

CHAPTER 1

INTRODUCTION

 1 AIMS AND BACKGROUND

“The greatest challenge of inter-disciplinary landscape archaeology in the Mediterranean in the coming years will be how 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.”

- Graeme Barker and David Mattingly, in their introduction to the POPULUS series of conference proceedings on the archaeology of Mediterranean landscapes (1999/2000: vii)

AIMS

In the archaeology of Italy from the Bronze Age to the Roman period, the study of the internal development of indigenous Italic societies and landscapes has remained a relatively underdeveloped area due to the emphasis on explanations relying on external factors (the influence of non-Italic cultures), dominant historical processes (the Greek and Roman colonizations), and a simplistic culture-historical view of society (stages of growth, flowering and decline). Much attention has been lavished on the influence on regional Italic cultures of foreign artefacts and manufacturing techniques during the ‘Mycenean’ and ‘international’ periods, when contacts of trade and exchange ranged throughout the Mediterranean. Similarly, interest in Greek and Roman colonization, mainly based on historical sources, has dominated the study of the role of native culture to the organization of regional Italic societies and landscapes. This one-sided approach has led to the view that the early urbanization of central and southern Italy has been a relatively homogeneous process, in which the role of international impulses and colonization movements has been paramount. Accordingly, the core aim of the Regional Pathways to Complexity (RPC) project has been to demonstrate both the much more complex nature of archaeological reality, and the decisive role played by the perspective offered by regional archaeological landscape study, by comparing the development of indigenous societies in central and southern Italy through the 1st millennium BC and into their incorporation into the Roman state, with the emphasis on the processes of centralization, urbanization, and colonization.

THE REGIONAL PATHWAYS TO COMPLEXITY (RPC) PROJECT

The RPC project started in the summer of 1997, was carried out by staff at the archaeological institutes of the University of Groningen and the Free University of Amsterdam, and ran for an initial period of four years until 2001. Accounts of its aims and context are provided elsewhere (most recently: Attema et al. 1998, Attema et al. (eds) forthcoming), and will not be repeated in detail here. The project as originally proposed for funding under the Netherlands Organization for Scientific Research (NWO) research program ‘Settlement and Landscape in Archaeology’ (Attema 1996) defines the aim of the project as “the analysis of the process of urbanization that took place in large parts of the Mediterranean world in the 1st millennium BC, through a study of long term developments in settlement behavior, land use and technology”.

In the project proposal Attema (1996:13-15) argued that, in the protohistoric and classical archaeology of Italy, the internal dynamics of the indigenous Italic societies and landscapes have remained underemphasized in favor of the influence of dominant external cultures and historical processes and the culture-historical paradigm of the growth and decline of great powers. Attention has been lavished on the presence of foreign artefacts and technologies in Italy in the Mycenaean and 'international' periods, when networks of trade and exchange extended across the Mediterranean. Similarly, archaeological study of indigenous Italian cultures has been overshadowed by a focus on Greek and Roman colonization based in historical sources. This lopsided interest has led to the early urbanization of central and southern Italy being cast as a relatively homogeneous process, in which external impulses and colonization movements were the prime moving factors. In contrast, regional archaeological research conducted from the 1980s by the institutes participating in the RPC project has shown that reality is much more complex; and a project that focuses on the variability of the Italian landscape and the persistence of indigenous regional traditions in land use, technology, and settlement behavior, has the potential to contribute significantly to a well-founded interpretation of early Italian urbanization processes.

Trajectories towards social complexity in protohistoric Italian regions are most clearly expressed in the Italian landscape through the centralization of settlements and through forms of early urbanization. Excavations and surveys have shown that in this process Greek and Roman colonization were potent forces of change. But social complexity was not solely brought about by colonists - some regions already had complex societies at the time that they were colonized, others less so. In addition, the nature and intensity of indigenous contacts with the colonial presence differed, with some regions less directly involved than others. The RPC project studies and compares three areas that show such diverging trajectories. These are the Pontine Region in Central Italy, the Salento Isthmus in Puglia and the Sibaritide in Calabria, all of which have a tradition in Dutch archaeological fieldwork. In these areas the research team of the RPC project compares the modes of interaction between the Italic peoples and Greek and Roman colonialism.

The central question of the project is "how did colonialism affect the Italian regional pathways to social complexity?" Comparative diachronic research of landscape and settlement dynamics is the way in which the project attacks this question over a time span of a millennium from the late Bronze age to the early Roman Empire. A long term perspective (1400 BC - AD 400) is adopted in order to observe this process in its full duration and regional variability. The chosen method of long term comparative study aims to identify connections between early urbanization in the three regions, as well as to gain a fuller understanding of the elements playing a role in this process - landscape, settlement systems, land use, technology, and tradition. Four Ph.D. students are being employed by the project to study each of these elements; the thesis that now lies before you has addressed mainly the element of settlement systems.

THE WROXETER HINTERLAND PROJECT (WHP)

The Wroxeter Hinterland project, funded by the Leverhulme Trust and running from 1994 to 1997 at the University of Birmingham Field Archaeology Unit (BUFAU) under the direction of Dr. Vince Gaffney. It is introduced in more detail in chapter 3 of this thesis. Although it is concerned with a much later period, and an area far removed from Italy, the Wroxeter Hinterland project's study of the transformation of the late pre-Roman British tribal society of the Cornovii into a Romano-British Civitas centering on Viroconium Cornoviorum (Wroxeter) focuses on the very same processes studied in the RPC project as well. The juxtaposition of examples and studies from both projects therefore provides a welcome broad canvas against which to place these processes.

PATTERNS

The emphasis throughout this thesis on the recording and analysis of pattern is in the intellectual tradition of the New Archaeology (Trigger 1989:310-312). I am disturbed by the current emphasis in both archaeological theorizing and teaching, on the historicist, post-processual approach. The academic

practice of archaeology can only be justified, in my view, if the basic rules of scientific research, publication, and debate continue to be taught and adhered to. As the pendulum swings from the scientific, rule-finding approach of the '60s and '70s to the humanistic, historicist approach of postmodernism in 1980s and 1990s archaeology, the straw man of 'environmental determinism' was set up to decry and distance oneself from.

Regional or landscape studies, whether research- or CRM-oriented, with or without the use of GIS, are generally concerned with discerning and interpreting patterns of archaeological land use and settlement. And undoubtedly the archaeological record is patterned in various ways, but so are other factors influencing our knowledge of that record – erosion and deposition, land use, and research bias, to name the most important. How can we interpret the archaeological record if we cannot separate the effects of these different types of pattern? And if human patterning is only one of a number of factors determining the archaeological patterns found by us, what does that say about the models (predictive or otherwise) that we produce? We can relate slope, distance to water, and other environmental variables to the occurrence of certain site groups, but the correlation may run via the effects of erosion and the differential visibility of archaeological materials on the surface, rather than directly.

Different types of patterning occur at different spatial and temporal scales. This thesis is about the detection, description, and explanation of such patterns. Since we must first understand how the ways in which we study the past affect our understanding of it, much of this thesis is devoted to methodology - how do we collect and record data, how do we analyze its structure, and how do we attach explanations to such structures? The goal of this work is to find ways of studying the past which can either avoid recording biases, or which allow formal corrections for such biases to be made. Methodological themes investigated in this thesis include: the design and execution of archaeological surveys (field walking); methods of analysis of both regional 'site' databases and local 'non-site' survey data using Geographical Information Systems; and methods of dealing with the tension between description, explanation, and extrapolation in archaeological location / allocation studies.

LANDSCAPE ARCHAEOLOGY AND THE ROLE OF GIS

The case studies involving field work and GIS analysis are all based on the theoretical premises of landscape archaeology – that human actions may occur, and leave an essentially continuous 'blanket' of traces, anywhere in the landscape, that the resulting surface record is a palimpsest of such traces through time, and that patterns in this record may be explained in part by the in turn limiting and enabling qualities of the landscape. These principles are extended into the realm of spatial extrapolation and cultural resource management using the theory of spatial sampling (which says that properties of a properly selected sample have a specific likelihood of also being properties of the parent population).

Archaeological input for GIS analysis comes in two forms. Firstly, traditional archaeological records often collected and enhanced in the form of a 'topographic' or desktop survey; and secondly, field walking surveys. The former are site-oriented without exception, and are based on archive research and a limited amount of field work; the latter come in several forms (urban, rural) and intensities but share the same theoretical basis.

Most analytical GIS use is based on the analysis of spatial or statistical patterns, hence on the quantitative aspects of the archaeological data. Before we can use either data type as GIS layers, a stage of source criticism (see Chapter 4 on bias modeling) must be applied. Next, methods for recording and describing the data must be standardized to some extent in order to allow comparison between surveys, and here again the premises of landscape archaeology influence the approaches chosen (chapter 13).

 2 STRUCTURE OF THIS THESIS

As once Gaul, the body of this thesis is divided into three parts – methodological studies, field work, and case studies. Most of the individual chapters have been conceived as separate articles, indeed some have already been published or are currently in publication, so each study carries its own introduction and conclusion, its own set of bibliographic references and, where appropriate, acknowledgements. Whilst I have tried to avoid duplication of text and figures as much as possible, and have liberally cross-referenced between the chapters, I have given precedence to the need to present the chapters in the form of self-contained units. In order to clarify to the reader how all the parts of this loose structure interconnect and serve to reinforce each other, it is presented in some detail below, and an attempt at its graphical representation has been made in figure 1.

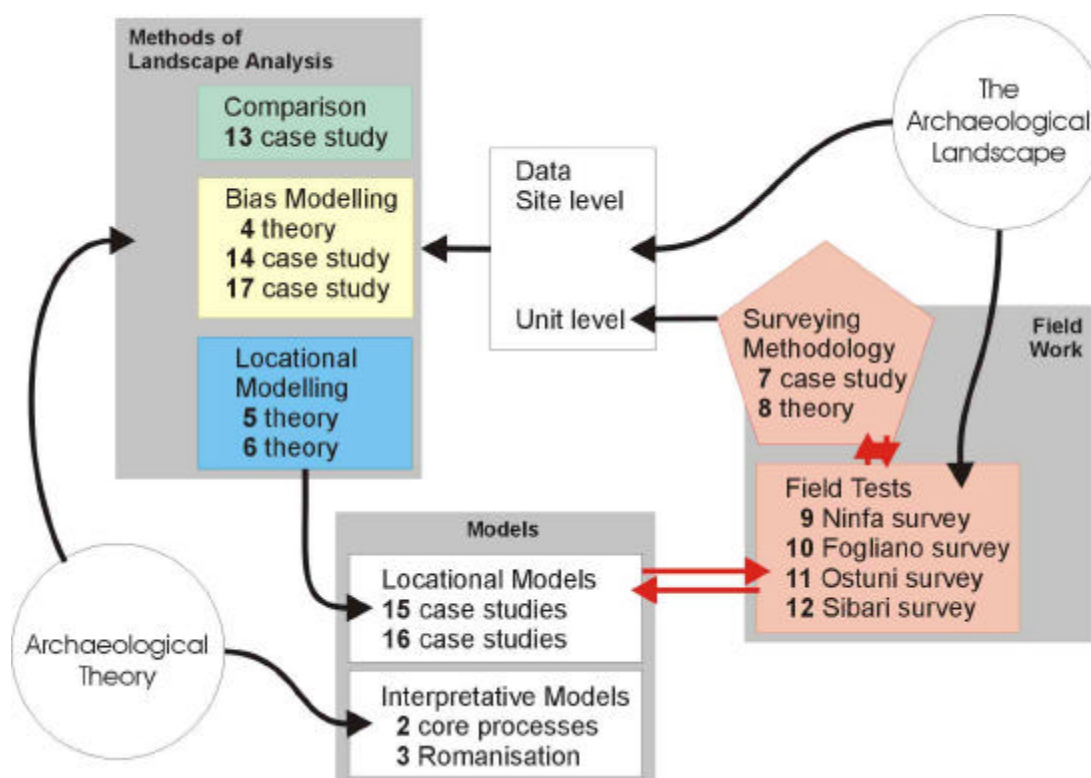


Figure 1 - Structure of this thesis. Middle range theory and models derived from archaeological theory are used to explain patterns in the data being derived from the archaeological landscape; field work is carried out in order to test and improve the models and develop an appropriate methodology.

The next two chapters in this introductory part of the thesis are intended to provide the broad archaeological and theoretical context to the research reported in the main body of the thesis. The central concepts and definitions employed by the RPC project are reviewed in chapter 2, which also defines and describes broad stages and variations in the processes of centralization, urbanization and colonization in the first millennium BC in Italy. It provides brief qualitative, quantitative, and spatial descriptions of these processes, and discusses differences and similarities of the three regions. Since the emphasis throughout this thesis is on the detection and explanation of spatial patterning on different scales, the potential for spatial analysis of archaeological data is discussed at two scales – that of the individual survey and that of the region – and the use of GIS in the modeling of archaeological landscapes is introduced here because it imposes certain restrictions on the types of analysis that can be handled. The introduction to the

thesis is completed with a chapter on the process of romanization in the Wroxeter Hinterland, reproduced from White & Van Leusen 1997 (chapter 3).

Following the body of the work, a final chapter (18) considers how the conclusions reached in these studies affect our view of the settlement dynamics and interregional differences in the study areas, and what recommendations can be made for future research and development in the field of landscape archaeology, GIS, and the management of archaeological resources.

2.1 METHODOLOGICAL STUDIES

My methodological bent is evident in the four chapters that make up this part of the thesis. The methodological studies conducted for this thesis are all concerned with the use of GIS for landscape archaeological research, either by understanding existing data sets in terms of their formation (chapter 4), by reviewing maturing research areas such as predictive modeling (chapter 5) and cognitive landscape analysis (chapter 6), or by examining its role in driving the evolution of field recording techniques (chapter 7).

BIAS MODELLING

The first (chapter 4) is about methods for recording so-called bias factors, i.e. factors that distort our picture of the archaeological record, and methods for correcting these distortions. It is based on an article published in 1996 (Van Leusen 1996a), which established my aims and general approaches to this subject in the context of the Wroxeter Hinterland Project. The chapter is about recent post-depositional and research biases in the kind of data that form the basis for archaeological landscape reconstruction and settlement history – site-based data collated from desktop study and older surveys, and land parcel-based data coming from modern surveys. Recent post-depositional biases are nearly exclusively related to human changes to the landscape and its use; research biases are those biases that have occurred in the past, and still occur, during the construction of the archaeological record; I specifically exclude biases occurring during the site formation process. My main point is that recent post-depositional and research biases can not just obscure, but also create patterns in the archaeological record. This has two consequences: firstly, if significant biases in the data we work with are not dealt with, then our reconstructions based on those data will be significantly flawed; secondly, comparison of the archaeological records of the three RPC Project study regions is predicated on the assumption that such records are, or can be made, comparable. Two case studies (chapters 14 and 17) demonstrate my approach in practice at two geographical scales, one concentrating on the role of ‘discovery’ biases in the regional site database used for the WHP; the other on the effect of subrecent large-scale landscape changes on survey results in the Pontine Region.

PREDICTIVE MODELLING

My second chapter on method (chapter 5) consists of a paper on the methodology of predictive modeling of archaeological site distributions, which is based on the extrapolation of geographical patterns and correlations in order to describe and predict typical locations where specific types of archaeological remains may be expected to occur. The chapter grew out of my earlier review of Dutch approaches to archaeological predictive modeling (Van Leusen 1996b), but many aspects were further developed in subsequent irregular meetings and discussions in the period 1998-2000 with members of the ‘bath-house’ group: Harry Fokkens, Hans Kamermans, Jos Deeben, Daan Hallewas, Jan Kolen, Ronald Wiemer, Eelco Rensink, Philip Verhagen and Milco Wansleebe. Philip, Milco and I co-authored and presented a previous incarnation of this paper at the 4th international conference ‘Archäologie und Computer’ (Vienna 1999, published as Verhagen et al. 2000), and the group as a whole recently submitted a successful proposal for an in-depth study of the role of predictive modeling in archaeological resource management to the Dutch Foundation for Scientific Research (NWO, Kamermans 2001). The chapter presented here, however, substantially reflects my own personal research and opinions with regard to predictive modeling. In it, I argue that many improvements are necessary to the current predictive modeling methodology as practiced by Dutch and international modelers, before the method can be

labeled either reliable or useful; and several likely avenues for future research and development are outlined.

COGNITIVE MODELLING

The third chapter (chapter 6) is concerned with visibility and accessibility modeling, two geographical analysis techniques only recently made feasible and popular among archaeologists by the spread of GIS. Both techniques are being used in attempts to model the social / cognitive, rather than the physical / economic, landscapes of the past. The text of this chapter is substantially enlarged and updated from an article I published earlier (Van Leusen 1999), and critically reviews the majority of accessible archaeological studies based on viewshed and cost surface analysis over the decade 1990-2000. The two techniques are discussed together because of certain similarities in methodology and underlying theoretical principles, which express an emphasis on the human experience of being and moving in the landscape; not surprisingly, they have been at the center of processual – postprocessual debate almost from the beginning. This chapter should be read in conjunction with the case studies presented in chapters 15 and 16, which investigate aspects of ‘dominance’, territory, and accessibility arising from current archaeological thinking about the role of Late Iron Age hillforts and markets in the Wroxeter hinterland, of early Roman colonies on the Lepine Margin, and of protohistoric settlements in the Sibaritide.

FIELDWORK METHODS

The fourth chapter on methodology (chapter 7) deals with the very practical question of how to conduct a field walking survey with a minimum of effort and error, and discusses experiments conducted during the SIBA2000 campaign with the use of self-locating digital handheld computers. This text has been presented by my co-author, Dr Nick Ryan, at the annual conference of CAA (Visby, Sweden, 2001), and will be published in the CAA proceedings for 2002 (Ryan & Van Leusen, forthcoming). The article describes ongoing development of the FieldNote system at the Department of Computer Science, University of Kent at Canterbury, UK. A new version of this portable system for self-location, mapping, and note-taking during archaeological fieldwork, was field tested in October 2000 during a systematic survey in the Sibaritide (Calabria, Italy; see chapter 12). In these tests, the system was used for wide-area mapping tasks for the first time, and proved to be very useful in mapping field boundaries, highland transhumance routes, and archaeological sites to a specified accuracy and in the absence of detailed up-to-date topographic maps. It also proved useful in navigation and in re-locating archaeological sites mapped in the 1960's. The article presents the results of these field tests and discusses their significance for future survey design and methodology, emphasizing the trade-off between speed of operation and accuracy. Lines for further development of the system, including improvements to both interface and functionality are set out as well.

2.2 FIELD WALKING CAMPAIGNS

In this part are collected the preliminary reports of the four field surveys which I conducted between 1998 and 2000 with other members of the RPC project in all three Italian study regions. The reports themselves have already been published or are in press, and are preceded here by a chapter (8) reviewing the aims, approaches, and results of the RPC field work. The Lepine Margin: Ninfa 1998 (chapter 9, Van Leusen 1998) was published in *Assemblage*, on-line journal of the graduate students of the Archaeological Institute at the University of Sheffield; The Pontine Margin: Fogliano 1998-9 (chapter 10, Attema *et al.* 2001) is published in *Palaeohistoria*, the annual journal of the Groningen Institute of Archaeology; The Salento Margin: Ostuni 1999 (chapter 11, Attema *et al.* forthcoming) will be published in *Studi di Antichità*; and the preliminary report on the Sibaritide 2000 survey appearing here as chapter 12 has been submitted for publication in *Palaeohistoria* as well.

It may be asked why field work was included at all in a synthetic project such as the RPC project. There are two reasons for this. Prior to the start of my research, I was unfamiliar with the archaeology and the landscapes of central and southern Italy. The fieldwork has been essential in providing first-hand

experience of the landscape, its scale and characteristic features, the climate, and myriad circumstances which currently preserve or destroy, hide or present archaeological remains. The second and more formal reason is that in providing methodological control over poorly understood regional data sets, the fieldwork represented an essential phase of ‘source criticism’ without which any synthetic work would have to appear of doubtful value.

2.3 CASE STUDIES

The case studies in this part of the thesis explore and demonstrate several of the issues raised in the methodological studies presented in chapters 2, 4, and 6, and most have already been referenced there.

BIAS MODELS

The case studies in chapters 14 and 17 explore the extent of modern land use and research biases in regional archaeological records (cf. chapter 4) at two different spatial scales. Chapter 17 presents an investigation of changes in land form associated with the land improvement scheme to which the Pontine plain was subjected in the late 1920’s and early 1930’s, and their influence on the results of the Fogliano survey (cf. chapter 10). This was the subject of an elective study under my supervision by graduate student Hendrik Feiken during 1999-2000, subsequently presented as a joint paper to the CAA 2000 conference and published in its proceedings as Feiken & Van Leusen 2001. Chapter 14 explores the correlation between land qualities, land use and land cover on the one hand, and the formation of the regional archaeological site record of the Wroxeter Hinterland on the other (see chapter 3 for an introduction). It is found that, whereas most large-scale patterns in this record are strongly correlated to the opportunities for discovery afforded by the combination of land use / land cover (LULC) and research methods in the 2nd half of the 20th century, a historical LULC reconstruction suggests that Wroxeter’s territory has been extremely stable in the *longe durée* – indicating that the subrecent pattern of land use in the region might be similar to that of the late Roman period.

COGNITIVE AND LOCATIONAL MODELS

The case studies presented in chapters 15 and 16 demonstrate issues currently at the heart of the debate on GIS predictive modeling (chapter 5), namely the modeling of ‘cognitive’ aspects of the landscape as opposed to the usual physico-economic modeling. Cases taken from both the RPC project area (chapter 15) and the Wroxeter Hinterland (chapter 16), and ranging in time from the Bronze Age to the Roman period, are used to explore the concepts of dominance and accessibility through the GIS techniques of viewshed analysis and cost surface analysis (chapter 6). These concepts are closely related to those of centralization, urbanization, and Romanization presented in chapter 2.

INTRA-REGIONAL COMPARISON

The discussion of the theoretical basis of, and potential approaches to, interregional comparison of settlement and land use histories in chapter 2 further explored in a case study concentrating on the Pontine region (chapter 13). Two aspects of such comparison are explored in depth: the creation of a GIS-enabled regional archaeological database, and the quantitative comparison of data sets collected within the same, adjacent, and more widely separated landscape units. An attempt is made to assess the extent to which the comparison of field survey results can throw light on the three core processes studied by the RPC project - centralization, urbanization, and colonization – in southern Italy.

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