19. Geoarchaeology in Mediterranean Landscape Archaeology: Concluding Comments

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What we wish to do in this final paper is to summarize some of the key points of methodology and approach, and the major operational problems, that emerged from the papers, the discussions, and our own personal reactions to what we heard during the sessions and read in more detail in the pre-circulated papers. In so doing, we want to direct attention towards the central goal of the POPULUS programme: the future direction of regional field survey in the Mediterranean, and in particular here to focus on the role of regional environmental reconstruction – the special theme of the Aix conference – in this future goal.

THE STRUCTURE AND PHILOSOPHY OF GEOARCHAEOLOGY

During the conference, several alternative views were expressed about the way Geoarchaeology ought to relate to regional archaeological research. At one end of the spectrum were some archaeologists who advocated that they (the archaeologists) should enlist a battery of natural scientists and tap into their results for the purpose of understanding the environmental context of an excavation or survey record. At the other end of the spectrum were some geographers who proposed that they (the scientists) should run the regional archaeological projects, the head scientist being partnered by an archaeologist: the head scientist would know how to find the appropriate specialists and weld their results into the geoarchaeological context called for by his/her partner archaeologist.

It seems to us that neither approach allows geoarchaeology to fulfil its critical potential in the study of past landscapes. Both lack one fundamental component: where do we find the interpretative approaches for the human-landscape interaction that constitutes the prime reason these many specialists are working alongside each other ? In reality the only developed intellectual approach has to be a coherent sub-discipline of *human ecology*, neither a form of natural science nor a form of archaeology, but an integrated way of understanding humans in dynamic landscapes. In our view at least, all the specialists on a regional archaeological project need to put their specific research results into the wider framework that human ecology provides. Tony Brown raised the possibilities of this way of thinking when he discussed the concepts of 'resource-scape' and 'task-scape' as applied to the human use of landscape (see Chapter 6). We cannot look for a better intellectual underpinning to such an integrated ecological perspective than in the French tradition of historical geography that can be summed up in the 'Possibilism' advocated by Vidal de la Blache and Lucien Febvre.

It may be necessary, in the real world of budgets and logistics, to commence regional environmental archaeology traditionally, by employing the natural sciences to analyze the changing forms of the landscape, and archaeologists to analyze the changing landscape architecture and settlement forms imposed by successive generations of human hands. Subsequently, however, we must go further to more interesting questions, such as the utilization of landscapes in rational or irrational ways, or with high or low exploitation, or with narrowly-based or broad-spectrum economies. Such questions of human adaptation and choice take us into dynamic human ecology; and here the archaeologists and natural scientists have to look continually to rural anthropology and sociology for insights into the complex and varied ways people may have responded to constraints and opportunities made available by specific regional landscapes at particular phases of their evolution.

LANDSCAPES AND TIME

However, modern or early modern ethnohistoric parallels are merely a source of models, not a blueprint for claiming, for example, a continuity of land use and *mode de vie* in a given regional landscape. Indeed a second major insight that the conference gave rise to in our minds, was the weakness of a simple uniformitarian approach to the region.

Philippe Leveau in his paper on landscape reconstruction (Chapter 17) rightly exposes the problem of 'regressive analysis', where we take recent forms of landscape and push them back as likely givens for far older phases of the same region. The prime contribution to Mediterranean landscape archaeology of geomorphology and of related disciplines such as palynology has been to emphasize that the past was indeed 'another country', offering different contraints and opportunities to human populations compared with the present landscape, and with human populations in turn differentially equipped to respond to them in terms of their social institutions.

When many of us were students, we were taught a form of ecology where the regional environment was supposedly self-driven by some immutable law towards a 'climax community', but it is now generally admitted that all environments are unstable and historically contingent. The tendencies that appear fitfully towards community structure are being analyzed in terms of 'strange attractors' or gravity fields in chaotic/complex systems. We missed reference to these new frontiers of human ecology, although many contributors provided examples of appropriate landscape changes.

Some of the major landscape changes we can now detect in the Mediterranean region were the result of gradual long-term processes, others may have been caused by catastrophic events of short duration and very long recurrence intervals. The widespread application of dating techniques such as luminescence and palaeomagnetism in the coming years is likely to have an enormous impact in this respect: more refined chronologies seem likely to emphasize different rates of landscape change rather than uniformity, with profound implications for our understanding of human interactions with their landscape.

LANDSCAPE AND SPATIAL SCALE

Several chapters provide insights into the problem of spatial scale in environmental reconstruction. Bottema, for example (Chapter 2), warns us against overemphasizing ecofacts and other environmental evidence from excavated site levels without a due awareness of the range within which the plant or animal forms had operated. Sites are 'spots' on the map, and the environment on and immediately around a site can be quite unrepresentative of the regional environment. The same can be said of sample locations for pollen cores, snail samples and so on – the data may reflect a wide potential range of environments at ranges from a few feet to hundreds of kilometres from the sample spot. An archaeological settlement is a 'sump' containing many residues for geoarchaeological analysis, but the catchments of the various organisms that produced them – people, rivers, animals, birds, microfauna, pollen, plants, snails, and so on – obviously vary enormously, a basic truism all too often ignored when it comes to integration and landscape reconstruction.

It is also rather rare to find a region where the sample locations for environmental data are so dense and complete that we can confidently reconstruct the entire regional environment without the need of archaeological settlement research. Indeed during the conference several case studies were presented where very little was known of the history and prehistory of local human settlement to match a detailed but hardly total set of environmental sample points across the landscape. What must be called for in the future, surely, is a combined operation at the same landscape scale, where settlement history is as well-researched and understood as the changing face of the natural landscape. The only way to accomplish the former task is through the use of modern intensive archaeological surface survey, as is discussed in other volumes in the POPULUS series. On the positive side, we saw the remarkable results that can be obtained through such a combination in many case studies, for example those discussed by Attema *et al.* (Chapter 11), Novakovic *et al.* (Chapter 8), Vella *et al.* (Chapter 14), Leveau (Chapter 17) and Trément (Chapter 18).

In many regional studies of Mediterranean landscape history, there remains a tendency to locate archaeological sites in the landscape and then to treat them as dots in the reconstructed environment. Clearly such a view is too one-dimensional. Most of the time people living at these sites were working in the landscape outside of them, and to mesh the environment with the past societies using it, we must have some models of human ergonomics, of how people use space two-dimensionally. Kevin Walsh reminds us of this concept with his opening remarks on Site Catchment Analysis (Chapter 1). It is a very different picture of human impact or human reaction to the potential of landscape if, for example, we assume a radial exploitation territory of a 1 km or 2 km radius out from a site (where land types may be limited in variety), or in contrast give sites 'strip' territories that are long and thin and stretch across a wide range of different landscape types, perhaps as much as 5–6 km distance. Both types of territory occur in traditional parish or commune boundaries.

LANDSCAPE DEVELOPMENT AND AGENCY

Ever since the publication of Claudio Vita-Finzi's seminal study of Mediterranean alluviation (Vita-Finzi, 1969), the respective roles of anthropogenic and climatic causation of Mediterranean landscape development have remained highly contested (for example: van Andel and and Runnels, 1987; Barker, 1995; Bintliff, 1992; van der Leeuw, 1995; Lewin *et al.*, 1995). The case studies here (such as Chapters 7, 10, 11, 13, 14, 16 and 18) are typical in emphasizing the complexity of the evidence for vegetation and sediment changes sometimes being the result of climate, or human actions, or both in combination. One notable contribution of the papers was to highlight the need for much greater understanding of the range of 'anthropogenic' factors likely

to impact on a landscape beyond the present simplistic models of vegetation clearance by people for ploughing or by goats – activities such as terrace building and abandonment (Moody and Grove, 1990; Wagstaff, 1992), fallowing changes, manuring, pastoralism (Chang, 1984), and charcoal-burning, for example – and of their potential signatures in the geomorphological, palaeoecological and archaeological record. The effects of similar processes may also vary, as Shiel points out in Chapter 8: erosion may be bad for one community but actually beneficial for a neighbouring community in a different topographical situation. Exactly the same can be said of the effects of small-scale climatic change.

In emphasizing the simplistic nature of current interpretative models, it is also worth noting that one of commonest themes running through the methodological papers that form the first section of this volume (Chapters 2–9), as was the case in the informal discussions at the conference, is the emphasis on the problems of contextual interpretation: taphonomy, taphonomy, all is taphonomy! The uncertainties of the methodological underpinnings of their discipline are emphasized by chapter after chapter, for example concerning links between present and past ecologies, or the efficacy of sampling procedures, or the robustness of standard analytical models. As in archaeology, so in dendrochronology, geomorphology, malacology, palynology, or whatever, there is currently as much art as science, and the chapters demonstrate a healthy awareness of the weaknesses of current methodologies, particularly regarding their sensitivity to recognizing, interpreting and measuring the effects of different kinds of human activities on the landscape.

LANDSCAPES OF VARIABILITY

Although some contributors to the conference called for global synthesis to summarize the grand timescale of landscape transformation under human influence, the consensus rather was to ask whether any historic or prehistoric landscape was ever a uniform environment – even under maximum human impact. When we analyze historic landscapes with excellent local detail, it is always the case that one parish or commune is slightly different from the next, that no one form of land use or vegetation type forms 100 per cent of the land surface. To expect whole countries or even wider geographical entities to follow a particular generalization of landscape type or land use type may therefore be illusory, and probably counterproductive of knowledge.

We might rather predict that all regional landscapes have been mosaics of environments and human usages at all times. The possibilities of each landscape will have interacted with the particular regional trajectory of human society in complex ways. To be sure, there will be trends which may or not be shared by adjacent regions, but prediction will probably be impossible given the input provided by local natural and human conditions. Perhaps Steven Jay Gould's 'Postdiction' is a better methodology, where we tease apart in retrospect the general trends and structures we understand, from the local perturbation and unpredictability we may describe but not necessarily be able to understand. Integrating the results of regional archaeological surveys provides encouraging signs that we can begin to compare and contrast the very different forms that Mediterranean regional landscapes appear to have taken, for example in response to Roman imperial expansion (Alcock, 1994; Barker and Lloyd, 1991; Carreté *et al.*, 1995; Cherry *et al.*, 1995; Potter, 1979), or as a complex set of outcomes from the interaction of core-periphery and neo-Malthusian structures (for example, in the Greco-Roman Aegean: Bintliff, 1997).

BIG ISSUES

Frequently through the conference we noted how regional investigations employing the techniques of landscape archaeology in different parts of the Mediterranean were raising the same major issues regarding human prehistory and history. One consistent theme for teams working in the central and western Mediterranean has been evidence for settlement shifts, population increase and agricultural intensification in the third millennium BC, and the extent to which these changes coincide with and are related to marked increases in the scale of human impact on sediments and vegetation and/or with climatic change. Regional interdisciplinary projects are contributing as profoundly to our understanding of the impact of Romanization on the human and natural landscapes of the Mediterranean. As discussed above, another central concern is the relative impact of climatic fluctuations and human impact in terms of dramatic environmental change. Here, one significant weakness of current work is the lack of emphasis on investigating the prehistory and history of Mediterranean uplands (Barker and Grant, 1991).

Perhaps the greatest challenge for inter-disciplinary landscape archaeology in the coming years, however, will be to bridge the divide between the ecological approaches of the natural sciences to past landscapes, on the one hand, and the concerns of social archaeologists on the other with the interface between human actions and landscape, a concern that also emerges from the POPULUS conference on GIS (Gillings *et al.*, 1998). The 'mental maps' or perceptions of the ancient peoples of the Mediterranean about the world they inhabited obviously conditioned their relationship to their landscape, and their treatment of it. The implication is that, whilst geoarchaeology must be an essential component of inter-disciplinary landscape archaeology, it cannot by itself move from defining the 'resource-scape' and thence the 'task-scape' to understanding the human landscape in all its complexity. This brings us back to the point we made at the beginning of this chapter about the necessity for a mature and equal relationship between

geoarchaeology as a natural science and archaeology as a human science in the investigation of Mediterranean landscape prehistory and history.

The Aix conference emphasized the enormous potential of effective partnerships between broad-based teams of geoarchaeologists and modern intensive survey teams in this endeavour. Reconstructing the history of Mediterranean landscape change certainly needs natural scientists to analyze the changing forms of the landscape, and archaeologists to analyze changing settlement morphologies and systems. To *understand* that history, however, in terms of the interactions between landscape and people, and the perceptions, choices and adaptations that have underpinned human actions, will need effective partnerships between broad-based teams of archaeologists, geoarchaeologists, historians, and anthropologists.

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