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Living Through Change: The Archaeology of Human-Environment Interactions. Introduction to the Special Issue

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Introduction

The role of humans as agents of environmental change is central to debates far beyond the discipline of archaeology. Life's essentials such as sustenance, fuel, shelter and material crafts have a fundamental relationship to the exploitation of natural resources. Given this pervasiveness of resource use, human action has had a profound influence on shaping the world around us, and with current global politics and a growing recognition of the threats of environmental change, it is not surprising that the voices of environmental archaeology have grown much louder in recent years.

At the forefront of the study of past human-environment relationships, environmental archaeologists are keenly placed to explore what it means to live through long- and short-term environmental change, contributing powerful and evidence-based accounts of human-environment interactions from the deep and recent past and their on-going ramifications (Dearing et al. 2006; d'Alpoim Guedes et al. 2016). Such explorations encompass not only changes to local and regional environments precipitated by human activity (e.g. Fairhead and Leach 1996; Redman 1999; Butzer 2005), but also the responses in human behaviour that are themselves stimulated by dynamic and changing environments (e.g. Rockman and Steele 2003; Cooper and Sheets 2012; Kintigh and Ingram 2018). The importance of these themes is reflected in the increasing reach of the discipline outside of the traditional boundaries of archaeology (e.g. Sandweiss and Kelley 2012; Guttmann-Bond 2019; though see Richer et al. 2019 for commentary).

Within this broader framework, this special issue brings together a selection of papers presented at the 40th conference of the Association of Environmental Archaeology held in 2019 at the University of Sheffield. This conference provided an opportunity to reflect on the discipline's past, and debate its future in the context of growing bodies of data, the integration of multiple proxies for change, new analytical techniques and fresh theoretical paradigms. The call for the conference was broad, reflecting the breadth of sub-disciplines that fall under the umbrella of environmental archaeology, yet urged for papers that explored environmental change from the human perspective, through engagement with questions of change, adaptation, sustainability and human impact.

The Association for Environmental Archaeology (AEA) has been at the forefront of environmental archaeology for the past 40 years. Beginning in the UK as a means of communication between specialists in an emerging field, the Association has developed into an international body adapting to the evolving and expanding approaches environmental archaeology now encompasses. The AEA champions the study of the relationship between humans and the environment, and the implications of that relationship for the development of human society and our impact on the world around us.

The health and appeal of environmental archaeology is reflected by the strong attendance at the 40th AEA Autumn conference, with 153 registered delegates, of whom 70 were AEA members (Figure 1). Unlike many archaeology conferences, only 63% of these were from academia, with 28% from the commercial sector and government agencies highlighting the importance of the discipline outside the academic world. Delegates were mostly based in the UK, but the global reach of environmental archaeology was apparent with delegates having travelled from Japan, Russia, Poland, Germany, Italy, Romania, Spain, Ireland, the Netherlands and Switzerland.

The University of Sheffield was a fitting host for this 40th anniversary of the AEA. Glynis Jones – who joined the Department of Archaeology at Sheffield in

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Figure 1. Group photograph of delegates at the 40th Association for Environmental Archaeology conference held in December 2019 at the University of Sheffield.

1984 – was the first editor of *Environmental Archaeology: The Journal of Human Palaeoecology*, the journal of the AEA that evolved from the much loved *Circaea* bulletin. The first issue of *Environmental Archaeology* was born from a session at the 1995 meeting of the Association for Environmental Archaeology, held in Sheffield. Then as now, Sheffield was renowned for environmental archaeology, pioneering the first specialised courses in environmental archaeology. Decades of world-leading research at the Department of Archaeology, University of Sheffield has left an indelible imprint on the discipline. A 2021 AEA Twitter poll illustrates Sheffield's influence on the environmental archaeology sector: 51.3% of respondents were alumni of Sheffield archaeology or linked to Sheffield archaeology; 56.5% work with Sheffield alumni. This was no more evident than at the 2019 conference in which many delegates had fond stories of study, teaching, research and collaboration in or with the Department.

Sheffield continues to have vibrant and active geoarchaeology, archaeobotany and zooarchaeology research teams. Geoarchaeological research at Sheffield is wide ranging and spanning both landscape level investigations into ancient responses and adaptation to climate change (Ayala et al. 2017), as well as on site analyses of the use and construction of domestic spaces. Sheffield's archaeobotanical research persists at the forefront of advances in research, most recently at the interface between ecology, genetics, agronomy and archaeobotanical data to challenge perceptions of early agriculture in southwest Asia and Europe (Jones et al. 2021). Likewise, the Sheffield's Zooarchaeology research team has become a pillar in the world of Zooarchaeology. Contributing to the advancement of the discipline with highly interdisciplinary research, the Sheffield Zooarch research group gathers researchers with a diverse range of interests that span different geographical regions and time periods, who all share the same enthusiasm in applying zooarchaeological research to explore issues in contemporary society and the world in which we live (Albarella et al. 2017). The planned closure of the Department of Archaeology at the University is, regretfully, a stark reminder of the threats faced by the discipline, the broader archaeology community and humanities subjects as a whole.

The research presented in this special issue appears on the surface to be highly diverse, reflective of the broad range of research represented at the conference. However, all the articles are connected by touching upon four core themes: stability in the face of external change, adaptations to changing environments, the disappearance of traditional practises, and the role of methodological innovations enabling us to explore the often subtle shifts in behaviours and environments.

The topic of migration and continuity of cultural traditions in different environments is at the centre of Gocman's paper (Ulana Gocman. Livestock Subsistence Strategies in the Middle and Late Bronze Age Lesser Poland, Environmental Archaeology, DOI: 10.1080/14614103.2021.1953936), which looks at livestock subsistence in the Middle and Late Bronze Age in Poland. Communities belonging to the Lusatian culture, migrating from Upper Silesia to Lesser Poland around 1350 BC, are thought to have had strong commitment to their own cultural traditions. Gocman finds this echoed in the animal bone remains, with

continuity in husbandry strategies between the two areas. Barba et al.'s research (Angelo Castrorao Barba, Claudia Speciale, Roberto Miccichè, Filippo Pisciotta, Carla Aleo Nero, Pasquale Marino & Giuseppe Bazan. The Sicilian Countryside in the Early Middle Ages: Human–Environment Interactions at Contrada Castro, Environmental Archaeology, DOI: 10.1080/14614103.2021.1911768) also touches upon this theme. In an understudied region and period – early Medieval Sicily – archaeozoology, archaeobotany and anthracology are brought together to explore the economic dynamics between the 8th and 11th centuries AD – a time of significant socio-political change. It is notable that no radical change is identified through Barba's analyses, with pork production even remaining consistent into the Islamic period.

McDonald et al (Sophie McDonald, Kevin Kearney, Benjamin Gearey & Derek Hamilton. Recession or Resilience: Evidence for Neolithic Agriculture in Updated Palaeoenvironmental Reconstructions from Lairg, Sutherland, Environmental Archaeology, DOI: 10.1080/14614103.2021.1916375) also address questions of environmental and economic stability head-on. They contribute to lively debate around a supposed agricultural collapse in the middle Neolithic of Britain. Their work focuses on Scotland, an area that has received less attention from the proponents of the collapse model attempting to detect fluctuations in the clearance of woodland – a marker of agricultural expansion – in the pollen record. Their analysis indicates that regardless of any events to the south, and a colder, wetter climate, the novelty of farming had not waned.

McDonald et al's work in reassessing a narrative of change, is dependent on an improvement in methodological approach, and has perhaps unexpected synergies with Rebolledo et al's (Sandra Rebolledo, Philippe Béarez, Débora Zurro, Calogero M. Santoro & Claudio Latorre. Big Fish or Small Fish? Differential Ichthyoarchaeological Representation Revealed by Different Recovery Methods in the Atacama Desert Coast, Northern Chile, Environmental Archaeology, DOI: 10.1080/14614103.2021.1886647) insightful study of fishing dynamics of the Chinchirro culture of northern Chile, which is in part a critique of the methodological constraints that limit our reconstructions of early fishing behaviours and in part a reconsideration of the chronologies of fishing techniques. In a region where past techniques are poorly understood, this paper presents an important contribution to the understanding of the variabilities and continuities in fishing strategies across the region, particularly in terms of access to pelagic environments and the implications that this has for fishing technologies. Nevertheless, as Rebolledo et al demonstrates, the choice of methodological approach has significant implications for how we understand the relationship between coastal and ocean resources. Rebolledo et al. explore how excavation strategies can have a pivotal influence on how we reconstruct past human relationships to water and sea creatures, not only through the diversity of aquatic resources recovered from a site, but particularly the difficulties that this presents in comparing fish assemblages between different sites.

In a similar vein, the paper by Michalczewski et al. (Krzysztof Michalczewski, Andriey P. Borodovskiy & Łukasz Oleszczak. The Ritual Use of Animal Scapulae in Central Asia in the Xiongnu-Xianbei-Rouran Period, Environmental Archaeology, DOI: 10.1080/14614103.2021.1905475) is a clear example of how a refined methodological approach can lead to a better understanding of aspects of a community which would otherwise remain hidden. Using experimental archaeology, the author explores scapulimancy – a method of foretelling the future through the observation of animal scapulae employed by past nomadic and semi-nomadic people of Central Asia. By comparing microscopic analysis of experimental and archaeological data (from the Xiongnu-XianbeiRouran period), Michalczewski is able to confirm the use of the scapulae at Chultukov Log-9 as 'oracle bones', objects with a rich symbolic meaning for pastoral, nomadic and semi-nomadic people in Central Asia, providing an insight into a rapidly disappearing behaviour.

Rapidly disappearing environments is the starting point of the paper by Weide et al. (Alexander Weide, John G. Hodgson, Hagar Leschner, Guy Dovrat, Jade Whitlam, Neta Manela, Yoel Melamed, Yagil Osem & Amy Bogaard. The Association of Arable Weeds with Modern Wild Cereal Habitats: Implications for Reconstructing the Origins of Plant Cultivation in the Levant, Environmental Archaeology, DOI: 10.1080/14614103.2021.1882715). The availability of environments unaffected by industrial farming methods is diminishing. Demonstrating the risk the loss of such habitats poses for studying the past, they collect the ecological data needed to differentiate the collection of wild grasses (foraging) from their cultivation (pre-domestication farming). Work such as this is crucial in establishing the means to trace the origins of crop domestication, which increasingly appears to lay in a protracted period of mutualistic relationships between humans and wild plants.

Speciale et al. (Claudia Speciale, Nunzia Larosa, Francesca Spatafora, Alba Maria Gabriella Calascibetta, Gian Pietro Di Sansebastiano, Giuseppina Battaglia & Salvatore Pasta. Archaeobotanical and Historical Insights on Some Steps of Forest Cover Disruption at Ustica Island (Sicily, Italy) from Prehistory Until Present day, Environmental Archaeology, DOI: 10.1080/14614103.2021.1962578) provides the first investigation into the vegetation history and agriculture of the Mediterranean island of Ustica from

prehistoric to modern periods. Archaeobotanical and anthracological data from excavations at Neolithic Piano dei Cardoni and the Middle Bronze Age Faraglioni together with historical map data reveal a cycle of human induced vegetation change. Periods of occupation and abandonment, determined by climate and, in more recent centuries, regional politics, led to phases of deforestation followed by forest regeneration and rewilding of the island. This paper makes an important contribution to the island biogeography in the Mediterranean.

Final Remarks

We hope that the overlapping themes described within this issue provide a snapshot of the diverse research foci of environmental archaeology today. What is particularly striking is the bringing together of analytical approaches to explore questions of change and stability from many angles. This multi-stranded approach, together with a continuous and reflective methodological improvement, is central to the longevity and prosperity of environmental archaeology. It not only legitimises environmental archaeological narratives when shared outside of the discipline, but also has enabled environmental archaeology to address new, pressing research issues. We hope that institutions across the world have the foresight to support this discipline as it travels forward with increasing relevance in its examination of human interactions with ever changing environments.

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Catherine Longford is a British Academy Postdoctoral Fellow in the Department of Archaeology at the University of Sheffield and member of the Archaeobotany Laboratory. Her research interests include archaeobotany, food and identity, agricultural systems and risk management in ancient societies particularly in Bronze Age Near Eastern and European archaeology.

Lenny Salvagno is a University Teacher in Zooarchaeology at the Department of Archaeology, University of Sheffield. Lenny's main interests are in animal domestication and husbandry intensification, the use of animals in medieval and post–medieval Britain, as well as Bronze and Iron Age Italy, ritual deposits, and the use of statistics and geometric morphometrics in zooarchaeology. She is also passionate about teaching zooarchaeology and the presentation of this field of study to the general public.

Michael Wallace is an Environmental Archaeology Consultant for Headland Archaeology and Honorary Research Fellow at the Department of Archaeology, University of Sheffield. His research focuses on prehistoric agriculture, the European Neolithic and the use of geometric morphometric and crop stable isotopes in archaeobotany. As of December 2022, Michael is the Chair of the Association for Environmental Archaeology.

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