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Introduction — Human-environment interfaces: Assessing the use of palaeoenvironmental information in Mediterranean landscape archaeology

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ABSTRACT

This short paper serves as an introduction to a special issue of JASRep that brings together some of the papers from a session at the European Association of Archaeologists annual conference held in Istanbul in 2014. The aim of that session, and these papers was to discuss recent developments in Mediterranean palaeoenvironmental research, but more specifically, how this research is integrated with archaeological evidence. The papers in this special issue deal with the full range of Mediterranean landscape-types and time-periods, encompassing early prehistory to the Medieval period; some engage with broad-scale climatic processes, while others deal with individual landscape or site-based assessments of human-environment interactions. They illustrate how, in very different ways, we can try to integrate environmental and archaeological data to understand the reciprocal links between cultural and environmental change. This introduction thus serves to situate these papers into a methodological and theoretical framework.

1. Introduction

The last ten years has seen an enormous increase in the quantity of Mediterranean palaeoenvironmental data from lake archives as well as terrestrial sedimentary archives (pollen, chemical/elemental/isotope data). This increase in data is partly explained by the development and application of new techniques such as OSL and cosmogenic dating (Brown, 2011; Walsh, 2014) which allow non-organic archives to be used. However, more often than not, the narratives produced by practitioners in these research specialisms are understandably limited in their engagement with detailed and complex archaeological evidence. An obverse situation characterises "cultural" archaeology, where research is dominated by investigations of monuments and artefacts, or at best, landscape surveys that emphasise the waxing and waning of site numbers; effectively employing these data as proxies for regional economic and demographic cycles. Also, a recent trend has seen the combination of environmental data and basic demographic and site data in the construction of models of environmental change (Roberts et al., 2011; Walsh, 2014). Few projects, including such modelling projects, attempt a full integration of environmental evidence within frameworks that identify the "natural" world as an integral element in the construction of, and changes in, culture. In this volume, the authors have reflected on these issues and produced syntheses that try to give equal weight and attention to palaeoenvironmental and cultural-archaeological evidence.

2. Rationale for this special issue

The publications in this special issue are the product of a session held at the European Association of Archaeologists annual conference held in Istanbul in 2014. The aim of the session was to create a forum where we could discuss recent developments in Mediterranean palaeoenvironmental research, but more specifically, how this research is integrated with archaeological evidence. In some ways, we might conceive of this as the point at which these different forms of data allow us to identify human practices and the concomitant development of environmental knowledge that emerges as mitigation strategies for changes in the environment in the past. By practices and environmental knowledge, we can encompass technologies in their broadest sense, from tools through to landscape management strategies, such as terracing or lake drainage, to mobility and changes in settlement location.

This special issue of JAS Reports presents extended versions of seven of the papers presented in this session. They deal with the full range of Mediterranean landscape-types and time periods ranging from early prehistory to the Medieval period; they cover a range of related issues from broad-scale climatic processes, down to individual landscape or site-based assessments of human-environment interaction. While the

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papers may thus seem disparate regarding chronological and geographic scope, data sources and approaches, as a set they illustrate how in very different ways, we can try to integrate environmental and archaeological data to understand the reciprocal links between cultural and environmental change. In this introduction, we will first highlight the variability in data sources and analytical methods that are represented in the papers and then move on to consider some of the key issues in bringing together palaeoenvironmental and cultural-archaeological evidence.

3. Human-environment interactions: sources and methods

As a first stage in the execution of a geoarchaeological or landscape project, many of us quite justifiably emphasise the importance of well-tested mapping and macro-scopic methodologies: basic landscape description and recording are crucial, especially in areas that have not seen much palaeoenvironmental work. Then, we need to consider landscape-scale taphonomic processes. An important part of any geoarchaeological work should be the elucidation of taphonomic processes with a view to facilitating comprehension and interpretation of sites and landscapes (see Attema this volume). The above work should form the basis for more targeted palaeoecological and/or geoarchaeological research strategies. The study of human relationships with vegetation via pollen, non-pollen palynomorphs (e.g. fungal spores), and charcoal analyses constitute a set of key methodologies and concomitant research issues with which we engage. Compared with more temperate zones, Mediterranean palaeoecological archives are often relatively impoverished due to the semi-arid climate and prevalence of limestone bedrocks. However, there are of course high-quality palynological archives in some Mediterranean environments, and recent research has benefited from the development of relatively cheap chemical and micro-biological techniques to analyse these records.

Several papers in this special issue clearly illustrate the potential offered by these techniques. Revelles discusses the domestication of arable plants and the impact of Neolithic people on surrounding vegetation using palynological evidence from across several associated cores from the Lake Banyoles area (Iberian Peninsula). Glais et al. present palynological and charcoal data from the landscape within which the tell site Dikili Tash (Eastern Macedonia, Greece) is located; and Walsh et al. present an analysis of coring and analytical data from the lake at Stymphalos. Although having a relatively restricted pollen record, in combination with XRF analysis it does provide good insight into the development of the lake and the surrounding landscape which can and were interpreted in a framework aiming to understand the myths associated with the landscape.

Mediterranean landscapes are often susceptible to soil erosion and comprise highly variable topography, for these reasons, the study of changes in topography and sedimentary histories are essential to the investigation of the history of Mediterranean landscapes (Bintliff, 2002; Butzer, 2008; Butzer, 2011; Vita-Finzi, 1969; Walsh, 2014; Brown and Walsh, 2016). The fundamental importance of geoarchaeological approaches to study processes of erosion and sedimentation in understanding taphonomy, as championed by Karl Butzer (Cordova et al., 2016) is indeed central to Peter Attema's argument, which builds on extensive programs of coring in the coastal plains of the Pontine Region and the Sibaritide in central and Southern Italy. Many of the contributions to this issue (Corrò, De Haas, Krahtopoulou, Walsh, et al.) include some geoarchaeological data, usually acquired through coring programs carried out in collaboration with physical geographers or geologists. Krahtopoulou and Veropoulidou present fieldwork from northern Pieria, Macedonia, Greece, demonstrating the utility of geoarchaeology in reconstructing past coastal configurations, as well as its capacity for informing our understanding of the development ecological niches/habits for certain resources, in this case, marine molluscs. Of particular importance in the contributions by Walsh et al., Corrò and De Haas are the efforts to reconstruct changing hydrological structures, which profoundly affected the development and exploitation of landscapes in positive ways. Cartographic and remote sensing data (followed up by geoarchaeological investigations on the ground) can provide valuable source of information for such reconstructions, which can in turn also help understand how environmental knowledge was used to deal with environmental change.

While a large variety of palaeoenvironmental data are used, the archaeological evidence that the papers draw on is arguably less varied. Some of the papers draw on detailed stratigraphic data from excavations at a single site (e.g., Corrò's discussion of the stratigraphy of Hadria; Walsh et al.'s discussion of Stymphalos), others primarily use either field survey data or regional inventories of (excavated) sites that provide rough chronological and typological information (e.g. de Haas). Mostly, these data are used to relate general settlement developments (e.g., location and number of settlements; extent and layout of cities) to environmental developments with varying degrees of success (e.g. Weiberg et al., 2016). The degree to which such data allow us to go beyond general correlations between palaeoenvironmental and archaeological data is very much dependent on the spatial scale and temporal resolution that both types of data can achieve (see below; cf. Lawrence et al., 2015; Contreras, 2017). Extremely useful additional information, often neglected, can be drawn from written sources – either 'historical' or ´mythical´. Although such data should be used with caution, some papers (e.g., Walsh et al., De Haas) clearly show how they may inform us on the mythology, perceptions and knowledge of past landscapes. For historical periods, these are clearly underused sources (cf. Traina, 1988).

4. Integrating environmental and archaeological data: spatial and temporal scales

One methodological, or strategic issue that we all have to engage with is that of scale: i.e. the spatial and temporal scales at which our data operate. A frank assessment of these scales is fundamental if our aim is to integrate different palaeoenvironmental data with archaeological evidence. At a temporal scale, all of the papers adopt a long-term perspective and consider phases of environmental processes or human activities (in a generic sense) rather than events; even those focusing on a specific period (e.g., Revelles on the Neolithic, De Haas on the Roman Republican period) still discuss data that represent developments that span centuries if not millennia. The spatial resolution of our different data have the potential to become precise and corroborative if we can directly correlate an environmental phase with an archaeological event (i.e. an archaeological context such as the construction of flood defence feature, or the movement of a site away from a zone that became susceptible to flooding). At the same time, some of the papers show that the chronological resolution of both environmental and archaeological phases is increasing, so that settlement phases and environmental changes can be pinpointed in time, as is the case for the hydrological changes to the Pontine plain as discussed by De Haas. Equally, environmental data as analysed through ITRAX/XRF scanning also has the potential to look at change and variability at a very fine-grained scale although its ultimate resolution is still limited by the dating method used. Nonetheless, this technique offers the possibility to combine assessments of long-term developments with short-term events and look at the interactions between processes working on different time scales.

With regard to the spatial scale, we can equally note that the papers address issues operating at different scales, from local to global. Thus, several papers (Walsh et al., Corrò and Mozzi, Glais et al.) explore human-environment interfaces at a local landscape scale (e.g., in the context of a single site and its direct surroundings), where the nature and extent of human manipulation of the environment is all the more intense and complex. Others explore regional (De Haas, Revelles, Krahtopoulou) and supra-regional (Attema) contexts.

The issue of scale-transfer, or more specifically up-scaling, where data derived from a local context (e.g. a specific lake or site) are employed in or integrated with broader scale micro-regional analyses

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