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Introduction

One motivation for writing this book is to bridge the conceptual and methodological gaps for those with a background in archaeology and ancient history, and those who work in the palaeoenvironmental sciences; different groups of researchers who all share a passion for Mediterranean landscapes. Therefore, the aim is twofold: to provide archaeologists and historians with a comprehensive overview of recent palaeoenvironmental research across the Mediterranean, and second, to consider ways in which this research can be integrated with what might be considered 'mainstream' or 'cultural' archaeology. This synthesis is structured in such a way that readers can 'jump' to the geographical or thematic sections that are of particular interest to them. In addition, the landscape thematic approach (with each chapter addressing a landscape type or connected themes) is designed to provide readers working in or researching a given landscape type access to modern environmental studies in those areas. Therefore, most of the chapters in this book follow a similar form. The first section in each chapter provides an overview of how each landscape/environment type has been studied, followed by a resumé (which is largely descriptive) of the principal findings of this research. Finally, latter sections of most chapters provide integrated assessments of some archaeological and palaeoenvironmental projects from across the region. The aim is not to define a sequential development of the Mediterranean environment and its peoples; this book is more concerned with the ways in which different peoples have interacted with different landscapes at different times. The examples comprise case studies from the beginning of agriculture to the end of the classical periods. This time span has been chosen, as much archaeological (especially landscape survey) and palaeoenvironmental research focusses on this chronological range. That is not

to say that there is a dearth of medieval evidence. In fact, another reason for ending the temporal perspective of this volume at the end of the Roman period is also due to the author's own chronological research interests.

Mediterraneanism

The Mediterranean is the only region in the world that gives its name to a climate type. Although this volume is concerned with the Mediterranean geographical region, Mediterranean environments exist in California, Chile, the Cape (South Africa), as well as South and Western Australia (Allen 2001: ch. 1). Consequently, the cultural significance of studying Mediterranean environments is of global relevance.

There have been many helpful discussions of Mediterraneanism in recent years, most notably in the book edited by William Harris (2005b). The key point is that, after much debate, most people who carry out Mediterranean research believe that a pan-Mediterraneanist framework is reasonable and useful, in part due to the shared environmental characteristics, but also because of the obvious connected histories and cultural developments across the region.

At one level, the sheer variety of landscapes across the Mediterranean (a region where Europe, Africa, and Asia meet) implies that there cannot be a singular Mediterranean. However, there is a set of similar environmental characteristics, in particular, similar geological structures and climatic cycles. There are, of course, important fluctuations in average temperatures, precipitation, and vegetation. However, such variations are not just spread across the region as a whole but can occur within subregions due to considerable local variations in topography. These features are considered in Chapter 2.

If one could provide a straightforward definition of a typical Mediterranean environment, we would emphasise the dramatic differences in landscape forms that exist within relatively small spaces. Between the Alps in the north and the Atlas mountains in the south, there are plains, wetlands, arid zones, forests, barren lands, and, perhaps most importantly, an incredible variation in coastal landforms, and within the sea, there are of course the islands. If we were to draw a transect across any part of the Mediterranean region, most if not all of these landscape types would be available – this sequence or group of landscapes is what

defines the Mediterranean. Most of these environments are dealt with via thematic chapters. Coastal environments are presented in Chapter 3, with an assessment of background changes in sea level, and an analysis of their variation across the Mediterranean. The ways in which different societies have engaged with coasts and the sea is dealt with in the second part of that chapter. Alluvial and fluvial systems are the subjects of Chapter 4. Here, descriptions of alluvial processes are presented along with studies of how Mediterranean people have engaged with rivers and wetlands. Although a related issue, the problem of aridity and areas where water supply is restricted or unpredictable is part of the subject matter of Chapters 5 and 6, where erosion, soils, and wider issues in Mediterranean geoarchaeology are considered. This analysis incorporates the assessment of vegetation histories and human engagements with vegetation from the Neolithic through to the Roman period. An overriding theme (discussed by others, e.g. Grove & Rackham 2001) is the notion of landscape degradation or the 'Fall from Eden'. This Genesis myth is founded on the notion that people in the past adopted an instrumental attitude to the landscape (i.e. exploited it without always caring for it), and this negligence was punished (in a codified form) via the story of the expulsion from Eden. Chapters 7 and 8 consider the range of processes discussed in the preceding chapters, but develop specific assessments of the 'bounded' and quintessentially Mediterranean islands and then mountains.

As the chapters unfold, the reader will probably appreciate that any notion of a single Mediterranean, with homogenous responses to similar environmental processes and common economic strategies, is largely misplaced (J. G. Manning & Morris 2007). If we accept that each environmental niche and its constitutive processes have a role as a non-human agent (Latour 1997), contributing to the development and continual reconstitution of cultures, then, on that basis alone, we cannot argue for a homogenous Mediterranean culture and integrated systems of environmental manipulation. However, it is possible to idealise a particular type of 'typical' Mediterranean physical geography. This idealised Mediterranean is sometimes conceptualised as a framework over which variations in cultural development are evident, but where the environmental framework apparently influences these variations. As French historian Henry Laurens (2010: 59–60) suggests, with chronological variations from area to area, Mediterranean peoples

have experienced the same processes that have profoundly transformed the Mediterranean landscape. Agricultural production expresses these shared traits with similar crops (e.g. wheat, olive, and vine) and landscape features (such as terracing). The ways in which people engage with the environment are influenced by the possibilities that occur naturally within a given space. However, the form of human engagement with that space is contingent upon a wide range of cultural processes. Each environmental niche is characterised by its potential and its limitations. The manner in which different peoples impose their layered cultural values on that environment, and develop their awareness of nature, clearly influences the ways in which landscapes evolve. Whilst any kind of environmental determinism is quite understandably frowned upon, we cannot underplay the impact of structural geology (topography), climate, vegetation, and hydrology on settlement, economy, ideology, myths, and culture across the Mediterranean. The complex tectonic processes and extreme topographical variations within relatively small spaces have always had a profound effect on where people can live and work. Anyone who has travelled along the coastline of Italy, Greece, and the larger Mediterranean islands cannot have failed to notice the ever-present mountain ranges in the middle distance, and the sheer cliffs dominating much of the coast. Large portions of these coastlines are uninhabitable or, at best, unsuited for agriculture or even pastoralism. Settlements are nested in the areas adjacent to faults or relatively flat zones that have evolved as rivers and streams, which in turn have deposited sediments and yielded a more 'useful' environment. If we accept that the processes that characterise these heterogeneous environments contribute to the construction of lifeways and culture in their broadest sense, then past human experiences and activities in these landscapes cannot be assessed via material cultural alone; we should also consider environmental processes in the development of a 'symmetrical anthropology' (Latour 1997).

Frameworks for the Assessment of Human–Environment Engagements

When we think about how people have interacted with an environment over time, we often consider the choices that they made regarding settlement location, landscape management (both in terms of the

geomorphic system and vegetation), choice of crops, extraction of rocks and minerals, and the impact that these activities had on the landscape. Archaeology and environmental archaeology are often concerned with researching and explaining change in cultural and environmental systems. Quite logically, we are interested in identifying and explaining changes in society and landscape and, most importantly for this volume, changes in the environment. Environmental archaeologists look for impact on the vegetation system or phases of erosion. When we do identify a phase of environmental stability, such a phase is identified because it represents a change or a rupture. However, periods of stability and maintenance of specific activities are just as important. We need to consider why people chose to settle and establish settlements in particular topographic situations within a given landscape. Many settlements have been continually occupied for centuries and even millennia. Briefly abandoned extant settlements often attract reuse; in some landscapes, we may want to consider different forms of inertia, as well as processes of change and adaptation. One relevant notion that has seen much discussion in recent years is 'resilience' (Butzer 2005; Redman 2005). Here, resilience theory does not imply that environments autonomously maintain equilibrium, but that societies who engage with these environments develop strategies for ensuring the persistence and productivity of a given niche.

We are often told that humans adapt to changes in the environment. What do we mean by this, and how can we be sure what adaptations were made? The environmental processes that we measure (eroded sediments, proxy data for vegetation change, etc.) are not necessarily representative of events witnessed by and responded to by past peoples. Whilst evidence for aridification caused by climate change, in the form of a reduction in precipitation, might induce settlement shift over a relatively long period, how do we demonstrate responses to shorter-term events, such as soil erosion? Substantial sedimentary units can be deposited by a few severe storms – events that would have been a common occurrence even within ostensible phases of environmental stability.

Modern, Western notions and perceptions of the environment are regularly informed by instrumental economic philosophies. Modern science, with its roots in the Enlightenment, employs a discourse; a way of interpreting and discussing the world that is so different to the numerous forms of environmental understanding that would have existed in

the past. In order to engage with this issue, the final section of most of the core chapters will examine how past societies may have engaged with the environmental processes that we believe are significant and relevant.

The other modern view of nature/landscape is one dominated by a Romantic aesthetic (see Johnson 2007: ch. 2). Again, this is in part a consequence of a disembedded relationship with the natural world: landscapes are places that we visit and engage with at an ideological level where perspectivism is all-important. This relationship with landscape characterises certain postprocessual approaches in landscape archaeology, in particular, phenomenological strands (Tilley 1994); approaches that appear to be underpinned by a Romantic notion of the countryside as destination and distraction, rather than a place of work and engagement with the sometimes harsh realities of the natural environment (Bintliff 2009; Flemming 2006). These approaches are often more detached from the reality of past lifeways than the environmental science that they often attempt to critique. Such approaches are not as common in Mediterranean archaeology (for an exception, see Hamilton et al. 2006), where emphasis is placed on assessing human impact on the environment or the economic potential of a landscape, and how this might have varied with climate change and/or human impact.

As a number of recent works have demonstrated, a significant underlying theme in Mediterranean landscape archaeology is the notion of the 'Fall from Eden', or the culpability of humanity in the destruction of a once supposedly pristine landscape (Grove & Rackham 2001). Recent narratives also attempt to demonstrate how the characterisation of Mediterranean environments as marginal and degraded has been misplaced. Horden and Purcell (2000: ch. V) believe that whilst certain Mediterranean niches are not always productive in isolation (in the sense that they easily generate surpluses), once we see the different niches as nodes within an integrated network of production, the whole is so much greater than the sum of the parts. Whilst these more recent frameworks are useful, we also need to consider how different groups in different societies in the past engaged with these landscapes. For example, some societies saw their relationship with nature as a conflict or battle, such as that which might have been held in Mesopotamian society (Hughes 1994a: 34).

Environmental Knowledge and Cultural Ecologies

Rather than provide a comprehensive overview of the development of cultural and historical ecology (dealt with in a number of publications, e.g. Balée 2006; Crumley 1994b; Meyer & Crumley 2012; Sutton & Anderson 2004), this section identifies some key tenets that underpin the approach adopted in this book.

The origins of most human ecological strands of thought lay with cultural ecology, which is directly associated with functional anthropology (Steward 1955). Cultural possibilists who worked within a cultural ecological framework suggested that certain peoples, in particular, hunter-gatherers, were constrained by their environments. Steward in particular developed these ideas and moved towards assessments of cultural evolution, emphasising adaptation and stability with the investigation of change in hunter-gatherer groups in North America (Bettinger 1991: 44–5). Some of these ideas were then adopted by archaeologists, and the fact its use is often associated with an under-theorised form of processual archaeology should not detract from the value of approaches that adopt a cultural ecological framework. One notion, which was applied by some archaeologists, was the culture-area concept, whereby technologies and human lifeways were apparently correlated with the nature of the environmental context within which societies developed (Clark 1968).

An early example of an unsophisticated cultural ecological interpretation of a historical process was the contention that the fall of Rome was an ecological catastrophe partly caused by a misuse of resources resulting from poor knowledge or information (Sutton & Anderson 2004: 3). As argued at certain points in this volume, what is more likely is that, at certain times and places, the environmental knowledge, articulated via macro-political and economic forces, was at odds with the environmental experiences and concomitant knowledge of the peoples who lived and worked in these different landscapes.

Cultural ecology assesses environmental knowledge, that is, how people understand and engage with their landscape and environment. The notion of adaptive strategies, where groups of people develop technologies that facilitate life and, in particular, food production in a given environment, is important. D. O. Henry's (1994) work in southern Jordan is one example of such an approach. This type of approach

does not assume that technologies and human lifeways will be repeated in landscapes characterised by identical or similar sets of environmental characteristics. As noted above, Mediterranean cultures do share certain forms of landscape-management strategies, but these strategies are contingent upon historical, cultural, and economic processes that vary across time and space. Responses to changes in the environment do tend to be controlled by the ability of social institutions to adapt. As Bettinger, Richerson, and Boyd (2009) suggest in their assessment of constraints on the development of agriculture, it was the gradual evolution of certain social institutions that limited the speed of the uptake of farming in some regions. A key question is how was environmental knowledge applied in the past, and by whom? People are not separate from ecological systems; they are participants in environmental processes, and as such, human participation in environmental change is quite natural (Walters & Vayda 2009: 536). At a wider level, a cultural ecological approach can also inform the study of landscapes where there is a dearth of material evidence, or in landscapes that are considered difficult to manage and in some ways 'unattractive', such as arid zones or mountains. Here, the premise is that each society's engagement with the environment is dynamic. Consequently, if we can elucidate the manner in which past peoples manipulated and responded to their environments, then this is an effective scheme for the investigation of past cultures and the transitions or changes in culture across a given landscape. Finally, resilience theory offers a way of conceptualising the relationships between different spatial and temporal scales of cultural processes (Redman 2005). Here, resilience theory presents a scheme for investigations of the relationships between small-scale, localised groups of people (e.g. individual farms) and how they relate to extensive hierarchical structures (e.g. the Roman Empire or its regional authority). Of most interest is the notion that successful environmental exploitation strategies only work if people can adapt. However, if local engagements with environments are controlled by entrenched political forces during periods of environmental change, and local people are unable to respond effectively to these changes, then such a situation might contribute to local and regional societal instability. When local, potentially small-and-fast, adaptive strategies are stifled by slow-responding, large-scale hierarchies, such as certain empires, then environmental problems might ensue. Conversely, certain hierarchical organisations might impose or apply new forms of environmental

management that are successful and enthusiastically adopted by local people. It is the appreciation of different forms of human ecology that allows us to move away from the original conceptions of cultural ecology, perhaps best characterised by the definition of 'culture areas' (Steward 2005).

In summary, the discussions developed in some of the following chapters are informed by the frameworks considered in this chapter. The ultimate aim is to identify trends and trajectories in Mediterranean landscapes from the Neolithic to the Roman period, sometimes offering resumés of published environmental research and presenting syntheses of this type of research with related archaeological information. Part of the approach includes the evaluation of the range of human–environment interactions across the Mediterranean, where environmental evidence can be deployed in assessments of human–environment engagements, and, where possible, to consider scenarios where variations in forms of environmental knowledge could have been responsible for stresses, ruptures, and resilience in the wide range of cultures that have lived and worked in these dynamic landscapes.

2

From Geology to Biology: Defining the Mediterranean

This chapter comprises a brief overview of the geological and biogeographical contexts of the Mediterranean. There is also a brief description of catastrophic processes, and some analysis of associated human responses to these phenomena. As the principal aim of this volume is the discussion of more mundane environmental processes, the assessment of catastrophic events is kept to a minimum, partly because there are a number of specialised volumes that deal admirably with these processes, and a single chapter cannot do justice to this increasingly popular area of research (Ambraseys 2009; Balmuth, Chester, & Johnston 2003; Nur & Burgess 2008).

Fundamental Geological and Biological Characteristics

The Mediterranean is defined in part by its geology. The Iberian, Eurasian, Arabian, and African plates; their associated faults; and mountain chains situated within relatively short distances from coastlines explain the enormous variation and complexity of Mediterranean landscapes. This geological crossroads is also important from a biological perspective, as flora and fauna (including humans) have moved from Asia and Africa, and then onwards between the Near East and Europe.

There are many books that provide detailed descriptions of the geological foundations and processes that characterise the Mediterranean (e.g. Dixon & Robertson 1996; Jolivet et al. 2008; Stanley & Wezel 1985). In simple terms, the Mediterranean comprises boundary zones between the Eurasian, African, and Arabian plates (Allen 2001: 48). Consequently, much of the Mediterranean comprises undulating topography and mountainous areas. The eastern half of the Mediterranean possesses a series of active fault lines that also include dormant and active