41st AEA Webinars

Sustainability in Environmental Archaeology

Sessions:

Session 1: September 15th 7pm (CET) – Sustainability of the Profession – Dr Gill Campbell – Historic England & Chair of the AEA

Session 2: September 29th 7pm (CET) – Sustainability in the Past – Dr Kristina Douglass – Pennsylvania State University

Session 3: October 13th 7pm (CET) – Sustainability and the Environment: Dr Camilla Speller – University of British Columbia

Session 4: October 27th 7 pm (CET) – Social Sustainability: Prof. Christine Hastorf – University of California, Berkeley

Session 1: September 15th 7pm (CET) – Sustainability of the Profession

Environmental archaeology as a discipline is in constant motion. New methods, practices, and research ideas are constantly being developed and excavations revealing new information regarding the past. It may be argued, however, that the discipline of archaeology itself is struggling with several sustainability issues. New methods often require destructive sampling, exhausting available resources. Furthermore, the sustainability of archaeology as a profession is affected by aspects such as the number of students taking a degree course in archaeology, limited financial sources, and fast-paced advancements made in scientific methods. This justifies the need for archaeology to continuously develop new methods, carry out outreach activities, engage in new partnerships with various fields, and improve heritage management. This all contributes to the potential impact of environmental archaeology on our understanding of a sustainable environment.

19:00-19:45 Keynote

Presenter: Gill Campbell

Affiliations: Historic England and Chair of the AEA

Title: *Sustaining Environmental archaeology as a profession: a pestle and (mortar) analysis*

Abstract:

As we experience a global pandemic and see, almost daily, evidence of climate change, environmental archaeology has never been of greater relevance. However, are the results of our research packing sufficient punch and contributing effectively to debates on how we build a sustainable future? How can we make the profession a viable and attractive career that is open to all? With both the lure and promise of new techniques how do we ensure that we are asking the right questions and not reinventing the wheel? What can we do to protect the collections and archaeological resource we rely on?

This paper will use a PESTLE (Political, Economic, Social, Technological, Legal, Environmental) analysis to explore these questions and attempt to identify the most important actions that we need to take in order to sustain the profession.

19:45-20:05

Presenter: Emma Karoune

Affiliations: Independent

Title: *Open Environmental Archaeology means Sustainable Environmental Archaeology*

Abstract:

If we are to contribute, as a profession, to the UN's sustainable development goals, we need to get the most value out of the research that we conduct. Goals such as quality education (Goal 4), gender equality (Goal 5), reduction of inequality (Goal 10) and responsible consumption and production (Goal 12) can all be addressed if we as a profession embrace open science practices. This is not just providing open access and considering where data is deposited; it is an all-embracing holistic approach to opening up research within our profession and to the wider global community. There have been few assessments of open science practices in Environmental Archaeology, with most concerning data sharing such as in Zooarchaeology (Kansa et al. 2020) and macro-botanical analysis (Lodwick 2019). A new review is presented here concerning the state of open science practices in phytolith research that has again found short falls in our professional practice. This assessment digs down into how we can practically improve openness in our research in terms of project planning, data sharing, and open access. However, it also touches on other aspects including the need for citizen science and consideration of inclusiveness in all research activities. These suggested steps forward are also useful for other disciplines to start to address their own practices and therefore start to work towards individual guidelines to make their own field more open and consequently more sustainable. References: Kansa, SW., Atici, L., Kansa, EC. and Meadows RH. 2020. Archaeological analysis in the information age: guidelines for maximising the reach, comprehensiveness and longevity of data. Advances in Archaeological Practice, 8(1): 40-52. DOI: 10.1017/aap.2019.36 Lodwick, L. 2019. Sowing the seeds of future research: data sharing, citation and reuse in Archaeobotany. Open Quaternary, 5(7): 1-15. DOI: https://doi.org/10.5334/oq.62

20:05-20:25

Presenter: D.J. Huisman

Affiliations: Cultural Heritage Agency of the Netherlands/University of Groningen

Title: *Lost again? The future of archaeological specialists' samples*

Abstract:

Archaeological investigations, and the varied specialist research associated with it, strives to find and uncover materials and knowledge that had been lost. Afterwards, most of the products are cared for. E.g. in the Netherlands, artefacts and (larger) bones are stored in depots or museums along with the documentation, which is made accessible online. And the research results are reported and may play a role in journal papers and books. This way, the results and products of excavations remain accessible for further research and interpretation. There is, however, a category of research products that are in danger of getting lost (again): This is the category of samples – raw or processed – that were taken for specialist research. After processing, these samples are still of great value for additional research. E.g. micromorphology thin sections and sieved or flotated botanical samples may be studied again with new research questions. And new techniques may be applied, e.g. stable isotope analyses on botanical material and mCT scanning or micro-XRF analyse on impregnated soil samples from micromorphological research.

I know too many examples where irreplaceable specialists' samples that would be valuable for new studies were lost, inaccessible or unknown to (still) exist. I therefore discuss and

advocate a standard practice in which samples for specialist research are stored along with documentation and artefacts in depots or museums.

20:25-20:45

Discussion

Session 2: September 29th 7pm (CET) – Sustainability in the Past

Sustainability is not only a topic of concern for societies today. In the past, communities were also challenged by issues such as climate fluctuations, environmental and landscape change, and the cultivation and maintenance of healthy, sustainable human, animal, and plant populations. The archaeological record can inform us on how people dealt with these issues and what it reflects about the interactions between humans and their living and non-living environment. This may be visible and studied at different scales, from local hunter-gatherer communities that practiced selective hunting and foraging strategies to long duréé changes in the landscape due to human intervention and their socio-economic practices. Reflecting on sustainability in the past can contribute to both a broader understanding of the past and new perspectives on the future.

19:00-19:45 Keynote

Presenter: Kristina Douglass

Affiliations: Pennsylvania State University

Title: On Equity, Inclusion and Justice in Environmental Archaeology

Abstract:

As the coronavirus pandemic continues to exact a heavy toll on communities around the globe, archaeologists, like members of most other professions, are faced with losses, disruptions, uncertainties, and the need to adjust their professional practices. While the spread of COVID-19 has dominated news cycles and is at the forefront of local, national and international concerns, it is one of many human-driven crises that are exacerbating inequality, marginalization and injustice. As environmental archaeologists, we cannot ignore the intimate ties these crises have to historical, political, economic and social aspects of human-environment interaction, whether we consider the asymmetrical power dynamics underlying the global economy and its catastrophic repercussions on fishing communities in the Indian Ocean, or the disproportionate impacts of the coronavirus pandemic on communities of color. The exceptional challenges of the present moment provide an important opportunity to contextualize and understand these issues using deeper time perspectives. More importantly, however, I argue that the moment is ripe for critical self-reflection on aspects of the practice of environmental archaeology, as many of these were built on a foundation of inequality that not only perpetuates harms against diverse communities and stakeholders, but also diminishes the quality and potential positive impact of the science produced.

19:45-20:05

Presenter: Theresa S. Nelson

Affiliations: University of Sheffield

Title: *Modelling Agricultural Energy Systems at Çatalhöyük*

Abstract:

Current sustainability narratives propose that before the Industrial Revolution humanity was “an insignificant force” on the Earth and “human-induced environmental change [was] highly localised”. This perspective is inaccurate. The Agricultural Revolution provides substantial evidence of human activity extensively affecting the environment. It brought new ensembles of activities, behaviours, and technologies permitting cultivation, surplus production, and changes in nutrition, workload, mobility, and population growth. From an archaeological perspective, agriculture profoundly affected social and environmental systems. From an energetic perspective, agriculture required and caused substantial changes in energy flows and new social institutions. The Agricultural Revolution epitomises humanity’s enduring struggle to sustainably balance available energy with energy use, social coherence, material acquisition, and community needs. As a discipline, archaeology has failed to consider the energy extraction processes required for agriculture to occur. Further, archaeology has not pursued understanding the development of human energy systems, or, modelled and analysed past energy systems. To address this research gap, my PhD establishes a methodology to quantify the energy demands and dissipations of Neolithic Çatalhöyük’s agricultural system. I recalculate Çatalhöyük archaeological data via a modern human energy requirements framework and demonstrate how to model past energy systems. In this paper, I use this research to provide an archaeological perspective on modelling society-energy relationships, bring history into energy sustainability models, and demonstrate how archaeology can contribute to sustainability, today.

20:05-20:25

Presenter: Irina A. Vishnevskaya

Co-Authors: Dashzeveg Bazargur, Tatiana G. Okuneva, Byambaa Gunchinsuren & Arina M. Khatsenovich

Affiliations: Institute of Archaeology and Ethnography SB RAS; Vernadsky Institute of Geochemistry and Analytical Chemistry of Russian Academy of Sciences; The Zavaritsky Institute of Geology and Geochemistry of the UB RAS; Institute of Archaeology MAS

Title: *Isotopic study of the Middle and Upper Paleolithic sites in Orkhon valley, Northern Mongolia*

Abstract:

Late Pleistocene environmental conditions in the Orkhon valley, Central Mongolia Mongolia is considered as the key region for understanding of Late Pleistocene human dispersal. The

scarcity of stratified Paleolithic sites in this region, stemming from erosion processes, is a big challenge for interdisciplinary research. Multilayered Moiltyn-am site was the first stratified Paleolithic occurrence found in Mongolia in 1949 and studied by three different teams in 1960-1990th. Here we present the new project, targeting study of deposits and faunal remains in the archaeological context to understand the accumulation of cultural horizons. The first results indicate the short-term occupational episodes of Orkhon valley, including Moiltyn-am and two neighboring Middle-Upper Paleolithic sites – Orkhon-1 and -7. Supposedly this valley was transitional path for human; we analyze environmental conditions and possible migrations of the ungulates, using δ18O, δ13C and δ15N stable isotopes and 87Sr/86Sr ratio and d88Sr with the background of ETR data. First results indicate that climate was semiarid, more humid, than modern, between 40–12 ka. 87Sr/86Sr ratio in the deposits of stratigraphic profile increases from the bottom to the uppermost layer from 0.7091 to 0.7096. Isotopic composition is similar to the typical rocks of upper crust. Its gradual increasing and ETR spectrums indicate significant mixture and averaging-out of sedimentary material before sedimentation. Isotopic composition obtained for 2 samples of ungulate teeth enamel is relatively equal - 0.7101±0.0003. Higher ratio probably indicates that ungulates herded in the other region during the first years of their lives (RSF #19-78-10112).

20:25-20:45

Discussion

Session 3: October 13th 7pm (CET) – Sustainability and the Environment

Throughout history, humans have been exploiting a wide variety of environmental resources and have been niche-constructing both the biotic and the abiotic environments. This impact on our surroundings has in some instances led to environmental degradation, climate change, and the introduction, endangerment, alternation, extirpation, or even extinction of animal and plant species. Environmental archaeology offers the possibility to assess the status of environmental factors in the past, and can provide modern sustainability studies and approaches with a baseline or data that can benefit attempts to protect our environment.

19:00-19:45 Keynote

Presenter: Camilla Speller

Affiliations: University of British Columbia

Title: *Ancient Waters: Biomolecular Contributions to Marine Resource Management and Conservation*

Abstract:

Over the last century, marine ecosystems have witnessed dramatic declines worldwide due to industrial overharvesting and human-induced environmental degradation. Resource managers are increasingly turning to archaeological data to provide baseline information on the past abundance and distribution of aquatic species, and to mitigate anthropogenic effects on marine and freshwater ecosystems. Biomolecular analysis of marine vertebrate remains recovered from archaeological and paleontological sites represent a rich resource for reconstructing past marine biodiversity and complexity over millennia. Through a series of case studies focused on baleen whales, Pacific salmon and Pacific herring, this presentation will highlight how collagen peptide mass fingerprinting (ZooMS) and ancient genomics can: 1) reveal the former distribution and ecology of extirpated populations; 2) quantify the impacts of anthropogenic alteration on adaptive variation; 3) reconstruct lost biodiversity of marine taxa exploited in the past. These case studies highlight the potential for biomolecular techniques not only to reconstruct marine paleoenvironments but contribute essential information for the conservation, management and restoration of modern aquatic ecosystems.

19:45-20:05

Presenter: Brenda Oxman

Co-Authors: Arzamendia Yanina, Marcelo Morales, Rojo Veronica & Yacobaccio Hugo

Affiliations: CONICET, Buenos Aires University

Title: *The Barrancas Biocultural Heritage Project, Argentinean Puna*

Abstract:

The aim of this paper is to present the Barrancas Biocultural Heritage Project, Argentinean Puna. The Puna is an arid region, with intense solar radiation, extreme temperatures and scattered resources. The socio-economic organization is based on llamas and sheep herding, and family scale horticulture. Primary productivity is concentrated in stable hydrological systems, which frequently form “vegas”. Vegas are essential in Puna landscape since they sustain plant communities which concentrate the highest primary productivity and biological diversity in a regional scale. Vegas are intensively used for grazing animals, channeling waters to irrigate crops and natural vegetation for fed livestock, and building infrastructure for the water supply for the town. Due to the importance of the ecological services of these ecosystems and that they are very vulnerable to climate change, their study and protection is urgent. Barrancas is currently inhabited by indigenous people and local communities and the area constitutes a County Reserve in order to protect the rock-art and archaeological sites. Archaeological evidence showed that since the late Pleistocene human populations have occupied the region forging an intimate relationship with the environment and developing different strategies (domestication of camelids) to adapt to the uncertainty of climate variability and behavior that defines them as resilient. This interdisciplinary project shows the complex human-vegas interaction history, incorporates multiple lines of evidence from environmental (pollen, diatoms and geomorphology analysis) and social sciences (ethnography) and traditional knowledge, in order to generate a wetlands management plan to promote public policies for the conservation and enhancement of heritage.

20:05-20:25

Presenter: Kimberley Davies

Affiliations: H. Mackay, M. van Hardenbroek, T. Fonville, K. Head, N. Whitehouse, A. Henderson, P. Langdon, P. Barrett & A. Brown

Title: *Lakeside settlements characterises prehistoric human-environment interactions by analysing geochemical and biological signals preserved within the sediments*

Abstract:

Humans have always been attracted to lakes as resource hotspots. In the Iron Age to Medieval Period in Ireland and Scotland, this attraction is reflected in lakeside settlements and the construction of artificial islands called crannogs, in thousands of small, largely lowland lakes. Limited excavations or environmental assessments have been completed at such sites, meaning our understanding of the spatio-temporal impact of prehistoric wetland societies on their environment is relatively limited. Sedimentary records extracted near to wetland archaeological sites provide a potential source of information from a wide range of proxies associated with site usage and wider environmental impacts of construction. We can detect activities with both high-temporal and analytical resolution that appear to have had profound effects on and within small lake environments that are sensitive to environmental change. Our research on lakeside settlements characterises prehistoric human-environment interactions by analysing geochemical and biological signals preserved within the sediments. Results of the palaeoecological analyses reveal the short-lived construction and occupation phases of crannogs from the Iron Age to the Medieval Period. The main effects of human activities on the lake ecosystems are nutrient-driven increases in productivity and shifts to more eutrophic conditions. Abandonment reduces nutrient inputs and aquatic productivity but, despite returns to pre-settlement levels, the lake ecosystems do not return to their previous ecological state. This research has enabled us to understand the sustainability of cultural practices across the time period in question and the legacy of specific actions in the landscape.

20:25-20:45

Discussion

Session 4: October 27th 7 pm (CET) – Social Sustainability

Social archaeology examines the social dimensions of human life in the past through the interpretation of archaeological remains, informing us about expressions of ethnicity, race, age, status, class, and gender. It provides insights into the social sustainability of past societies. Through, for example, the investigation of the unequal distribution of power, wealth, and resources, social archaeology can reveal patterns regarding social practices and how communities and societies were shaped and developed through time. Interpretations of the past are also influenced by social issues in the present. Increasingly, archaeological studies advocate for more agency for groups traditionally under-represented in

research. Here environmental archaeology also plays an important role in lending more agency to non-human species, for example in social zooarchaeological and multi-special approaches.

19:00-19:45 Keynote

Presenter: Prof Christine Hastorf

Affiliations: University of California, Berkeley

Title: *Plant protection as societal sustainability: meaningful Andean landscapes*

Abstract:

Until 2000 years ago many people engaged with their landscape in an agentive way. To them, everything was a subject not an object, plants, animals, rocks and streams were alive. The indigenous American ontology assumes that all who live in a landscape are responsible for all other beings, plants, animals, water, and rock. This includes both the fields of planted domesticates as well as the gifts of the wild. Archaeologists and anthropologists are learning that as people settled down in this landscape, they valued not only their domestic animals and plants but also the wild beings that resided throughout the landscape. These beings are not just part of the ecology of a vibrant ecosystem, they are also beings that require social relationships and tending to maintain this diverse world. This talk will discuss this worldview that has sustained farmers and collectors for thousands of years by presenting an Andean indigenous world view of a farming community who produce food for their families, and maintain their community while tending to the beings throughout the landscape. These reciprocal interactions promote both social and botanical well-being that has sustained people and plants for thousands of years. These ideas help us to think about the longue dureé of domesticates and food.

19:45-20:05

Presenter: Aleksa K. Alaica

Affiliations: University of Toronto

Title: *Pastoral Practices and Marine Resource Exploitation among the Moche of North Coast Peru: Examining Social and Cultural Continuity through Vertebrate and Invertebrate Remains*

Abstract:

The environmental disruptions of ENSO events, droughts and climatic shifts have impacted pre-colonial cultures of the Andes region for millennia. Among the Moche (CE100-850), a series of droughts and ENSO events created constraints to agricultural practices that shifted the reliance of rural communities to mobile pastoral practices and greater marine resource exploitation. Despite, the sociopolitical transformations of the Late Moche period (CE600-850), pastoral activities persisted through predominantly coastal herding strategies and local animal management, supplemented by long-distance trade with the northern and southern highlands. At the site of Huaca Colorada, the combination of marine resource exploitation and agro-pastoral activities permitted the stability of rural coastal communities to engage with larger

political spheres of Moche influence in the Jequetepeque Valley on the north coast of Peru. I present the distribution of vertebrate and invertebrate species to demonstrate the continuity of mollusk collection, hunting, herding and fishing practices despite volatile environmental conditions. I argue that the stability of social interaction is predicated on sustainable subsistence acquisition strategies. In the Late Moche period, rural and urban communities were maintaining interaction through seasonal cycles of gathering that permitted the negotiation of trade relations, authority and cultural capital. In the end, social sustainability was possible during environmental instability because of the resilient strategies employed by indigenous stakeholders. These insights place important attention on the integral study of ancient practices to ensure the sustainability of our contemporary environment, indigenous traditional knowledge and cultural practices.

20:05-20:25

Presenter: Taariq Ali Sheik

Affiliations: Department of Art, Culture, History, and Antiquity, Faculty of Humanities and CLUE+, Vrije Universiteit Amsterdam

Title: *Environmental Archaeology: Inter-disciplinary Decolonization?*

Abstract:

2020 has certainly been something. I, like a lot of people, have been watching the enfolding health, social, economic, and environmental crises with a mix of shame, anger, fatigue, and helplessness. But, we should not forget that these crises have been unfolding for hundreds of years. Where does Environmental Archaeology, and its related disciplines, lie among these crises? The field is by no means free from complicity in producing and maintaining inequality, but simultaneously occupies a liminal space, laden with the capacity to challenge the norms that have shaped the world as we know it today. This talk aims to present both the potential of environmental archaeology to contribute to a more sustainable, equitable, and accountable present and future, and highlight the systemic factors that have (re)produced violence, discrimination, and degradation. A diverse range of sources will be drawn on to highlight the potentials and limitations of a Decolonial Environmental Archaeology, from the intersectional feminist labours to deconstruct the primacy of Cartesian dichotomies, to palaeoecology and archaeology to provide material evidence for the intersecting roles of racialization, sexualization, colonialism, imperialism, and modernization in manufacturing a world defined by crisis. A final note will be made to emphasize that there can be no decolonization without emancipation. Therefore, any decolonial environmental archaeology needs to be both reflective and accountable, aware of its institutional context and complicity, and active in its potential to harbour diverse perspectives and challenge harmful narratives.

20:25-20:45

Discussion