commonly difficult to observe the archaeological record, even invisible to archaeologists. Some materials are only preserved charred or in anaerobic conditions in very exceptional sites, or leave a very fine hint within e.g. containers. As a consequence, they have received less attention than plant foods or firewood. This session aims to provide an overview of technological uses of plants along different periods and among different societies, trying to answer questions such as: how societies organized woodland management and acquisition of raw material; how societies organized transformation and consumption of these resources; how tools and goods were produced; how an interdisciplinary research will improve the study of the production and consumption of goods and tools made of plants. We welcome contributions dealing with study cases, methods and techniques to approach the study of these remains, experimental and ethnoarchaeological approaches to generate hypothesis and models for understanding the technologies of goods production, as well as their significance in social and economic terms.

01 TOUGH AND BENDY: WOOD AS A RAW MATERIAL FOR THE EARLIEST AND LONGEST-SERVING WEAPONS

Author(s): Milks, Annemieke (University College London, Institute of Archaeology)

Presentation Format: Oral

This paper will present a review of the current evidence for the use of wood as a raw material for untipped wooden spears. The earliest weapon in the archaeological record is the Clacton spear point (UK), which dates from the interglacial MIS 11, ca. 400,000 BP. This broken wooden spear was manufactured from yew (Taxus baccata), and the following interglacial period has preserved wooden spears and other wooden tools at the site of Schöningen (Germany) made primarily of spruce (Picea sp.) but also pine (Pinus sylvestris). Further examples of wooden spears are known from the Late Pleistocene and early Holocene, and untipped spears were in use amongst recent hunter-gatherers as well. Although the use of wood as a raw material during the Pleistocene is rarely preserved, it is certainly there. The paper will give an overview of known wood species selected for the manufacture of archaeological and ethnographic untipped wooden spears, and compare these choices with bioavailability as well as with material properties of the wood species. It will also present original research of damage and breaks that have occurred on replica spears made of spruce during experimental use and studied on ethnographic examples in museum collections, and discuss this damage in relation to wood properties and terminal ballistics. The selection of wood species with particular properties indicates that hominins were cognisant from an early period of the material properties not just of particular species, but of structural properties of wood as well. The broad chronological comparison facilitates a discussion of choices in raw materials by different species of Homo, and how they relate to concerns for manufacture and durability of these earliest weapons.

02 PLANT FIBRES AT THE FINAL MESOLITHIC AND THE EARLY NEOLITHIC OF ZAMOSTJE 2, SERGIEV POSAD (RUSSIA)

Author(s): Berihuete-Azorin, Marian (Institut fur Botanik, Hohenheim Universitat) - Lozovskaya, Olga (Laboratory for Experimental Traceology, Institute for the History of Material Culture, Russian Academy of Science)

Presentation Format: Oral

Ropes, strings and cords were extensively used during prehistoric times. However, due to their perishable nature they are seldom retrieved at archaeological contexts. Vegetal fibres constituted, until the appearance of synthetic fibres, one of the main raw materials for their elaboration. Moreover, their uses were numerous: from structures' construction and means of transportation, to clothing and ornament, as well as the elaboration of fishing nets or as bowstring.

Thanks to the exceptional preservation conditions at the waterlogged site Zamostje 2 (Sergiev Posad, Russia), numerous fragments of ropes and fishing nets, dated between the 7th and the 5th millennium cal BC, have been recovered. All of them are elaborated with plant fibres: some have already been identified, while others are still under study. In this work we address the study of these remains from a technological point of view (knots, braiding, diameter of the ropes), combined with an archaeobotanical and ethnobotanical approach (most popular kind of used fibres, raw material procurement, fabrication processes and uses).

We offer also a wider look at the vegetation and paleolandscape context of the site, in order to better understand the strategies used for resource management within the framework of the economic activities of the inhabitants of Zamostje 2.

03 FUNGI IN ARCHAEOLOGICAL SITES: THE CASE OF THE EARLY NEOLITHIC SITE OF LA DRAGA (BANYOLES, SPAIN)

Author(s): Palomo, Antoni (Museu d'Arqueologia de Catalunya) - Berihuete, Marian (Institute of Botany, Hohenheim University) - Girbal, Josep (Department of Botany, Universitat Autònoma de Barcelona) - Piqué, Raquel (Department de Prehistòria, Universitat Autònoma de Barcelona)

Presentation Format: Oral

The importance of fungi in modern societies is well documented, they have been used traditionally as food, raw material and medicine. However, the preservation of fungi at archaeological sites is very rare. Only a few archaeological sites and mainly thanks to waterlogging or frozing conditions, have provided fruiting bodies of fungi. One of the most frequent types recovered from the archaeological contexts is the Polypore's group. Several species of bracket fungi have good characteristiques as tinder. However, they are not usually recovered in a charred state, probably due to the archaeologist's lack of experience for recognizing this type of remains.

The early Neolithic site of La Draga (Banyoles, Spain) has provided a singular assemblage of Polypores preserved under waterlogged conditions. Among them, several taxa have been identified: Skeletocutis nivea, Coriolopsis gallica, Daedalea quercina, Daldinia concentrica, Ganoderma adspersum and Lenzites warnieri. Some of them have been traditionally used as tinder. Some of them are partially carbonized and show evidence of manipulation, which suggests that they were intentionally gathered to be used as tinder. In this paper, we try to prove this hypothesis following an experimental approach. Additionally, the experimentation allowed us to understand the response of polypores to the carbonization process and to foresee their possibilities of survival within archaeological contexts.

04 SELECTIVE USE OF CORNUS SANGUINEA L. (RED DOGWOOD) BERRIES IN LATE NEOLITHIC

Author(s): Tolar, Tjaša (ZRC SAZU, Institute of Archaeology) - Vovk, Irena - Glavnik, Vesna (National Institute of Chemistry, Depart. of Food Chemistry)

Presentation Format: Oral

Numerous fragments of Cornus sanguinea shells in the cultural layer of Late Neolithic pile dwelling site Strojanova voda at Ljubljansko barje, Slovenia, indicate selective use of red dogwood fruits/seeds. Although these fruits are considered inedible, they must have been used for some purpose. They were pressed and crushed, either to obtain oil, juice or even dye (mesocarp of fresh fruits has an intense red colour) or perhaps for some other purpose? (e.g. soap or protection cream).

The experiment was made with the materials and tools known and used in Late Neolithic. It was established that fruits were most probably processed on a quern-stone, where very fine and malleable material could be gained. By chemical analyses, that will confirm some groups of compounds (e.g. lipids, saponins, flavonoids), useful information about possible uses of raw (and boiled) material that was gained by grinding will be provided. By cooking and boiling the malleable material (and even whole uncrushed fruits) some oil can be extracted. The experiment of dying three different types of textiles and threads with the boiled material of fresh and processed red dogwood fruits showed that this kind of use is less probable. The same applies to the possibility of using it to make juice, since the boiled "soup" does not have an attractive smell. However, it could be used for medicinal purposes. It is therefore most likely that it could be used as a sort of a soap or cream. More information will be available when the on-going chemical analyses will be completed.

05 THE FOREST YIELDS IT ALL. ETHNOARCHAEOLOGICAL AND PALAEOETHNOBOTANICAL INVESTIGATIONS OF PLANT USE BY MOBILE HUNTER-FISHER-HERDERS IN THE NORTHERN SIBERIAN TAIGA

Author(s): Piezonka, Henny (Christian Albrechts University Kiel) - Adaev, Vladimir (Tyumen Scientific center, Russian Academy of Sciences) - Kirleis, Wiebke (Christian Albrechts University Kiel) - Poshekhonova, Olga (Tyumen Scientific center, Russian Academy of Sciences)

Presentation Format: Oral

Ethnoarchaeological approaches can greatly contribute to our understanding and interpretation of the archaeological record as they can show analogies, help solving questions of archaeological visibility, and provide insight into indigenous knowledge. A Russian-German cooperation project is devoted to the study of settlement systems and lifeways of the Northern Selkup, a mobile group in Western Siberia. Located in a remote region of the northern taiga, some Selkup families continue to live as hunters, fishers and reindeer herders in the forest and have preserved many traditional features in their everyday culture and way of life. New information is generated during the project by observation, interviews, survey and archaeological excavation. It provides insights into the all-important role the forest and its plants play in the Selkup life, in particular in their material culture and economy. In our talk we will highlight aspects of woodland management and plant use. The human impact on the forest is held slight. Old things and waste are normally not buried but hung into trees, and the acquisition of raw materials such as wood, birch bark and sedges for shoe fillings does not leave substantial traces as everything is available in abundance. Winter settlements consisting of pit houses, however, seem to influence the on-site vegetation more long-term. Possibly, the occurrence of juniper on such sites might render this plant an anthropogenic indicator. Wood, birch bark and roots comprise basic materials in larger enterprises such as the construction of winter dwellings, the building of dug-out canoes and of sledges, and the construction of stationary fishing devices. Many items of everyday used are very quickly made on the spot from wood and birch bark. Plants provide important, storable parts of the diet (berries, pine nuts, mushrooms) while medical plants only play a marginal role.

06 LONG-TERM EFFECTS OF FOREST EXPLOITATION FROM EL ARGAR (2200-1550 CAL BC). BRONZE AGE IN THE SOUTHEASTERN OF THE IBERIAN PENINSULA

Author(s): Celma Martínez, Mireia (Universitat Autònoma de Barcelona)

Presentation Format: Oral

This research work has focused its study on the Argaric settlement of La Bastida (Totana, Murcia) for the knowledge of the paleoecology and paleoeconomy of the archaeological group of El Argar (ca. 2200-1550 cal BC) during the Bronze Age.

The charcoal analysis aims to understand the functioning of the society-environment relationship and the circle of timber production-consumption. The results show an environment with a great arboreal forest richness, with a reduced variety of conifer taxa and a great diversity of dicotyledon taxa. One of the factors that could affect forestry exploitation capacities lies in the tools available to society, including, also, their organizational capacities for transporting the acquired wood to the place of consumption. The reduced possibility of access to certain goods would depend directly on the social condition (ruling class, intermediate class or servants), age, and gender/sex. The use of the ax would be necessary and essential when the cutting and/or pruning of trunks and branches of great caliber was required. For all other cases, the manual collection of living and/or dead wood would be sufficient. The ax and adze would be a tool controlled by the intermediate social category and, in particular, by the male sex (regardless of the age of the individuals).

As a result, 28 plant taxa were determined for the site. The maintenance and social reproduction allowed the durability during ca. 650. That being so La Bastida presents the highest taxa variability for the whole Argaric territory and a resilient environment.

So, how long will forest exploitation be considered the main cause of the environmental collapse?

07 PLANT-BASED MANUFACTURES FROM IRON AGE CONTEXTS OF NORTH-WESTERN IBERIA: TECHNOLOGICAL KNOW-HOW AND MATERIALITY

Author(s): Martin Seijo, Maria (Universidade de Santiago de Compostela)
Presentation Format: Oral

Plant-based manufactures were crucial in the day-to-day life of the communities that inhabited North-western Iberia during Iron Age. Most of them were made with wild plants which were used in many different ways, as raw material for building purposes, for making domestic, artisanal, and ritual objects, for crafting household equipment, weapons, and even log boats. These plant remains are evidences not only of the material culture and technological know-how of these Iron Age communities but also of the complex entanglements that were established between forests, scrublands, plants and humans.

The existence of fire-events in several sites and the intentional or accidental charring of wooden manufactures has favoured the preservation of plant-based crafts through carbonisation. The fire has preserved these perishable materials but also has made more difficult their identification and study because they are highly fragmented and frequently incomplete. At present there is an increasing body of wooden manufactures, mostly preserved as direct evidences –such as carbonised or mineralised items- but also as indirect evidences –such as clay imprints of baskets or wattle-hurdles-.

The study of these manufactures made of wood and other wild plants revealed the complex strategy of wild plant management developed by these Iron Age communities which had a deep knowledge about their environment and plant resources. But also approaches us to the materiality of perishable objects and structures and to their role to the senses and their sensitive perception.

08 FIREWOOD EXPLOITATION AND USE IN THE CENTRAL PYRENEES: THE CASE OF THE PARC NACIONAL D'AIGÜESTORTES I ESTANY DE SANT MAURICI

Author(s): Obea Gómez, Laura - Gassiot, Ermengol - Celma, Mireia - Salvador, Guillem - Piqué, Raquel (Universitat Autònoma de Barcelona) - Mazzucco, Niccoló (Université Paris Ouest Nanterre) - Quesada, Manuel - Rodriguez Anton, David - Diaz, Sara (Universitat Autònoma de Barcelona) - Clemente, Ignacio (Consejo superior de Investigaciones Científicas - CSIC)
Presentation Format: Oral

During the last decades, research has provided insights into the human occupation of the high mountain environments since the beginning of the Holocene. Archaeological and paleaoenvironmental studies on both sides of the Pyrenees have provided strong evidence for human presence at mid and high altitudes. Human activities have been constant along the centuries although their intensity has changed through time. Those activities have been usually related to herding practices, pasturing and sheepfolding, but also mining, and charcoal production for industrial purposes. However, an early impact on the landscape can be tracked back to the Neolithic period. Thanks to the research developed in the Parc Nacional d'Aigüestortes i Estany de Sant Maurici (PNAESM) by the Grup d'Arqueologia d'Alta Muntanya (GAAM), today about 350 sites, three of which have been completely excavated, have been documented, most of them related to farming practices. In this presentation we would like to focus on the firewood exploitation and use. The human groups that occupied the mountainous areas of the Central Pyrenees constantly needed heat and light and, therefore, the managing of firewood has been an important task in terms of time and efforts. Since some of the analyzed sites are located above the treeline, the integration of anthracological, dendrological and geographical data through Geographical Information Systems represent an interesting way to approach firewood managing. At the moment, the results from Cova del Sardo (1800 m.a.s.l.), seem to indicate a close-range firewood exploitation.

776 HERITAGE MANAGEMENT IN THE 21ST CENTURY: WHERE IS IT HEADING? STATE AGENCIES, NGOS, CHARITIES OR INDEPENDENT ORGANISATIONS?

Theme: Museums and the challenges of archaeological outreach in the 21st century
Organisers: Bedin, Edoardo (Arheološki muzej u Zagrebu) - Miaczewska, Anna (Uniwersytet Marii Curie-Skłodowskiej)
Format: Regular session

Cultural sites and museums have been run primarily on public funding, yet some countries – although just a handful – have taken an alternative approach by establishing national independent organisations. They are set up as charities to receive special benefits and they strive to fundraise enough to enable day-to-day operations as well as long-term conservation.

All these various agencies focus on operation management, service industry settings and branding heritage in order to generate revenues for conservation and enhance the quality of the visitor experience. What are the results achieved so far? Are current models suitable or are there alternative paths to be explored?

The purpose of this session is to gather experts of various backgrounds to share their on-going research on site and museum management, frameworks already in use by managers and directors of these institutions to enable relevant conservation and visitor's experience. Papers should explore issues encountered during the project development, creation and delivery of successful management plans – that deliver both

vital conservation and exceptional visitor's experience – and the impact of institutions such as Heritage Lottery Fund. The session also aims at exploring the differences between heritage sites run by state agencies, NGOs, charities and independent organisations in the following areas: policies, decision-making, development of management plans, fund-raising to enable conservation and visitor's experience planning, define balance between conservation and visitor's experience delivery. Papers exploring financial issues and how to successfully address them are welcome.

ABSTRACTS

01 CHANGE OF PARADIGMS IN AUSTRIA´S HERITAGE MANAGEMENT?

Author(s): Schrettle, Bernhard (Archäologisch-Soziale Initiative Steiermark; University Graz)
Presentation Format: Oral

Just in 2015 (!) the state of Austria ratified the Charters of Valetta and as well the Charter of Faro. This does not mean a paradigmatic change in heritage policy because changes have already taken place in the last 20 years.

A paradigmatic change was the decision about 10 years ago to publish all protected areas and all archaeological reserves (archaeological zones , Fundhoffungsgebiete) in a public gis – system. The claim of the Valetta convention for integrated preservation of archaeological heritage and its integration in developement plans was implemented as well (at least on the paper…) Because the building authority in Austria is at the regional (Gemeinde) level and heritage management at the state (unmittelbare Bundesverwaltung) these do not work always in harmony… (Austria is a federal state – the responsibility for heritage management lies at the state; but again and again discussions are going, wether it should be handed over to the federal states).

As nearer to the regional level one approaches, the more important is work, that is done by regional museums, registered associations as well as private companies. For those, one of the most important goals is to rise public Awareness für protection of archaeological heritage. The challenge is to combine scientific goals (research), preservation (mainly by non-destructive methods), and the demand of local authorities – who want to leave something visible, for „touristic" needs. In the paper I will try to discuss the existing system and the systemic difficulties for NGOs to combine these sometimes contradictory targets.

02 SECTORS, MODELS, CHALLENGES FOR THE EFFECTIVE GOVERNANCE OF VIRTUAL MULTIMODAL MUSEUMS IN THE DIGITAL WORLD: TOWARDS AN EFFECTIVE DECISION-MAKING PROCESS

Author(s): Giannoulis Giannoulopoulos, Georgios - Pujol, Laia - Pares, Narcis (Universidad Pompeu Fabra)
Presentation Format: Oral

During 2017, the EU-funded project Virtual Multimodal Museum (http://www.vi-mm.eu/) brought together more than 200 experts with very diverse backgrounds (archaeologists, curators, managers, computer scientists, designers, policy makers) to discuss Virtual Multimodal Museums from seven different perspectives. In our presentation, we would like to focus on the results of the thematic area related to their social and economic dimension.

The first set of outcomes provides an overview of the field: target sectors and audiences; added value of ViMMs with the help of examples; and guidelines on policies, strategies of engagement, and evaluation. The second set of outcomes provides models for the effective governance of VIMMs. Particularly, experts produced a decision-making process scheme organized in 4 stages (idea generation, design, implementation, operation) identifying the relevant decisions, the various internal and external stakeholders, the challenges, and the financial and human resources required in each step. The ultimate goal is to help the Cultural Heritage community enhance planning and sustainability, business and operational planning, cost factors, selection of adequate methods and technologies, effective monitoring of implementation, skill development, and adequate organizational processes. The third set of outputs provides tools and methods for the continuous assessment of the social and economic impact of ViMMs, beyond the simple measurement of quantitative sales and web indicators.

We hope that this presentation will contribute to the work of archaeologists and Cultural Heritage professionals who wish to engage in the design and implementation of a Virtual Multimodal Museum.

03 PROMOTING LOCAL ARCHAEOLOGY: BETWEEN PUBLIC AND PRIVATE AGENTS

Author(s): Bressan, Marianna (Ministero dei beni e delle attività culturali e del turismo - Italia)
Presentation Format: Oral

From 2014 a reform of the Italian Ministry of Cultural Heritage proclaimed the technical and financial independence of 30 'cultural sites, established new local departments appointed with the organization of non-independent museums and left to the Soprintendenze, that are normally charged with preservation tasks, 'less important' archaeological areas. Within this framework, we fight every day to promote an archaeological heritage that has its own historical relevance as well as a local economic and social interest.

The aim of this paper is to introduce you to the case study of Montegrotto archaeological areas. These three areas were adjusted for public enjoyment thanks to a project developed by Padova University together with the Soprintendenza (which is also the owner of the sites) and the City of Montegrotto. Two main problems arose, strictly connected to financial assets: maintenance and management of the three adjusted archaeological areas. Maintenance is provided by means of public funds paid by the Ministry. They

are both ordinary funds, which are quite meagre and not a fixed sum, and extraordinary ones, requested and obtained for specific needs, which usually are represented by emergency situations. Management of the three areas is provided by a cultural association of professional archaeologists, chosen by means of a public announcement of selection. This association guarantees the ordinary public enjoyment of the areas and also organizes special openings and festivals for the promotion of the sites. The association is funded by the visitors' offerings.

During the conference the spokesmen of the association will explain the fund-raising activities they undertook, with more or less success, and they will report on the economic means they adopted in management of the site. The many obstacles faced during the years in promoting these sites brought us to elaborate a more wide-range project.

04 BOTTOM-UP APPROACHES FOR HERITAGE/ARCHAEOLOGICAL SITES: ARE THERE REALLY SUSTAINABLE MODELS? THE CASE OF NAPLES (ITALY)

Author(s): De Vivo, Caterina (Made in Culture)
Presentation Format: Oral

Naples, in Southern Italy, is very rich in archaeological and heritage sites. For decades, many sites were closed and inaccessible to the public because of the lack of resources. In the last few years, many of these sites re-opened to the public thanks to the contribution of local NGOs and Associations deeply rooted in the territory. All of this was possible thanks to special agreements between Public Institutions and private no profit organizations that were nominated responsible for the sites. Italian academic literature, as well as the Italian Ministry of Culture and Tourism, started to draw attention to these experiences presenting them as positive models that can be considered the right solution for the management of the so-called minor sites. This is particularly relevant in a Country like Italy where it is constantly repeated that there is such a rich cultural heritage that it is not possible for the State alone to directly manage and finance everything. However, none has ever demonstrated the real economic sustainability of these bottom-up management experiences. What emerges from the interviews with workers on these sites is that very often the site management relays on voluntary work. Moreover, the volunteers are highly specialized heritage professionals that could not find better work opportunities. This paper tries to understand whether bottom-up site management approaches are really sustainable and what should be the limits in the use of volunteers in managing a heritage site, as well as if underpaid professional workers should really be considered volunteers.

05 NT SUTTON HOUSE, AN EXAMPLE OF EFFECTIVE DECISION-MAKING AND RESOURCE MANAGEMENT TO ALLOW CONSERVATION AND RAISE AWARENESS ON HERITAGE

Author(s): Bedin, Edoardo (Arheološki muzej u Zagrebu)
Presentation Format: Oral

Heritage is under constant threat of destruction, climate change, soil exploitation and erosion, lack of awareness amongst the public, unsustainable business plans. At the base of every effective conservation program there is a robust management plan which does consider the importance not only to preserve but to increase the conservation capacity. In this new millennium – after the 2007 financial crisis and the long-term austerity policy – this capacity can only be reached by two key factors: raising awareness amongst local communities and general public, and by generating consistent revenues (and increase them) to enable more resources to become available. Effective conservation and successful fund-raising, increased awareness and wider audience, higher revenues and more skills available are all part of the system the National Trust has developed to protect and preserve for this generation and those to come our heritage ("Forever and For Everyone", NT motto). Through my personal experience at Sutton House in London, first as a volunteer, then as a member of staff with focus on visitor experience, fund-raising (memberships and raffle ticket and other fund-raising events), conservation, event assistant, I am going to present how this 1535 Tudor House has managed to fend off the crisis through careful decision-making on how to distribute the financial and human resources available. The use of the space available is not only as a traditional museum, but also as community centre, and a place for new artists to exhibit, and a venue for weddings and private functions, as well as local and national meetings of various organisations are held in this historical house (NHS research groups, local authority meetings, NT meetings, etc.). All of the previous activities create the base for a successful management and the preservation of the last Tudor House in London still standing and open to the public.

06 SUSTAINABLE CULTURE: THE CASES OF POPULONIA AND POGGIO DEL MOLINO

Author(s): Megale, Carolina (Associazione culturale Past in Progress, Museo etrusco Populonia)
Presentation Format: Oral

Opened in 1943, since its reorganization in 1985, the Etruscan Museum of Populonia was in 2015 that became a centre piece of the management of cultural heritage's new vision for the area. The company in charge of Populonia castle now envisage the museum as a central place for the dissemination and promotion of the cultures and traditions surrounding the Castle. The services have been entrusted to an external company, while the scientific and cultural activities are now managed by the Past in Progress Cultural Association.

Today the 'Gasparri Etruscan Museum' is the most visited archaeological museum in the Livorno and Grosseto coastal area. With its strategic position, the new management system and the coordination of both their scientific and non-specialist activities present

an excellent and fully sustainable opportunity to promote archaeology and to spread the meaning of our shared heritage among all citizens.

Continuing in the spirit of shared archaeology and economic sustainability, Past in Progress, through an agreement with the Town of Piombino, manage the research and development projects covering the archaeological area of Poggio del Molino.

The specific goal of the project is to finally give a defined structure to a reality which already exists in Poggio del Molino, the creation of a shared archaeology park. This will be a public space, fully equipped and accessible for all, the idea is to develop it around an existing archaeological excavation site. This is a place where members of the public can enjoy spending their spare time watching as archaeologist carry out work on the various excavations sites. To fully understand the impact this project has had on the region and to evaluate its economic benefit, an economic impact study has been carried out, this document we will present the results.

07 CROWDFUNDING OF ARCHAEOLOGY

Author(s): Kubiatowski, Zbigniew (The Institute of Archaeology and Ethnology Polish Academy of Sciences)
Presentation Format: Oral

This presentation presents issue known as „crowdfunding of archaeology" and possibilities of use it for financing archaeological studies and preservation of cultural heritage. A big part of it will also focus on influence of crowd-funded archaeological projects of the archaeology promotion and social and economical development.

On beginning I will focus on an idea of crowdfunding. I will show short history and fast development from an idea to multimillion business. Next I will present crowdfunding community in Poland. After this introduction I will pass to case studies and I will present several interesting projects realized thanks to crowdfunding. Among others done in Poland "Unusual burial ground of old Slavs" and "Erem's mission - Egypt - Examination of tombs from 4,000 years".

According to "case studies" methodology presentation, all presented projects will be able to be compared. In the last part I will compare characteristic of each part of them between all projects and that will be base for conclusions.

Three main highlights of this presentation are: an influence of crowd-funded archaeological projects to an archeology and heritage promotion; opportunity to involve society in work of discovery, preservation and promotion of cultural heritage; research on the possibility to finance archeological works from crowd-funding sources.

a. SOCIAL AND OCCUPATIONAL INTEGRATION THROUGH ARCHAEOLOGY

Author(s): Tsironi, Stella (ASIST)
Presentation Format: Poster

The financing of projects, which are related to archaeology, conservation and preservation of monuments entail a considerably financial committment. These high cost are traditionally covered by research institutes, universities, by the national heritage agency (Bundesdenkmalamt) or by private sponsors.

In Austria a new system has been developed, in which institutions, who are organised as NGOs, organise projects, that are are promoted from the public employment service and supporting the occupational integration of unemployed persons, who receive a time-limited but nevertheless regular employment. The very purpose of these measures is the reintegration in the labour market of persons exposed to long-term unemployement, through assisted working and social counselling but also to avoid long-term dependency on public benefits. The persons involved are confronted with complicated and multidimentional problems, which allow them only a difficult and restricted access to a working life.

In the field of cultural heritage more and more new employment projects are being submitted and supported. Public funded manpower is responsible for services and activities, mainly manual operations (excavating as well as cleaning, sorting and storaging of the findings etc.), who are instructed and supervised by trained specialists (also public funded). In this way the heritage management is enhanced by a symbiotic relationship between scientific operations and socioeconomic measures.

The poster presentation is being based on examples from projects carried out from Austrian institutions and NGOs, provided from the public employment service Austria (AMS) or from the EU, in the field of archeological research, preservation of monuments as well as restoration and museum presentation.

778 EXAMINING THE DIFFERENT APPROACHES, THEORIES, AND METHODOLOGY BOTH CULTURALLY AND IN THE APPLICATION OF EUROPEAN COMMERCIAL FIELD ARCHAEOLOGY

Theme: Theories and methods in archaeological sciences
Organisers: Forrestal, Colin (Universitat Rovira i Virgili) - Clark, Peter (Canterbury Archaeological Trust)
Format: Regular session

In every country worldwide commercial practitioners of field archaeology be it urban, rural or a mixture believe that their methodology is the best or is it just the minimum required to satisfy the planning or environmental issues raised in a development or rescue scenario. Obviously,

there are different planning and environmental legal regimes in each member country of this association as well as a multitude of funding issues.

This session is designed to examine the different aspects of commercial field archaeology as practiced in each of this association member states. It aims to explore the different skill sets required to be a commercial archaeologist in the different jurisdictions, and the culture shock involved in practicing archaeology in a way that is alien to the way taught in your home country, It aims to investigate how we can learn from each other by having our methodologies presented to a pan European audience.

The call is for oral presentations of 15 minutes maximum duration on the methodologies of commercial archaeology as practiced in their country, covering such topics as excavation, recording, photography, finds processing, archiving and methodologies such as single and multi context excavation and the use of systems such as the Harris Matrix.

ABSTRACTS

01 INTRODUCTION TO SESSION 778: ALONG WITH A QUICK INTRODUCTION TO CIFA, AND NEW GENERATION AND THE INTERNATIONAL PRACTICE GROUPS

Author(s): Forrestal, Colin (CIfA; Erasmus Mundi - IPHES at URV) - Clark, Peter (CIfA; Canterbury Archaeological Trust)
Presentation Format: Oral

This session proposal developed out of a conversation at a Chartered Institute for Archaeology (CIfA) Advisory council meeting that had discussed people trained outside of the U.K and coming here to work and whether we could do a workshop between New Generation and International Practice Special Interest groups.

Initially it was envisaged as a "what you need to know to work in the UK" workshop, so very UK focused. Then we thought what so perfect about UK archaeology, maybe we could learn more by having a cultural, methodological and political perceptive session that was not UK centered.

We considered that what we wanted and should be exploring on a pan European perspective is our diversity, problems and gremlins in a spirit of co-operation rather than conflict and discussing what makes archaeology such a personally fulfilling profession; just a shame not a financially utopian plane to exist on.

We will give a brief overview of CIfA's structure, the importance of its various structures and membership, and its role as a Chartered Professional Body. Not only as an advocate in the UK for Archaeology and the Historic Environment but increasingly in Europe and throughout the world. Supporting a good, ethical, sustainable protection of archaeology and the historic environment and all aspect of their legal defense.

We will also explain what the special interest groups of New Generation; encouraging people into our profession and providing a pathway to succeed and International Practice; co-operation and support and advocacy within Archaeology Globally; do, and whether or not you are a commercial, academic or volunteer archaeologist how CIfA and its special interest groups is appropriate to you.

But in the end, we want to hear from you, and learn from you as part of all of our continual professional development. Enjoy.

02 SEYITÖMER HÖYÜK RESCUE EXCAVATION PROJECT

Author(s): Bilgen, A. Nejat (Dumlupinar University, Tavsanli yolu 10. km Fen-Edebiyat Fakültesi Arkeoloji Bölümü-KUTAHYA)
Presentation Format: Oral

Seyitömer Höyük is located inside the coal reserve zone of a thermal power plant 20 km away from the center of Kütahya province, Turkey. Previously excavated by museums, the mound was excavated by Dumlupinar University, Department of Archaeology from 2006 to 2014. The rescue excavations used a crew of 60 to 100 workers and in the recent years approximately 300 workers were employed unearthing cultural layers ranging from the Roman period to the Early Bronze Age. During the, officially permitted and controlled, rescue excavations which were initiated with the aim of exploiting the coal reserve beneath the mound approximately 10.000 items were discovered and a museum was founded at the University, also a section at the Archaeological museum was dedicated to findings from the site.

The city plans pertaining to the cultural levels were drawn and the Early and Middle Bronze Age architectural layers were discovered to be finely preserved beneath the Roman and Hellenistic layers. The results presented in tens of scientific books, articles, and theses influenced both the regional and the Anatolian archaeology. The excavations ceased in 2014 as the coal reserves and the thermal power plants were privatized. To stop the excavate of this month will also stop to have important informations of the past in this region.

03 A NEW LEGISLATION AND A NEW ROLE FOR COMMERCIAL ARCHAEOLOGY IN FLANDERS, BELGIUM

Author(s): Vandevelde, Jessica (Flemish Heritage Agency)
Presentation Format: Oral

In the last 15 years, the archaeological landscape and the role of commercial archaeology in Flanders have changed dramatically.

Whereas field work used to be carried out by (local) government agencies or research institutes, today it is mainly done by independent, commercial archaeological companies. Changes in legislation have also massively increased the amount of field work. All this time, the decision where, when and what type of archaeological investigation had to be undertaken, has been one made by the heritage consultants of the Heritage Agency of the Flemish government. Both the archaeological world and the construction industry felt this to be very restraining and meddlesome.

With the newest change in legislation mid 2016, this too has changed. Commercial archaeologists are now responsible for the entire archaeological process, including doing the initial desktop study, advising on the right type of field work and deciding on the most appropriate strategy and methods. The role of the Heritage Agency has changed to that of coaching and quality monitoring, instead of directing. The new model has obvious advantages. Site directors are now more free to act upon their own insight and experience, and desktop studies are done more thoroughly.

The Heritage Agency meanwhile can focus on creating new supporting tools, like the official quality standard ('Code for best practice') and other guidelines. As different companies and individual archaeologists tend to focus on different aspects, and some will advise further fieldwork more easily than others, the agency is also making sure the process is kept fair and consistent. Although the transition to the new model created some tension at first, all parties concerned now seem to be settling in their new roles.

04 LEGAL MINIMUM FOR ARCHAEOLOGICAL DOCUMENTATION IN POLAND

Author(s): Wisniewski, Mariusz (Mazowiecki Wojewódzki Urząd Ochrony Zabytków)
Presentation Format: Oral

Many of archaeological sites can be considered perishable. They are endangered and sometimes destroyed partially or entirely by nature or human activity(s). These activities differ: some like farming cause 'slow' degradation of archaeological monuments, while other – like construction work lead to a rapid destruction of archaeological remains.

In authors opinion, in certain conditions, no other human activity is so thoroughly destructive as archaeological excavations. Thus, preservation by record is the only option for vast majority of archaeological monuments researched with this method, especially when one considers geological conditions of Poland and character of prehistoric and early historic archaeological sites in this country.

The aim of this paper is to present legal solutions used in Poland and to evaluate their implementation using the example of the region of Central Masovia with particular emphasis on large archaeological projects associated with infrastructural development of the region. Data presented and analysed is drawn from personal experiences of Heritage Inspectors, published work and unpublished archaeological reports from the area representing period from 2012 until 2018.

Particular legal requirements exist in Polish archaeology and this paper will shortlist key issues which reappear during and after archaeological excavations on different sites in the region. Examples are going to be presented in hope to spark a long term discussion. Some comparisons with single context recording system will be highlighted with applicable examples.

05 CONFRONTING HERITAGE CRIME: REACTION AND RESPONSE

Author(s): Clark, Peter R (Canterbury Archaeological Trust; CIfA; Society of Antiquaries of London)
Presentation Format: Oral

In January 2018 the Canterbury Archaeological Trust suffered a major robbery, in which thieves smashed their way through an external wall to gain access to the Trust's store of archaeological artefacts. Thousands of objects were looted, including nearly 1000 rare Anglo-Saxon glass beads, Iron Age and Roman coins, combs and other items recovered from the Trust's excavations in Canterbury and the County of Kent over the last 40 years. This was a serious blow to the understanding of Kent's long history, particularly as many of the more recent finds had not been properly studied or recorded. Heritage Crime remains a serious problem in south-east England, with illegal metal-detecting on scheduled ancient monuments, the looting of historic shipwrecks on the sea floor, vandalism and destruction by fire of ancient monuments, and now the deliberate and systematic theft of archaeological stores in the region. The problem is not unique to the south-east, but is prevalent throughout the British Isles, which has led to the creation of ARCH, The Alliance to Reduce Crime against Heritage, a nationwide partnership between the British Police and a host of national agencies in attempt to address the issue. This paper describes the circumstances of the Canterbury robbery and the reaction to the crime, both in terms with dealing with the immediate aftermath and our continuing collaboration with Kent police in the fight against Heritage Crime more generally.

06 PREVENTIVE ARCHAEOLOGY IN THE CZECH REPUBLIC

Author(s): Kucharík, Milan - Olhava, Richard (Labrys o.p.s.)
Presentation Format: Oral

The Heritage Act in the Czech Republic of the year 1987, including the following amendments and subsequent documents, does not basically regulate the methodology of archaeological excavations. Inspection of researches focuses on realizing formal administrative operations. Attitude to commercial research is schizophrenic. On the one hand, some archaeologists claim that competing for archaeological research is something inappropriate, on the other hand, the same archaeologists do not prevent competing and dumping prices at the same time. This situation concerns both public and private companies. This is possible because of the absence

of any standard of archaeological excavations and prices. It also allows a wide range of research approaches. The methodology of research goes back mainly to the 80s and 90s of the 20th century. Within research in urbanized areas, the square net systems of small dimensions of the sectors and the orientation of research are the traditional research methodologies, they are primarily based on the documentation and interpretation of their pependicullar cuts. There is the absolute absence of knowledge of other methods and workflows. Outside the medieval sites, research of the overburden on the subsoil and the research of the pits predominate, it is desirable and suitable. On a large number of sites, where the sub-layer is abraded this procedure is perfectly correct, but there is a number of locations where this process leads, for example, to the destruction of graves and shallow pits or floor layers in houses. The reason of this solution is often economic. Archaeological firms are trying to meet their customers` price and time demands. These sites, however, provide the most valuable information on prehistory that we have at our disposal.

07 ADAPTIVE PHOTOGRAMMETRY: THE USE OF PHOTOGRAMMETRY WITHIN THE EXCAVATION ENVIRONMENT OF INFRASTRUCTURAL ARCHAEOLOGY

Author(s): Kimball, Justin - Åstveit, Leif Inge (Universitetet i Bergen)
Presentation Format: Oral

Photogrammetry is becoming a standard tool within archaeology, yet there remains uncertainty to its definitive role. Important questions remain, the most notable being "how can photogrammetry benefit archaeological documentation?" and "when is it appropriate to use photogrammetry?". We must be willing to answer questions like these in order for archaeology to incorporate and benefit from new technologies. This is an active issue within research archaeology; however, the goals of research archaeology do not necessarily match those within archaeology as a whole. Today, infrastructural archaeology, not research archaeology, accounts for the majority of excavations and it is within this that we must explore the role of new technologies. We have endeavoured to address this issue within the Sotrasambandet project—a large infrastructural archaeology project managed by the University of Bergen. The project involves the excavation of several Stone Age sites situated on the western coast of Norway ahead of the construction of a new roadway. These kinds of projects are fast-paced and highly dynamic, and archaeologists working in these environments must have access to the right tools and methodologies to perform their jobs. At the Sotrasambandet project, we have found that photogrammetry is a powerful component of our documentation strategy. Through this technology, we have been able to achieve both traditional and novel formats of documentation for infrastructural archaeology. Most significant, has been that using this technology has allowed us to achieve an adaptive photogrammetry—in other words, we have established a methodology that allows archaeologists to document in 3D and return that data quickly to the field in a variety of formats for immediate use. Our use of photogrammetry addresses the issues highlighted above by developing a framework for the technology while demonstrating its ability to affect the quality and functionality of documentation within the constraints of infrastructural archaeology.

08 STARTING IN THE UK COMMERCIAL ARCHAEOLOGY SECTOR: OR I THOUGHT I WAS AN ARCHAEOLOGISTS NOT JUST A DIGGER

Author(s): Forrestal, Colin (Erasmus Mundi - IPHES at URV; CIfA)
Presentation Format: Oral

With the shortage in the UK of trained archaeologist entering the commercial sector, commercial units have been recruiting from outside the UK. While this paper is in no way a discourse on Brexit and its impact it does examine the cultural and methodology shock for those coming to work in the UK who were trained outside the UK.

For those wishing or contemplating coming and practicing archaeology in what is left of the North-West peninsula of Europe this I hope is an interesting beginner's guide as to what to expect when you step off that plane into the reality of Archaeology in the U.K.

This paper will cover subjects such as your qualifications, requirements, the weather, professional bodies such as CIfA and why you should join prior to coming to the UK and Trade Unions such as Prospect. In addition, it will look at PPE, what are CSCS cards and how you may obtain them, which again can be fraught with difficulties as well as covering skill sets, language, and law.

Then it will consider types of sites, rural, urban, listed, scheduled, recording and the Harris Matrix methodologies. This will include a worked example after explaining the basics for all to attempt.

This is an attempt to give a quick guide to the joys and pitfalls of commercial archaeology in the UK with links to other sites the archaeology of which can range from the Palaeolithic through to modern and of course you will be expected to have an understanding of the peculiarities of what remains of this part of the North-West Peninsula of Europe.

779 BOYNE TO BRODGAR: RESEARCHING NEOLITHIC MONUMENTALITY IN IRELAND AND NORTHERN BRITAIN

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Sheridan, Alison (National Museums Scotland) - Cooney, Gabriel (University College Dublin)
Format: Regular session

This session will introduce an international programme of research designed to explore the nature, developmental trajectories and inter-connectedness of Neolithic monuments in Ireland, the Isle of Man and northern Britain, and to explore wider Atlantic links. Inspired by Professor Johannes Müller's (University of Kiel) major project on Neolithic monumentality in northern Germany and southern Scandinavia, and in memory of the late Dr Magdalena Midgeley, the initiative is still in its early stages, but this session will describe what has been achieved so far, what work is in the pipeline, and will offer some case studies that explore Neolithic monumentality and what it can tell us about the societies who built and used these monuments.

The papers in this session will cover: i) the research agenda that has already been developed by the author with Professor Gabriel Cooney (University College Dublin)to identify key research questions and the strategy to address them; ii) the background to the planned geophysical surveys in the Boyne Valley and on Rousay in Orkney by the German Archaeological Institute; iii) some case studies of landscapes with Neolithic monuments; and iv) evidence for long-distance contacts among Neolithic monument users along the Atlantic façade. A representative of Professor Müller's project will offer guidance on the lessons learned from this huge research programme.

ABSTRACTS

01 BOYNE TO BRODGAR: RESEARCHING NEOLITHIC MONUMENTALITY IN IRELAND AND NORTHERN BRITAIN

Author(s): Cooney, Gabriel (University College Dublin) - Sheridan, Alison (National Museums Scotland)

Presentation Format: Oral

Boyne to Brodgar is the name of a programme of research into Neolithic monumentality in Ireland, northern Britain and the Isle of Man. Inspired by the highly successful Frühe Monumentalität und soziale Differenzierung programme led by Professor Johannes Müller (University of Kiel: http://www.monument.ufg.uni-kiel.de/), Boyne to Brodgar is the brainchild of the late Professor Magdalena Midgley (Edinburgh University). This presentation sets out its aims and aspirations, and presents the research framework that underpins the programme (https://prehistoric-scotland.com/themes/a-boyne-to-brodgar-research-framework/). Questions of origins, trajectories, social and ideological significance and meaning are explored, along with Continental connections at various points from the late fifth to the mid third millennium BC. The paper also serves as an introduction for the approach taken in the session which is to focus on active programmes of work on this theme or planned research. Perhaps the most tangible aspect of the theme are the megalithic tombs, particularly in the passage tomb tradition that occur in the Boyne and Orkney and the exploration of the links between their builders in the centuries around 3000 BC. However, ongoing archaeological research indicates that there a range of potential links at this time and furthermore they have a long background of contacts along the Atlantic Zone and in turn provide the basis on which links continued into the third millennium BC.

02 A DECADE OF REMOTE SENSING IN BRÚ NA BÓINNE, CO. MEATH, IRELAND: PUTTING THE PIECES TOGETHER

Author(s): Davis, Stephen (University College Dublin) - Rassmann, Knut - Beusing, Ruth - Banffy, Eszter (Romano-Germanic Commission, Frankfurt)

Presentation Format: Oral

This paper will elaborate upon the results of remote sensing within the Brú na Bóinne World Heritage Site, Co. Meath, Ireland over the last ten years or so, building upon early work with lidar based surveys (2009-2010), through small scale geophysical campaigns to encompass multiple campaigns of large scale geomagnetic prospection undertaken in collaboration with the Romano-Germanic Commission, resulting in what is now the largest concerted geophysical survey in Ireland. Rather than approach these surveys in an 'anomaly by anomaly' fashion, this paper will instead look to expand upon what we archaeological knowledge we have gained from these surveys with a focus on a number of chronological periods and elaborating on the archaeological context of the results to date. The paper will also consider where these surveys leave us in the context of the Brú na Bóinne WHS Research Framework and also the Boyne to Brodgar initiative as a whole. The paper will seek to provide a roadmap as to what we might prioritise as regards the Brú na Bóinne end of the Boyne to Brodgar 'corridor', and what such research might look like going forward, especially given the project aims of attempting to incorporate local communities into ongoing research.

03 INVESTIGATIONS IN LANDSCAPE ARCHAEOLOGY IN THE BOYNE VALLEY, IRELAND AND IN ORKNEY, 2016-2018 – PRELIMINARY RESULTS OF PROSPECTIONS

Author(s): Rassmann, Knut - Bánffy, Eszter (RGK - Romano-Germanic Commission DAI) - Downes, Jane - Gibson, Julie (University of the Highlands and Islands) - Sheridan, Alison (National Museums Scotland)

Presentation Format: Oral

The Romano-Germanic Commission joined the 'Boyne to Brodgar' initiative in 2016, with the main goal being to undertake research in both the Boyne Valley in Ireland and in Orkney, using a set of appropriate non-invasive methods of prospection. The ultimate goal was a joint interpretation of all the data. Our common research aimed to investigate the interaction of social, economical, cultural and environmental phenomena in different types of landscapes in a diachronic perspective. Our exploration of the landscapes was

based on geophysical prospecting and sedimentological analysis, and we adopted a systematic approach that integrated the various data from remote sensing and topography within a GIS. In the Boyne Valley large areas were investigated on the periphery of the monuments of Newgrange, Knowth and Dowth. The field work on the Orkney Islands is focussing on tracing settlement patterns connected to chambered tombs, on the Island of Rousay.

The use of a similar research design in both regions produces compound databases, something that is crucial for comparing trajectories of change in Neolithic land use, and in understanding those changes. Therefore our empirical approach is underpinned by theoretical concepts concerning the interwoven nature of past socio-environmental dynamics. This landscape-based approach is the first stage of a broad interdisciplinary study.

04 PASSAGE TOMBS LOST – RECENT (RE-)DISCOVERIES ON THE DEVENISH LANDS AT DOWTH, CO. MEATH, IRELAND

Author(s): Ni Lionain, Cliodhna (Devenish Nutrition; UCD School of Archaeology) - Davis, Stephen (UCD School of Archaeology)
Presentation Format: Oral

The concentration of Neolithic monuments, in particular passage tombs, in Brú na Bóinne (Co. Meath, Ireland) was one of the reasons that this area was inscribed in the UNESCO World Heritage Site list in 1993. The Brú na Bóinne archaeological complex is bounded by a substantial meander of the Boyne river to the south and by the Mattock river to the north, effectively creating an island that is home to at least forty passage tombs. The monumentality and high visibility of many of these sites has captured the general public's imagination, as well as academic focus. But what did this area look like in the past? How many tombs originally constituted this funerary landscape? Are there ways to rediscover the tombs that may have been lost over time?

This paper will look at the forgotten and lost tombs of this internationally significant necropolis, examining different routes of rediscovery, including remote sensing, folklore, and historical research, as well as the potential of research and rescue excavations to broaden our understanding of this Neolithic landscape. A case study looking at the research and commercial archaeological work undertaken to date on the Devenish Lands at Dowth will also be presented in the context of the wider passage tomb complex at Dowth.

05 SEQUENCING MEGALITHIC ART AT KNOWTH AND OTHER PASSAGE TOMBS FROM BOYNE TO BRODGAR

Author(s): Twohig, Elizabeth (University College Cork)
Presentation Format: Oral

The paper will present an overview of megalithic art in Ireland, with particular reference to Knowth. The publication of the excavation of the main tomb (Knowth1) by Eogan and Cleary in 2017 presented a series of radiocarbon dates which allow us to understand the development and chronology of the monument more fully and now it is possible to build a firmer framework for the various types of carvings at Knowth. The earliest megalithic art at Knowth comprises the spirals and zigzags of the putative Tomb 1A, which was identified by the use of a number of carved stones in significant locations in Tomb 1B. Further styles and techniques then follow each other in sequence, indicating a long period of deployment of megalithic art. The latest form of carving comprises various types of pick dressing which overlies earlier carvings. The Knowth sequence can be matched to a limited extent in the megalithic art at other Irish passage tombs but the sheer quantity of art at Knowth makes is particularly significant. This improved understanding of the development of art at Knowth enables a more robust critique of the likely connections with people who were making art on settlement sites and megalithic tombs in the Orkney Islands; it will thus connect directly with the Boyne to Brodgar theme and will review the generally accepted similarities between Grooved Ware ceramics, mobiliary objects and Irish megalithic art.

06 PASSAGE TOMB PEOPLE – IDENTIFYING THE SOCIAL DRIVERS OF PASSAGE TOMB CONSTRUCTION

Author(s): Smyth, Jessica (University College Dublin)
Presentation Format: Oral

Passage Tomb People (PTP) aims to identify the social drivers of passage tomb construction along the Atlantic Façade. Many hundreds of these monuments dot the Atlantic coast, from northern Scotland to southwest Spain, the very largest tombs clustered in complexes (including three UNESCO World Heritage Sites) in Orkney, eastern and western Ireland, western France and the Iberian Peninsula. Their connectedness (in terms of iconography, building methods, and material culture) has long been recognised, but to date there has been little targeted research on the societies that built them. Erected several centuries after the arrival of farming in each region, these 'mega' tombs may be responses to economic stress or, equally, the result of surplus and increasing social competition among communities. The Passage Tomb People project targets those monuments erected in the later 4th millennium BC. It will probe the connections between monument construction and changes in farming practice, diet, health and environment, testing whether similar factors triggered similar behaviours across a number of key passage tomb areas. This will be achieved through systematic and large-scale programmes of biomolecular and isotopic analyses tailored to the taphonomic conditions of each of the target regions, crucial in successfully mining these otherwise challenging archaeological horizons and materials.

07 EXPLORING AN INTERCONNECTED WEB: ORKNEY, THE BOYNE VALLEY, GROOVED WARE AND THE PASSAGE TOMB TRADITION

Author(s): Carlin, Neil (University College Dublin)
Presentation Format: Oral

This paper examines the relationship between the use of latest Irish passage tombs and the development of the British and Irish Grooved Ware complex, including its Orcadian origins. I will highlight how the architectural forms of these passage tombs and their associated material culture, symbolic repertoires and depositional practices in Ireland and Orkney indicated sustained connections between people in these places. This will include a synthesis of the results of recent dating programmes and a reassessment of the character of depositional practices at Irish passage tombs from 3300 to 2700 BC. Based on this, I will show how the adoption of Grooved Ware occurred in Ireland occurred as part of the Middle Neolithic passage tomb tradition 3000/2900 cal BC. I will also demonstrate that use of these passage tombs did not suddenly cease at the end of the fourth millennium, but continued largely unchanged until c. 2700 BC. This indicates that the adoption of Grooved Ware in Ireland did not herald an era of large-scale social transformation. I will argue that the Grooved Ware complex developed out of a pre-existing interaction network between people across the islands of Ireland and Britain who shared architecture, practices, and objects strongly relating to the use of passage tombs.

08 MATERIAL PASTS: THE EARLIER PREHISTORIC MONUMENT COMPLEX OF BRYN CELLI DDU. RECENT RESEARCH AND COMPARISONS

Author(s): Griffiths, Seren (UCLan) - Edwards, Ben (MMU) - Reynolds, Ffion (Cadw) - Stanford, Adam (Aerial Cam)
Presentation Format: Oral

The monumental complexes from Ireland, northern Britain and the islands off the north and west coasts of Britain have long been recognised to demonstrate connectedness and interaction across the Irish Sea. Forms of monuments, portable material culture, and aesthetic culture of these sites and things demonstrate wide-spread cultural practices beyond contemporary national borders. This paper will present recent work on one of these complexes – the monuments from the landscape surrounding Bryn Celli Ddu, Anglesey, north Wales. We will present some of our innovative methods, our initial research findings, and make comparison with other monumental landscapes around the Irish Sea to discuss the very specific history of this important landscape. As part of our practice we make use of a range of exciting landscape archaeology techniques, including geophysical survey (ERT, resistivity, magnetometry), aerial photogrammetry, laser scanning, and augmented reality landscape modelling, as well as more traditional landscape archaeology techniques including fieldwalking and excavation. Our attachment to place is not only expressed through our archaeological work, but through the kinds of engagements we make. This research has at its heart immersive creative practice, with an emphasis on active public archaeology, including traditional aspects of artists in residence, parallel museum exhibits, open days and school visits, but also harnessing digital technologies for engagement, all of which is delivered bilingually.

09 DARK DAYS & BRIGHT NIGHTS: THE ISLE OF ARRAN, SCOTLAND, A BOYNE TO BRODGAR CASE STUDY

Author(s): MacGregor, Gavin (Northlight Heritage) - Brophy, Kenneth (University of Glasgow)
Presentation Format: Oral

We present the results of recent work on the Isle of Arran, Scotland, which has begun to re-explore its Neolithic remains. As well as a marked concentration of Neolithic sites, including significant numbers of Chambered Cairns and settlement evidence, the island is the source of Pitchstone, a lithic material which circulated across Northern Britain in fourth millennium BC as part of wider complexes of movement and exchange. Several megalithic monuments have been subject to survey and visualisation in recent years through a Forestry Commission Scotland project.

We will highlight the work around the Burning The Circle event, run in partnership between Northlight Heritage, National Trust for Scotland and University of Glasgow, which uses a combination of experimental archaeology and performance to educate and entertain. Over several years we have extended creative practices and successfully grown audiences.

We will also present on the results of a workshop with stakeholders designed to explore research, interpretative and audience development opportunities around the prehistory of the Isle of Arran.

We contend further work on the Neolithic of the Isle of Arran, and some of the approaches we have developed, has significant potential to contribute to the overall goals of the Boyne to Brodgar programme, and will outline some possible approaches as to how this can be achieved.

10 FROM BOYNE TO BRODGAR - BUT WHAT HAPPENED IN BETWEEN?

Author(s): Gannon, Angela (Historic Environment Scotland)
Presentation Format: Oral

During the Neolithic the sea was an active medium conveying different plants, animals and material culture, as well as an understanding of new technologies, including monumental architecture, pottery production and stone tool manufacture. This is no less true than along the Atlantic façade, where the sea was an important routeway connecting the elites of Orkney with their Irish counterparts in the Boyne valley. But this was no superfast highway so what happened in between? This paper draws on evidence from archaeological field survey projects undertaken over two decades, formerly as the Royal Commission on the Ancient and Historical

Monuments of Scotland but now under the auspices of Historic Environment Scotland. It will specifically reference islands off west mainland Scotland and will explore the evidence for the movement and exchange of ideas and resources. Even if the archaeological record for settlements remains relatively poor, this paper will demonstrate that the construction of stone-built monuments on these islands implies that they were not simply stepping stones of a mobile community. It will make a case that these islands have long been overshadowed by the World Heritage Site status of the Boyne Valley and Orkney, and that perhaps future research agendas should focus elsewhere, and to these islands in between.

11 REVISITING ORKNEY'S CHAMBERED CAIRNS

Author(s): Anderson-Whymark, Hugo (National Museums Scotland) - Ritchie, Georgina - Farrar, Steve (Historic Environment Scotland)
Presentation Format: Oral

In Orkney, numerous Neolithic chambered cairns were excavated in the 19th and early 20th century, revealing a few largely intact structures and more fragmentary remains. A concerted conservation campaign by the Ministry of Works and individuals, such as Walter Grant, in the early 20th century ensured that more than a dozen of these sites were conserved, often reroofed, and opened to the public. Eleven of these tombs are scheduled monuments and Properties in Care (PIC) of Historic Environment Scotland (HES). As part of a rolling programme of revising and updating interpretive material for PIC, HES' Cultural Resources Team recently revisited the presentation of ten unstaffed Orcadian cairns with faded and outdated interpretative panels. Updating these resources gave HES the opportunity to reassess what is known about the monuments that they describe. Various new studies were commissioned, including: lipid analysis of ceramics, ancient DNA analysis of human remains, and radiocarbon dating of secondary deposits from a number of tombs. In order to develop new ways of visually representing the sites, 'structure-from-motion' photogrammetric models of each cairn were also commissioned. These models captured the monuments in unparalleled detail, allowing the architecture of the cairns to be better understood. The models also documented known pecked rock art within the cairns and assisted in the rediscovery of lost motifs.

This paper presents initial results of these analyses and further explores how the 3d models provide visitors, both on the ground and in virtual environments, opportunities to engage with and explore these remarkably preserved cairns.

12 CONNECTED COMMUNITIES: NEOLITHIC MONUMENTS AND LANDSCAPE IN ORKNEY AND BEYOND

Author(s): Downes, Jane - Card, Nick (University of the Highlands and Islands) - Dockrill, Stephen - Bond, Julie (University of Bradford) - Banffy, Eszter - Rassmann, Knut (RGK - Romano-Germanic Commission DAI) - Mainland, Ingrid - Gibson, Julie - Lee, Dan (University of the Highlands and Islands)
Presentation Format: Oral

Survey and excavation in Orkney is changing our perceptions of Neolithic monumentality and dwelling. Still many questions remain about the different character of landscape and monuments on different islands within the archipelago. This paper presents explores two iconic case study areas within Orkney: the Ness of Brodgar and the Heart of Neolithic Orkney World Heritage Site, and the island of Rousay. In both these areas where landscape survey, field walking, geophysical survey, archive research and excavation are being used to explore these rich multi-period landscapes. Using Neolithic tombs as a focus, and new results from excavation and geophysical survey (the latter being undertaken by RGK-German Archaeological Institute as part of 'Boyne to Brodgar') we will explore the results of these projects drawing upon the Neolithic context for monumentality and the afterlives of tombs. We are only just starting to come to terms with the medieval and post-med landscape in the World Heritage Site, but on Rousay the richness of the more recent landscape has so far allowed for a more fine grained approach. Beyond the major sites in West Mainland Orkney including the Ring of Brodgar, Ness of Brodgar, and Barnhouse, recent geophysical survey and fieldwalking has allowed exploration of the spaces in between the well-studied monuments. On Rousay, beyond the settlement of Rinyo, are there any other Neolithic settlements, and how do communities on the island connect with those in 'The Heart of Neolithic Orkney' and further afield? As well as examining intra-Orkney connections, the findings including material culture from the Ness of Brodgar will be considered in the wider Atlantic Neolithic context.

13 STUDYING STONE ELEVATIONS: A NEW WAY TO COMPARE NEOLITHIC CONSTRUCTIONS

Author(s): Cousseau, Florian (UMR6566-CReAAH)
Presentation Format: Oral

For the last five years in the west of France the author has been developing a methodology for studying the elevations of the drystone-built elements of megalithic monuments. This has borrowed from the approach used to study historical buildings. Our study sites were five Neolithic monuments in western France, namely three circular cairns and two complex long barrows on the northern coast of Brittany: Carn and Barnenez. The results showed that it is possible to obtain new information using this elevation approach. Firstly, it revealed that the biography of each monument is often more complex than expected, with the aspect and functionality of each phase becoming clearer. Secondly, it then allowed us finally to approach the builders, examining their gestures and techniques and seeing how they organised the construction and how long it took. These new data provide us with new criteria that can be used to compare all stone constructions. In this regard, we studied the cemetery of Guennoc whose cairns are geographically and technically close to those of Carn and Barnenez. We found evidence for an architectural model that has been shared between one phase of Barnenez and one of Guennoc. This observation allows us to propose that either the idea of the model, or else the builders, moved

from one to the other.

For the Boyne to Brodgar project, we want to extend our methodology to Scotland, a country rich in well-preserved Neolithic stone monuments. Furthermore, Orkney has domestic stone-built sites (e.g. Skara Brae) whose construction can be compared to that of their megaliths. This proposed research could reveal similarities and differences in the biographies of construction, the character of each phase and the techniques of construction, not only from one megalithic monument to another, but also between megaliths and stone-built settlements.

14 EARLY MONUMENTALITY AND SOCIAL DIFFERENTIATION ON THE NORTH EUROPEAN PLAIN

Author(s): Mueller, Johannes (Institut fuer Ur- und Fruehgeschichte Kiel)
Presentation Format: Oral

The DFG Priority Program 1400 "Early Monumentality and Social Differentiation, On the origin and development of Neolithic large-scale buildings and the emergence of early complex societies in northern central Europe" started its work in 2009. In total, 22 University Departments, Research Institutes and Heritage Management Offices in 16 partial projects investigate the Neolithic on the Northern European Plain, in respect to a complex topic: How is the relation between monumental buildings and social structures and developments especially 3800-2800 BCE? Results and interpretations of the project are already published in 15 monographs and several articles. The close interlinkage of natural and life scientists, and prehistoric archaeologists allowed a new view on triggers and consequences of Neolithic monumentality.

In literate as well as in illiterate societies, Monumentality represents a form of materialisation of a mode of memory that involves an awareness of the historic dimension of the actions of persons or groups involved. Jan Assmann has dealt with this concept from the perspective of an Egyptologist. An implementation of his concept of "Cultural Memories" into the concept of Monumentality allows for a fruitful analysis of prehistoric monuments in a phenomenological framework.

Although monuments have always played a prominent role in neolithic research, in the Central European research until now only a rather limited set of interpretative strategies have been applied. Looking into the wider, international research practise, often interpretative strategies have been applied that tend to neglect the material basis and its chronological and spatial structure. Sociological concepts and concepts from social anthropology are gaining more and more ground as a starting point for interpretations towards societal developments and the meaning of monumentality in the Neolithic.

a. TRANSECTS OF TIME: A MULTIDISCIPLINARY APPROACH TO INVESTIGATE NEOLITHIC MEGALITHIC TOMBS THROUGH GENETICS, ISOTOPES, AND RADIOCARBON DATING

Author(s): Fraser, Magdalena (Dept. Archaeology and ancient history; Dept. Organismal Biology, Evolutionary Biology Centre, Uppsala University)
Presentation Format: Poster

The island of Gotland in the Baltic Sea has been populated for over 9000 years, and cultural remains spanning from the Mesolithic to Historical times are relatively well documented due to the longstanding tradition of archaeological research. Still there are certain time-periods and cultural developments that are better studied than others leaving large chronological gaps in our understanding of the demographic developments on the island. This is also largely due to the low number of burials from the Late Mesolithic and Early Neolithic cultures, and for the Latter Stone Age period many of the burials have previously been plundered, disturbed, and in some cases partly destroyed.

One of the chronological gaps for the demographic developments on Gotland is the uncertainty of the duration of the Funnelbeaker culture (alternatively Trichterbecher TRB) and their association with the contemporaneous sub-Neolithic Pitted Ware culture. Additionally, the Late Neolithic (c. 2400-1800 cal BCE) stone cists burials on Gotland have not previously been directly dated, but assigned temporally solely based on the artefacts within the burials which often show affinity also into the Early Bronze Age (c. 1800-1100 cal BCE). As the LN period comprise of a 600 year timespan, little is known regarding the population demographic developments on the island during this archaeological time period.

Here I present new research based on analyses of human remains from five previously excavated Neolithic megalithic monumental burials from the Middle to the Late Neolithic/Early Bronze Age period on Gotland which are discussed in light of the demographic developments on the island.

780 ARCHAEOLOGICAL UNCERTAINTY; A JOURNEY THROUGH THE RUINS OF A DISCIPLINE

Theme: Archaeology and the European Year of Cultural Heritage
Organisers: Trelka, Malgorzata (Ironbridge International Institute for Cultural Heritage) - Howard, Sarah (Ironbridge International Institute for Cultural Heritage) - Beaulieu, Kiara (Ironbridge International Institute for Cultural Heritage)
Format: Regular session

Archaeology has its roots within Western knowledge systems that were traditionally exclusionary rather than inclusionary. Today, archaeology is incorporated into the wider category of cultural heritage, increasingly contributing to contemporary studies of material and immaterial culture and serving as an instrument of social sustainability agendas. The disciplinary landscape of archaeology has changed dramatically over the last 30 years to be more reflexive and responsive to the needs of diverse contemporary cultures, but we have often neglected the social and economic well-being of our own practitioners. Latent prejudices within the theory and practice of archaeology such as gender biases, colonial understandings of the past, cultural and social misrepresentation continue to be an issue within the contemporary discipline. As such, critical heritage studies perceive archaeology as a relic of an antiquated practice preoccupied with fossilising an authorised heritage discourse (AHD) and monumental European vision of the past. But the counter AHD could be considered just as damaging to professionals who have dedicated their lives to undertaking extensive study and training for a 'career' only to find that it does indeed eventually lead to ruin(s). Archaeology is a discipline in social, economic and political transition. Whilst this is potentially an exciting period of rediscovering what it means to do archaeology in the 21st century, it is also a source of anxiety for practitioners who are already under pressure.

ABSTRACTS

01 DEALING WITH UNCERTAINTY: IMPROVING MENTAL HEALTH AND WELLBEING IN AN ARCHAEOLOGICAL WORKPLACE

Author(s): Whitaker, Katy (University of Reading; Historic England)
Presentation Format: Oral

As this session call observes, the archaeological workplace - in fact, the heritage workplace - has been transformed in recent years. Themes in the UK include archaeological professionalization; the development of commercial archaeology (hand-in-hand with national and European legislative change); a large increase in university attendance; and since 2008 an austerity agenda that has seen massive (and ongoing) cuts to local authority archaeology services, museums, and other cultural heritage institutions.

As a result of market fluctuations, impending legislative upheaval, and biting budget reductions, the current environment is one of change and uncertainty in both the private and public sectors. These can be difficult for organisations and individuals to handle. What can be done to support and sustain the people who are at the root of our heritage? Not only practitioners and colleagues, but also our peers, our partners, our public, the next generation?

This paper presents one way that a large heritage organisation, Historic England, is taking steps to support not only the physical, but also the mental, health of its staff. Drawing on recent examples of projects showing that heritage can benefit well-being, I suggest that Historic England's approach can have an effect beyond its personnel, to the wider community.

02 INCLUSION IN THE ANXIETY BUBBLE: HOW DO WE ACCESS ACCESSIBLE ARCHAEOLOGY?

Author(s): Pageau, Hanna (University at Albany)
Presentation Format: Oral

The Anxiety Bubble is something that encompasses the daily life of the modern academic, however, it disproportionally effects graduate students and ECRs (whether tenure track or not) - even more disproportionately if you're part of a marginalized group. This presentation will focus on a culmination of previous survey work and on going research into accessibility and archaeology. Looking at the experience of archaeologists to drive the idea that not only is archaeology failing at making itself accessible, but that academia itself and archaeology as an extension, is still actively fighting against truly becoming accessible - especially for those from poor economic backgrounds and with chronic health issues. While even a temporary health concern can be a rise for anxiety, especially for those on the job market or finishing up a degree where it will be hard to explain gaps in employment or studentship without encountering ableism - this paper will focus on the long term accessibility issues in archaeology for those with chronic conditions that shape life long goals and carers into tiny boxes that, often, don't fit the 'mold' of archaeology well as it is currently presented. Navigating a career in academia, especially in the field sciences is inherently anxiety inducing and this talk will focus on what the current state of is, what is being looked at as the future of, and how practitioners actually deal with accessibility in archaeological fields.

03 REFLECTING ON THE EVALUATIVE PROCESS AND EXPLORING PUBLIC SKILLS TRAINING

Author(s): O'Mahoney, Alice (University of Bradford)
Presentation Format: Oral

Archaeology's relationship with the public is an important one, across the cultural sector there has been a focus on the impact of heritage on the public. However, as the economic and political backdrop of the UK changes governmental funding of the culture sector has been vigorously cut. This has encouraged debates within the archaeological discipline, and across the cultural sector, concerning themes of sustainability and diversity regarding outreach projects and funding of projects. The heritage sector has begun to emphasise the importance of heritage on people's well-being, as well as measuring heritage's impact. Archaeology's influence on well-being has been investigated from the perspective of the public, but rarely from the perspective of those within the discipline. The overall research project investigates the experiences of those in the field, and aims to further understanding regarding current practices of evaluation in archaeological outreach, as well as the experiences of archaeologists conducting outreach. The research

situates itself within the public archaeology literature, and encourages the use of public engagement strategies across the discipline. This presentation briefly discusses the methodology and findings of research done into archaeological outreach evaluation techniques, with a focus on skills training for public engagement. The presentation looks at analysis completed on semi-structured one-to-one interviews conducted with archaeologists who work in the field of archaeological outreach, the data collected from the interviews was examined using Interpretative Phenomenological Analysis. The interviews reveal the beliefs and understandings regarding undertaking archaeological outreach, how to evaluate the projects undertaken, and the personality required to be part of effective outreach. Based on this research the presentation argues for the use of communication and public skills training for archaeologists.

04 DISCREPANCY BETWEEN THE IDEAL AND THE REALITY - FINNISH PERSPECTIVE TO ARCHAEOLOGY IN TRANSITION

Author(s): Seppanen, Liisa (University of Turku) - Haggrén, Georg (University of Helsinki)
Presentation Format: Oral

Archaeology is a vast discipline, which has expanded its fields of study ranging from distant past until present and anticipating the future. It combines methods and theories from humanities, sciences and social studies and seeks to understand both material and immaterial culture on global as well as on local level. Today, the discipline provides an unlimited number of possibilities as well as challenges for its practitioners.

In this paper, we are discussing the situation in archaeology and archaeologists in Finland today. As an academic discipline, archaeology is very small when compared with other countries and other disciplines like history. One can study archaeology in three universities (Helsinki, Turku and Oulu) where small units are trying to stand out from the others by profiling themselves distinctively. At the same time, the units of archaeology are combined with other departments providing students with common education together with history (Turku), cultural anthropology (Oulu) and cultural studies (Helsinki). Incorporating archaeology with other disciplines is in line with recent trends and expansion of the scope archaeology. In practise, however, the amount of education in archaeology is decreasing while the scope of archaeology, as well as professional requirements in the field are constantly increasing. This is a situation, which causes concern about the expertise of future archaeologists as well as about the role of archaeology as an academic discipline.

Whilst expansion and re-determining of the discipline to holistic cultural heritage has changed the research and education within the field, it has not widened the conceptions related to archaeology as a subject and archaeologists as experts studying the human past. When archaeology is expanding, it is vital to expand the conceptions related to archaeologists as professionals and employees as well. How can this be achieved convincingly and justify the expansion of the subject without losing its identity?

05 ARCHAEOLOGISTS AND THE HERITAGE COMMUNITY

Author(s): Trelka, Malgorzata (University of Birmingham)
Presentation Format: Oral

The way archaeology is conducted in Europe is regulated by laws and international treaties. Within policies regulating archaeological practice, there is a duty within each Nation State to educate the public about their heritage. This role has been fulfilled over the last century by archaeologists and later heritage practitioners who see the act of educating the public as their moral duty. Engagement activities have transitioned from instances of indoctrination on the conservation ethos, formal education to informal engagement, active community involvement and more recently the facilitation of grassroots heritage projects. Although not explicitly acknowledged, part of this process is still relying on training of peoples' opinion on value judgements to match that of changing national agendas. The process of raising awareness amongst the general public and the role of archaeologists in this, poses an ethical question of whether diverse values can be accommodated within shared public past. This paper explores the relationship between different forms of public engagement and how they influence the composition of heritage communities and cognitive communities in an attempt to engage people with 'their' past, even if this is one which they cannot or, more importantly, do not want to relate to. The involvement of the heritage communities is critical in the heritage process as they are the supporters of our profession. However, the identity of the heritage community created as a consequence of archaeological practice can create tensions within society and lead to archaeological anxiety.

06 PUTTING THE ME BACK INTO ARCHAEOLOGICAL HERITAGE MANAGEMENT

Author(s): Howard, Sarah (University of Birmingham)
Presentation Format: Oral

This paper is a candid discussion about the place of emotion and empathy within archaeological heritage management (AHM), challenging the notion that having an emotional response to your work and people you work for is 'unprofessional'. As an AHM professional working for a public body, I am always conscious that I need to remain neutral in the way I conduct my work and myself. Although there is a rhetoric of making real connections between places, people and communities, cool detachment is still considered to be the epitome of professionalism. Whilst I was able to operate like this for a number of years as I traversed the country following short-term contracts, 3 years ago I found myself back where I started. This was not just because I became responsible for the area where

I received my post-university training in 2007, working closely with my former mentors, but I was also based within the region where I grew up. Whilst I am by no means the same person I was 15 years ago when I left, I know I have more of an understanding of various communities and socio-economic groups in that region than other colleagues. Whilst I cannot speak on behalf of these people, I believe no one has the right to do that, I do have a level of empathy that prevents me from using sanctioned, and quite frankly socially damaging, narratives about post-Industrial Northern England. Despite recently redrafted heritage policy playing down intangible qualities of nationally designated heritage, my experiences over the last few years has confirmed the idea that heritage is the process of attaching meaning and is primarily about people, not stuff. As such, the ability to empathise, and not gloss over difficult pasts with grand narratives of decline and regeneration, is essential for professional heritage managers.

07 RAGING AGAINST THE MACHINE; ARCHAEOLOGY, METAL DETECTING, AND LEGISLATION IN NORTH AMERICA

Author(s): Beaulieu, Kiara (University of Birmingham)
Presentation Format: Oral

Archaeological workers in North America are often envious of the supports, initiatives, and legislation that other regions have enacted to protect cultural heritage. It seems many cultural heritage laws used to protect sites elsewhere are just not viable, can not be enforced, or are seen as not applicable in the Americas. This leaves North American archaeologists attempting to alter or create new initiatives at a distinct disadvantage. Metal detecting in North America provides a case study of these difficulties and the concerns brought forth by professionals. Elsewhere initiatives such as Portable Antiquity Scheme (PAS) or Portable Antiquities of the Netherlands (PAN) have been enacted, but advocates of those sorts of developments in North America have yet to achieve much success.

This paper explores North American metal detection and the potential for instituting a PAS or PAN-like system in that region. It would seem that copying one of those foreign initiatives would mean simply "plugging in" necessary information and a ready-made project would then be complete. In reality, facets unique to North America mean the importation of innovations developed elsewhere to protect and promote material culture are anything but simple. These specifically hinder relationships with the public or special interest groups.

08 HOW DO WE KNOW WHAT WE KNOW? – IDENTIFYING DIFFERENT TYPES OF ARCHAEOLOGICAL SITES

Author(s): Kama, Pikne (Valga Museum)
Presentation Format: Oral

Knowledge about archaeological sites is the basis for constructing the past and therefore it is critical to understand how the information about archaeological landscapes has formed. The knowledge about different heritage sites have cumulated differently. I focus on the reasons of identification three types of sites in the south-eastern Estonia: prehistoric strongholds; burial sites on dry land and wetland sites with potential human remains. As it turns out, the main reason for the identification of the sites is the local knowledge expressed in folklore. Archaeologists have used folklore successfully to find new archaeological sites. At the same time not always is the knowledge among local people supported by the archaeological finds. We cannot be sure is the gap between folklore and identification made by archaeologists based on actual difference or is it just a result inadequate archaeological investigation. In the analysis of wetland sites, my own fieldwork, undertaken at wetlands selected on the basis of folklore that referred to human remains, is presented. Unfortunately, the fieldwork did not grant any archaeological finds and it is uncertain if the folklore and archaeological finds did not engage as tightly as expected or the absence of finds is the result of inadequate archaeological methods. When using folklore in archaeological approach, one has to keep in mind how folklore emerges and the character of the information it tends to pass on. For example, is folklore a result of the original use of sites, or caused by unearthing remarkable archaeological finds in latter times. The results of this study show the great value of folklore in improving our knowledge of our archaeological heritage. However, it is important not to rely upon folklore alone. Equally important is to get hold of the archaeological information that is not reflected in folklore and therefore not yet found.

09 HARNESSING THE SUBVERSIVE POWER OF ARCHAEOLOGY: THE VISION AND PRACTICES OF PATTANAM (MUZIRIS) EXCAVATION PROJECT, INDIA

Author(s): PJ, Cherian (PAMA Institute for the Advancement of Trans-disciplinary Archaeological Science)
Presentation Format: Oral

Pattanam excavations (2006-2016) unearthed massive material evidence exposing transoceanic links (3rd c BCE to 5th c CE) of the Indian subcontinent from Hepu site in South China to Catalonia in Western Mediterranean. The artefacts point to brisk transcontinental network, active fifteen centuries before Vasco da Gama reached the Indian shores (1498). The technology, planned life, trade and cultural diversity etc visible at the site point to invaluable and precarious heritage value of a densely populated coastal village.

The paper will share the journey of a barefoot archaeology adventure into an international archaeology project. Challenges encountered – paucity of funds, colonial administrative legacies, non- academic interventions, local community perceptions, lack of socio-political sanctions – etc will be discussed.

The project brought together a collaborative and holistic vision relying on the subversive knowledge potential of archaeology. Through ownership of the site, multi-disciplinary excavations, advanced post excavation collaborative studies, trans-disciplinary

training, imaginative illumination and contextualization of finds, publications and local-community-centric conservation strategies, the project aimed to transform Pattanam village into a world heritage site and trans disciplinary-knowledge hub.

The paper would analyse the practical experiments and experiences the project underwent. The Green Archaeology and Muziris Heritage projects were the eco and heritage sensitive educational initiatives ensuring local community participation and empowerment.

10 GENTLY GNAWING ON OUR PHALANGES: WITHER ARCHAEOLOGICAL WAYS OF KNOWING IN AN ARCHAEOLOGICAL HERITAGE MANAGEMENT BEYOND ARCHAEOLOGY

Author(s): Ferris, Neal (Univerisity of Western Ontario)
Presentation Format: Oral

In Canada archaeology sits between colonial and contemporary reconciled notions of the past and heritage, and between the State and Indigenous sovereigns. Archaeological Resource Management (ARM), regulated by State and broader societal conceptions of what archaeology "is," has seen the Authorized Heritage Discourse (AHD) shift away from archaeologist-centric values. Heritage management is becoming less "soft" State obligation to preserve the material past for all and for science, and more "hard" fiduciary State obligation reconciling colonial legacies and recognized Indigenous sovereign rights over this heritage. In turn, these changes are heralding a re-definition of the role of archaeologists in ARM: less authorized experts and primary value-makers of archaeology, and more technicians servicing other societal values and opinions of this contested material heritage.

Practitioners struggle to adapt to this change, but generally assume there remains a place for an archaeologist's way of knowing the past: those archaeologist-centric ways of reading landscapes, site formation processes, long term material lifeways, and ancient lives lived as reflected through the material record. However, ARM is overwhelmingly infused with culture history and pre-occupied with object identifications and regional normative constructs as the way of knowing and valuing the past. Indeed, the reformulation of archaeology as heritage beyond archaeology invites those outside archaeology to question the greater validity of jargonistic classification and cultural historical narratives over their own opinions and reading of "archaeology." So, is there a place for an informed, reflexive archaeological meaning making within a resituated heritage conservation regime? Can it in contribute to a State/Indigenous Sovereign-framed AHD? This paper considers the implications of the material heritage beyond archaeological sensibilities as ARM practice shapes broader understandings of what the archaeological record represents, and what value there might be to how archaeologists think and make meaning in a time when knowledge is just another opinion.

782 THE VALUE OF LITHIC RAW MATERIALS IN DEFINING PREHISTORIC SOCIAL TERRITORIES

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Mangado, Xavier (SERP - University of Barcelona) - Delvigne, Vincent (University of Liège; University of Bordeaux)
Format: Regular session

This session will look at potential prestige lithic raw materials which, among other archaeological remains such as bone industries and ceramics, could be considered good indicators for defining social and economic territoriality and mobility patterns in prehistoric societies.

Numerous sourcing studies have traced the movement of lithic raw materials over short and long distances - often to reconstruct potential trade routes, distributions patterns, how goods might been transferred between settlements, and the geographic extent of movement. One objective of these studies is to better understand the territories of prehistoric populations - in terms of their extent and nature. Trade, whether for economic or social purposes, is interaction between people (settlements, groups, or regions) and its amount can indicate the degree of interaction. Although artefact typologies may indicate shared ideas, they do not necessarily indicate ongoing interaction, and might only indicate the original spread of an idea. Trade can occur, increase, or decrease between formerly unrelated groups. Although it might not coincide with the origins of a cultural group, it will likely coincide with the transmission of knowledge and ideas, which, among other characteristics, play a large part in defining a cultural group, and how connected groups were.

The aim of this session is to present and discuss the construction and development of the concept of prehistoric territoriality in different human societies around the world, through the regional analysis of lithic sourcing, the technology applied to these lithic raw materials, and their exchange patterns or trade routes through time.

ABSTRACTS

01 PREHISTORIC TERRITORIES: WHAT ARE WE STILL SAYING?

Author(s): Delvigne, Vincent (Service de Préhistoire, University of Liege; UMR 5199 PACEA, University of Bordeaux) - Bindon, Peter (Australian Ethnographic Institute P/L) - Bracco, Jean-Pierre (UMR 7269 LAMPEA, Aix-Marseille University) - Fernandes, Paul (SARL Paleotime, Villard-de-Lans; UMR 5199 PACEA, University of Bordeaux) - Lafarge, Audrey (UMR 5140 – Archéologie des sociétés médi-

terranéennes, Université of Montpellier 3) - Raynal, Jean-Paul (Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology; UMR 5199 PACEA, University of Bordeaux)
Presentation Format: Oral

Ten years after the 126th CTHS congress, "Territories, Displacement, Movement and, Exchange During Prehistory", the statement we made then regarding the semantics of "the territory" still stands. The term "territory" in prehistoric sciences has almost as many definitions as there are authors. Disregarding the number of occurrences of this widely used term and focussing instead on the question "What is a territory?" we find prehistorians often floundering for a comprehensive definition.

Using comparisons with other social science disciplines, in this presentation we aim:

i) to clarify and develop the notions of place, space and territory;

ii) to establish if and how the degree of mobility of individuals and groups influences the structuring of spatial thinking; and

iii) to explore ways to approach these different concepts in prehistory.

Recurrences in the function of prehistoric sites and in the use of certain materials found at those sites are expressions of structure in prehistoric behaviour. They make it possible for us to hierarchize spaces like areas of acquisition, zones of exchange, non-places, voids etc. and by extension to model paleolithic territories.:

Territorial definitions of nomadic people drawn from physical evidence derived from just one site are questionable to say the least. Therefore, the results of work by geographers showing that consideration of all possible interconnections in a wider landscape can produce territorial descriptions should be applied to the prehistoric situation. Thus, it is necessary to adopt a new understanding of the scale of prehistoric occupation, departing from the viewpoint of a single site into a more global realisation of a network of resource localities and habitation places.

02 DETERMINING THE FORAGING RADIUS OF THE NEANDERTHALS OF THE ABRIC ROMANÍ (NE SPAIN) THROUGH THEIR CHERT PROCUREMENT STRATEGIES

Author(s): Gómez de Soler, Bruno (Institut Català de Paleoecologia Humana i Evolució Social - IPHES; Àrea de Prehistòria, Universitat Rovira i Virgili - URV) - Soto, María (Department of Anthropology and Archaeology, University of Calgary) - Vallverdú, Josep (Institut Català de Paleoecologia Humana i Evolució Social - IPHES; Àrea de Prehistòria, Universitat Rovira i Virgili - URV) - Vaquero, Manuel (Àrea de Prehistòria, Universitat Rovira i Virgili - URV; Institut Català de Paleoecologia Humana i Evolució Social - IPHES)
Presentation Format: Oral

Chert is the most used raw material along the Abric Romaní sequence, reaching in most cases more than 80% of the lithic assemblages. Systematic prospecting and petrographic analysis led us to determine the extent and nature of the foraging radius of the Neanderthals that occupied the Abric Romaní during the M, Oa and P levels, dated between 50-55 ka BP.

The Abric Romaní (Capellades, Barcelona) is a travertinic rockshelter situated at the right bank of the Anoia river, in a narrow corridor that puts in contact the inner part of the Catalonian region. Our study area comprises a 30 km radius from the site, where more than 30 primary outcrops with silicifications have been documented, and differentiated as local (< 10 km) and regional sources (>10 km from the site), considering the foraging radius from ethnographic data sets (Binford, 2001), which barely overcome the 8 km, as limit. Understanding this foraging radius as the hunter-gatherers parties leaving the campsite for exploiting the landscape and return in a single day (Binford, 1982), we applied the chert abundance ratio (Soto et al. 2017), a quantitative approach to the raw materials availability in the territory, for a better understanding of the lithic landscape.

The lithic procurement model of the three studied levels reveals most of the used raw materials come from the Sant Martí de Tous (SMT), an area located at 15 km from the Abric Romani and where the highest concentration of silicifications are described. This radius sometimes increases up to 24 km, based on the procurement of the Panadella chert type (PAN).

These results determine the foraging radius of the Neanderthals from the Abric Romani can be included in a regional mobility range, increasing the known foraging area extent of the historical hunter- gatherers.

03 THE PROVISIONING TERRITORY THROUGH MIDDLE AND UPPER PALAEOLITHIC: BETWEEN PREHISTORICS' AND PREHISTORIANS' PERCEPTIONS

Author(s): Caux, Solène - Vaissié, Erwan - Faivre, Jean-Philippe (De la Préhistoire à l'Actuel: Culture, Environnement et Anthropologie - PACEA,- UMR 5199, Université de Bordeaux)
Presentation Format: Oral

During the Palaeolithic, the cultural territory is traditionally represented for each prehistoric group by the area containing all sites where evidences of this material culture occur. Inside this large cultural territory we could attempt to identify provisioning territories by studies focused on one single site or by regional synthesis showing the relations between several places. However, some studies highlight that provisioning territories and cultural territories do not always fit. How to interpret such results?

Here we present a cross-study of four French sites from both Middle and Upper Palaeolithic in order to compare the classical model and the outsider results. We will first synthesis the results of Combe-Grenal (Lot; Middle Palaeolithic) and l'abri Pataud (Dordogne; Upper Palaeolithic) that fit with the classical model and show clearly all the well-known differences regarding provisioning territories between these two phases. Then we will detail two other cases that show significant differences between provisioning and cultural

territories: Baume-Vallée (Haute-Loire; Middle Palaeolithic) and le Pigeonnier (Gironde; Upper Palaeolithic). Finally, we will discuss the interpretation of these results on various levels questioning:

- our own concepts: what is a cultural territory and how do we define the share of knowledge through space?

- on what data are we basing the comparisons to support the cultural territory expansion?

- and finally the palethnological implications of these outsider cases for both Middle and Upper Palaeolithic: could we precise the management of raw materials between direct (nomadism) or indirect (trade) provisioning by the study of resources and/or groups mobility?

04 AT THE FRONTIER, DURING THE LGM: A CASE STUDY FROM MOGYORÓSBÁNYA (HUNGARY)

Author(s): Markó, András (Hungarian National Museum - Budapest)

Presentation Format: Oral

The Pebble Gravettian site cluster at Mogyorósbánya (northern part of Transdanubia, Hungary) is securely dated to the LGM based on the lithostratigraphic evaluation and two 20-19 ka radiocarbon dates. The rich lithic assemblages are dominantly made of medium to poor quality pebble raw materials, most probably of local origin. A single flake of rock crystal collected in the Eastern Alps and probably some pieces of radiolarite and Tevel flint indicate south-western contacts.

A significant number of artefacts were made of obsidian, imported from a distance of 210-250 km from eastern direction. Moreover, 5% of the artefacts were made of extra-Carpathian raw material types, basically of Cretaceous flint and Jurassic silicites.

The supposed source areas of these later rocks are lying in southern Poland and in Moravia, at a distance of 220 to 270 km from Mogyorósbánya. From these territories, however, no evidence of human occupation is known from the period of the LGM: after the rich Gravettian occupations, a few and very scarce assemblages are dated to around 18 ka.

The re-utilisation of a lithic artefact collected in the nearby surface scatter is documented by refits. However, it is improbable that all the pieces made of 'Northern raw material' types would have been collected from a secondary context, i.e. from earlier archaeological localities, not buried during the LGM (e.g. the Late Gravettian sites in the Váh valley, Slovakia).

As the typological and technological traits of the Mogyorósbánya collections are homogenous for each raw material groups, we suppose episode-like human presence in the regions north of the Carpathians, indicated by the occurrence of high quality raw materials and a piece of fossil resin in the Mogyorósbánya assemblages.

05 LITHIC PROCUREMENT AT MONTLLEÓ OPEN-AIR SITE: TRACING PAST HUMAN ROUTES

Author(s): Sanchez De La Torre, Marta (PPVE. Universidad de Zaragoza; SERP. Universitat de Barcelona) - Mangado, Xavier (SERP. Universitat de Barcelona) - Mercadal, Oriol (†) - Langlais, Mathieu (PACEA - UMR 5199; SERP. Universitat de Barcelona) - Le Bourdonnec, François-Xavier (IRAMAT-CRP2A - UMR 5060) - Gratuze, Bernard (IRAMAT-CEB - UMR 5060) - Fullola, Josep Maria (SERP. Universitat de Barcelona)

Presentation Format: Oral

Montlleó open-air-site (Prats i Sansor, Catalonia) is located in the hearth of the Catalan Pyrenees, at 1144 m asl. The site, placed in one of the largest high-attitude valleys in the Pyrenees, the Cerdanya Valley, is a natural road to cross the Pyrenees in the Eastern part.

The site, discovered in 1998 and excavated since the 2000 by a multidisciplinary research team from the SERP (University of Barcelona), was occupied by hunter-gatherer groups during the Upper Palaeolithic. The research works have detected until now at least two different chronocultural occupations: one possibly dated from the Badegoulian (16900±110 BP and 18860±80 BP non cal) and another from the Lower Magdalenian (15440±80 BP and 15550±140 BP non cal).

Lithic raw materials recovered at Montlleó are diversified, by the presence not only of exogenous rocks, as chert, but also by local rocks, as rhyolite, quartz, quartzite and lydite. The archaeopetrological study of the recovered lithic set has comprised micropalaeontological, petrographical and geochemical analyses (energy dispersive X-ray fluorescence and laser-ablation inductively coupled plasma mass spectrometry). Results have allowed determining several origins for rocks, showing a great knowledge of the Pyrenean territory and making evident the existent relation between both Pyrenean slopes during the Late Glacial Maximum.

06 INVESTMENT IN SOCIAL CAPITAL AND THE VALUE ASCRIBED TO CERTAIN RAW MATERIALS BY ABORIGINAL SOCIETIES IN PRE-CONTACT NORTHEASTERN NORTH AMERICA

Author(s): Burke, Adrian (Université de Montréal)

Presentation Format: Oral

This paper discusses the circulation of a variety of lithic raw materials (e.g., cherts, quartzites, quartz crystals, copper, steatite, argillaceous pipestone) in the Great Lakes and Greater Northeast region of North America. While it is difficult to establish the "value" that various pre-contact Aboriginal societies attributed to these materials, there are some materials that regularly travel much further than others or that are found in very specific contexts (e.g., ritual deposits, burials). This points to a greater "value" for these particular materials in terms of distance from source but more specifically in terms of the investment that has been made in social capital. This investment, and the value ascribed to the material, can be measured in a relative sense by the different territories that

have to be crossed as materials travel from their geological source and the workshops surrounding these outcrops to local communities, the larger region, and then beyond. The circulation of some raw materials clearly points to the boundaries or outer limits of some of these societies. However, many materials transcend cultural and linguistic boundaries and travel far beyond, exceeding 1000 kilometres in some cases. This suggests that certain raw materials also carried intrinsic value that was shared and recognized among many different pre-contact Aboriginal societies.

07 ON THE RECONSTRUCTION OF PREHISTORIC SOCIAL TERRITORIES. THE LA DÉSIRADE LITHIC WORKSHOPS AND THE DISTRIBUTION OF LA DÉSIRADE CHERT (F.W.I.)

Author(s): de Waal, Maaike (Faculty of Archaeology, Leiden University)
Presentation Format: Oral

The widespread presence of raw materials suitable for the production of stone tools on the south-eastern part of La Désirade, a small island east of Guadeloupe (French West Indies), is an interesting feature as these materials cannot be obtained on most of the neighbouring limestone islands. Small amounts of lithic off-site material have been found all over the south-eastern part of La Désirade, indicating that this area was incidentally used for the exploitation of local raw materials for the production of lithic artefacts. Concentrated and repeated activity took place at four lithic workshops. The worked material, La Désirade chert, has been found in several site assemblages well outside La Désirade itself.

This paper will aim at presenting the La Désirade lithic workshops, a technological characterization of La Désirade chert and its micro-regional and regional distributions, and the ways this material was used in pre-Columbian society. These data will be used to indentify territories within and outside the East-Guadeloupe micro-region, which comprises the islands of La Désirade and Petite Terre and the Pointe des Châteaux peninsula of Guadeloupe. These territories will be compared with territories identified by analysing potential prestige materials, such as St. Martin greenstone and shell guaizas ('masks'). The combination of the analysis of the La Désirade chert and the potential prestige materials is expected to provide an impression of social, political, economic and even ceremonial organization and mobility patterns of the pre-Columbian societies involved.

08 NEW MINERALOGICAL DATA ABOUT LAPIDARY EXOTIC MATERIAL DISTRIBUTION DURING THE EARLY SALADOID PERIOD (500 B.C.–500 A.D.) IN THE LESSER ANTILLES.

Author(s): Queffelec, Alain (CNRS UMR5199 PACEA, Université de Bordeaux, Ministère de la Culture) - Fouéré, Pierrick (INRAP Grand-Sud-Ouest et Dom Tom; CNRS UMR5608 TRACES, Université Toulouse Jean Jaurès, Ministère de la Culture) - Bellot-Gurlet, Ludovic (CNRS UMR8233 MONARIS, Sorbonne Université) - Stouvenot, Christian (DAC Guadeloupe, Ministère de la Culture; CNRS UMR8096 ARCHAM, Université Panthéon-Sorbonne, Ministère de la Culture) - Paris, Céline (CNRS UMR8233 MONARIS, Sorbonne Université) - Caverne, Jean-Baptiste (APRAGE)
Presentation Format: Oral

Lapidary artwork is a specificity of Amerindian crafting during the early Saladoid period in the Antilles area, a ceramic age culture lasting about from ca. 500 B.C. until 500 A.D. Beads and pendants are the most often recovered artifacts in their settlements remains, processed in a wide variety of raw materials. These gemstones are very often referred to as exotic since they are not coming from the island where they have been discovered by archaeological excavations. The location of these highly valuable and symbolical artifacts provides the basis for a different interpretation at two different scales. According to some authors, their intra-site distribution is connected to sociopolitical organization, while their wide regional distribution led to the hypothesis of a pan-Caribbean network during this period. Our recent work updates the previous data by studying newly excavated sites as well as refining outdated mineral characterizations. New results, combined to a literature-based database, allowed for the creation of an improved and renewed vision of the distribution, potential provenance and uses/discards of these numerous gemstones. For instance, provenance of amethyst, once supposed from Martinique (Lesser Antilles) is now assumed to come from Brazil. New turquoise studies also point towards a potential South-American origin. The unique position of these artifacts in dumps are contested by works on archaeological sites located in French islands and quite poorly known by the Caribbean community. It has been years since the last works on lapidary artwork has been done in the Caribbean area. This study lays the foundation for further work in the region.

09 CENTRAL ANATOLIAN VOLCANIC RAW MATERIALS AND IMPACT ON NEOLITHIC COMUNITIES

Author(s): Baysal, Adnan (Trakya University)
Presentation Format: Oral

The region of Central Anatolia is host to intense volcanism. As a result of this it can also be observed that the region is in possession of a rich volcanic raw material potential. This geography makes up the general raw material sources of both Neolithic settlements such as Çatalhöyük and Aşıklı Höyük known from archaeological literature, as well as many other large and small settlements and modern cities. The aim here is to analyse the intense exploitation of obsidian and volcanic rocks at the two Neolithic sites, the contribution to socio-economic development and communications beyond the geography in which they are found. In addition, whether this situation is an advantage or a disadvantage will be questioned. Particular emphasis will be given to the use of the raw material sources, the cultural effect of the relationships developed as a result of the distribution of the materials and the degree to which cultural characteristics were transferred. This paper aims to question the cultural relations, impact of economic or social progress and cultural exchange and its limits on the basis of the raw material use and utilization of it. As result, it also discuss and questions

the location and richness of the sources should have always a positive impact on the cultural transmission.

10 OBSIDIAN DISTRIBUTION IN THE WESTERN MEDITERRANEAN AND THE SPREAD OF THE NEOLITHIC PACKAGE: A CHRONOLOGICAL AND GEOGRAPHICAL COMPARISON

Author(s): Tykot, Robert (University of South Florida) - Freund, Kyle (Indian River State College) - Vianello, Andrea (University of South Florida)

Presentation Format: Oral

The introduction of agriculture, animal husbandry, ceramics, and year-round settlements (the Neolithic package) to western Europe was paralleled by the distribution and trade of obsidian up to 1000 km from four island geological sources (Lipari, Palmarola, Pantelleria, Sardinia) in the central Mediterranean. The distribution of obsidian artifacts infers maritime transport capabilities, as does the arrival of domesticated animals on two of these islands, and overlaps very much with the range of the Early Neolithic ceramic Cardial Impressed Ware style. Using scientific analyses since the 1960s, and especially non-destructive X-ray fluorescence (XRF) spectrometry in the past decade, an extremely large dataset of more than 15,000 analyzed obsidian artifacts has been produced, representing 500 archaeological sites spanning the Neolithic to Middle Bronze Age (ca. 6000-1500 BC). Extensive work has also been done on the properties and features of the geological sources and subsources, and on studies of lithic typotechnology and use-wear patterns of archaeological artifacts.

These data are combined with archaeological fieldwork and other information to assess economic and social factors regarding access to and territorial control of the sources, and the production and distribution of obsidian cores and tools, which change during the Neolithic. There were technological developments such as indirect percussion and pressure flaking, specialization in lithic artifact production, and socioeconomic changes from small villages of early agriculturalists in the Neolithic to larger settlements of complex societies by the Bronze Age. Overall there was a northern and western direction of obsidian movement from the island sources of Monte Arci and Lipari during the Neolithic. Interpretations of the frequency and mechanisms of obsidian production and transport will be discussed, as well as potential symbolic, ritual, and functional roles that these raw materials may have played, and suggestions made about the likely movement of other materials and people.

11 FROM THE WORKSHOP TO MARGIN OF DIFFUSION : EXAMPLE OF LONG BLADE IN NON-HEATED BEDOULIAN FLINT AT THE MIDDLE NEOLITHIC

Author(s): Reggio, Adrien (LAMPEA (UMR7269); Aix-Marseille Université) - Gibaja, Juan-Francisco - Terradas, Xavier (IMF-CSIC Barcelone) - Palomo, Antoni (Museu Nacional de Arqueologia) - Borell, Ferran (IMF-CSIC Barcelone) - Bailly, Maxence (LAMPEA - UMR7269; Aix-Marseille Université)

Presentation Format: Oral

During the Middle Neolithic in southern France during the 5th millennium cal. BC (Chassey culture) and the 4th millennium cal. BC, long blades and bladelets made of Bedoulian flint circulated. This diffusion is made over a wide area from the south eastern of France and beyond the Chassey culture sphere (Swiss, Northern Italy and Spain). There is agreement that these blades and bladelets were produced by highly skilled knappers.

Production and diffusion of heat treated Bedoulian flint bladelet and nucleus component is well known and characterized, with production site and consumption site. While the production of larger non-heated blades in bedoulian flint still remains relatively poorly understood. Recently, the study of the lithic assemblages from a series of Chassey settlements and workshops in the south of France has provided key data about the local organisation of non-heated long blades production and defined a 'community of practice' organized around few workshop. These results make possible further studies aiming at characterizing the margins production and diffusion processes, from production areas in south eastern France to the distant end of the exchange networks in Catalonia region (in the north eastern of Spain). It is this problematic that we will discuss in this communication.

12 ON THE SOURCES AND USES OF FLINT BY THE LINEAR POTTERY CULTURE COMMUNITIES: A VIEW FROM CHEŁMNO LAND, POLAND

Author(s): Werra, Dagmara H. (Institute of Archaeology and Ethnology Polish Academy of Sciences, Warsaw)

Presentation Format: Oral

The Vistula basin is rich in deposits of several kinds of flint, which were widely used in prehistoric times. These flint varieties include "chocolate", gray white-spotted, striped (banded), and Volhynian flint, the latter known from the easternmost part of the basin. By contrast, Chełmno Land (the Polish Lowland), occupied by Linear Pottery culture (LPC) communities, lacks deposits of raw materials suitable for making chipped stone tools. Nonetheless, some Chełmno Land sites contain LPC pottery along with large quantities of artifacts made from high-quality siliceous rocks. To date, 14 sites in Chełmno Land have yielded more than 1400 flint artifacts, making up between 3,5% up to as much as 85% of the inventory at individual sites. In the oldest phase, Jurassic-Cracow flint (from Polish Jura, near Cracow) dominates, while the younger phases consist overwhelmingly of "chocolate" flint from the northeast margin of the Świętokrzyskie (Holy Cross) Mountains. The "chocolate" flint is present in several visual varieties, indicating that it could have been imported from different outcrops. This suggests that the links with the south were not limited to one area and could have changed over the time, and that access to the outcrops and/or material preferences may have changed during the time LPC commu-

nities occupied Chełmno Land.

This paper will present the results of analysis of lithic inventories from Chełmno Land as potential indicators of siliceous rock exchange by LPC communities and discuss the implications for changes in mobility patterns during this time.

13 THE LITHIC PROCUREMENT AND PRODUCTION IN THE LATE NEOLITHIC PERIOD IN SOUTHWESTERN PART OF HUNGARY. A CASE STUDY FROM ALSÓNYÉK-BÁTASZÉK

Author(s): Szilagyi, Kata (Eötvös Loránd University - Institute of Archaeological Sciences; Móra Ferenc Museum)

Presentation Format: Oral

The Late Neolithic Alsónyék–Bátaszék site has an enormous extension, is located in Southwestern-Hungary, more precisely South-East Transdanubia. The whole chipped stone assemblage consists of nearly 7000 pieces of tools. The greatest quantity of the lithic raw material is Mecsek radiolarite. The source of the Mecsek radiolarite signifies the local supply zone. The local Mecsek radiolarite was of good quality and available in sufficient quantities. This radiolarite was regularly collected and was largely able to cater the raw material claim of the region. The geological sources of this radiolarite were located near Alsónyék. Based on the raw material distribution, the Late Neolithic community at Alsónyék had very strong local networks. The enormous settlement area, the high number of features and finds of the settlement's stone collection does not show such widespread intercultural networks. In contrast, we find imported tools from distant raw material in graves. There was a clearly defined pattern of raw material manipulation within the site. Local and regional raw materials predominate in the settlement's assemblage (tools for everyday use). It was an extraordinary task for the community to collect those lithic raw materials that are located outside the settlement's catchment area. This gathering pursuit happened outside everyday activity, thus this task was a community interest.

14 ELABORATELY DECORATED CHALCOLITHIC BASALT VESSELS: REGIONALIZATION, CONVENTIONS AND PRESTIGE ITEMS IN THE SOUTHERN LEVANT

Author(s): Chasan, Rivka - Rosenberg, Danny (Laboratory for Ground Stone Tools Research, Zinman Institute of Archaeology, University of Haifa)

Presentation Format: Oral

The Late Chalcolithic period of the southern Levant (ca. 4,500–3,900 calBC) marks increased social complexity, new cult and burial customs, technological developments and a rise in craft specialization. At the same time, increasing regionalization is observed within the ceramic, flint, stone, copper and ivory industries. These regional patterns are also exhibited, in part, within the basalt vessel industry.

Chalcolithic basalt vessels were frequently meticulously made, with either a flat or a fenestrated pedestal base. Unlike preceding periods, many of these vessels were decorated. While the vessels and the most common decoration forms were used over a wide geographic span, a relatively small number of these vessels bear unique incised elaborate designs and were regionally bound. This group was constrained primarily to the area between the Yarkon River and the Negev Desert in Israel, an area distant from high quality basalt sources. This elaborate decoration is defined as a complex set and combination of geometric motifs that cover the entire or most of the exterior vessel wall.

The excessive time, effort and skill invested in the formation of the elaborate decorations as well as the unique pattern each vessel bears, in contrast to the conventional decoration forms, added to the high-risk and demanding efforts put into the vessel manufacture, suggesting that these elaborately decorated basalt vessels were greatly appreciated. The relatively small number of these highly invested vessels, in general and within the decorated basalt vessels, suggests that these were regarded as prestige goods, and that they were probably used for special purposes or occasions. The distribution of these vessels, overlapping with the distribution of other prestige goods, further indicates that their function and social and economic values were geographically restricted.

15 THE GEOCHEMISTRY OF BASALT VESSELS: INDICATORS OF TRADE AND EXCHANGE DURING THE CHALCOLITHIC AND EARLY BRONZE AGE I IN ISRAEL

Author(s): Gluhak, Tatjana (Römisch-Germanisches Zentralmuseum) - Rosenberg, Danny (Zinman Institute of Archaeology, University of Haifa)

Presentation Format: Oral

A clear rise in the production of basalt vessels and the appearance of large assemblages of these meticulously made artefacts are one of the most notable characteristics of the Chalcolithic and Early Bronze Age I periods in the southern Levant (ca. 4500-2950 CalBC). The raw material selection for the production of these highly invested vessels reflects a prevalent use of basalt, even at sites distanced from potential basalt sources. The noted preference for basalt, even if locally not available, rises essential questions regarding trade and exchange mechanisms as well as the social and economic mechanisms which controlled the trade.

The current paper presents first results from our ongoing project that aims to provide better understanding of Chalcolithic and Early Bronze Age I basalt vessel production and exchange. Selected basalt vessels from different Chalcolithic and Early Bronze Age I sites in Israel are sampled and analysed for their geochemical characteristics. The results are used to determine the basalts' inter- and intra-site geochemical variability, as well as to define the number of different basaltic rock sources which were used for the production. The evaluation of these data will enable us to map not just the distribution of these vessels across the landscape and over

time, but also to track possible trade routes and identify distributions centres. To enable a provenance determination of the basalt vessels, the analyses of the artefacts are accompanied by extensive geochemical studies of potential basalt sources in Israel.

16 SPECIAL FLINT ARTEFACTS AND 'PRESTIGIOUS' RAW MATERIALS IN PREHISTORY: A BULGARIAN CASE STUDY

Author(s): Gurova, Maria (National Institute of Archaeology with Museum)
Presentation Format: Oral

The abundant data on prehistoric flint assemblages and the numerous studies made by the author allow a re-assessment of the role and value of raw materials in the complexity of chipped-stone industries. Comparative and diachronic analysis of the assemblages reveals specific features (including raw material) which elucidate topics such as intra- and inter-site relations, networks, social and symbolic messages, and identity.

The distribution and use of particular raw materials in distinct 'cultural' contexts suggest different values embodied in various raw materials. Thus, the latest of these became a hallmark for community lifestyle and in a broader scale – for intercommunity = territorial /local and supra-regional relations.

Bulgarian prehistoric periods offer abundant data on the specific use and social values of stone/flint raw materials. The Early Neolithic chipped-stone industries of the Karanovo I and II cultural alliance (part of a supra-regional technocomplex on the Balkans) are recognisable by formal toolkits made of Balkan flint. The Chalcolithic period became famous thanks to its unique superblades made of high quality Ludogorie flint, which attains a broader Balkan scale of distribution and use in both the domestic and mortuary domains.

This paper presents a rich spectrum of empirical data and cognitive insight into these types of raw materials which had high practical, aesthetic and symbolic value in the prehistoric Balkans.

17 "EXOTIC" MATERIALS AND ARTEFACTS IN THE 4TH AND 3RD MILLENNIA CALBC IN WESTERN PART OF EASTERN EUROPE

Author(s): Tarasov, Alexey (Karelian Research Centre, Russian Academy of Sciences) - Kriiska, Aivar (Tartu University)
Presentation Format: Oral

In the 4th and 3rd millennia calBC various foreign materials and artefacts were spread in extensive territories of the European boreal zone. The most numerous foreign materials were flint (from the central part of European Russia, South Lithuania and Belarus), amber (from the territory of Latvia and Lithuania) and metatuff (from the Onega region in Karelia). In general, flint was used for making small cutting and scraping tools, such as scrapers, burins and knives, and also arrowheads. Most of amber finds in western part of Eastern Europe are pendants or other adornments, sometimes figurines and unworked pieces. The most numerous metatuff artefacts are wood chopping tools of the so-called Russian-Karelian type (axes, adzes, fluted adzes), which were manufactured in special workshops, mostly in the estuary of Shuya River near Lake Onega. Patterns of distribution of different "exotics" and chronological dynamics of their appearance in the studied region are remarkably different as well, suggesting existence of slightly different social mechanisms driving their circulation in the society and shifting networks of this circulation.

Both resources and exotic objects, most likely related to prestige and religion, were transmitted through the barter exchange system. It is difficult to say whether this exchange had any economical effects. The exchange and giving gifts were at that time rather a part of social and individual behavior, with the aid of which relations were established and retained, and the sense of support and community was strengthened. Regardless of the real effect for the economy, they were a remarkable part of the socio-economic development and testified complex cultural behavior of the population of the European boreal zone at the end of the Stone Age.

18 AMBER FAKES? TWO UNUSUAL CASES IN IBERIA´S LATE PREHISTORY

Author(s): Odriozola, Carlos - Garrido-Cordero, José Ángel (Departamento de Prehistoria y Arqueología, Universidad de Sevilla) - Daura, Joan (Departamento de Prehistoria, Historia Antigua y Arqueología, Universidad de Barcelona) - Sanz Borràs, Montserrat (Departamento de Paleontología, Universidad Complutense de Madrid)
Presentation Format: Oral

Baltic and Sicilian ambers have been exchanged, traded and trafficked in Europe since the Paleolithic, considered as commodities with an important symbolic value in European Prehistory. Until now, FTIR analysis have proven to be a useful tool to track amber origin. In this paper two unusual case study are shown, La Molina (Lora de Estepa, Sevilla, 3rd millennium BC) and Cova del Gegant (Sitges, Barcelona, 2nd millennium BC). In both case study, biogenic beads (seeds and shell) have been coated with pine resin to imitate the appearance of amber beads.

These fake amber beads are the unique cases known for European Late Prehistory, however, there are evidences of ancient modification strategies and techniques for personal ornaments in Mediterranean Prehistory. For example, fake turquoise beads (odontollite) have been recorded in Neolithic Syria, and heat-treatment has been recorded also for alter the colour of beads in Franchthi Cave (Greece) or Varna necropolis (Bulgaria), evidencing the diversity and continuity of these strategies and practices in Late Prehistory.

In this paper we rethink the role of raw materials as exotica and bring to scene the role of 'fake' raw material in cases were procurement of highly appreciated raw material is disrupted by political or economic factors.

19 THE ALLURE OF THE EXOTIC: THE SOCIAL USE OF TRANSLUCENT BEADS DURING 4TH-TO-2ND MILLENNIA BC IN WESTERN IBERIA

Author(s): Odriozola, Carlos - Garrido-Cordero, José Ángel (Departamento de Prehistoria y Arqueología, Universidad de Sevilla) - Sousa, Ana Catarina - Gonçalves, Vítor S. - Andrade, Marco António (UNIARQ-Universidade de Lisboa)

Presentation Format: Oral

In the Iberian Peninsula a wide range of raw materials (over twenty minerals) accounting for all the soils colors were used in the beadmaking. However, despite the available diversity of colors and minerals Iberia beadmakers had certain color preference. Greenstone overwhelmingly dominates the archaeological record. Because of this, beads raw material and color diversity has been systematically disregarded, despite many studies have shown an ample variety of minerals used for beadmaking in Prehistoric Europe.

Systematic studies concerning mineralogical sourcing or characterization do not yet exist for beadworks in the Iberian Peninsula, not even a general inventory of context where beads may be found. Indeed, no systematic studies have been done on sourcing minerals others than variscite-like minerals. Besides this, the ubiquitous natural occurrence of most silicate and carbonate minerals results in the assumption of local procurement versus the non-local of variscite-like minerals; and the consideration of non-local as prestigious, based on the basic assumption that non-local materials are rare, exotic, and alluring, by the fact that they are brought from far places, what make them desirable social for elites self-presentation and social action.

Within this general context transparent or translucent raw material are expected to play a key role in elite self-presentation and social action. These translucent raw materials of different colors (pink, green, yellow, purple …) appear in an extremely low percentage within the funerary assemblages of Western European Prehistory, what means they are rare, and therefore alluring. By that reason should have attracted elite's attention.

This paper records by the very first time, after Cardoso pioneering work on Portuguese fluorite beads, a comprehensive study of Western Iberia translucent beads specially focused on fluorite and the role these beads could have played during social action in European Late Prehistory societies.

a. HUMAN OCCUPATION AND USE OF THE SPACE OF HUNTER-GATHERERS IN MOUNTAIN RANGE ENVIRONMENTS AT THE SOUTH-CENTRAL ANDES DURING THE MID-HOLOCENE

Author(s): Grasset, Sebastián (UAB) - Méndez, César (CIEP - Centro de Investigación en Ecosistemas de la Patagonia)

Presentation Format: Poster

The present investigation through the study of the lithic set of an archaeological site (Techo Negro) discusses the types of occupation and forms of use of space by hunter-gatherer groups that inhabited mountain range environments in the South-central Andes region (~ 29 ° -32 ° S) during the Mid Holocene. The inland area of the pacific slope (current Chilean territory) and especially the highland sector, has been considered as a marginal environment in which there is a low human signal and where few archaeological explorations have been made. Through the technology organization approach and in specifically with the technological provisioning strategies (Kuhn 2004) by means of the identification of the transportation patterns of the raw material from their source to the places in which were manufactured and used the tools, it was possible to understand the changes in the scale/duration of the occupations and the implications of these for the organization of the mobility of the hunter gatherers groups that inhabited this environment under climatic stress periods. With which it has been possible to determine that the mountain range of the pacific slope, would be used under short but repetitive occupations, as this inland area would offer good quality raw material and terrestrial resources complementary to the coastal subsistence.

b. A SINGULAR LITHIC RAW MATERIAL? STUDYING THE GEOGRAPHIC DISTRIBUTION OF NEOLITHIC JASPER IN THE NORTHEAST OF THE IBERIAN PENINSULA

Author(s): Monforte-Barberan, Andreu - Breu, Adrià - Molist, Miquel (Grup de Recerca Arqueològica del Meiterrani i del Pròxim Orient - GRAMPO, Departament de Prehistòria, Univeristat Autònoma de Barcelona - UAB)

Presentation Format: Poster

Jasper was the most widely used raw material for the production of lithic tools during the first phases of the Neolithic in the Barcelona plain. This raw material is located in association with the marine sedimentary series of the Miocene age that constitutes the mountain of Montjuïc, inside Barcelona, which it is found filling fractures in highly cemented sandstone and microconglomerates. Its exploitation is documented in Paleolithic and Epipaleolithic phases although it would not be exploited in a massive and continuous way until the Ancient Neolithic, being gradually replaced by other materials in the Middle and Final Neolithic. As previous studies suggest, would there be an unequal frequency in the presence of this material around its possible origin (Montjuïc)? In addition, would the known distribution of Jasper be consistent with a circulation from a possible center in the Barcelona plain?

This poster presents the work in progress concerning the characterization of the Jasper exploitation in the Barcelona plain during the Neolithic. In this sense, the recent prospection carried out in the outcropping areas of the Morrot and the Castell de Montjuïc is presented and lays out the different geographic distributions of Jasper lithic tools in a synchronic and diachronic way to assess the extension of its presence in the archaeological record during the Neolithic in the northeast of the Iberian Peninsula

787 ISSUES IN MEDITERRANEAN SEASCAPES: FROM THE TERMINAL PLEISTOCENE TO THE EARLY-MIDDLE HOLOCENE – EXOTICS, SOCIAL INTERACTIONS AND ENVIRONMENT

Theme: Mediterranean seascapes
Organisers: Moutsiou, Theodora (James Cook University,University of Cyprus) - Revelles, Jordi (Universitat Autònoma de Barcelona) - Kassianidou, Vasiliki (University of Cyprus) - Ghilardi, Matthieu (CEREGE-CNRS) - Walsh, Kevin (University of York)
Format: Regular session

In the first part this session will deal with exotics and social Interactions in the Terminal Pleistocene – Early Holocene Mediterranean Seascape. In this first part of the session we will examine how exotic materials were circulated and used across the Mediterranean during the terminal Pleistocene – early Holocene. Of particular interest is the movement of exotic items across the Mediterranean seascape reaching the various Mediterranean islands from the neighbouring mainland. Case studies are welcome that show how social communication was possible via sea routes despite geographical distance and presumed water 'barriers'.

The second part of the session will deal with defining the environmental framework of Neolithisation. Human-environment interactions during the Early-Middle Holocene in the Western Mediterranean. Speakers will discuss on how the Mediterranean Sea played an important role in the process of expansion of the farming lifestyle, reaching the westernmost part of the Mediterranean region in the second half of the 8th millennium cal BP. The adoption of an economy based on agriculture and husbandry, the establishment in permanent settlements, increasing population and the intensive and reiterative resources exploitation implied significant landscape transformation from the Neolithic onwards in the Western Mediterranean region.

ABSTRACTS

01 EXOTICA IN NEOLITHIC SOCIETY: RECIPROCITY, REDISTRIBUTION, AND THE CIRCULATION OF OBSIDIAN IN THE CENTRAL MEDITERRANEAN

Author(s): Freund, Kyle (Indian River State College)
Presentation Format: Oral

This paper interrogates the concept of "exotica" and its value in studying social interactions amongst agro-pastoral societies of the Neolithic. This issue is addressed by contextualizing data obtained through obsidian provenance studies in central Mediterranean prehistory, in turn allowing for the reconstruction of the movement of obsidian across the landscape and a discussion of the cultural circumstances that mediated its use.

In contrast to the eastern Mediterranean where obsidian use dates back to the Upper Palaeolithic, it is not until the beginning of the Neolithic (ca. 6th – 4th millennia B.C.) that we see the widespread exploitation of raw materials from the central Mediterranean island sources of Lipari, Monte Arci (Sardinia), Pantelleria, and Palmarola. To date, these obsidians have been reported at over 500 Neolithic sites spanning a vast area that includes modern-day Italy, France, Slovenia, Croatia, Bosnia and Herzegovina, Albania, Tunisia, Algeria, Malta, and Spain. By combining provenance data with information about the form and function of the objects themselves, this paper highlights how reciprocity and exchange facilitated the creation and maintenance of social relations across space and how the redistribution of obsidian by residents of a select number of gateway communities fostered the emergence of dynamic power relations in central Mediterranean Neolithic society.

02 OFF IN THE HILLS: EARLY NEOLITHIC TRADE NETWORKS IN CYPRUS AND THE CURIOUS CASE OF AIS GIORKIS

Author(s): Simmons, Alan (Universities of Nevada, Las Vegas and Reno)
Presentation Format: Oral

Until recently, most researchers believed that the earliest substantial human occupation of any of the Mediterranean islands occurred relatively late, during the later Neolithic. Even on islands such as Cyprus, where an aceramic Neolithic period was well-established (the Khirokitia Culture), this was more recent than contemporary mainland developments. This scenario has been rewritten with compelling evidence for pre-Neolithic occupations on islands such as Cyprus, Crete, and Naxos. Furthermore, the Neolithic on Cyprus is now as old as that of the adjacent mainlands, with both Pre-Pottery Neolithic A and B occupations that pre-date the Khirokitia Culture being well documented. The bulk of this "Neolithic Package" had to be imported from the mainland, but this generally is viewed as being economic, with limited evidence of exotic trade goods. Most of these sites are coastal, but the Cypro-PPNB site of Ais Giorkis stands out for many reasons. First, it is some 20 km from the coast, in the foothills of the Troodos Mountains. It also contains huge chipped stone and faunal assemblages, although it likely was only a seasonal settlement. Despite this, numerous exotic artifacts occur at Ais Giorkis, including imported obsidian and carnelian. Thus, even this remote upland site was involved in some sort of trade network involving mainland materials beyond food. This paper addresses the circum-Mediterranean exchange network that the Cypriot Neolithic, including Ais Giorkis, was likely associated with, examining not only the materials traded but their social implications. It also questions the concept of the sea as a barrier, since there is increasing evidence for far more regular island-mainland interaction than originally believed. Finally, there is very limited evidence that these early island groups exported materials to the

mainlands; rather they appear to have only been recipients of trade goods, and reasons for this are explored.

03 COLOURFUL NETWORKS: PIGMENTS AS A COMMODITY BINDING EARLY NEOLITHIC COMMUNITIES TOGETHER IN THE EASTERN MEDITERRANEAN SEASCAPE

Author(s): McCartney, Carole - Kassianidou, Vasiliki - Moutsiou, Theodora (University of Cyprus)
Presentation Format: Oral

Research dealing with the exchange of exotics between islands and their neighbouring mainland areas typically focuses on hard stone materials like obsidian, and significant progress has been made in the sourcing of obsidian leading to the development of models of exchange networks that underpin such connectivity. Though researchers have listed less tangible exchange items, progress in Neolithic exchange has been limited to the diffusion of plant and animal species from mainland areas to islands. Here we present new data from a recently excavated early Neolithic site on Cyprus, Ayia Varvara Asprokremnos (AVA), that contribute to the discussion of 'early connectivity' as evinced through the consumption of less tangible material culture, specifically pigments.

Unique evidence of intensive pigment processing from the Late Pre-Pottery Neolithic A (PPNA) site of Ayia Varvara Asprokremnos (AVA) provides an opportunity to evaluate an island commodity other than land linked to Neolithic expansion in the Eastern Mediterranean. The distinctive geology of Cyprus provides a wealth of natural pigments that would have been valued in the expanding communal activities characterizing the early stages of village settlement. In contradiction to the generally perceived model of Neolithic diffusion due to farming, AVA provides the opportunity to evaluate the development of exchange by seafaring groups focused on commodities and trade as a key aspect of increasing social complexity during the Neolithic. By looking at pigment processing in AVA, we are able to suggest possible directionality of early connectivity between Cyprus and the Eastern Mediterranean mainland, providing islands an agency contrary to traditional views that regard them as passive recipients of mainland advances.

04 EXOTICS AND SOCIAL INTERACTIONS IN TERMINAL PLEISTOCENE – EARLY HOLOCENE CYPRUS

Author(s): Moutsiou, Theodora (University of Cyprus; James Cook University) - Kassianidou, Vasiliki (University of Cyprus)
Presentation Format: Oral

Cyprus, the third largest island in the Mediterranean, has traditionally been perceived as a marginal region until the Neolithic when demographic pressure in the mainland led humans to the island. The existence on Cyprus of exotic raw materials, however, dating to the Terminal Pleistocene – Early Holocene suggest that Cyprus was part of an extensive social landscape from that time. The paper discusses rare raw materials identified in lithic assemblages from Epipalaeolithic and Aceramic Neolithic sites on Cyprus, eastern Mediterranean. Apart from the locally available picrolite, obsidian and carnelian from mainland sources are used in the manufacture of stone tools and ornaments. The distinctive physical qualities of all three raw materials as well as the effort exerted in their curation suggest active choice by the tool maker. Why was so much effort exerted in the acquisition of the specific raw materials? Are physical qualities, primarily colour, responsible for their selection or must other factors be taken into account? And what does the presence on the island suggest about Early Holocene social landscape of the region? The paper puts forward the notion that, due to their small circulating quantities, these rare raw materials had a significant symbolic value for their bearers and functioned as 'symbols of relatedness' across long-distances.

05 ENVIRONMENTAL FRAMEWORK OF NEOLITHISATION IN CORSICA. NEW DATA FROM THE SITES OF PIANTARELLA AND SAINT FLORENT (CORSICA, FRANCE)

Author(s): Revelles, Jordi (Universitat Autònoma de Barcelona) - Ghilardi, Matthieu (CEREGE-CNRS) - López-Bultó, Oriol (Universitat Autònoma de Barcelona) - Vacchi, Matteo (University of Exeter) - Brkojewitsch, Gäel (Université de Lille III)
Presentation Format: Oral

Multiproxy geoarchaeological research combining pollen analysis, sedimentology and macrofaunal identification was carried out in two lagoons of Corsica (the fourth largest Mediterranean island). We analysed two cores sampled in the coastal lagoons of Saint Florent (northwestern coast) and Piantarella (southeastern) to reconstruct ecological changes, vegetation history and climatic modifications at opposite sides of Corsica. It allowed to define regional differences and characterising environmental dynamics of Corsica since the Mid- Holocene. Mediterranean scrublands and evergreen sclerophyllous open forests predominated since the early Mid-Holocene. First signals of farming practices, mainly represented by presence of Cerealia-t pollen and spores of coprophilous fungi, were identified in Neolithic chronologies. In addition, occurrence of macro-charcoal in pollen samples evidenced fire episodes at local scale, which could suggest human impact or be natural induced, given the role of fire as an active factor of landscape transformation in Mediterranean ecosystems.

In addition, the integration of multiproxy datasets from different coastal lagoons in Corsica enabled the reconstruction of palaeo-environmental dynamics during the Holocene and assess the influence of the relative sea-level evolution in the configuration of coastal environments. In that sense, at the Mid- to Late Holocene transition, freshwater shallow lakes turned into swamps and marshlands with higher salinity. The development of brackish and saline environments is clearly related to the sea level rise and drier climate conditions.

This paper is a contribution to the French national Research Programme CNRS-MISTRALS-PALEOMEX-INEE that aims to evaluate the impacts of Holocene climate changes on both the landscape configuration and the human societies since Early Neolithic times.

06 HUMAN OCCUPATION AND LANDSCAPE EVOLUTION AT CENTRAL PYRENEES DURING MID-HOLOCENE. THE SANT NICOLAU VALLEY CASE STUDY (7000-2000 YR CALBC)

Author(s): Rodríguez Antón, David - Ermengol, Gassiot Ballbè - Laura, Obea (Departament de Prehistòria, Facultat de Filosofia i Lletres, Universitat Autònoma de Barcelona) - Raquel, Cunill (Departament de Geografia, Facultat de Filosofia i Lletres, Universitat Autònoma de Barcelona) - Jordi, Revelles - Vasiliki, Andreaki (Departament de Prehistòria, Facultat de Filosofia i Lletres, Universitat Autònoma de Barcelona) - Anna, Bonet (Departament de Medi Ambient i Ciències del Sòl, Universitat de Lleida) - Rosa Maria, Albert (ICREA, ERAAUB, Secció de Prehistòria i Arqueologia, Universitat de Barcelona) - Ramon, Perez Obiol (Unitat de Botànica, Departament de Biologia Animal, de Biologia Vegetal i d'Ecologia, Universitat Autònoma de Barcelona) - Niccolò, Mazzucco (UMR 7055, Prehistoire et Technologie, CNRS – Université Paris Ouest Nanterre.Arqueología de las Dinámicas Sociales. Consejo Superior de Investigaciones Científicas - CSIC. Institución Milá i Fontanals - IMF)

Presentation Format: Oral

The 15 years of survey and research at Aigüestortes i Estany de Sant Maurici National Park, located in central Pyrenees, has shown an early human presence related to the development of an agro-pastoral economic system. The prehistoric human occupation that ranges chronologically from Mesolithic to Bronze Age is normally documented in rock-shelter sites. Focusing on past landscape evolution and human impact recognition on the study area during the Holocene period, a series of off-site samplings have been implemented and combined with archaeological research, integrating surveys, site sampling and excavations. We present here the results of one of these test-pits which include a palaeosol dated between 5200 and 4940 yr calBC. The test-pit is located a Aigüestortes riverbank at the bottom valley area, at 1771 m a.s.l., at the surrounding area of Cova del Sardo, an archaeological site that covers almost the entire Neolithic sequence from 5606 to 2495 yr calBC. Various analyses were undertaken including phytoliths, micromorphology, chemistry, charcoal and pollen. The results indicate that the fire episodes occurred at the primeval sub-alpine forest may be associated to an early Neolithic occupation of the axial Pyrenean Mountains. This microscale perspective complements the regional palaeoecological data obtained from a lacustrine core realized at Estany Redó d'Aigüestortes, a nearby lake located at 4.5 km east, in Sant Nicolau valley. Different proxy data indicates an abrupt change from 5000 to 4400 yr calBC related to a local decrease of arboreal percentages and associated to the emergence of Abies, Fagus and Alnus taxa into the valley. As a consequence, these results provide new insights into the Neolithisation process of the Western Mediterranean mountain areas, and in particular, into the impact which first farming societies had on forests and ecosystems, through burning for landscape transformation, forest clearance and the establishment of pastures and/or agricultural land.

788 TEXTILE ICONOGRAPHY FROM EUROPE AND ASIA

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Makin, Alexandra (University of Manchester) - Rammo, Riina (University of Tartu) - Cuomo, Marianna (Università degli Studi SuorOrsola Benincasa, Napoli; LATEM - Late Antiquity and Medieval Archeology Laboratory)

Format: Regular session

Producing and using textiles has been an important part of everyday life throughout history. Its uses include the functional such as furnishings, packaging and transport; as clothing, it distinguishes people's position within society, their profession and religious vocation. At the same time, extant historical textile items, or their fragments, are relatively rare as cloth is by its very nature fragile and therefore a perishable material, particularly within archaeological and some historical contexts. Due to the poor survival rate, there is a lack of comparative material which hampers research of both European and Asian textiles, as a result an interdisciplinary approach is needed to study the different topics textiles relate to, these include, but are not limited to, the analyse of soft furnishings, dress, clothing culture (e.g. social connotations), textile technology, design and patterns. As historical images of textiles from both geographical areas survive in larger numbers than the materials themselves, iconography is one of the main sources for this kind of research.

This workshop will explore depictions of textiles within European and Asian art and how we should interpret them. We warmly welcome papers addressing visual representations of dress, textile tools, and textile production. How different sources are in accord and how, for example, iconography and archaeological finds complement each other. How the depictions relate to our knowledge of past garments or textile techniques. How images of textile production or dress reflect social practices and traditional values. How textile patterns and structures have been used as a form of decoration.

ABSTRACTS

01 DRESSED TO DIFFER: ARTISTS, MERCHANTS, AND OTHER FIGURES IN THE PAINTINGS OF KUČA

Author(s): Klein, Astrid (Leipzig University)

Presentation Format: Oral

The purpose of this study is to explore the different fashion styles of the worldly and civilian people of the Kuča region on the North-

ern Silk Road. In the wall paintings of the 5th to the 7th century these people are generally depicted within the Buddhist narrative scenes. They are engaged in specific activities within the narrative. This makes it possible to investigate how a person's clothing style is connected to his respective role and profession.

In addition to the different clothing styles of painters, actors, dancers, and musicians, merchants and peasants, distinctive attire points to various types of social and cultural distinction. Frequently, it is the headdress that makes the difference: while painters wear a kind of headscarf, actors and dancers are shown with animal masks; musicians however wear their hair short and uncovered. At the same time, there are distinct particularities that characterize different kinds of merchants: The First Style paintings bear strong influences of the Indian or Late Antique fashion style. They show merchants clad in a flowing tunica, a wrap skirt and without footwear. The Second Style paintings, in contrast, generally depict the Central Asian or Iranian manner of clothing: merchants dressed in a caftan with lapels and a buckle, and trousers tucked into their boots.

To what extend can the depiction of clothes be analyzed according to functional, social or cultural backgrounds? Can the real image be distinguished from the cliché?

02 FABRICS IN THE EARLY MIDDLE AGES AND THEIR PICTORIAL IMITATIONS: SOME CASES FROM CAMPANIA

Author(s): Cuomo, Marianna (Università degli Studi Suor Orsola Benincasa)
Presentation Format: Oral

The study of tissues in antiquity is still today a field of analysis not yet fully explored. The lack of direct evidence has created tears not easy to mend, but which have often been reconstructed through the iconography of the textiles perpetuate by other artistic productions. In the south of Italy, for the early medieval age a study of comparison and reconstruction of the textiles typologies has been done by the underwritten, in a master degree thesis, dedicated to velaria in Campania. The results of that study were already partly published, while other will be reported. The findings highlighted the centrality of painting as a medium for the reconstruction of textiles and its fidelity to the original models; in particular, has emerged the habit of frescoing the dado with imitation of tissues preserved in the treasures of the churches, for witness their presence and to pass on the memory. Here we propose some interesting comparisons, which have shown the actual derivation of some frescos, from precise fabrics, present in the Campania region (Italy), in the period under examination.

03 THE STITCHED ART OF TEXTILES: DEPICTIONS OF LITURGICAL GARMENTS ON TWO EARLY MEDIEVAL EMBROIDERED PRIESTLY VESTMENTS

Author(s): Makin, Alexandra (University of Manchester)
Presentation Format: Oral

St Cuthbert's stole and maniple are two of the most important early medieval embroideries surviving today. The only embroidered stole and maniple to survive from Anglo-Saxon England, these ecclesiastical vestments represent tangible archaeological evidence of highly skilled medieval craftsmanship and artistry. These objects demonstrate wider Anglo-Saxon attitudes towards the wearer and the priestly vocation not just through their technical attributes but also through their design. On the stole these ideas are displayed through the full-length figures of sixteen prophets (four major, twelve minor) on either side of an Agnus Dei, and the heads of St Thomas and St James set in end tabs. On the maniple there are depicted full-length figures of a Pope and a deacon on either side of a Dextera Dei set in a quatrefoil, with the heads of St John the Baptist and St John the Evangelist set in the end tabs.

As part of an immersive approach to creating and wearing priestly vestments, the clothes that the embroidered figures are wearing form an intricate part of their meaning. Previously these garments have been studied for their technical attributes, iconography and place in tenth century Anglo-Saxon art (Hohler and Freyhan, The Relics of Saint Cuthbert, 1956). However, none of the design, including the clothes, has been studied as part of an early medieval immersive material and religious culture. In her 2014 publication Maureen Miller demonstrated that the garments worn by the clergy during the medieval period were more than simply richly embellished vestments, they and their designs had deep religious and secular significance. This paper will use Miller's approach to investigate the immersive meaning that the garments depicted on the stole and maniple would have had for the early medieval maker, wearer and onlooker, as a reminder of religious obligation and secular patronage and power.

04 CARVED IN STONE: UNIQUE MEDIEVAL DEPICTIONS OF RURAL DRESS IN ESTONIA

Author(s): Rammo, Riina (Researcher at the University of Tartu) - Ratas, Jaana (University of Tartu, Viljandi Culture Academy)
Presentation Format: Oral

Medieval depictions of local inhabitants are extremely rare in Estonia, thus, very little is known about dress of the period. Mainly archaeological sources, for example, excavated burials and jewellery, have been used to collect data about one's appearance. Two carved stone decorations depicting probably local inhabitants in the churches of Karja and Pöide on the island Saaremaa are unique. The construction of the churches in the end of the 13th century and the 14th century dates also the figurines to the same period.

Both men and women have been depicted in the scenes serving a moral purpose. Although the human figures are very small and schematic, some peculiar traits have been emphasized by artisans who carved the decorations. Details of their clothing, for example, brooches, shawls and an apron with broad hem decoration, indicate the archaeological parallels and suggest clearly that they

represent local inhabitants. Moreover, these details distinguish the decorations from other contemporaneous figures in the same churches. The presentation gives an overview how the depicted dress relates to our knowledge of the garments on the basis of archaeological finds and discusses problems related with the comparison of the different sources. In conclusion, an attempt to interpret the figurines' dress in social context is made.

05 THE OLD RUSSIAN SHIRT IN GRAPHIC AND ARCHAEOLOGICAL MATERIALS OF 11TH-17TH CENTURIES

Author(s): Stepanova, Iuliia (Tver State University)
Presentation Format: Oral

The Old Russian graphic sources reflecting the materials and the type of Old Russian clothes are considered in the research. Among them – the arts and crafts objects, a book miniature, iconography and fresco of 11th-17th centuries. The types of a cut of the top of shirt are allocated on the basis of studying of graphic sources. There are some forms and decor of a collar and sleeves. The silk and woolen tablet-woven collars were found in the Old Russian burials. The stand-up and turn-down forms of collars are confirmed by the archaeological data.

The tradition of decoration of sleeves by contrast strips on a shoulder is traced by the iconographic sources. Presumably, this tradition is connected with the formation of a cut of clothes with inserts on the shoulders. This type of shirt is characteristic cloth of east Slavs in 18th-19th centuries. The archaeological finds of the shirts with the humeral insert (straps) confirm the use of this type of clothes in Old Rus'. Also the use of clothes with very long sleeves (including of pleated textiles) is confirmed by the depictions and the archaeological sources from Moscow and some burial sites. The archaeological and iconographic sources correspond with each other and allow to make the reconstruction of a form an Old Russian shirt.

789 FOOD AND DRINK IN ARCHAEOLOGY: MULTIDISCIPLINARY APPROACHES TO PAST FOOD PRACTICES (PART 2)

Theme: Theories and methods in archaeological sciences
Organisers: Delaney, Sarah (University of York) - Hondelink, Merit (University of Groningen) - Champion, Louis (University College of London - UCL, Royal Museum of Central Africa Tervuren; MRAC) - Mayor, Anne (Laboratoire Archéologie et Peuplement de l'Afrique - APA, Unité d'anthropologie du Département de génétique et évolution de l'Université de Genève - GENEV) - Vieugue, Julien (UMR CNRS 7055 Préhistoire & Technologie)
Format: Regular session

Throughout human history, food has been – and still is – an integral part of life. In recent years, the importance of preserving knowledge about food and food practices of (sub-recent) past societies has been acknowledged not only by researchers from different fields, but also by UNESCO when food-related traditions were included in the UNESCO Intangible Cultural Heritage list. This acknowledgment of food, and the practices associated with it as intangible heritage, forms part of the acknowledgment that the study of food is a proper research field its own right. When studying past food and alimentary practices, archaeologists consult and apply a range of methodologies from different disciplines, including but not limited to anthropology, biology, chemistry, history and physics. The fact that past food practices can be studied from a multitude of different disciplines, be it from the humanities, social sciences or natural sciences, may have a negative effect on the integration of research results.

This session focuses on bringing together research on past food practices, comprising of production, storage, procurement, preparation, consumption and deposition from studies examining evidence from across the globe. This session aims to encompass multiple different bioarchaeological and natural science methods, from archaeobotany, stable isotopes, parasites, lipid analysis, micro-debris to zooarchaeology and more. We encourage papers showcasing results that show promising findings for other specialists to incorporate in their own research projects.

ABSTRACTS

01 IDENTIFYING EPIPALEOLITHIC AND NEOLITHIC FOODSTUFFS IN SOUTHWEST ASIA: ARCHAEOBOTANICAL METHODS, RESULTS AND CHALLENGES

Author(s): Arranz Otaegui, Amaia (University of Copenhagen) - Gonzalez Carretero, Lara (University College London) - Richter, Tobias (University of Copenhagen)
Presentation Format: Oral

Our modern food culture is anchored in several milestones that occurred during the Prehistory, such as the invention of cereal-based meals (e.g. bread), the use of spices or the development of cooking methods such as baking, soaking or fermenting. But, when and where did these practices first emerge? Until now, the study of food crusts from ceramic vessels has been the main proxy to answer these questions but this approach is limited in the chronological scale, as it fails to provide evidence on food practices that pre-

date the invention of pottery (i.e. Neolithic, c. 8.5 ka cal. BP in southwest Asia). In the recent years, several archaeobotanists are highlighting the presence of macroscopic (c. 2-20 mm) lumps of charred food remains (CFR) in archaeobotanical samples starting from the Epipaleolithic period (c. 15 ka cal. BP). The systematic analyses of CFR from Palaeolithic, Epipaleolithic and Neolithic sites enables a more critical and holistic evaluation of hunter-gatherer and farmer-herder food resources and provides first-hand, novel and reliable information to evaluate current subsistence paradigms. Drawing on several case studies, this paper explores different archaeobotanical approaches for the study of prehistoric food in southwest Asia, with special focus on the analyses of CFR, and reviews the evidence gathered to date. The work concludes with some suggestions for future research based on the knowledge accumulated and the challenges faced.

02 NEW METHOD TO TRACE CEREAL AGRICULTURE THROUGH ANALYSIS OF PRESERVED LIPIDS IN ARCHAEOLOGICAL CERAMICS

Author(s): Hammann, Simon (University of Bristol) - Cramp, Lucy (University of Bristol)
Presentation Format: Oral

The study of tissues in antiquity is still today a field of analysis not yet fully explored. The lack of direct evidence has created tears not easy to mend, but which have often been reconstructed through the iconography of the textiles perpetuate by other artistic productions. In the south of Italy, for the early medieval age a study of comparison and reconstruction of the textiles typologies has been done by the underwritten, in a master degree thesis, dedicated to velaria in Campania. The results of that study were already partly published, while other will be reported. The findings highlighted the centrality of painting as a medium for the reconstruction of textiles and its fidelity to the original models; in particular, has emerged the habit of frescoing the dado with imitation of tissues preserved in the treasures of the churches, for witness their presence and to pass on the memory.

Here we propose some interesting comparisons, which have shown the actual derivation of some frescos, from precise fabrics, present in the Campania region (Italy), in the period under examination.

03 PALEODIETARY RECONSTRUCTION OF THE BÜKKÁBRÁNY - BÁNYA POPULATION (EASTERN HUNGARY) THROUGH NOVEL APPLICATION OF DENTAL MICROWEAR AND STABLE ISOTOPES APPROACHES

Author(s): Hernando, Raquel (IPHES. Institut Català de Paleoecologia Humana i Evolució Social; Area de Prehistoria, Universitat Rovira i Virgili - URV) - Gamarra, Beatriz (School of Archaeology and Earth Institute, University College Dublin) - Lozano, Marina (IPHES. Institut Català de Paleoecologia Humana i Evolució Social; Area de Prehistoria, Universitat Rovira i Virgili - URV) - Tutkovics, Eszter K. (Rétközi Museum) - Kalli, András (Budavári Ingatlanfejlesztő és Üzemeltető Nonprofit Ltd., Régészeti Szolgáltatási Főosztály) - Köhler, Kitti (Research Centre for the Humanities, Institute of Archaeology, Hungarian Academy of Sciences) - Szeniczey, Tamás - Hajdu, Tamás (Department of Biological Anthropology, Institute of Biology, Faculty of Science, Eötvös Loránd University) - Feeney, Robin N. M. (School of Medicine, University College Dublin) - Pinhasi, Ron (Department of Anthropology, University of Vienna)
Presentation Format: Oral

Dietary reconstruction of ancient human populations allows us to infer subsistence strategies including their cultural and technological aspects. The two most widely used techniques to analyze dietary patterns and subsistence strategies of ancient people are dental microwear and stable isotope analyses.

Dental microwear has shown to be successful when describing the physical properties of the food ingested by individuals, such as hardness and abrasiveness, allowing to infer the dietary preferences and how food was processed before consumption. Correspondingly, 13C and 14N isotopic analyses from bone samples are indicative of the average diet over a period of time prior to the death of the individual, which is useful for discerning among the consumption of foods from different origins.

A sample of 29 permanent molars and 37 bone collagen samples of human remains from the Middle Neolithic Bükkábrány - Bánya site (Hungary) was used to develop a multidisciplinary approach that combines both techniques. Given that isotopic data from collagen are rarely combined with dental microwear patterns, we present for the first time the results of both approaches applied in Hungarian archaeological populations. Our aim here is to have a comprehensive reconstruction not only of the diet of the studied population, but also of the socioeconomic organization of these ancient populations. Moreover, we intend to evaluate if combining both approaches offer more precision to understanding these past populations.

04 TYPOLOGICAL AND ANALYTICAL STUDY OF TWO COMBUSTION STRUCTURES FROM THE EARLY IRON AGE SETTLEMENT OF THE SANT JAUME COMPLEX (CATALUNYA)

Author(s): Saorin, Carme (GRAP - Universitat de Barcelona)
Presentation Format: Oral

The Sant Jaume Complex is a warlord-based sociopolitical entity comprising the Early Iron Age settlements (650-575 BCE) of Sant Jaume and La Moleta del Remei in Alcanar, and La Ferradura, La Cogula and El Castell in Ulldecona, all of them in the Catalan region of Montsià, in the south of the province of Tarragona.

Each of these settlements had a specific function within the framework of this entity: Sant Jaume is the centre of a warlordship that ruled over the rest of the settlements; in this regard, the majority of the population resided in the great town of La Moleta. La Cogula was a watchtower that controlled the area from a hill higher than 400 mASL, whereas La Ferradura and El Castell were small

establishments to control the passage from the interior of the Ulldecona gully to the routes that go to the coast going through Sant Jaume and La Moleta.

In this context, we study two combustion structures for culinary purposes one located in the field A5 of Sant Jaume and the other in the field A3 of La Ferradura. These structures, unlike the ones at the village of La Moleta (located at the centre of the room), are attached to a wall.

The study that we will present in this poster will consist of the results of the FTIR analysis, a technique that allows us to estimate the cooking temperatures achieved by these structures, the composition of the sediments used as building materials and even identify the presence or absence of ashes. We will also conduct a typological and formal study, in order to compare them and evaluate different aspects – for instance, to check if the different functions of both settlements are reflected in these structures at all or they may provide information on their sociopolitical relationship.

05 BEER PRODUCTION AND CONSUMPTION IN ANCIENT CHINA

Author(s): Wang, Jiajing - Liu, Li (Stanford University)
Presentation Format: Oral

Beer, made from cereal grains or other starchy substances, was one of the most widely consumed alcoholic drinks in the ancient world. Beer making was an integral part of rituals and competitive feasting, a social regulatory mechanism in hierarchical, and possibly a motivating factor for the original domestication of cereals. In ancient China, the production and consumption of alcohol have been an important cultural element. Evidence based on written and artistic sources suggests that brewing beer may have been a ubiquitous tradition in antiquity, but direct archaeological evidence of beer has been relatively sporadic. To address this gap, we need a better understanding of the residues produced by beer brewing. Over the past several decades, the development of starch analysis has provided an effective method to study ancient drinking practices. Archaeological excavations in China have revealed certain forms of ceramic vessels associated with making and drinking beer. These vessels show various forms in time and space, and such variations are closely related to both social contexts and brewing technological developments. In this presentation, we will report early evidence of beer making in Neolithic China based on starch analysis, introduce a method for identifying starch residues from cereal-based beer, and explore the origins of diverse fermentation technologies in prehistoric societies.

06 POWER, PROVISIONING, POTS, AND PIGS AT PETSAS HOUSE, MYCENAE

Author(s): Trusty, Debra (University of Iowa) - Meier, Jacqueline (Trent University) - Price, Gypsy (Appalachian State University) - Shelton, Kim (University of California, Berkeley)
Presentation Format: Oral

Petsas House, located in the settlement just down slope from the citadel of Mycenae (Greece), is a Late Bronze Age pottery production and domestic structure functioning between c. 1400–1320 BCE, when palatial elites were consolidating power and expanding territorial control. One feature of the structure is a deep (+12 m) well, filled shortly after the destruction of the building with diverse materials, including ceramics and animal bones. We combine these two categories of evidence to examine how elite members of society provisioned craft producers and vice versa. Together, ceramic and faunal analyses can enhance the results that each produces independently and better identify economic systems that supported complex, stratified societies.

Stylistic, petrographic, and neutron activation analyses indicate that a large proportion of the cooking vessels were locally produced for elite, large-scale feasting events, as signified by large cauldrons and specialized shapes. A smaller portion of these vessels (lamps, especially) was reserved for domestic activities. Faunal evidence supplied by zooarchaeological and isotopic analyses also indicates some local sourcing. Locally raised pigs dominate the faunal assemblage, but additional resources were also likely supplemented by sheep and goats originating from large-scale herds, such as those maintained by the palatial elite. These integrated results suggest a redistributive system in action: provisioned surplus resources for craft producers and mobilized finished supplies for consumption events elsewhere. Both bodies of evidence show dependence on and independence from elites: ceramic distribution connections existed between Petsas House and the palatial elite, but the entire assemblage is not for feasting. Likewise, dietary provisioning was more independent, including some autonomy from palatial rule. Ceramic and faunal analyses, therefore, suggest that Petsas House was a workshop that could be fully autonomous and integrated with palatial elites simultaneously.

07 CUISINE IN TRANSITION: ORGANIC RESIDUE ANALYSIS OF SICILIAN COOKING POTS

Author(s): Lundy, Jasmine (University of York)
Presentation Format: Oral

During the Middle Ages, Sicily saw rise to four radical ideological regimes from the 6th to 13th Century. During this time Sicily would have experienced new political and religious ideologies, the arrival of new migrants, the introduction of new agricultural systems and the appearance of new resources.

This project is investigating how resource acquisition and local diets may have changed as a result of these transitions. This is being achieved through the isolation and identification of organic residues in cooking pots and other domestic containers from Sicily. Organic residue analysis (ORA) can inform us on the contents of the pot, but also how specific commodities were prepared and combined- Cuisine. Culinary choices are often linked to food availability and foodscape, wealth, faith and societal value. Thus identified

cuisines can be telling of social and economic values assigned to different foods as a result of these changing factors.

Well-established methods in high throughput lipid residue analysis including GCMS, GCCIRMS AND HTGC are being employed to determine pottery function and contents. A large scale in depth analysis of vessels from several multi period sites across Sicily, will allow significant patterns within and between assemblages to be determined.

This paper will present preliminary analytical results showing specific identifications of organic residues extracted from cooking vessels obtained from several sites in Sicily. It will be shown how this information can be pieced together to draw overall conclusions regarding food preparation and consumption. Whilst discussing the importance of using cuisine to aid our understanding of socio-economic effects on past populations.

08 FISH CONSUMPTION AT VILNIUS LOWER CASTLE (13TH-17TH C.)

Author(s): Blaževicius, Povilas (National Museum – Palace of the Grand Dukes of Lithuania; Vilnius University, Faculty of History, Department of Archaeology) - Piličiauskienė, Giedrė (Vilnius University, Bioarchaeology Research Centre) - Tetereva, Diana (Vilnius Toy museum)

Presentation Format: Oral

Vilnius Lower castle and the Palace of the Grand Dukes of Lithuania (13th-17th c.) are sites of an extraordinary importance for the history of the Lithuanian state. Members of various social strata – kings, dukes, bishops, knights as well as craftsmen and servants lived in the territory of the castle through the centuries. Since the middle of the 20th c., an area of about 18 000 m2 was excavated across the huge castle complex. These excavations uncovered a defensive structures, living houses, dozen latrines, parts of sewers and pipelines for supplying water, as well as more than half million archaeological artefacts. Among these more than 60 000 animal bone fragments were analysed, and around 4000 fish scales and 300 fish (sturgeon, zander, pike, wels catfish, etc.) bones were identified. The aim of our presentation is to demonstrate and discuss the general results of these analyses that concern fish consumption in Vilnius Lower Castle during the Late Middle Ages and the Early modern period. A unique synthesis of archaeological and historical data, bioarchaeological and parasitological evidence allows us to reconstruct fishing practices, to evaluate the importance of fish in the diet of the inhabitants of the castle and even to trace their hygiene practices.

09 LET'S GET EXPERIMENTAL: USING EXPERIMENTAL ARCHAEOLOGY TO ASSESS ORAL INHALATION OF STARCH GRANULES DURING CEREAL PROCESSING

Author(s): Delaney, Sarah - Alexander, Michelle - Radini, Anita (University of York)

Presentation Format: Oral

Results from micro-debris analysis of dental calculus (tartar) from published individuals in different periods of time have shown evidence of starch granules from many different plant sources. Often starch granules are interpreted as deliberate consumption of starchy food. While processing and cooking does alter starch morphology and optical properties, in dental calculus the preservation of starch often appears very good with little or no evidence of alteration, and their origin to different plants groups has been shown possible. It is however unclear how such good preservation can occur if the source of starchy food has been heavily processed and cooked.

Documentary and archaeobotanical evidence indicates that cereals such as wheat, barley, rye and oats were commonly consumed during the Medieval period in England, often ground into flour for bread and other food preparations. Using experimental methodologies to replicate the processing of starchy plant food in the Medieval period, this paper demonstrates that the handling and processing of starchy food, before cooking and consumption, generates a flux of well preserved starch in the mouth. Such flux of particles of starch provides a plausible way of intact starch to become incorporated in the forming calculus. Unaltered starch entombed in this way in calculus becomes a precious evidence as the features necessary for identification are preserved. Potential health consequences of excessive exposure to their inhalation are also examined.

10 EXPLORING TRANSFORMING DIETS IN INDUSTRIALIZED SOCIETIES (LATE 18TH TO 19TH CENTURY): A DIRECT ISOTOPIC APPROACH

Author(s): Chidimuro, Blessing - Alexander, Michelle (University of York) - Collins, Matthew (University of York; Natural History Museum, University of Copenhagen)

Presentation Format: Oral

The Industrial Revolution of 18th -19th century England was marked by rapid socio-economic and political change, representing one of the shortest periods over which food acquisition and consumption have been transformed. During pre- industrial times, foods such as sugarcane and tea were scarce and consequently luxury goods. Improvements in agricultural practices, new trade routes and slavery - elements of the wider Industrial Revolution - saw prices of these commodities plummet, fuelling their consumption by the masses. Cane sugar, a C4 carbohydrate plays a crucial role in this dietary transition. Post-medieval archaeological human-skeletal evidence is increasingly available and dietary studies using isotope analysis on these are increasing in number. However, these studies have until now focussed on dietary protein (collagen). The consumption of carbohydrates can be detected in bone and tooth mineral carbonate. Bone mineral carbonate is particularly prone to diagenetic alteration. If a carbohydrate signal could be deciphered from adult bone (as opposed to childhood enamel) we could provide an independent measure of the speed and reach of this C4 car-

bohydrate revolution.

In this paper, we present bone mineral (δ13C) and collagen isotope (δ13C, δ15N) results from selected post-medieval sites. In addition, the results of diagenetic pathways of archaeological bones investigated through FTIR-ATR are presented. The results obtained from FTIR suggest differences in diagenetic alteration between sites. The study demonstrate a need for systematic evaluation of mineral integrity in all archaeological bone before and after pretreatment. We investigate the isotopic results from bone mineral to explore the potential for studying the carbohydrate fraction of the diet and detecting the proposed rise in sugar consumption during this period. We further investigate our data alongside historical evidence to explore potential links between socioeconomic status and food consumption for these communities.

11 THE INFLUENCE OF THERMAL PROCESSING OF DRINKING WATER ON ISOTOPIC COMPOSITION OF OXYGEN IN BONE APATITIES- ANIMAL-BASED MODEL

Author(s): Lisowska-Gaczorek, Aleksandra (Institute of Zoology and Biomedical Research Jagiellonian University; Institute of Ecology and Bioethics Cardinal Stefan Wyszyński University in Warsaw) - Cienkosz-Stepańczak, Beata - Szostek, Krzysztof (Institute of Zoology and Biomedical Research Jagiellonian University)

Presentation Format: Oral

The stable oxygen isotopic ratio in mineral fraction of bone tissue is determined by the isotope composition of drinking water. The process of thermal treatment of water or liquid foods there is an isotopic fractionation, resulting in a change in the oxygen isotopic composition of consumed water. Consequently, it can be assumed that bone tissue of individuals drinking boiled water will not reflect the environmental levels of oxygen isotopes what can affect the interpretation of many results obtained as a result of isotopic analysis.

The main aim of the studies was to determine the influence of thermal processing of drinking water and breastfeeding on final isotopic composition of oxygen in bone apatites taking into account isotopic fractionation using rats as an animal-based model.

The experiment was carried out for 59 Wistar rats divided into two groups according to the type of consumed water (tap water, long boiled water).

On the grounds of the analysis of stable oxygen isotopes in rats bone tissue, the degree to which a consumption of a thermally processed water can affect the proportion of oxygen isotopes in human bone tissue was estimated. As a result of consuming thermally processed water, the oxygen isotopic value in rat bone phosphates increased by 2.33‰. Depending on the applied regression equation, consumption of thermally processed water can raise the oxygen isotopic composition of human bone phosphates to 2.19-3.72‰.

Project financed from National Science Centre (NCN) Poland resources. Title “The application of the analyses of stable oxygen isotopes on the animal model in interpretation of anthropological research on prehistoric and historic human groups” No: 2014/15/N/NZ8/00351

12 THE TRUTH LIES WITHIN THE POT: EXPERIMENTAL APPROACHES TO THE RECONSTRUCTION OF PREHISTORIC CULINARY PRACTICES THROUGH MICROBOTANICAL ANALYSES

Author(s): García-Granero, Juan José (School of Archaeology, University of Oxford) - Urem-Kotsou, Dushka - Lymperaki, Marianna (Department of History and Ethnology, Democritus University of Thrace) - Stagkidis, Yiannis (Traditional potter) - Bogaard, Amy (School of Archaeology, University of Oxford)

Presentation Format: Oral

In the last few decades, the analysis of microbotanical remains (phytoliths and starch grains) from archaeological potsherds has greatly expanded our knowledge of past plant-related subsistence strategies worldwide. Phytoliths are often found on non-edible plant parts but can also represent the use of taxa often underrepresented in the macrobotanical record, such as spices; whereas starch grains are produced in the edible plants parts (seeds, fruits, underground storage organs, etc.) and are usually regarded as a direct evidence of the consumption of starchy plants, including, among others, cereals, pulses and tubers. However, certain methodological issues are seldom addressed throughout these analyses, including the representativity of microbotanical remains and their integration with other organic residues (e.g. lipids). Moreover, current recovery methods require that potsherds remain unwashed after their retrieval from the archaeological deposits, which is unfortunately very rare, thus limiting the amount of microbotanical studies that can be conducted. This presentation will discuss the results of a series of experiments conducted with modern replica cooking pottery vessels aiming at exploring: a) the preservation of microbotanical remains when cooked with different vessels and cooking conditions (technique, temperature, time, etc.), including the use of meat and dairy products; b) the spatial distribution of microbotanical remains in pottery vessels; and c) the relative occurrence of microbotanical remains from different taxa after successive cooking experiments. Moreover, we will present the results of laboratory experiments conducted with subsamples of the replica vessels to develop alternative methods for the recovery of microbotanical remains from pottery vessels aiming at effectively integrating them with other organic residues.

a. BONE GREASE RENDERING OR MEAL BOILING? AN INTEGRATED ARCHAEOZOOLOGICAL AND BIOCHEMICAL APPROACH TO THE STUDY OF FOOD AND CULINARY PRACTICES

Author(s): Tornero, Carlos - Ferratges - Kwekel, Eloísa (Departament de Prehistòria. Universitat Autònoma de Barcelona) - Villarroya, Ignacio (Servei d'Anàlisis Químiques. Universitat Autònoma de Barcelona) - Saña, Maria (Departament de Prehistòria. Universitat Autònoma de Barcelona)

Presentation Format: Poster

Food and cooking practices are a fundamental part in the organization of human communities. These activities give us information about how they were adapted to the environment and dietary resources, having a direct impact on the way the communities organize they daily life. In this sense, the animal processing and cooking methods implemented may have large social repercussions for prehistoric groups. However, identify this different work processes and techniques in archaeological contexts is not an easy task.

The faunal remains from archaeological context can provide valuable information about the way meal was obtained and prepared. Actually, through the identification and classification of thermoalteration marks on bones it is possible to know how the meat portions were exposed to fire and then, how they were cooked. Furthermore, the study of anatomical variability, bone morphology and the breakage patterns of faunal remains can allow us to identify between diverse work processes as narrow extraction or bone grease processing.

To carry this out, we studied an important sample of faunal remains coming from settlements with Mesolithic and Neolithic occupations located in the Northeast of the Iberian Peninsula. Our aim is to evaluate how the incorporation of some Neolithic elements (i.e. domestic resources and pottery vessels) in this regions changed the way in which food was acquired and prepared. The study of faunal remains has been done both at macroscopic and at microscopic level, through biochemical techniques that allow us to stablish a correlation between the changes observed in the bone surface and the changes suffered in the chemical structure of bone. The obtained results suggest that dietary shifts occurred at the beginnings of the Neolithic in the Northeast of the Iberian Peninsula not always were correlated with changes in cooking techniques.

b. CHEMICAL DETERMINATION OF ANCIENT DAIRY PRODUCTS AND MILLET IN THE CORDER WARE BURIAL LATE ENEOLITHIC CONTEXT FROM MORAVIA (CZECH REPUBLIC)

Author(s): Peška, Jaroslav (Archeologické centrum Olomouc) - Kučera, Lukáš - Fojtík, Pavel - Barták, Petr - Kučerová, Pavla - Pavelka, Jaroslav - Komárková, Veronika - Beneš, Jaromír - Polcerová, Lenka - Králík, Miroslav - Bednář, Petr

Presentation Format: Poster

Chemical analysis of archaeological objects is important part of current archaeological investigations. In the presented study, a soil from four archaeological vessels from rescue excavation close to the village Držovice was analysed using gas chromatography-mass spectrometry, enzyme-linked immunosorbent assay and matrix assisted laser desorption/ionization mass spectrometry combined with advanced statistical treatment (principal component analysis and orthogonal projection to latent structures). The study of differences among particular soil layers in those vessels allowed to reveal several markers of their original content. Milliacin, a chemical marker of a broomcorn millet was detected by gas chromatography/mass spectrometry. Matrix assisted laser desorption/ionization technique revealed presence of di- and triacylglycerols in two ceramic Corde Ware beakers with volume 0.8 and 0.6 L, respectively. The enzyme-linked immunosorbent assay was used for confirmation of the presence of milk proteins in two vessels. The obtained results can help to understand the diet habits of former population and economic situation. The identification of organic residues from the end of Eneolithic period of Moravia is extraordinarily important. Based on chemical analysis in context with archaeological studies discussed in this communication we suggest that direct gene mutation allowing to digest lactose spread during the last Indo-European migration (beginning of the Corded Ware culture).

This study was supported by Czech Science Foundation (17-17346S) and Ministry of Education Youth and Sports of the Czech Republic (CZ.1.05/2.1.00/19.0377 and LO1305)

c. CURRENT ETHNOBOTANY FOR INTERPRETING ARCHAEOBOTANICAL REMAINS: THE CASE OF "GRÜNKERN" (TRITICUM SPELTA)

Author(s): Berihuete-Azorin, Marian - Stika, Hans-Peter (Institut fur Botanik, Hohenheim Universitat) - Valamoti, Soultana (Dept of Archaeology, School of History and Archaeology, Aristotle University of Thessaloniki)

Presentation Format: Poster

Grünkern has been produced traditionally in a particular region of Germany till recent date. Grünkern is made by harvesting unripe winter spelt and smoking it for several hours in special installations, in order to prolong its shelf life. The first written reference to Grünkern dates to the 17th century, but we suspect that its use has a longer tradition and that it could be a preparation already practiced in prehistoric times. As part of the project PLANTCULT (ERC Consolidator Grant, GA number 682529), we intend to document this fact archaeologically, for what we aim to develop the necessary methodological tools.

The goal is to produce reference material that will be used for comparisons with archaeological remains and therefore allow the identification of Grünkern production in the archaeological record. Our research concentrates on the Bauland region, a gently hilly and open landscape that lies in the north-eastern part of the state of Baden-Württemberg and where its preparation has a long tradition. Here, the production of Grünkern which was not systematically recorded till date, has been ethnobotanically documented

and samples have been taken from each preparation stage. Afterwards, the samples have been charred under controlled conditions, measured and photographed. The evaluation of the results concludes that ripe and unripe spelt grains present differences that in some cases could be observed in archaeological materials.

d. MORPHOMETRIC ANALYSIS OF ROMAN GRAPE SEEDS FROM THE ARCHAEOLOGICAL SITE OF TORRES DOS NAMORADOS (FUNDÃO, PORTUGAL)

Author(s): Coradeschi, Ginevra (Laboratório HERCULES, Universidade de Évora) - Ucchesu, Mariano - Bacchetta, Gianluigi (Banca del Germoplasma della Sardegna - BG-SAR, Hortus Botanicus Karalitanus - HBK, Università degli Studi di Cagliari) - Alegria Ribeiro, Carla (Independent Archaelogist) - Angelo, Maria João (4CEAACP: Centro de Estudos em Arqueologia Artes e Ciências do Património, Faculdade de Letras da Universidade de Coimbra | Fundação para a Ciência e Tecnologia - FCT) - Eiras Dias, José Eduardo - Cunha, Jorge - Baleiras-Couto, M. Margarida (Instituto Nacional de Investigação Agrária e Veterinária / INIAVPólo de Dois Portos) - Sadori, Laura (Università La Sapienza, Dipartimento di Biologia Ambientale) - Barrocas Dias, Cristina (Laboratório HERCULES, Universidade de Évora)
Presentation Format: Poster

This research aims to provide a first contribution for understanding viticulture during Roman time in Portugal. Identified as a Roman vicus, the archaeological site of Torre dos Namorados (Quintas da Torre, Vale Prazeres / Mata da Rainha, Fundão) is nowadays an extraordinary case in the territory of this region, with the presence of structures and elements related to wine and olive oil mills. During the archaeological excavations (2006 and 2007), a Roman lacus musti was retrieved - a box built with tegulae and bricks – that contained thousands of charred grape seeds.

In this work, we present the preliminary results of the morphological characterization of the archaeological charred grape seeds. The characterization took place through the comparison of archaeological charred grape seeds with 58 autochthonous cultivated grapes and 15 accessions of wild grapes from Portugal. Modern materials were provided by the Instituto Nacional de Investigação Agrária e Veterinária (INIAV, Portugal).

Moreover, to identify the archaeological material, the modern grape seeds have also been charred, in an attempt to mimic the original conditions of carbonization.

For each archaeological and modern charred grape seeds, a total of 106 morphometric features were measured by image analysis techniques. Subsequently, the data were statistically explored applying the stepwise Linear Discriminant Analysis (LDA) to compare the experimentally charred wild and cultivated grape seed lots and the archaeological charred grape seeds. Preliminary results, showed a high degree of similarity between archaeological and some modern cultivated grape varieties in Portugal.

In particular, the archaeological grape seeds of Torre dos Namorados seem to be similar to some autochthonous grape varieties currently cultivated in the region of Alentejo. Likewise, some similar anatomical features were observed between the archaeological seeds and some wild grapes from Alentejo.

e. UNDERSTANDING RITUALS IN GRAVISCA SITE: A MULTIDISCIPLINARY APPROACH

Author(s): Patrizi, Giulia (Laboratory of Archaeobotany and Palaeoecology, University of Salento) - Pennetta, Antonio (Laboratory of Chemical Analyses for Cultural Heritage, University of Salento) - Fiorini, Lucio (University of Perugia) - De Benedetto, Giuseppe Egidio (Laboratory of Chemical Analyses for Cultural Heritage, University of Salento) - Debono Spiteri, Cynthianne (University of Tübingen, Institute for Prehistory and Early History and Medieval Archaeology) - Fiorentino, Girolamo (Laboratory of Archaeobotany and Palaeoecology, University of Salento)
Presentation Format: Poster

The site of Gravisca, situated about ten kilometres from Tarquinia (the ancient Tarkna), represents one of the most important harbours of antiquity. It was a crossroad of goods and people in the centre of the Mediterranean area between the end of the 7th century BC and the Roman period. It constitutes also an extraordinary evidence of an emporic sanctuary, similar to Naukratis in Egypt, created as a protected area where Greek merchants from the eastern Mediterranean Sea could exchange their products in the Etruscan territories, under the protection of divinities who were their guarantors.

In this complex framework, thanks to the accurate archaeological field work, have been individuated traces of rituals connected to the divinities that patronized the sanctuary. Therefore, a multidisciplinary approach has been used in order to investigate these contexts, where stratigraphical evidences, archaeobotanical remains and analytical chemistry talk together.

During the excavation, the archaeological strata sampled have been used for the archaeobotanical analyses: after the flotation, seeds and charcoals have been isolated and identified. To identify different types of lipids absorbed by the ceramic core, vessels coming from the same contexts has been sampled and analysed using high temperature gas chromatography and compound-specific isotopic ratio. The collected data are indispensable to reach the final goal: discover and understand the set of actions that connect divinities, human actions and environment.

f. MILKTEETH: CALCIUM ISOTOPE ANALYSIS OF HUMAN DENTAL ENAMEL FROM MODERN AND ARCHAEOLOGICAL PERMANENT TEETH

Author(s): Wright, Carrie (BioArCh, Department of Archaeology, University of York; Department of Geosciences, Stony Brook University; Department of Anthropology, Stony Brook University) - Rasbury, E. Troy (Department of Geosciences, Stony Brook University) - Ku-

cine, Allan (Department of Oral & Maxillofacial Surgery, Stony Brook University) - Twiss, Katheryn (Department of Anthropology, Stony Brook University) - Collins, Matthew (BioArCh, Department of Archaeology, University of York; Natural History Museum of Denmark, University of Copenhagen)

Presentation Format: Poster

The use of calcium isotope ratio values in enamel as a means for understanding milk consumption is still in the early stages of development for archaeological research. The focus thus far has been on enamel from herbivores and deciduous human teeth in order to investigate infant nursing and weaning. In archaeological contexts, permanent teeth have better survivorship in the burial environment, are collected more frequently than deciduous teeth, and provide a broader range of information (from birth through the late teens), thus making the analysis of permanent teeth a critical area of research. Gaining access to modern human teeth for research purposes is very difficult, but the MilkTeeth project has secured the necessary ethical permissions, allowing the collection of permanent teeth with corresponding dietary and life history information from tooth donors. This will allow calcium isotope analysis of modern human dental enamel, in order to investigate both infant nursing/weaning and post-weaning dairy food consumption. The goal of this work is to create the necessary understanding of how calcium isotope ratios in modern human teeth, correlated with dietary and life history information, can facilitate reliable interpretation of calcium isotope ratio values in permanent human tooth enamel from the archaeological record. This poster will present the first results of this new area of research.

g. WEST LITHUANIAN SUBADULT DIET DURING LATE ROMAN AND EARLY MIGRATION PERIODS BASED ON ISOTOPIC DATA FROM HUMAN TEETH

Author(s): Simcenka, Edvardas (Department of Archaeology, Faculty of History, Vilnius University) - Bliujienė, Audronė (The Institute of Baltic Region History and Archaeology, Klaipeda University) - Skipitytė, Raminta - Garbaras, Andrius (Mass Spectrometry Laboratory, Department of Nuclear Research, Center for Physical Sciences and Technology) - Miliauskienė, Žydrūnė (Department of Anatomy, Histology and Anthropology, Faculty of Medicine, Vilnius University) - Šapolaitė, Justina - Ežerinskis, Žilvinas (Mass Spectrometry Laboratory, Department of Nuclear Research, Center for Physical Sciences and Technology) - Masiulienė, Ieva (The Institute of Baltic Region History and Archaeology, Klaipeda university) - Piličiauskienė, Giedrė (Bioarchaeology Research centre, Vilnius university) - Čeponkus, Justinas (Institute of Chemical Physics, Faculty of Physics, Vilnius University)

Presentation Format: Poster

The period discussed in this article was a time of significant changes in climate, economy and social structures, all followed by major migration of people. People of the Culture of Burials Encircled with Stones from Western Lithuania were also unable to avoid these processes which mark the end of Late Roman Period when this culture thrived, while the beginning of Migration Period, which is defined by the demographic decline and shifts in settlement structures, ensues.

In order to asses whether these social and economic changes had any noticeable impact on people's diet and mobility, the stable isotope analyses of human teeth and animal bones were conducted. Samples were taken from osteological material retrieved from western Lithuanian sites of the Late Roman to the Early Migration periods (the beginning of the 3rd - the middle of 5th century AD).

The isotopic data of human teeth showed that during their non-adult years human diet was based on the products procured from agriculture (C3 cereal plants and animal husbandry (domesticated herbivores and omnivores). The isotopic data between people of different social statuses indicate a dietary similarity among the individuals of varying wealth in their respective communities. The isotopic values also suggest that all the people originated from the local area, even though archaeological artifacts clearly indicate wide ranging contacts across the Baltic Sea and a relationship with the communities of Central Europe.

Overall, these results indicate that despite all the demographic and climatic upheavals, which appeared at the beginning of the Migration Period, the primary sources of food remained unchanged between the Late Roman and Early Migration periods in the studied populations. Although more isotopic data are needed, the results of this study provide first glimpses on diet of people from Late Roman and Early Migration period in Western Lithuania.

790 INSIGTS IN ARCHAEOLOGY TODAY

Theme: The archaeology of material culture, bodies and landscapes

Organisers: Bogdanovic, Igor (Universitat Autonoma de Barcelona) - Andreaki, Vasiliki (Universitat Autònoma de Barcelona) - Suryanarayan, Akshyeta (University of Cambridge) - Boom, Carina (-) - Picas, Mathieu (University of Barcelona) - Molina, Bárbara (University of Barcelona)

Format: Regular session

The European Archaeology is one dynamic interdisciplinary space widened by constant innovation in method and theory. However, interior diversification of the field and hi specialization of research are evident. One example for focused interest grouping is a structure of big gatherings as it is the annual meeting of EAA, which counts with 260 sessions in 6 thematic blocks. We consider that one of these clusters should be dedicated to more transversal knowledge and try to contribute to wider picture of contemporary archaeological practice.

This session is meant for these who are interested in having a more general picture of what is happening in European Archaeology today and

aims to exchange the knowledge beyond the boundaries of specialized groups. Without chronological or territorial bounds, this session addresses current topics in archaeological theory, method and scientific techniques, as well as topics concerning different aspects of heritage, including present-day reality and future of traditional heritage institution: museum. Most of contemporary European social challenges related to archaeological knowledge deal with preservation, protection, management and presentation/communication of heritage according to important changes, some would say paradigmatic shift, in the ways how the knowledge is created, distributed and consumed. The current trend of Digital Heritage reinforce the idea that the most important objects of the archaeological heritage are knowledge and data, and therefore they should be preserved, protected, and reachable to wide society. The session also welcomes archaeological insights in different aspects of past and even present social life, as may be religion, ritual or politics.

ABSTRACTS

01 MANAGING KNOWLEDGE TO MANAGE THE PAST IN AN AGE OF UNCERTAINTY

Author(s): Lee, Edmund (HE - Historic England)

Presentation Format: Oral

My contribution will draw on experience in the related disciplines of information management and knowledge management as used in the public sector heritage agencies in England since the 1990's. In the 90's and early 2000's the emphasis was on management of inventories of the nation's archaeological sites and historic buildings, through the adoption of standards for data content, indexing terminology and interoperability to support data sharing. These inventories were repositories of supposedly factual expert knowledge provided for public use for both for management of change to the land- and townscape, and for research. However, in the last decade the separate discipline of knowledge management has highlighted the limitations of information- based knowledge. Beyond the reach of technical information management, are broader questions. What knowledge is needed? What is of interest? Who should set the agenda? How should new knowledge be represented in inventories and other database records (if at all)? How can knowledge best be shared and made available? How should knowledge gathered in the present be made relevant when future research and management needs are not known? I will look at ways in which process and methodology reviews are starting to reshape archaeological practices in England, emphasizing the need for a knowledge management approach with the aim of re-integration of archaeological research processes. Can we apply some of the insight into knowledge organisation derived from the work on national inventories to a broader range of the knowledge needs of archaeological research?

02 PATTERNS OF LITHIC RAW MATERIALS PROCUREMENT DURING THE MIDDLE PLEISTOCENE IN CALERIZO DE CÁCERES, EXTREMADURA SPAIN

Author(s): Akintayo, Akinbowale (Universitat Rovira i Virgili) - Canals, Antoni (Universitat Rovira i Virgili; Institut Catala Paleoecologia Humana i Evolucio Social)

Presentation Format: Oral

This work presents a study of the provenance of lithic materials from the excavated site of Santa Ana in Calerizo de Caceres - a karstic system confined between quartzitic hills with abundant lithic materials and availability of surface and groundwater resources, with the ultimate aim of understanding how human groups who inhabited this area during the Middle Pleistocene made use of geological sources for lithics production on the one hand, and the extent to which they moved about on the landscape for subsistence purpose on the other hand. Macroscopic/visual characterization of archaeological samples, as well as the geological sources was employed do determine the provenance of materials, through the comparison of results from characterization of archaeological materials using the results for those of the geological sources as references for source provisioning. Spatial analysis of location data collected during prospecting of the landscape as well as digital elevation model of the area were used to interpret the movement pattern on the landscape from the site (Santa Ana Cave) to geological deposits of raw materials present within the studied landscape using GIS. The results showed that both primary and secondary sources were visited by this prehistoric groups for raw materials procurement and the maximum distance travelled in order to acquire these materials do not extend beyond 15km. A cluster of these sources were found to be located at distance of about 1.5km and the pattern of movement was found to be along river channels as deposits around water sources were found to be the most visited for raw materials acquisition judging by the number of pieces from the archaeological assemblage.

03 COLLUVIAL DEPOSITS AS PROXY INDICATORS OF HUMAN ACTIVITY: A CASE STUDY FROM NORTHERN ENGLAND

Author(s): Gardner, Tom (University of Edinburgh) - Tipping, Richard (University of Stirling) - Kinnaird, Tim (University of St Andrews) - Finneran, Anna (University of Durham)

Presentation Format: Oral

While conventional methods for assessing Holocene changes in landcover prove fruitful for assessing broad changes, short and abrupt changes to local landscapes are harder to identify. Events such as soil erosion represent significant alterations to landscapes within the lived experience of individuals in the Holocene, the narrative of which may be missed by pollen analysis and macrobotanical methods. These changes may be climatic or anthropogenic, but could still have had impacts on local communities, es-

pecially across prehistoric periods.

Sediment-stratigraphic analyses were employed at the Bradford Kaims in north-east England to establish the age, magnitude, frequency, and landscape change impact of colluvial sediments when excavation had recovered no evidence for human activity other than a large suite of non-domestic Bronze Age burnt mounds. The methodology combined conventional AMS 14C dating and sediment characterisation with more novel techniques, such as portable OSL and soil micromorphology, to recover a chronology of prehistoric soil erosion that preceded and post-dated excavated evidence, resulting in very significant landscape change. This landscape change was characterised by very abrupt episodes of erosion across numerous periods, some associated with settlement use, some with industrial activity, and some with riverine avulsion and climatic shifts.

We hope to present these findings as evidence of a successful methodology for assessing abrupt and short-lived landscape change in the Holocene.

04 CLIMATE OF CHANGE: EXPLORING THE SOCIAL CONSEQUENCES OF CLIMATE DRIVEN VEGETATION CHANGE IN THE ARCHAEOLOGICAL RECORD

Author(s): Cromartie, Amy (Cornell University)
Presentation Format: Oral

Narratives in archaeology surrounding changing climate often center around the management of natural resources, the modification of agriculture strategies, and political collapse. Climate change, in reality, is a complex process that manifest itself in multiple ways. On the vegetation landscape this can be through moving treelines, the appearance and disappearance of species, and the growing and shrinking of water sources. These changes can have a profound impact on the ecological organization of both plant and animal communities. The potential of these changes to reorganized human religious and social structures in the past, however, needs more attention. In this talk I will utilize paleoclimate and archaeobotanical records from the Ancient Near East and Caucasus to examine how climate reshaped the vegetation landscape and how these changes in plant communities may have led to the reorganization of social structures. I will call on examples from our contemporary crisis and the ethnographic record to illustrate how religious and social communities are being reorganized by the disappearance of plant and animal species. Finally, I examine how we can approach thinking about the social manifestation of climate variation in the archaeological record by focusing on social changes in the Early and Late Bronze Age in Armenia in relation to changes in the plant landscape.

05 UNDERSTANDING BATTLEFIELDS: THE ANALYSIS OF BATTLEFIELDS THROUGH THE ARCHAEOLOGY OF ARTEFACTS

Author(s): Claxton, Kevin (University of York)
Presentation Format: Oral

Battlefield archaeology is a relatively new discipline but one which has helped take the study of conflict from the province of the historian to a broader understanding through archaeological study. This paper presents how battlefields can be located and interpreted through the study of their material remains using examples from the authors own research and drawing from examples from battlefields around the world and from different periods.

The primary focus of this paper is the research carried out by the author on the artefact assemblage from the English Civil War battlefield of Cheriton (1644). The paper discusses the analysis of the complete assemblage, including the methodology used, and presents the results of this analysis including the location and spread of the battlefield area. This study also shows how results have been able to shed new light on the interpretation of the events of the battle. This study will then be compared with examples of previous artefact analysis from other battlefields, including the Battle of Bosworth (1485), Battle of Little Bighorn (1876), and the Fall of Singapore (1942), with the aim being to show how the approaches to studying battlefield artefacts can be applied to different periods and counties and how interpreting these remains can lead to a better understanding of these key moments of human conflict.

06 MATERIAL TRACES OF THE WAR IN THE BIALOWIEŻA PRIMEVAL FOREST IDENTIFIED WITH THE HELP OF THE AIRBORNE LASER SCANNING

Author(s): Szlazak, Roman - Wawrzeniuk, Joanna (Institute of Archaeology Cardinal Stefan Wyszyński University in Warsaw)
Presentation Format: Oral

Located in the north-eastern part of Poland the region of Podlasie was a ground of numerous military activities during the modern times. Some took place in the Bialowieża Forest, one of the largest forested areas in Poland, covering nearly 1 500 km2, of which 42% is located in Poland and 68% in Bialorus.

Significant part of the Białowieża Forest was protected for centuries by Polish kings and later authorities. At present this area is variously protected includingthe UNESCO listed bioreserve of the Bialowieża National Park. Archaeological survey there was always very difficult because of dense vegetation, and lack of agricultural activities. However this situation results in very good preservation of various traces of military activities. This opportunity may be effectively exploited by new technological developments, e.g. airborne laser scanning (ALS) or high accuracy GPS.

In January 2017 the three-years research project "Cultural and natural heritage of the Białowieża Forest" has been launched financed by the National Science Centre. It aims at comprehensive, interdisciplinary examination of the archaeological resources in

the Polish part of the Białowieża forest with the help of ALS, field verification, geophysical surveys, test excavations and complex laboratory analyses.

The aim of the presentation is to show the interim results of research on the Białowieża Forest military history. Although the first information on modern military operations from this area are dated to the Napoleonic campaign, the first visible military structures come from the 19th Polish uprisings. Further traces come from the World War I, Polish–Soviet War of 1921 and World War II. The presentation will show combined results of ALS analysis, field surveys, archival searches and old maps analyses.

07 ETHICS IN TREATMENT OF ARCHAEOLOGICAL AND ANTHROPOLOGICAL REMAINS

Author(s): Rita, Solazzo (Paris 1 Pantheon Sorbonne) - Solaini, Prisca (Università di Roma La Sapienza)
Presentation Format: Oral

In recent years the concept of ethics, concerning the treatment of human remains, has increasingly taken hold in archaeological debates. The sensitivity and importance given to anthropological studies and remains has increased since the moment of the discovery during the excavations, but especially for the subsequent exposure in museums, both as regards respect for the deceased that will be exposed, and for what could be the possible reaction of the public. We have therefore taken into consideration the legislation on the subject, starting from the countries as France, Italy, the Netherlands and Germany.

The heart of the debate revolves around the question of the treatment of human remains in the anthropological and archaeological field and what are the ethical and legislative norms on the exposure of bodies in Europe, taking the example of France, Holland and finally England. So we will consider the religious aspect, what are the moral obligations that an archaeologist must make, starting from the discovery of the corpse, the treatment for protection and conservation until the arrival at the museum exhibition.

We have also taken into consideration the ancient and religious texts, that show us how the concept of respect for the dead constitutes the core of the ethical treatment of human remains; we will investigate how also religion could help the work of the anthropologist and the archaeologist. As we will see, common morality derive from the different cultures, and varies from country to country, depending on national history; our intent is to find out what the territorial differences are.

08 DIMENSION OF THE DEATH AND THE SPLIT BODY. ON THEORETICAL APPROACH TO HUMAN REMAINS IN ARCHEOLOGY

Author(s): Durczak, Kinga (Leiden University)
Presentation Format: Oral

In our European philosophy human being is split, we exist in constant dichotomy: soul opposed the body, mind opposed the matter. In the same ways, there are multiple ways in which death is study on scientific grounds, including archeological: biological, cultural or social It reflects ways that research about the body are split: there are gender studies that concentrate sole on the cultural expression of sex or biological studies of human remains that go without consideration of the cultural or sociological aspect We divide the body and death, into those small categories, to be able to better understand them and often we after answering specific question we forget to put them together, and in doing so we are losing focus on human beings as whole.

This biased approached of dichotomy is still present in scientific world, biologist and other scientist, with their 'hard facts', thinks of culture as a mean of human develop, and on the other humanist focus of with their approached things of biology as a shameful secret that is not worth consideration. The boundaries created on philosophical grounds impacted are ways on thinking about the body.

To be able to bridge the gap between scientific and humanistic in studies of death we need to refocus on the body, as it acts as anchor to reality, to both cultural and biological being and provide a space to process that end up in emergence of individuality and personality. We need to build a theoretical approach and practice that will results in incorporating both types of research. A good example of such bridge is theoretical approaches that osteobiography provide. There individual, is study as many ways as possible, cultural and biological, to give a better answer about it past life and death.

09 LA VALLETTA CONVENTION IN SERBIA: THE TIME TO CHANGE OR FIRST TO IMPLEMENT

Author(s): Joncic, Nenad (University of Primorska Faculty of Humanities)
Presentation Format: Oral

After the adoption of the La Valletta Convention, the structure of the archaeological practice changed substantially all over Europe. However, the implementation of the Convention varies considerably from one country to another. The very common occurrence is a great increase in a number of preventive researches. We should not ignore the fact, that in Eastern Europe, the introduction of La Valletta-based preventive archaeology went parallel with the process of democratization, denationalization, and privatization, and establishment of the free market economy, while Western Europe adopt doctrine of the La Valletta Convention and some of its major achievements, as the inclusion of archaeology into spatial planning process and the polluter pays principle in the first place.

Serbia is a country with an archaeological history from the last decades of the 19th century. With good archaeological practice and an exceptional academic tradition in regional terms in SE Europe. The modern state of Serbia has maintained its good archaeological practice despite a significant decrease in state-funded projects. Key factors that disturb development-led archaeology in Serbia are the resistance of public sector institutions to privatize or commercialize archaeology. This continues to affect the development of the discipline of archaeology and heritage protection within Serbia. Although, Serbia signed the convention in 2008.

10 PRESENTATION MODELS OF ARCHAEOLOGICAL HERITAGE. FROM PROJECT TO REALITY. THE CELLA VINARIA PROJECT AS AN EXAMPLE (TEIÀ-MARESME-BARCELONA)

Author(s): Martín i Oliveras, Antoni (Universitat de Barcelona; Goventment of Catalonia-Ministry of Culture-Archaeology & Paleontology Service) - Sierra Díaz, Leticia (Universitat de Barcelona; toolbox gestión y comunicación integral SL)

Presentation Format: Oral

The concept of presentation refers to the form, the content and how to transfer the heritage and the knowledge associated with it. We share the idea that heritage is an essential instrument of formal education in society and all citizens (public, visitors, users, etc) must recognise its values. However they must feel like the heritage belongs to them; it must be understood, it must be seen as something useful, it must be wanted, and all of this involves awaking emotions. If what we want to demonstrate cannot be understood, if we do not feel that it belongs to us, if we do not see any motive or use for it, it would be very difficult to provoke any type of emotion within us, and it would be difficult for any project which does not take these concepts into account to succeed.

The presentation of archaeological heritage must be able to make an impact in people's minds. This is why archaeological sites can only be a knowledge resource if it is contextualised within a framework of ideas. Presenting these ones in a framework of ideas means provoking thoughts and following a line of argument. That is, putting it into context. This last concept involves the development of an expository discourse directed towards a wide enough variety of publics and users, searching different levels of reading and explanation needed to satisfy each of these groups, while maintaining the respect, seriousness and the scientific accuracy.

The CELLA VINARIA Archaeological Park located in Teià (Maresme, Barcelona) was inaugurated in 2009. It is a complex model facility with three main presentation elements that offers different resources to the visitor: An oenological and touristic reception centre, Veral de Vallmora's archaeological site museumized and an Experimental Roman Vineyard.

11 "A BOTTOM-UP COLLECTION":THE CROWDSOURCED COLLECTION OF THE YMCA BASKETBALL MUSEUM IN THESSALONIKI, GREECE

Author(s): Theodoroudi, Eleftheria (Aristotle University of Thessaloniki - AUTH; YMCA) - Kasvikis, Konstantinos (University of Western Macedonia - UoWM)

Presentation Format: Oral

The YMCA Basketball Museum in Thessaloniki opened its doors to the community of YMCA, to the citizens of Thessaloniki and to the Basketball community of Greece in 2013 as part of an INTERREG "Greece – Bulgaria" project titled "Youth Mobilization – Cultural Heritage and Athletic Valorization". It is the first Basketball Museum in Greece and one out of a few around the World. One of the objectives of the YMCA Basketball Museum is to maintain the memory of the first open Basketball court, where basketball was played in Greece for the first time. The making of the museum has been a constant demand of the YMCA community and of the volunteers of the organization in order to preserve the history of Basketball in Thessaloniki and at the same time to highlight the role of YMCA in the dissemination of the sport.

Since its beginning the Museum developed an open collecting policy to enrich the surviving collection and archive of the YMCA; at the same time crowdsourcing proved an invaluable tool for the gathering of various type of material and immaterial traces. YMCA volunteers, old players and athletes donated material from their own personal collections and also they have come with their stories and their memories enriching the archives of the Museum. This paper will explore on the one hand the impact of the crowdsourcing bottom – up collection of material to the practices of the Museum and on the other hand the relationship and the feeling of community and pride for the people that offered their own personal collections and memories. In our case the poetics and politics of collecting involves personal values and material identities identified in the crowdsourcing practice of the volunteers engaged in the project of creating the YMCA Basketball museum.

12 REPORT-BASED ARCHAEOLOGY: DON'T WE NEED MORE COMPILATION?

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

Presentation Format: Oral

Every year, a large number of areas are excavated and surveyed in a planned way by archaeologist. Furthermore, rescue excavations are carried out upon unexpected finds, or due to a rescue project. In any case, countless archaeological finds and even monumental structures are uncovered during these excavations. Thereafter, classification and preservation processes are conducted. Finally, publishing stage begins, and this stage enjoys a long journey. Generally, publishing of an archaeological find begins with a simple process, which may be called a report, consisting of the technical, measurable and locational properties of the find. After that, the find is assessed in a context consisting of parallel samples. This is an endless process, owing to the constant probability of finding an artifact or a structure. As long as archaeological finds are encountered, more and more singular, report-based publications will be issued. As a result, a huge mass of accumulated publications occurs, yet researchers undergo lack of compiled datasets. Although both systematic excavations and surveys occasionally suffer from unsatisfying compiler publications, the latter experiences it more deeply. The reason is that surveys are short-term activities, generally carried out in ancient rural areas, and therefore a single area cannot yield broad data. However, surveys can be executed quickly, and therefore a great deal of surveys can yield rich data source in a short time, so that an extensive accumulated data source emerges. I think this data source requires to be compiled interpretively.

This presentation aims to emphasize the importance of compilation and creating datasets, especially for rural areas in archaeology, with the examples from Anatolia.

13 SCANDINAVIAN GOLD BRACTEATES AND THE ORIGIN OF BEOWULF

Author(s): Battaglia, Frank (College of Staten Island/ City University of New York)
Presentation Format: Oral

From roughly 450 to 550, Germanic leaders exchanged Scandinavian gold bracteates in a practice imitating Roman imperial favors. A unique contemporary source for pre-Christian religion, bracteate art intimates that the Norse mythology known from later texts was coalescing in the Migration period. On some bracteates, for example, runes may identify houaR, "The High One," as Othin would be identified in Hávamal, dating to about 1100.

Among the four main types, the central image on D-bracteates comprises different monster-like animals, often interpreted as defeated demons. Of 1003 bracteates known in 2010, D-forms, mostly from the 6th century, comprise the second largest group, with 359 examples. Over three hundred times, thus, high-level Germanic alliances were marked by a medallion citing intervention with a monster. If ever we would expect monster stories to have been current in Germanic Europe, it would have been then.

To the sixth century, therefore, we may look for the origin of Beowulf. Supporting this inference, some two-dozen analogues of the poem are linked to Scandinavian princely families from D-bracteate areas. Heroes of these stories are commonly either Geatish or connected to Rogaland and Hordaland. Västragötland, Sweden and Rogaland and Hordaland, Norway are areas of concentration of D-bracteates outside Jutland that shared dies and techniques of manufacture.

Differences within Denmark in the distributions of D-bracteates have been seen by Karen Høilund Nielsen as marking "competing power structures" in the last phase before the unification of a Danish state. Bone-tempered ceramics from the vicinity of the earliest Scandinavian great hall at Gudme on Funen hint that the exo-cannibalism of the poem distorts and demonizes indigenous chthonic religious practices descended from Neolithic endo-cannibalism. We would expect these practices to have been rooted in the village communities described by Mads Kähler Holst that, unexpectedly, are sometimes in areas with D-bracteate finds.

14 TERRACOTTA LAMPS OF THE GAMOS WORKSHOP FOUND IN CYRENAICA AND CRETE

Author(s): Bak, Maria (Institute of Archaeology University of Warsaw)
Presentation Format: Oral

This paper explores the terracotta lamps of the Gamos workshop found in two regions of the ancient world: Crete and Cyrenaica. Although both lands, for a long time were conjoined into one roman province (67 BC – 297 AD), studies on trade and functioning of both regions have traditionally been conducted separately (except for the problem of money circulation). The local production of terracotta lamps provides insight into trade patterns between Crete and Cyrenaica and is probably the only evidence proving very close relations between both parts of the province.

In 1974 Luciana Mercando (working on the material from Heraclion Museum, Crete) and in 1985 Donald Bailey (examining lamps from excavations in Berenice, Libya) published their catalogues, which included lamps signed ΓΑΜΟΥ. Both scholars attributed the Gamos workshop to local production (dated around 2nd century AD) – Luciana Mercando to Crete and Donald Bailey to Cyrenaica. Their assumptions were based on clay characteristics. The discrepancy of opinions can easily be explained since even today neither in Crete nor in Cyrenaica has any workshop surely attributed to Gamos been found. Since that time, new discoveries of lamps have been made, and the dispute around the provenience of Gamos workshop is still ongoing.

The purpose of this paper is to present the repertoire of forms and iconography used in the group of lamps attributed to Gamos found both on Crete and in Cyrenaica. Another aspect of this study is to compare the lamps of Gamos workshop with the examples of other local lamps produced between 1st – ca. mid-3rd century AD. The examined material includes numerous unpublished lamps of Polish excavations in Ptolemais, Libya conducted in years 2001 – 2010.

15 ROMAN AGE BRONZE-WORKING IN CENTRAL ADRIATIC ITALY: INVESTIGATING THE SPATIAL CONTEXT OF URBAN PRODUCTIONS

Author(s): Carboni, Francesca (Ghent University)
Presentation Format: Oral

Finds from excavations and accidental discoveries have unveiled the wide diffusion of bronze statues, bronze inscriptions and a huge quantity of more common bronze objects in central Adriatic Italy throughout Roman times. Nevertheless, the evidence of archaeological remains referring to some bronze workshops and a certain number of metal production indicators is quite surprising for this region, where well-documented systematic investigations remain inadequate.

Both the technology and the generally high quality that often characterise the bronze productions point to a considerable level of craft specialisation, as a result of a long technological and economic adaptation process often carried out by several generations of artisans. However, despite the high level of specialisation, bronze fusion and working needed basic equipment and installations, which, not always requiring fixed facilities, allowed easy mobility for the craftsmen. Most probably the specialisation of workshops was influenced by the changing demands which affected the manufactured objects as well as the production techniques of this geographic area in the different periods.

Besides a certain quantity of imported artefacts, the archaeological evidence seems to suggest that the production cycle of raw materials from distant areas was locally completed, in manufacturing workshops usually located within the city's walls, namely where the main customers for this kind of goods were settled.

The present contribution intends to analyse the overall amount of available data, enriched by an updated research conducted in local museums and archives, with the aim of discussing the position of these craft activities in their spatial (urban) environment as well as the spatial organisation of the bronze-working cycle related to this region of the Italian Peninsula during the Roman age.

16 HORUS ON THE CROCODILES AND EROS ON THE GOOSE: PERSONAL MAGIC AND CONTROL OF WILD THINGS IN ROMAN EGYPT

Author(s): Hackley, Laurel (Brown University)
Presentation Format: Oral

This paper investigates the use of cippi of Horus, otherwise known as Horus on the Crocodiles, in Roman Egypt. These objects, which depict Horus the Child or Harpocrates, are stelae produced in various sizes and materials. They are apotropaic, thought to protect against wild animals, and to aid in recovery from animal attack. They were most commonly manufactured in the Late and Graeco-Roman periods, although New Kingdom examples exist. The iconography of these stelae, which show the young god seizing and standing on various dangerous animals, recalls another class of apotropaic object: Middle Kingdom ivory wands. The wands show a very similar collection of wild creatures, probably also had a protective function, and were closely connected with the mythology of the young Horus. Although Harpocrates was a creation of Hellenistic Egypt, he appears across the Roman world. Harpocrates and Horus are also frequently conflated with Eros, whose iconography involves control of birds and other animals.

Both the wands and the cippi were employed by individuals and in domestic contexts, and both were apparently used by many segments of the population. This example fits into a general pattern of earlier Dynastic "folk" or "magical" traditions increasing in visibility in Roman Egypt. This raises interesting questions about personal agency in negotiating with the divine, changes in social structures that supported this agency, and the legibility of personal practice in the archaeological record.

17 HORNED-FIGURES AND WEAPON DANCERS: ENDURING SYMBOLS IN PREHISTORIC SCANDINAVIAN RELIGION

Author(s): Maddox, Timmis (Independent)
Presentation Format: Oral

Over the past decade, Bronze Age Scandinavia has come to be characterized by an Indo-European belief system, one which is believed to have placed the Vedic Divine Twins at the center of the worship. During the Early Iron Age, however, scholars such as Lotte Hedeager argue that prehistoric Scandinavian religion experienced a shift away from its Indo-European roots - with all previous deities and symbolic structures abandoned in favor of the Norse faith. Yet the archaeological record indicates that certain Indo-European symbols, such as the horned-figure and weapon dancer imageries, experience continued use as religious iconography within the new faith. This paper argues that the continued use of these images suggests that while the specific belief system to which they referenced may have changed, the core Indo-European message behind these symbols remained constant. By examining the use of symbolic structures such as the horned-figure and weapon dancer images over time, this paper argues that—rather than a dramatic transformation which left the Bronze Age Indo-European religion, and all of the components which embodied it, abandoned—a more gradual shift took place which allowed for the absorption of previous symbolic elements into the new belief system, emphasizing the endurance of prehistoric Scandinavian symbolic structures.

18 ATTIRE OF ADORNMENTS FROM ANCIENT RUSSIAN TREASURES AND SOCIETY

Author(s): Zhilina, Natalia (Institute of Archaeology Russian Academy of Sciences)
Presentation Format: Oral

The purpose of the work is to is to trace correlation between the types of hoards with jewelry works in them and the social composition of society. Archeology, operating with serial and mass material and precise methods of its study, observes more complete spectrum of the manifestation of art in everyday life. New artistic ideals change the attitude of people to traditional values and in particular to one's own appearance. The situation is examined on the material of the attire of adornments from Russian hoards of the 9th-13th centuries. It is possible to trace the history and succession of social groups, changes in the social status and artistic tastes of the owners.

In the 9th century Slavic nobility prefers cast and forged jewelry, in the 10th century filigree attire in a geometric style was created. Traditional art interacts with Scandinavian items in animal styles and with the curling filigree, which corresponds to the war Scandinavian nobility. In the 11th century the transition from paganism to Christianity, from the Scandinavian influence to the active role of the Byzantine canons caused the change in the artistic tastes but it was not yet been expressed in the creation of modern jewelry, the share of forged and cast items was large. Hoards of 12th – the first third of the 13th century characterize the whole society on the eve of the Tatar-Mongol invasion: princes, boyars, noblemen, townsmen, villagers (specific types of hoards). The best things are made in the techniques of cloisonne enamel and niello at the level of the world's jewelry, their stylistic development corresponds to Byzantine art. These things create the artistic ideal of the era.

19 THE WRITING'S ON THE WALL: A MATERIAL CULTURE ANALYSIS OF ARTISTIC AND POLITICAL EXPRESSION AS GRAFFITI IN ISTANBUL

Author(s): Geraets, Joel (University of Bristol)
Presentation Format: Oral

This paper analyses the critical place of graffiti in two urban neighbourhoods in Istanbul: Caferağa in Kadikoy, on the Asian side of the city, and Bozkurt, in Şişli, on the European side, during the political turmoil between May 2015 and April 2017. Exploring this graffiti as a surface assemblage within a material culture analytical framework, and the wider landscape with reference to archaeological-anthropological Landscape theory, this paper aims to investigate this material as the product of an author, symbolizing, and/or communicating a particular message, and as an active and dynamic source of agency in the political process.

By defining this urban material in terms of its relationships and collaborations within the experiential world of its production, it is possible to overcome the ontological dualism present within the human/object divide: graffiti can then be evaluated as a contributing factor to the political situation, along with human agency. This situational analysis of graffiti, and other artistic and political material, can illuminate a host of contemporary struggles in Turkey: minorities and their access to democracy, problems facing marginalised communities, and broader issues of political discourse, between opposition groups, and between the state and its citizens.

Art was central in inaugurating dialogue between political groups during the Gezi Park Protests (Çolak 2014; Yanık 2015; Gürcan and Peker 2015) - events which amounted to a fundamental change in the dynamics of Turkish politics (Göle 2013). As such, the analysis of artistic and political material alongside human agency presented here aims to be a powerful interdisciplinary contribution to understanding current Turkish political dynamics through their visual and material expression.

a. PROMOTING THE ROMAN MARKET OF ATHENS AND HADRIAN'S LIBRARY AS A GROUP

Author(s): Spyropoulou, Aliki (Architect)
Presentation Format: Poster

The object of this poster is to present the Roman Market and Hadrian's Library as one unique archaeological site of Roman times. In Athens today, there are three separated, not inter-related, fenced archaeological sites, despite encompassing the ruins of the two Romans monuments. The growth of the modern city has caused parts of them to be removed, making it difficult to understand their structure. Although built in different eras in Roman architecture, they constitute a group reflecting common views about the organization of public space in Roman times.

In this poster is presented the structure of two Roman's monuments, their relation to the ancient's streets and their evolution over time, as they were covered over by successive layers of civilization and by the urban fabric created during Turkish rule. The historic physiognomy of the site, the evolution over time of its road network was studied, covering the period from the 4th century BC to the 19th AD, and enriched by excavation findings.

Historical research, in conjunction with the urban planning study and sketches representing the Roman market –half of which has been excavated today so that theoretically we know its boundaries– reveals that the Roman street separating the two monuments does not coincide with today's street, but cuts through a noteworthy building of architecture in the reign of Otto (1832-62), is a listed historic monument. So what will happen? Must a 19th century monument be removed to highlight the Roman period?

The excavations of the Roman Market and its close relation to promotion as a group with Hadrian's Library raises a number of issues, as one era appears to conflict with the other as regards roads and monuments.

b. THE UNIQUE VESSEL FROM THE WIELBARK CULTURE CEMETERY IN MAŁE CZYSTE (CHEŁMNO LAND, POLAND)

Author(s): Pronobis, Maria (Institute of Archaeology Nicolaus Copernicus University)
Presentation Format: Poster

The turn of the ages in Pomerania and Chełmno land brings significant changes to many of features of Oksywie culture. The changes are so strong that it was considered reasonable to distinct here in the 1st century AD a new cultural unit - Wielbark culture. Archaeologists identify the Wielbark culture with the circle of Goths' cultures which comprises the Wielbark culture, the Masłomęcz group, the Chernyakhow culture and Sîntana de Mureş culture.

The people of the Wielbark culture used both inhumation and cremation rites. The cremated dead were placed directly into small pits or into urns. Wielbark culture grave goods did not include many pottery, except urn and seldom second clay vessel. The cemetery in Małe Czyste is dated from the 2nd century BC to the 2nd century AD.

A unique vessel from the cemetery in Małe Czyste was found in a cremation grave, dated at 1st century AD. During the documentation work and "stacking puzzles" from pottery pieces, there was reconstructed an unusual vessel, not seen before among pottery of Wielbark culture. Analogous artefacts archaeologists name as "cult discs" and assume that these items were portable altars, probably related to lunar or solar cults. Such altars are known from Kuiavia, from the 2nd to the 4th century AD, after the disappearance of large-scale sanctuaries, for example at the cemetery in Sławsko Wielkie.

As to the vessel in Małe Czyste, unusual is the context of its excavation, because it was found close under the clay urn in a cremation grave. This situation makes many interpretative possibilities.

c. THEORETICAL ARCHAEOLOGY OF THE LATE BRONZE AGE IN VOLGA-URAL REGION

Author(s): Shcherbakov, Nikolai - Shuteleva, Iia (Bashkir State Pedagogical University named after M. Akmulla, Laboratory of Method and Methodology of Humanitarian Research)

Presentation Format: Poster

Dominating method in investigation of the Late Bronze Age in provincial archaeology of Volga-Ural region is presented by comparative typological and culture-historical methods. According to adopted in archaeology concept of "archaeological culture", in the first half of the XX century theory of multiple archaeological cultures of the Late Bronze Age in Volga-Ural region was developed. Nowadays this theory is in crisis. Syntashtinskaya, Abashevskaya, Alakul, Fedorovskaya and Srubnay archaeological cultures as well as multiple types in specified archaeological cultures have no stable chronological correlation and succession which is proved by results of natural-science researches. Not investigated topics can be specified as follows: problem of development of own technology to produce bronze, ceramics, bone and stone tools of trade, based on existing experience in Volgo-Ural region; problem of openness of communities of the Late Bronze Age in Sothern Transurals to accept new people and technologies (it's interesting due to geographical location of the researched area: between European part of Eurasia and Central Asia). Development of the society during the Late Bronze Age was also major problem: social changes and economic development within this short period of the Late Bronze Age. The issue of anthropologic influence on the landscape of the Late Bronze Age societies, including destructive effect on the landscape during bronze production and agricultural activities.

Increase in scope of archaeological researches, salvage archaeological works doesn't let Russian archaeologists conduct deep theoretical analysis of obtained variety of archaeological sources. The dissolution of the Soviet Union led to gradual failure and absence of demand for theory of archaeology in modern Russia. Therefore, as it turned out, for theory of archaeology in Russia Marxism was the only system-forming theory.

d. RESEARCH AND GOOD PRACTICES ON SAFEGUARDING OF CULTURAL HERITAGE IN THE CONTEXT OF THE CONTEMPORARY INTERVENTIONS IN THE HISTORICAL MONUMENTS

Author(s): Turcanu-Carutiu, Daniela (Ovidius University of Constanta; Society for American Archaeology) - Ion, Rodica-Mariana (ICECHIM, Group of Evaluation and Conservation Cultural Heritage, Bucharest) - Schroder, Verginica (Ovidius University Constanta, Faculty of Pharmacy) - Tincu, Sorin (Corvin's Castle, Museum of Archeology, History and Ethnography, Hunedoara) - Ravotto, Alessandro (Institut Català d'Argueologia Clàssica - ICAC)

Presentation Format: Poster

The diagnosis of the degradation stage of different materials such as natural stone, crushed stone, sands and gravels, clay, inorganic binders (lime, natural cements, hydraulic lime, and gypsum), mortars, artistic components (painted surfaces, stone) from the Corvin's Castle have been investigated by using advanced investigative techniques and issuing recommendations on restoration and preservation operations.

Undoubtedly, the phenomenon of degradation can not be understood without knowing the mineralogical and structural composition of the rock in question. Degradation can either manifest itself as a change in the intrinsic properties of the rock, or as a change in the integrity and morphometry of the lithic body. As it results from the literature, but also from its own observations, the degradation of the rocks put into operation is often a summation of the effects of several elementary processes, different from each other through causes, effects and mechanisms of deployment. Some are purely mechanical, with macroscopically easily visible effects, affecting only the shape and geometric integrity of the lithic object. Others, more subtle, affect even the mineralogical and structural essence of the petrographic type. Under such circumstances, the evaluation of the Corvins Castle stone degradation require the use of modern high-fidelity portable and laboratory equipment for analyzes: UV-VIS, FTIR, RAMAN, XRD, EDXRF, ICP-AES, TGA / DSC, SEM / EDX, AFM, GC-MS, HPLC etc.

Also, the study of interactions and compatibility between traditional construction materials and modern restoration products, the influence of local materials as a part of cultural and technological heritage and the monitoring and characterization of weathering features, including the biological aspects, are the other main points of this paper. Biological and microbiological experiments by: optical microscopy, stereomicroscopy, culture media, UV analyzes, bacterial and fungal tests, PCR analysis (detection of infections, species, genre).

e. PALAEOENVIRONMENTAL RESEARCH OF THE ORGANIC FILL OF THE SMALL DEPRESSION NEAR THE EARLY MEDIEVAL STRONGHOLD IN SANTOK (WEST POLAND)

Author(s): Rzodkiewicz, Monika (University of Adam Mickiewicz in Poznan, Faculty of Geographical and Geological Sciences, Institute of Geoecology and Geoinformation) - Zamelska-Monczak, Kinga (Institute of Archaeology and Ethnology of the Polish Academy of Sciences, Center for Prehistoric and Medieval Studies, Poznan) - Piotrowski, Andrzej - Sydor, Paweł - Żuk, Tomasz (Polish Geological Institute - National Research Institute, Pomeranian Branch in Szczecin, Poland) - Krzymińska, Jarmila (Polish Geological Institute – National Research Institute, Marine Geology Branch in Gdansk) - Noryśkiewicz, Agnieszka M. (University Nicolaus Copernicus, Faculty of History, Institute of Archaeology, Torun)

Presentation Format: Poster

We present a record from the sediments of Santok settlement, located in the border area of Wielkopolska and Pomorze, on sandy

island on valley's bottom, at confluence of rivers Warta and Noteć.

Archaeological studies confirms that the oldest early medieval settlement in Santok was founded in 8th century. Settlement functioned as point of exchange and service on waterway leading from Baltic zone deep into interior of Polish lands. In 10th century, huge fortified stronghold was erected in the same place and Santok became watchtower on borderland of the first Polish state. Advantages of that location were obvious and inhabitants used the same place for over 600 years. The chronology was established by archeological research and confirmed by 14C dating. We used biotic (pollen, ostracod and diatom analysis) sedimentological and geochemical proxies to reconstruct the environmental changes within a time of increasing human activity and fluctuating climatic conditions.

In this study we focused on diatom analysis. Diatoms are microscopic algae that form a siliceous frustule that is generally well preserved in sediments. Diatoms and diatom assemblages are very useful as integrated indicators of environmental change because species distributions are closely linked to water quality parameters including nutrient status. Diatom species also have affinities for particular physical habitats. For example, planktonic diatoms are found in the open water and benthic diatoms are bottom dwellers.

We also aimed at quantitative reconstruction of the pH and eutrophication (TP) using diatom-based transfer functions in order to identify reference conditions for the Santok settlement recorded in the sedimentts from that small depression. The results of our research shows that diatom communities were sensitive to climatic changes, besides in our results, also reflect well human activity.

The research was supported by the National Science Centre Poland (grant NCN 2015/18/E/HS3/00425).

f. RHYTHMS OF CARE: RETHINKING NEOLITHIZATION THROUGH A MULTISPECIES LENS

Author(s): Gorczyk, John (Cornell University)
Presentation Format: Poster

This paper investigates the complex entanglements of animal-human communities at the early Neolithic site of Slatina in Bulgaria's Sofia Basin. Neolithization, the spread of farming lifeways throughout the Near East and into Europe, has been a recurring subject of interest for prehistoric archaeologists for over a century. Although it has been characterized in many forms, neolithization is still most often viewed as a migration of people, plants, animals, and technology. At such broad geographical and temporal scales, it becomes difficult to envision the material signatures of human-animal interaction at the local level. More seriously, archaeological treatments of neolithization risk becoming teleological, viewing it as a march of progress that culminated ultimately in urbanism and early state formation.

A different approach, informed by multispecies ideas, explores the daily, seasonal, and annual rhythms of Neolithic life at the level of an individual settlement. At this scale, the participatory roles of animals become much clearer. No longer simply 'along for the ride', their unique behaviors and physiological needs entangle humans in their care. Within this perspective, Neolithic life (and by extension, neolithization) is much less inevitable, fraught with the contingencies inherent in complex ecologies. Such a Neolithic could have failed to spread any further.

A multispecies archaeology can benefit greatly from the toolkit available to researchers across subdisciplines. In my work I employ common zooarchaeological techniques and join them with other proven methods, namely stable isotopic analysis and thin section micromorphology. Each of these methods has the benefit of shifting the analytical focus to the tissues of the animals themselves, yielding information on their life histories as well as their seasonal interactions with the humans who lived at Slatina.

g. SAN ADRIAN/LIZARRATE CAVE (GIPUZKOA, BASQUE COUNTRY): HIGHLAND HUMAN SETTLEMENT DURING THE LAST 14,000 YEARS

Author(s): Moraza, Alfredo - Ceberio, Manuel- Tapia, Jesus (Aranzadi Society of Sciences)
Presentation Format: Poster

San Adrian cave is located in the watershed between the Cantabrian and Mediterranean seas, in the Aizkorri mountain range (North of the Iberian Peninsula). It is a tunnel-shape cave with a steep slope, located at 1,000 meters a.s.l. and its dimensions are 60-70 m length and 25-30 m width.

Archaeological survey and restoring works in the cave began in 2008 and continue up to day. The environmental characteristics of that place allowed the cave to be home to different human communities across centuries. The constructions and arrangements made in the cave (a road, a chapel, a castle and several huts and pits) show how human settlers made the best of the natural resources and of the strategic location of this mountain pass.

The intense occupation of the cave and its distance to current roads and urban development allow preserving an exceptional archaeological sequence. The stratigraphy covers from the Upper Palaeolithic up to the beginning of the XX century, with human occupations ascribed to the Late Magdalenian, Bronze Age, Roman period, Medieval Age and Modern Age. These aspects make San Adrian to be one of the most interesting sites in the Cantabrian region and provide stimulating perspectives for our future research.

791 FUNERARY RITUAL ALONG HOLOCENE PERIOD

Theme: The archaeology of material culture, bodies and landscapes
Organisers: Subirà, M. Eulàlia (Universitat Autònoma de Barcelona) - Gonzalez, Ian (Université Paul Valery, Montpeller)
Format: Regular session

The study of manipulation and marks in human remains can contribute to understand past societies: funerary rituals but also episodes of violence. The researchers need new methodologies and answers to resolve some questions:

How to distinguish marks of violence from fleshing?

How to interpret if the marks are due to a mere funeral ritual or a practice of anthropophagy? Are the same rituals along prehistory to recent periods?

Are homogenous practices throughout Europe simultaneously?

Why appear in caves only any parts of skeletons?

These are some of the questions that the researchers often ask themselves when they analyze the bones and observe marks. A researchers meeting in this area can give a collective response on some aspects.

So, this session is a compilation of different cases of some practices along Holocene related to funerary archaeology. Issues to be discussed will include genealogy, body manipulation, body fragmentation, ritual practices, gendered burial practices, secondary burial practices, differences in burial rites related to the status of the deceased, normative treatment and abnormal practices, grave goods, cremation vs. inhumation practices, evidence of violent death, including mass murder events, burial structures. Authors may include in their discussion osteological analysis and palaeopathological examinations. They can also refer to other analytical tools such as ancient DNA (aDNA) tests. Examples will be drawn from a wide period covering from prehistory in all its different epochs to Roman times, to early medieval and medieval to the modern era and will answer ours questions.

ABSTRACTS

01 LOOSE HUMAN BONES AND THE EARLY POSTGLACIAL SOCIETIES IN SW IBERIA

Author(s): Peyroteo Stjerna, Rita (Dep Organismal Biology, Human Evolution, Uppsala University; UNIARQ, Centro de Arqueologia da Universidade de Lisboa) - Gonçalves, David (Archaeosciences Laboratory, Directorate General for Cultural Heritage - LARC/CIBIO/InBIO; Research Centre for Anthropology and Health - CIAS, Department of Life Sciences, University of Coimbra; Laboratory of Forensic Anthropology, Centre for Functional Ecology, Department of Life Sciences, University of Coimbra) - Piga, Giampaolo (Laboratory of Forensic Anthropology, Centre for Functional Ecology, Department of Life Sciences, University of Coimbra) - Araújo, Ana Cristina (Archaeosciences Laboratory, Directorate General for Cultural Heritage - LARC/CIBIO/InBIOI; UNIARQ, Centro de Arqueologia da Universidade de Lisboa)
Presentation Format: Oral

Human remains dated to the Early Mesolithic (11500 – 8500 cal BP) are extremely rare in SW Iberia. The shell middens of Toledo and Pinhal da Fonte, located along the present coast of the Portuguese Estremadura, are the only early postglacial sites with directly dated human remains. The human bones and teeth from these sites were found disarticulated and in unknown association with other archaeological features. The remains from Toledo comprise nine loose teeth, a fragment of femur and two foot phalanges, possibly corresponding to two adult individuals; while at Pinhal da Fonte, just one fragment of a scapula (acromion) was found. So far, evidence for the manipulation of body parts, such as defleshing or disarticulation, has not been found. The lack of alterations related to subaerial exposure suggests that the remains were buried sometime before, or soon after the complete decomposition of the soft tissues. The depositional and post-depositional history of these remains is unclear making it difficult to determine if these contexts resulted from intentional post-mortem practices.

The Mesolithic loose human bones (LHB) phenomenon has been observed in other regions of Iberia and north-western Europe, suggesting the existence of an associated socio-cultural behaviour. The remains from Toledo and Pinhal da Fonte may correspond to a similar practice, although the available evidence is not conclusive. In Portugal, the scarcity of Early Mesolithic human remains contrasts with the burial grounds of the Late Mesolithic (c. 8400 – 7000 cal BP) with numerous individual inhumations (MNI=376), making the LHB evidence even more striking.

In this paper we present new radiocarbon dates of early postglacial human remains and discuss the interpretative challenges of archaeological contexts within the Mesolithic LHB phenomenon while examining on how attitudes towards the dead body may also be reflected in settlement patterns (disperse/mobile vs clustered/settled).

02 REBUILDING LIVES THROUGH SKELETAL REMAINS. FUNERARY PRACTICES OF BRONZE AGE POPULATIONS IN NAVARRA (SPAIN)

Author(s): Díaz-Navarro, Sonia (University of Valladolid)
Presentation Format: Oral

This paper presents a thorough description of seven burials dated to the Bronze Age. The aim has been to analyze the human remains deposited there, in order to approach the ways of life and death of these past populations. The sample is composed of 25 subjects buried in different types of graves located in the province of Navarra which have been dated between 3400-3000 years B.P.

The results obtained with the osteological analysis of the skeletal remains and the archaeological study of the tombs allow us to broaden the discussion about the funerary ritual and funerary treatment of the Bronze Age. Each of sepultures has been studied individually and has been compared to formulate cultural proposals. We have estimated the minimum number of individuals, the sex, age and stature of the subjects and we have analyzed the paleopathologies and markers of musculoskeletal activity.

Thus, we could interpret how these past populations were, how they lived and how they died. The skeletal remains also give us information about whether there were episodes of violence, whether they suffered from diseases that left a mark on the skeleton, the activities they carried out assiduously and the differences in the development of these tasks by sex. Finally, we discuss about curious peri and post-mortem treatments that some of the analyzed subjects present, providing new information about the funerary treatment that these individuals received in order to transit correctly towards the life beyond the grave.

03 POST-MORTEM MANIPULATED HUMAN BODIES IN THE CANTABRIAN BRONZE AGE (NORTHERN IBERIA)

Author(s): González Rabanal, Borja - Marín Arroyo, Ana Belén - González Morales, Manuel Ramón (Instituto Internacional de Investigaciones Prehistóricas de Cantabria)
Presentation Format: Oral

Burial caves were common during the Bronze Age in the Cantabrian Region (northern Iberia). They were usually located in narrow cavities with small galleries, low ceilings and difficult access. Inhumation consisted in the deposition of the human bodies on the cave surface where neither grave, perimeter structure or protection were made. The morphology of the karstic cave protected the dead from outside, acting as a "temple cave". Although this cultural tradition is very common to the east of the region (Basque Country and Cantabria), it is scarce and poorly documented on the west (Asturias).

This study is focused in two sites called La Llana and El Espinoso caves, located in eastern Asturias. La Llana has an enormous cave vestibule where a single burial was initially documented in a primary position within a cave diverticulum. At El Espinoso within a small room, a primary collective burial (MNI: 20) was discovered scattered around the surface, without any anatomical connection.

Taphonomic analyses was carried out to disentangle the inhumation ritual and the post-mortem alteration occurred at both caves. Bioestratinomic and diagenetic modifications were studied, and Fragmentation Rate and Index of Anatomical Preservation were applied.

Those burials suffered diagenetic processes motivated by water flows inside the cave. Moreover, a ritual manipulation of the bodies after the inhumation was well documented. At La Llana, the individual had some long bones in an inverse position and part of its grave goods was found in a nearby gallery. At El Espinoso, the anatomical preservation of the individuals was characterised by the scarcity of skulls and long bones and, in general, a high bone fragmentation.

La Llana and El Espinoso caves constitutes the first burial caves, studied taphonomically, with evidences of post-mortem cultural manipulations. Finally, these sites consolidate the burial cave tradition previously unknown in Asturias region.

04 HUMAN REMAINS AND CORPORATE IDENTITY IN EARLY BRONZE AGE IRELAND AND SCOTLAND

Author(s): Haughton, Mark (University of Cambridge)
Presentation Format: Oral

Funerary practice in the Early Bronze Age is characterised by variability across Britain and Ireland, although broad trends of similarity exist. The post-mortem treatment of the body is particularly variable, with inhumation and cremation both commonplace, evidence for mummification, and for the re-opening of graves for subsequent burials or the removal of human remains. At other times, single bones were deposited in graves alongside more complete remains, and recent work by Tom Booth has identified that these bones were sometimes curated for long periods. These bones-as-grave-goods form the focus of this paper.

Attempts to understand the varying treatments of the body have often focused on religious belief or status differences amongst the deceased, but little in the way of clear explanatory trends has been identified. This paper will take a new tack, exploring the evidence for local variation in the treatment of the dead body and asking whether such variation reflects locally held understandings of death and the body which in turn influenced understandings of group identity. The cemetery space will be identified as one of a range of possible influences upon these practices, and upon the communities' understandings of proper mortuary treatment.

Selected case studies from cemeteries across Ireland and Scotland will be presented to demonstrate the range of different approaches to human remains that these communities maintained. Differences in the preferred strategies of retention, curation and deposition, even within confined geographical areas, enable a wider discussion of the role of mortuary practice, and human remains

in particular, in defining group identity.

05 POST MORTEM AGENCY OF UNBURIED CORPSES FOLLOWING THE SANDBY BORG MASSACRE

Author(s): Alfsdotter, Clara (Linnaeus University)
Presentation Format: Oral

This paper discusses possible social implications of non-interactions with the corpses following an Iron age massacre (c.400-550 CE). Remains from a minimum of 26 humans have been identified inside the ringfort 'Sandby borg' (present Sweden). Lesions from interpersonal trauma bear evidence of a lethal attack. The dead bodies in Sandby borg were left to rot inside houses and out on the streets. Results from a taphonomic analysis proves it unlikely that the human remains were manipulated post mortem. The ringfort was abandoned following the assault. In order to understand why the corpses were left unburied, how the corpses were perceived in their contemporary setting and what part they played in the social transformation following the violent event, I discuss the potential power of the corpse in relation to lethal intergroup conflict.

As the corpse carries strong political and symbolic capital, it is useful in the process of social disruption. Since the emotional response to death and the implications of violence are always culturally encoded, I compare the (non-)treatment of the dead in Sandby borg with the prevailing normative treatment. In order to understand the potential postmortem agency of the Sandby borg corpses, I contextualise the osteological empirical material with social theories on the liminal phase of the body, the ontology of death, and post-mortem agency in lethal intergroup conflicts. I conclude that the corpses likely exerted post mortem agency in benefit of the perpetrators and at expense of the victims and their sympathisers, possibly leaving the victims in an eternal liminal phase.

06 MANIPULATED BODIES IN PROTOHISTORIC GAUL: COMPLEX THOUGHT AND FUNERARY ARCHAEOLOGY

Author(s): Gonzalez Alaña, Ian (Université Paul Valéry Montpellier-UMR5140 CNRS)
Presentation Format: Oral

Celtic Gaul on Protohistoric Ages, and especially in Iron Age, is known for a very wide range of funerary and mortuary practices, that can be found in a multiple micro-cultural spheres.

In this particular chrono-cultural sphere, we can observe some cases of body manipulation, that can be interpreted from mere deposition of bodies, to complex and ritualized practices. The meaning of this work will be to focus on particular cases in which we can see every type of body manipulation. from the end of the Bronze Age to the end of the iron Age, a lot cases of body manipulation can be seen.

We will point out some specific cases of post-mortem body manipulation in Iron Age Gaul, and specifically in what can be named, nowadays, as Meridional France. We will point out and study some of the differences in those special Practices, and see if we can interpret it as mere mortuary practices, or maybe as complex ritual deposits or funerary practices. To do that, we will use a very transversal approach based on Morin's "Pensée Complexe". Transversality and Complex Thought can be very helpful to give a new focus, and a very new approach to the study of funerary remains.

07 THE BODY DIVIDED: A BIOARCHAEOLOGICAL ANALYSIS OF DECAPITATION AND FRAGMENTATION PRACTICES IN LATE WESTERN ROMAN BRITAIN

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

Archaeological investigations of Romano-British burials have revealed normative and non-normative burial treatments and attitudes toward the dead. Bioarchaeological investigations of Late Roman period (3rd – 4th century A.D.) decapitation burials in central and southern Britain revealed possible 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. These contexts suggest decapitation was part of a sub-class of mortuary treatment in the region used to mark identity or communal membership rather than a deviant rite. This project will use mortuary and bioarchaeological data from 103 decapitation inhumation burials from seventeen Late Roman period sites in Oxfordshire and Gloucestershire in western Britain to investigate whether or not evidence of similar post-mortem fragmentation or mutilation activities, and if so, do those practices appear to mark identity or communal membership of the deceased? A contextual analysis revealed evidence for three types of post-mortem manipulation of the body, including: 1) evidence for incisions or chops due to decapitation; 2) evidence of additional mutilation or fragmentation; and, 3) repositioning, replacement, or removal of remains from burials and deposits. Further analysis revealed different uses of decapitation and fragmentation practices toward certain groups of individuals between sites in the region. These mortuary treatment patterns suggest there is evidence that communities utilized mortuary practices steeped in both Late Iron Age and Roman period practices to signal identities, communal membership, or ostracism by physically transforming, breaking, and manipulating specific bodies over time.

08 EINMAL IST KEINMAL. CREMATION PRACTICES ON THE EASTERN FRINGE OF THE FUNNELBEAKER CULTURE'S SPREAD AREA

Author(s): Haluszko, Agata (Archeolodzy.org Foundation) - Chmielewski, Tomasz (Institue of Archaeology and Ethnology, University of Gdańsk) - Pienkos, Igor (Igor Pienkos INGWAR, Jedrzejow) - Furmanek, Mirosław (Institute of Archaeology, University of Wrocław) - Starkova, Elena (The State Hermitage Museum, Sankt Petersburg) - Zawislak, Paweł (Lublin)

Presentation Format: Oral

After few post-war decades of the Neolithic research in south-eastern Poland, we have already got used to the omnipresence of „megalithic" cemeteries of the Funnelbeaker Culture. It is generally supposed today that every such burial ground was organized around eastwards-oriented elongated trapezoidal monumental grave mounds known as chamberless tombs. Richly arranged graves were always situated in the eastern forefront of tombs, whereas less complex ones were placed in rows along their walls. Inhumation of bodies in extended supine position was prevalent, yet extraordinary practices such as disarticulation of bodies or manipulation on bones are recorded quite commonly. Architectural monumentality, variability of grave's arrangements and funeral rite compose perhaps complicated nonetheless apparently patterned picture of necrolatry. Owing to fieldworks conducted in the Dobużek Scarp Microregion, this picture became even more intriguing.

Investigations on site Mikulin 9, commune Tyszowce, revealed a big cemetery representing easternmost emanation of the megalithic funeral idea of the Funnelbeaker Culture. Although no relics of architecture were preserved in the unearthed part of the burial ground, four east-west-oriented rows of unshowy skeletal graves discovered suggest presence of at least two monumental tombs. Generally, burial rite respects funeral norms of the Funnelbeaker Culture. However, next to typical inhumations, two cremation graves were unearthed as well.

Even though cremation occurs in the Funnelbeaker Culture in south-eastern Poland, the phenomenon is rather marginal. Moreover, none of hitherto identified cases of burning deceased reminded burials discovered in Mikulin. Their uniqueness within the funeral tradition in question invited an engrossing investigation into the problem. This preliminary anthropological and archaeological study provides a tentative interpretation of cremation practices observed.

The research was conducted within the NCN project no.2012/04/S/HS3/00269 entitled The Dobużek Scarp Microregion as a part of the physiogeographical and biocultural borderland between the Baltic and Pontic zone (6th-2nd millenium before Christ).

09 THE PUZZLE OF A LATE NEOLITHIC COMPLEX OF SKULLS FROM SOUTH-EASTERN EUROPE

Author(s): Kogalniceanu, Raluca (Institute of Archaeology, Bucharest) - Simalcsik, Angela (Centre of Anthropological Research, Iasi)

Presentation Format: Oral

The presentation is focused on the re-analysis of a complex from the Late Neolithic Hamangia cemetery from Cernavodă–Columbia D (Romania), excavated in the 1950's. The complex included, beside the human disarticulated osteological remains, an animal jaw, sweet water shells, a large stone, a small white cave calcitic concretion and a pottery fragment. The analysis underwent several stages: the processing of the archaeological data, the anthropological re-evaluation, the combination of the two sets of information and interpretation. The human skeletal batch is formed of 11 calottes and other tens of postcranial remains. The minimum number of individuals is 11 (a child, three young adults, four middle-aged adults and three old adults). The sex ratio is seven men / three women. One of the skulls caps shows traces of cultural modifications – calotte removal, polishing, breaking and postmortem trepanation, performed, probably, with the purpose of obtaining an artifact. One of the cranial fragments presents traces of postmortem burning. The taphonomic analysis indicates the following: none of the individuals is represented 100%, the conservation state of the remains is satisfactory, subaerial weathering was observed on all bones, and postmortem fissures and fractures also (most of them produced in the past, after disarticulation). The radiocarbon dating of some of the remains from the complex came back with interesting results, meant to shed some light into the time-lime of the complex. This example of secondary and multiple manipulation of human remains, and especially of cranial parts, is not unique, similar cases, but with different background motivations, ranging from the Paleolithic to the Middle Ages.

10 HOW DID PEOPLE HANDLE DEAD BODIES IN THE LATER STONE AGE?(ON MATERIALS OF HUNTER-GATHERER BURIAL SITES ON THE RUSSIAN PLAIN)

Author(s): Khramtsova, Anastasia (Institut fuer Ur- und Fruehgeschichte Kiel)

Presentation Format: Oral

Over 80 Late Stone Age burial sites of the late 4th-3rd-millennium cal BC have been excavated on the vast territory of the Russian Plain, including prominent cemeteries such as Karavaikha and the Sakhtysh group, but also many lesser-known sites. Specifically, the complex ways in which hunter-gatherer-fishers were dealing with their dead have not been investigated in detail for these materials so far.

Based on a new systematic assessment of all available information from field recordings and anthropological reports as part of a Ph.D. project, the paper will present an overview of various post-mortem manipulations of the corpse which were traced on the remains from burial sites associated with the Modlon and Volosovo cultures. The following issues will be discussed:

1. Disarticulation of the body and physical ritual abuses: cases, tools used for those purposes and traces of tools on the bones, observations on body parts which were destroyed most frequently (e.g., intentionally crushed skulls, cut tibia and fibulae after dis-

posing of bodies).

2. Completeness of skeletons and features of their disposition in multiple burials; cases of mixture human and animal bones in collective graves.

3. The appearance of body parts in none-burial contexts (e.g. human bones found among kitchen waste, contexts of display of human skeletal parts in settlement contexts); discussion of the respective contexts in order to trace distinguish ritual and profane roles and functions.

4. Evidence for bonding of the body, assessment of the place of this manipulation among the other kinds of interactions with human remains.

As a conclusion, the significance and possible interpretations of these documented post-mortem manipulations and usages of the bodies within and beyond the burial context will be discussed.

11 INTENTIONAL RITUAL PENETRATION OF BURIALS (IN THE CASE OF LISAKOVSK ANDRONOVO BURIAL SITE, THE BRONZE AGE, KAZAKHSTAN)

Author(s): Usmanova, Emma (Saryarka Archaeological Institute of Buketov Karaganda State University)
Presentation Format: Oral

Intentional penetrations of female graves were conducted to perform operations on the skull as part of Andronovo funeral rites of the 2nd millennium BC. Headgear and other ornaments were taken out from some women's graves. Ritual penetration into the burial may have been one of the last stages of the funeral rite or the annual commemorative cycle. It is possible that ceremony participants understood which burial sites are permitted to be penetrated, and which are not. The following basic actions associated with the skull and destruction of the skeleton can be assumed based on preliminary correlation of signs of the funeral rites of the Andronovo tradition: 1. Initial burial of only the head / skull (or with some parts of the skeleton). 2. Exposure of the skull separately after penetration. 3. Setting the lower jaw apart after penetration. 4. Separation of the skull (head) from the body of the buried and its removal from the burial. Several types of cultic penetrations into the female burial were revealed a short time after the funeral: 1) removal from the grave of the ceremonial headgear and costume accessories (for further use in the family), sometimes together with a skull that could be used in ancestral shrines or for magic rituals; 2) special installation of a headdress with skull (this was done for socially significant women buried in the central part of the necropolis); 3) subsequent installation of an individual skull or its part (jaws). Probably, these ritual actions were associated with the cult of the skull, cult of fertility, and veneration of ancestors in the Andronovo community of Eurasian steppes during the Bronze Age.

12 SECONDARY MANIPULATION OF BODIES IN THE BRONZE AGE CARPATHIAN BASIN: THE CASE OF HUMAN REMAINS IN SETTLEMENTS

Author(s): Szeverenyi, Vajk (Déri Múzeum, Debrecen)
Presentation Format: Oral

During the past two decades, the study of human remains from prehistoric settlements has gained new momentum in Hungary. The phenomenon can be observed in many phases, but is perhaps most prominent during the Copper and Bronze Ages. Thanks to the large-scale preventive excavations of the last few decades, our database concerning the issue has increased considerably, which sheds new light on previously excavated assemblages as well. In this paper, starting from the analysis of human remains from two Middle Bronze Age settlements near Érd (Pest County) and Makó (Csongrád County), I would like to examine if some kind of pattern can be observed in the deposition of human remains at Early and Middle Bronze Age settlements in the Carpathian Basin and especially in Hungary, and what kind of social and ritual practices can be reconstructed through their analysis. What could have been the role of these depositions in Bronze Age social and religious life? What kind of death-related beliefs might they reflect? Were these depositions part of 'normal' burial practices or do they represent 'irregular' burials? Is there a pattern in 'fragmenting' bodies after death in Bronze Age Hungary? How can we reconstruct the relationship of these communities to living and dead human bodies?

13 HANDLING BODY PARTS: TREATMENTS TO THE DEAD IN CENTRAL ANATOLIAN NEOLITHIC COMMUNITIES

Author(s): Buyukkarakaya, Ali Metin (Department of Anthropology, Hacettepe University) - Godon, Martin (Institut Français d'Études Anatoliennes - IFEA)
Presentation Format: Oral

Within the process of neolithization, it has been determined that the relationship between human beings and nature has been seriously changed. It can be said that transition to settled life, domestication processes and the dramatic change in demographic structure triggered more complex sociocultural development. Evidences of the increased social complexity can be seen in mortuary practices. Many archaeological and anthropological investigations have pointed out that standardization in the treatments of the dead could overpass some local cultural variations. It is also suggested that this standardization is related to the common symbolic worlds of agricultural communities.

In this study, mortuary practices of Central Anatolian Neolithic settlements (Tepecik-Çiftlik, Köşk Höyük, Çatalhöyük, Boncuklu and Aşıklı) are examined. The investigations have shown that the practices are complex, frequently multiple-stages, and often associ-

ated with repeated rituals at different time intervals. Intervention patterns such as secondary burial practices, dismemberment and skull removal have been documented in the communities. It can be safely said that, in the studied communities, some of the body parts coming from dead bodies are likely to undergo specific materialization in relation to ritual uses. In this presentation, we focus on the processes related to the treatment of the dead and are eager to discuss them within the concept of production chain, meaning according to the variability of methods and techniques applied to the bodies after life.

14 SEASONAL BURIALS AS A CASE OF NEOLITHIC BODY MANIPULATION IN ANATOLIA

Author(s): Harabasz, Katarzyna (Adam Mickiewicz University)
Presentation Format: Oral

The so-called 'seasonal burials' originating from the Neolithic site of Çatalhöyük, in Central Anatolia, Turkey, reveal that the deceased were predominantly interred in oval pits dug into the platforms of still inhabited buildings. This, as well as the cultural sphere associated with sepulchral activity, indicates a close relationship between living and dead people. Considering the internal and external factors that affect the nature and rate of decomposition of individuals at Çatalhöyük, one can infer that bodies were manipulated immediately after death and directly preceding placement into graves.

While there is a significant distinction between those who research human-thing interactions and those who study the human being itself, a fundamental source of complex investigations about individuals' lives are human remains. Knowledge of the human body increases with analyses of illnesses or violence, as well as with the application of ecological models that demonstrate the effect of environmental change on socio- cultural actions. This study aims to extend current research by using cross-cultural comparisons to show inter- disciplinary links between archaeology, physical anthropology and forensic sciences, and in turn using these as a foundation for discussing key and holistic themes that contribute to the development of our understanding of post-mortem body manipulation.

Focus is placed on understanding the passage of time and moment of deposition at Çatalhöyük; more specifically, on how the season of the year could have a major impact on the complex nature of post- mortem body manipulation, such as the choice of manipulation technique and/or selection of post-mortem decay type. This examination demonstrates the research potential of utilising a holistic, interdisciplinary approach to the study of human remains to inform on any individual life from the past.

15 STUDY OF SHROUDING IN EARLY MEDIEVAL POLAND AS EXAMPLE OF INTERACTION BETWEEN LIVING AND DEATH

Author(s): Durczak, Kinga (Leiden University)
Presentation Format: Oral

Post mortem interaction with human remains, cover an enormous time frame, from the moment of death to the recovering the remains and their later fate. In my case I would like to research case of the medieval cases of warping. Warping human remains in shrouds is a well know practice in human history. There are some archeothanatological studies of the use of shroud for example Mesolithic or Islamic practice but usually early Christian tradition of it is omitted. (Nilsson – Stutz, L., 2009)We know from the historic record that it was wide spread and part of the rituals in which body of deceased was manipulated.

Therefore, I would like to examine a case study of the use of shrouding in the early medieval Poland based on the cemetery in Giecz. In the early X century first, Polish state emerge from the Slavic tribes that were living between Oder and Vistula. With the decision of first ruler new religion was introduce to inhabitants. (Kara M. et al. 2016) With conversion to Christianity new ways of handling human remains appeared, but there are almost none historic records of about this change and only archeological record could provide information about this process. Archeothanatology can provide insight into shrouding as important part of Christian tradition, before introduction of the coffins, studying of it can provide better insight into ways conversion take place.

16 AN ALIEN, A FREAK OR A VAMPIRE? ATYPICAL BURIAL FROM THE CHURCH OF THE HOLY TRINITY IN BYSZEWO (POLAND)

Author(s): Nowak, Sebastian (Nicolaus Copernicus University in Torun)
Presentation Format: Oral

Atypical burials pose some interpretational challenges for archaeologists. On the one hand, by their differentness from accepted canons, they allow to make courageous theses, but on the other hand they require enormous empathy, so that the story constructed by the researcher does not turn into a fairy tale.

During archaeological research conducted in the southern crypt in the church of The Holy Trinity in Byszewo (Kuyavian-Pomeranian Voivodeship, Poland), archaeologists found painted coffin marked with a caravaca. The burial located inside meets the criteria of atypical funeral practices, often referred to as anti-vampire practices.

Due to the small number of archaeological artifacts contained in the coffin, the burial can be dated to the second half of the 18th century.

Attempts to describe freaks and people posthumously associated with dark forces, in the opinion of local communities, being the source of problems and disasters sent to relatives of the deceased, are for the researchers, who deal with these basic issues, very

interesting. Sickle, brick or tile are objects that could be helpful in solving problems with freaks accused of being vampires They could be the easiest way to deal with phobias and superstitions related to unfinished affairs, drawing the deceased from the dead to the world of the living.

17 FILLING AND EMPTYING THE GRAVE: A CASE STUDY FROM HIERAPOLIS

Author(s): Wenn, Camilla Cecilie (Museum of Cultural History, University of Oslo)
Presentation Format: Oral

Recent excavations by the Department of Archaeology, Conservation and History (University of Oslo) in Hierapolis, Turkey, have focussed on a grave complex consisting of three house graves and three sarcophagi, all constructed in stone. Over the course of c. 12 centuries, starting in the late 1st century AD, these graves were used and re-used for burials, leaving behind a complex and challenging situation. The graves in question were constructed as family monuments, where the family would gather to commemorate their dead over many generations, and in which the contents would be reorganised to incorporate an increasing number of individuals. Over time, the ownership of the graves became less clear, and other factors became more significant for the continued use of graves. The result is a complex and challenging archaeological record comprising skeletal remains, objects used in and outside the grave, and the effects of human and natural manipulations of the contents. The paper will briefly outline the archaeological evidence from the graves, proceeding to a discussion of the various processes by which people have used and interacted with the graves and the bodies within over the centuries, using the osteological and other bioarchaeological data, the grave goods, and the epigraphic evidence, but also including the larger context of a society in change, particularly the Christian conversion, and the consequences of natural disasters as backdrops.

18 DEMOGRAPHIC BURIAL PATTERNS WITHIN THE WALLS OF A MEDIEVAL TRANSYLVANIAN SZÉKELY CHURCH

Author(s): Bethard, Jonathan (University of South Florida) - Zejdlik, Katie (Western Carolina University) - Kulhavy, Katie (University of Tennessee) - West, Frankie (Western Carolina University) - Nyárádi, Zsolt (Haáz Rezső Múzeum) - Gonciar, Andre (ArcheoTek-Canada)
Presentation Format: Oral

The ruins of a medieval Székely church are located in present-day Harghita County, Romania. Politically Romanian, culturally Székely (Maygar), and located within the historically episodic Transylvania region, the individuals interred in the church steadfastly maintained their occupation of the area despite social instability. Human interment within the walls of the church started in the second half of the 12th century and extended to the early 17th century with the majority of the burials interred during the 14th and 15th century. During this time period various non-local political and religious ideologies passed through the area. Despite this, burial treatment appeared to remain consistent with individuals interred within coffins, in a west-to east orientation, typically extended and supine, and without grave offerings. Very little visibly differentiates individuals within the church walls with the exception of age and sex. Males and non-adults are represented in higher frequencies within the church walls, especially near the altar of the church. This may be the result of ad sanctos burial practices in which individuals of higher social standing were placed near the church altar. The noble family from the village is also placed near the front of the church. This paper discusses the demographic burial patterns present at the church and interprets them from a culturally embedded standpoint of a stable cultural practice within an instable cultural region.

19 MOLECULAR APPROACHES TO UNDERSTANDING THE PAST: A CASE STUDY FROM 17TH CENTURY TRANSYLVANIA

Author(s): Bethard, Jonathan (University of South Florida) - Nyaradi, Zsolt (Haáz Rezső Múzeum) - Gonciar, Andre (ArcheoTek-Canada) - Monroe, Cara - Hoffman, Courtney (University of Oklahoma)
Presentation Format: Oral

Bioarchaeologists working in contexts across Europe have recognized the important ways in which non-adult skeletal remains, including those of fetuses and perinates, inform interpretations about the past. New insights into population demography are possible when contextualized archaeological data are coupled with powerful analytical tools such as ancient DNA (aDNA) analysis. In this paper, we describe a 17th century Szekely mortuary context from Eastern Transylvania where remains of seventy individuals were uncovered from inside a Reform church during salvage excavations. Analyses of skeletal age indicated that forty-nine of the individuals belonged to either fetal or perinatal age cohorts.

In order to better understand this mortuary context, aDNA from ten individuals was extracted and analyzed in the Laboratories of Molecular Anthropology and Microbiome Research at the University of Oklahoma. Genetic sex typing revealed that three individuals were female and five were male; three of which may have had mixed result due to damage or contamination despite clean room procedures and negative controls. Nine out of ten samples provided haplotype data. Of these, all had phylogenetic relationships to the Eastern European region or to the Uralic-Finno Language Family. Overall, this study indicates that aDNA is a powerful tool for better understanding mortuary contexts involving non-adult individuals.

797 INTERNATIONAL COOPERATION IN ARCHAEOLOGY AND HERITAGE AND THE WORLD BANK'S ENGAGEMENT IN CULTURAL HERITAGE MANAGEMENT

Organisers: Criado-Boado, Felipe (EAA)
Format: EAA President's Forum

The World Bank has long recognized that its projects, especially those with a physical footprint, can have inadvertent but adverse impacts on tangible and intangible cultural heritage. Since July 2006 there has been a safeguard policy on physical cultural resources to address such risks. With the advent of the Bank's new Environmental and Social Framework those provisions have been strengthened into a stand-alone Standard on Cultural Heritage that covers heritage of all types. Beyond the bank's approach to balance heritage preservation with economic development, the Bank has increasingly supported projects which pro-actively promote the responsible and productive use of cultural heritage. This session will explore the risks and opportunities for the Bank's increased engagement in this area.

798 CULTURAL HERITAGE AND DEVELOPMENT: THE WORLD BANK'S NEW ENVIRONMENTAL AND SOCIAL FRAMEWORK

Theme: Archaeology and the European Year of Cultural Heritage
Organisers: Scott, Colin (The World Bank) - Khawaja, Afshan (The World Bank) - Criado-Boado, Felipe (EAA) - Altschul, Jeff (SRI Foundation)
Format: Other - workshop (by invitation only)

The World Bank has long recognized that its projects, especially those with a physical footprint, can have inadvertent but adverse impacts on tangible and intangible cultural heritage. Since July 2006 there has been a safeguard policy on physical cultural resources to address such risks. With the advent of the Bank's new Environmental and Social Framework those provisions have been strengthened into a stand-alone Standard on Cultural Heritage that covers heritage of all types. This session will present the new Standard and how it will apply in practice in the countries where the Bank focuses its development projects. This invited session targets archaeologists working either as consultants or as regulators on projects financed by the World Bank or other multi-lateral financial institutions as well as elected leaders of professional archaeological societies that represent them.

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