Deconstructing the Land: the Archaeology of Sacred Geographies

César Parcero-Oubiña

Abstract

This paper illustrates new potential for the application of GIS in archaeological research. The aim of this text is to show how, by means of the application of a structured and detailed methodological procedure, it is possible to apply GIS analysis to the study of some spatial features that lie usually far from the interaction between archaeology and computing. We will illustrate the potential of this strategy with a brief summary of a case study in Galicia. Within our analysis, the role of GIS in archaeology is reviewed, in order to re-evaluate its actual importance. In this way, we direct our interest into the crucial distinction between description (analysis) and interpretation (meaning).

1 Introduction[1]

The enormous analytical power which new technologies (in this case, computers) offer to archaeological study has lead, on many occasions, to a progressive move away from the objectives of archaeological study. These are being undermined by the strong attraction offered by these new instruments for data analysis, and which have become an end in themselves. In other less extreme, but more frequent cases, the application of a particular tool (GIS) to the archaeological record -- particularly in landscape and spatial applications -- has lead to an overvaluing, and even a monopolisation, of the most obvious aspects of the record: those which refer to the use of the environment, whether for productive or socio-political ends. In contrast, the possibility of applying this technology to the study of less obvious aspects, such as the symbolic concept of the space, has been systematically ignored.

We believe that this problem is mainly derived from the excessive importance given to the tools of analysis themselves (GIS), due to their obvious novelty and the wide range of possibilities they offer. Consequently, crucial questions relating to archaeological analysis are being pushed into the background.

In this paper we intend to show how, without having to discover new frontiers in using GIS as a tool, it is possible to obtain more benefits using well-known information analysis techniques. This allows the possibility of applying current methods to the study of non-immediate aspects in archaeological landscapes, enhancing the potential of gaining access to the symbolic concepts of the archaeological landscape.

2 General approach

The following suggestions are not intended as a final product of our investigation, nor do we even wish to offer a theoretical discussion as a foundations for further work. We do, however, consider it necessary to detail the initial concepts which direct our investigation, and the rules which underlie its development -- something comparable to the rules of play. These principles also correspond to the general guidelines of the work carried out by the Landscape Archaeology Research Group in the University of Santiago de Compostela (Spain), of which we form a part. This development may be consulted, for example, in Criado 1995.

2.1 Regarding the use of GIS in archaeology

We do not intend to enter into a wide-ranging process of compiling and criticising the habitual use of GIS in archaeological investigation. Firstly, this is not the aim of this work. Secondly, it is an overly specific task for this study, and thirdly, because readers of this text, situated as it is in a volume which is dedicated specifically to computer applications in archaeology, will already have sufficient understanding of the subject.

What we do intend to do is to clarify what is our position in this area. A position which is not original, and does not intend to be original. The use of GIS in archaeology, as with any other instrument or information analysis technique which may be available, cannot be disconnected from the essence and logic of archaeological investigation. Landscape Archaeology (our line of work) like any other manifestation of archaeological investigation, cannot be dedicated only to the collection and systemisation of data, nor to the processing of this information through more or less sophisticated technologies, such as GIS. The final objective should always be to *generate social significance* from archaeological data and to produce interpretations based on the material under study. In our opinion, archaeology does not differ from other areas which study historical dimensions (Bermejo 1990, Neustupný 1995), although in other aspects it is distinct.

2.2 About landscape

It has already been said that our line of work is Landscape Archaeology (as defined in Criado 1995). This assumption basically incorporates two concepts regarding landscape:

1. We try to analyse those elements which compose the archaeological record, whatever its scale -- from sites (Méndez 1994), to material cultural objects (Prieto and Cobas 1995). These are all treated as objects which are involved in the landscape and are participants within it.

This decision is not gratuitous or random: the landscape appears to us as the most valid *contextual element* in order to fully understand the archaeological record, and the way that this is constituted within a spatial matrix.

2. The landscape is not only a contextual framework but is also susceptible to being converted into another element of the archaeological record. It is possible to understand the landscape as an object in itself, along with certain formal features, which means that it may be analysed and interpreted using archaeological methodology. *The landscape is not only a context, but may also be an object under study*, as it is not just space, but a social product.

2.3 Regarding the archaeological analysis of the landscape

The perspectives from which Landscape Archaeology can be made are very varied and non-exclusive. In fact, it is possible to combine several of them into a single study (Parcero 1995). One of the critical factors which brings about this diversity of approximations is the treatment of *time*.

With respect to this, in this study we propose an analytical approximation which may be able to deal with more than the static analysis of the landscape conceptualised as space. We believe that the potential of incorporating the temporal component will help to enrich this area, primarily through the *diachronic study of different types of landscape superimposed on the same physical space*. This approach conceives the landscape according to the double perspective proposed in section 2.2 and should lead (see section 2.1) to the construction of interpretations concerning correlations or differences detected in different types of landscape.

2.4 The methodology of analysis

As suggested above it is also intended to conceptually distinguish between the fundamental phases of the archaeological study of landscape (analysis and interpretation). Here we can illustrate how this distinction takes shape within the actual process of investigation. The *analysis* of the objects under study should allow for the transformation of a group of physical realities (objects from the real world) which are generally dispersed, unconnected or genetically unequal, into a structured group of recognisable evidence, with perfectly defined formal features, and accordingly without the subjective weight of interpretation.

Interpretation will only be possible if the objects under interpretation have been previously analysed through their non-subjective formal features. We therefore consider it necessary to reconstruct study objects based on *description*, through the *analysis of their formal components*, according to their own rules, and without introducing meanings during the analytical process.

3 The objects of study

Having explained the principles upon which our work is based, we will present the documentation (objects) used for analysis. It is not difficult to guess that, as we are exploring the applications of GIS in the archaeological record, these objects are classified into two groups or classes:

1. Firstly we need a physical, orographical or environmental matrix, which reveals human activity in any historical or prehistoric context. The first object of analysis will accordingly be *space*, understood from an ahistoric or, more exactly, deculturised point of view: space as surroundings, as a simple physical support, characterised by a series of features (forms, relief, geology etc.) which pre-exist human activity and are situated over it (or, more precisely, beneath it). Space, understood in this way, is a passive object (not a subject), and is thus susceptible to objective analysis.

2. Secondly, we define the anthropic component, resulting from the *archaeological record*. In principle, any sub group from the archaeological record is susceptible to this second object of study. However, the more evident and direct that the spatial implications of this record are, then the easier it is to put them in context with the first object under study. The easiest realities to analyse will be, for example, the models of placement and the patterns of site distribution, etc. We propose a non-restrictive vision of the archaeological record, which fits not only the 'ancient' (prehistoric) elements but also the historic and traditional record, including land use in the rural world to juridical, political or symbolic aspects of the socio-cultural landscape in different historical moments.

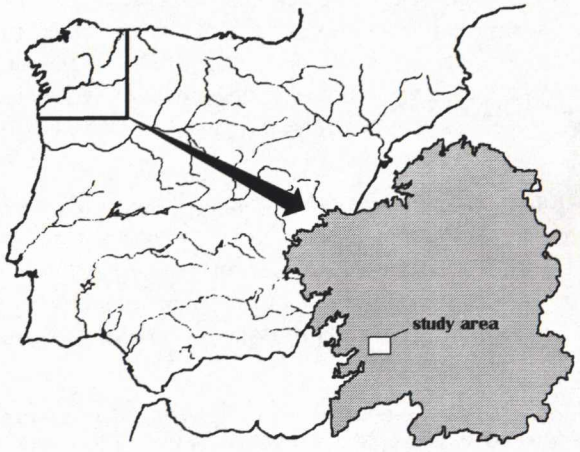

Figure 1: Location of the study area in the Iberian peninsula.

In the following example, the intention is to carry out a diachronic analysis of different types of landscape superimposed in a specific area of Galicia, in the North-western Iberian peninsula (see Fig. 1). This is an area of around 130 km^2 on the western flank of Galicia, near the coast. There are a large number of archaeological elements within this physical matrix, corresponding to different cultural contexts, with the most outstanding being rock carvings from the Bronze age (Bradley et al. 1996) which have recently been integrated into another study (Parcero *et al* forthcoming) We will not consider these now, but instead will deal with the analysis of the following elements of the record:

1. The distribution of fortified settlements (castros) in the Iron Age (ca. 8th Century B.C. – 2nd Century A.D.). There are 11 sites in the area (see Fig. 2) whose exact periods of occupation are unknown (note 2) although they respond to the same type of socio-cultural rationality, which is essentially related to the fact that they are fortified (note 3).
2. The situation of two indigenous-Roman stone inscriptions (see Fig. 2) presumably of a religious nature (parcero *et al* forthcoming)
3. The distribution of the traditional rural population (from the Middle Ages) (see Fig. 3). We have data which allow us to offer a global distribution of population in the area up to the middle of the 19th century (note 4).
4. The traditional judicial boundaries (parishes) (see Fig. 3). At this time it is not clear where the origin of these limits lies. Those which we offer come from at least the start of the 17th century (note 5).

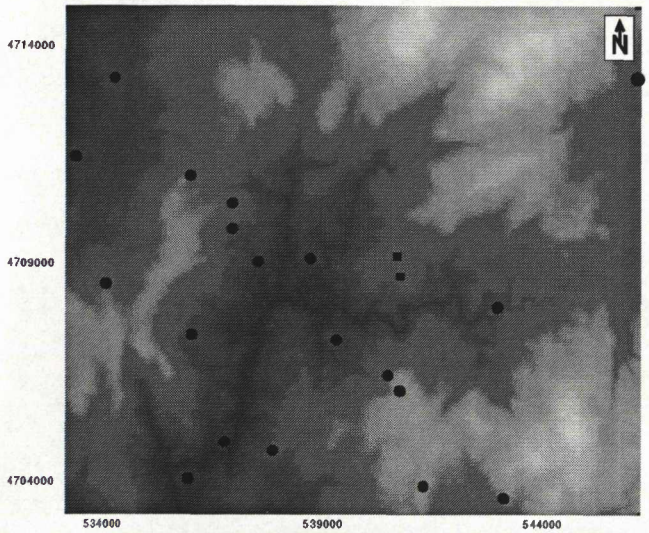

Figure 2: Distribution of Iron Age hillforts (round dots) and inscriptions (square dots) over a DEM of the study area.

4 The procedures of information analysis

We already have a group of data susceptible to analysis. We have briefly indicated what method of analysis we believe to be the most convincing: description. There are various ways of describing objects. Our proposal may be expressed through the opposition between *deconstruction and reconstruction*. Thus, the analytical procedure which we follow is based on breaking down the study objects (physical space and the elements selected from the archaeological record) into their component parts and analysing the formal relationships between them.

The deconstructive process may therefore be understood as breaking down and extracting the minimal formal features which comprise each of the elements under study. For example, the physical medium may be broken down into elements such as slopes, height, hydrological network, plant cover, etc. From this maximum breakdown one may then begin to analyse the relationships between each element, looking for significant correlations between them and enabling the construction of new elements, formed by the combination of the initial elements, etcetera.

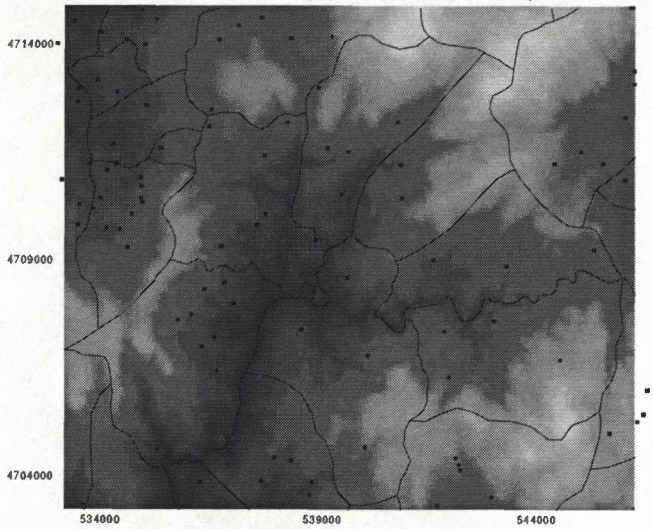

Figure 3: Distribution of traditional villages and parish boundaries over a DEM of the study area.

Each of the study objects previously presented must be broken down in this way and independently analysed. It is only in a second stage when the correlation between the different objects analysed in this way has been provided that meaning and interpretation will emerge.

The role and utility of GIS in each of the stages of analysis is quite clear. GIS becomes an extremely interesting tool for the analysis of data, in the manner suggested here, particularly given their ability to process large amounts of data and the ability to use this facility for the process of deconstructing the objects under study (above all relief). GIS allow for a much more neutral and 'objective' analysis than any other traditional instrument used for this work, as a resultof their ability to obtain statistical indices which support the perceptions and impressions obtained from analysis.

Their use does not end with the first stage of analysis. The ability of GIS packages to connect different types of data is well known (in fact this is one of their essential functions), along with their capability for determining significant correlations and for obtaining differential indices of significance. This use is particularly important as, without access to a GIS, it is unthinkable to check all of the possible correlations between numerous types of data.

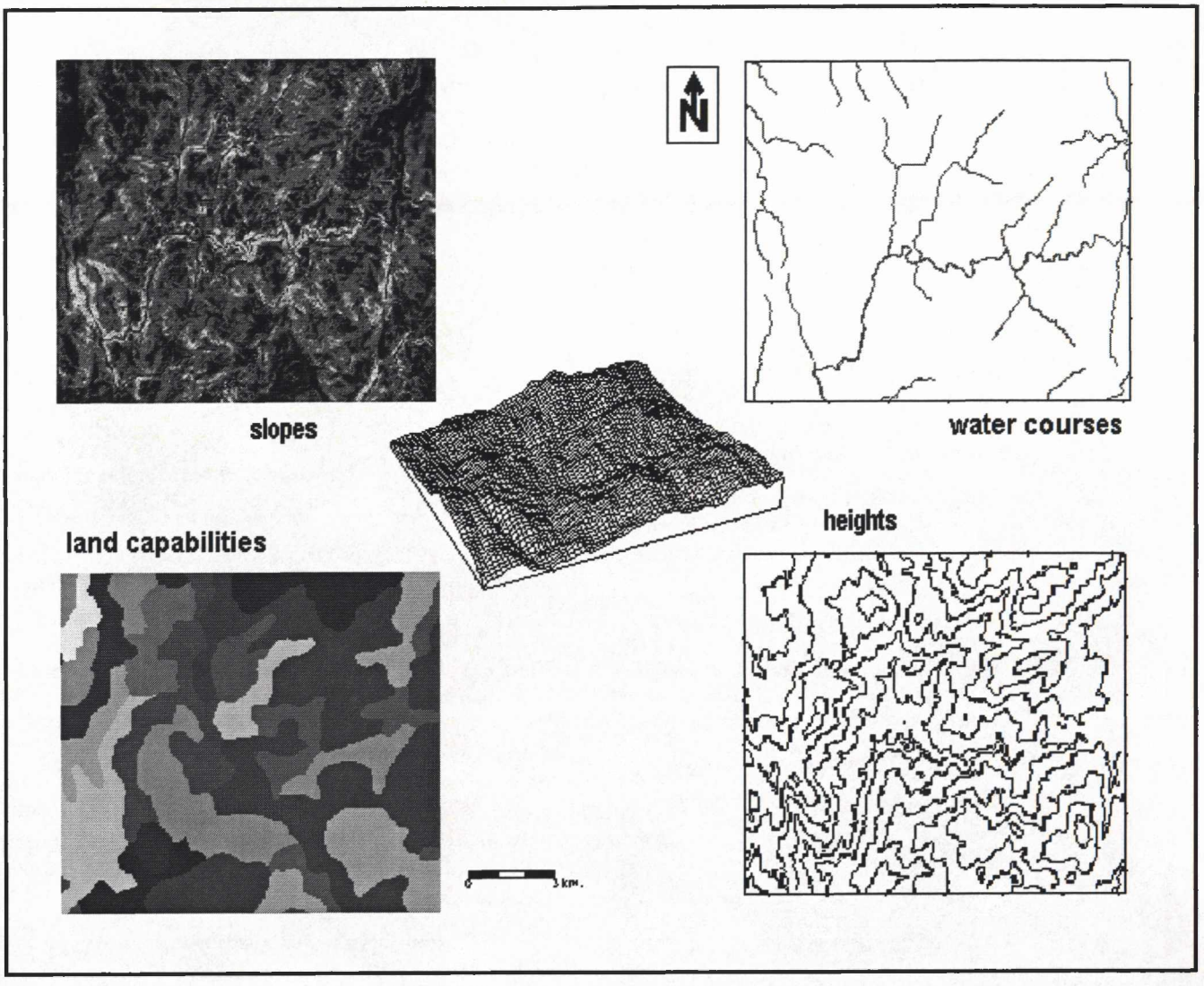

Figure 4: The physical matrix deconstructed into some of its basic elements.

Entering into more detail, the steps which we will follow in the analysis are the following:

1. Independent formal (deconstructive) analysis of the study objects – relief and archaeological documentation. Some elements which may be isolated are:
   - 1.1 elemental forms
   - 1.2 conditions of visibility
   - 1.3 lines of sight
   - 1.4 significant elements and places
   - 1.5 occupation basins
   - 1.6 elements relating to movement
   - 1.7 the hierarchy of elements
2. Investigation of connections between the different types of elements isolated within each group of study objects in order to find significant correlations and groupings. Including, for example, connections between slope maps, the presence of water courses and the nature of terrain order to obtain a new working object in the form of a map of accessibility.
3. The establishment of correlations between objects within both spheres and the determination of the most characteristic elements. Significant correlations can be the relationship between a type of settlement and soil,or with present day land use.
4. From description to interpretation 1: a proposal of hypothetical models which explain these correlations, starting with the most basic models and arriving at general models for each category within the archaeological record. The intention is not to explain the previous correlations through purely causal arguments such as: if A shows a positive correlation with B, then one of them is the cause of the other. The intention is, on the contrary, to produce coherent readings which, paying attention to the contexts from which the data arises (the context of A and the context of B), generate new interpretative factors: if A and B show a positive correlation, then maybe there is a C which relates to both of them. Statistical models are thus created for each of the cultural sequences analysed.
5. From description to interpretation 2: a comparison between the models established in 4, and with correspondences and disconnections being established between them. The product of 4 should be the emergence of a new group of objects for analysis which need not correspond to physical realities but may relate to non-material products, with interpretative models. Now, with

respect to the possibility of analysing superimposed landscapes in the same space, the intention is to find common ground between these models and landscapes, and to bring about new dynamic models in which time is incorporated.

6. The interpretation of models produced in this manner, from the possible existence of principles of organisation and the conceptualisation of the landscape which is similar or different for each of the contexts analysed. The final result is an interpretative discourse capable of explaining the different patterns of construction and conception of a particular space throughout the chosen temporal sequence.

The first three steps are susceptible to the use of GIS. It is clear from this scheme that their use is not the finality of the study (which is incomplete without having arrived to at least the fourth point), nor as an interpretative instrument as such (as they are absent as of the fourth point), but instead they are viewed as :

1. Useful for the management and analysis of large sets of data (an instrument in the truest sense of the word).
2. tools used to objectify the results of the analysis and to reaffirm observations which were apparently subjective.
3. Instruments for contrasting hypotheses derived from using other analytical methodologies.

5 Analysis

Given that the objective of this text is simply to illustrate a procedure in archaeological investigation, we are not going to offer a detailed analysis (this may be consulted in Parcero *et al* forthcoming, where the range of data used is larger). We will offer some brief notes which will give an example of the analytical procedure which was presented in the previous section (note 6).

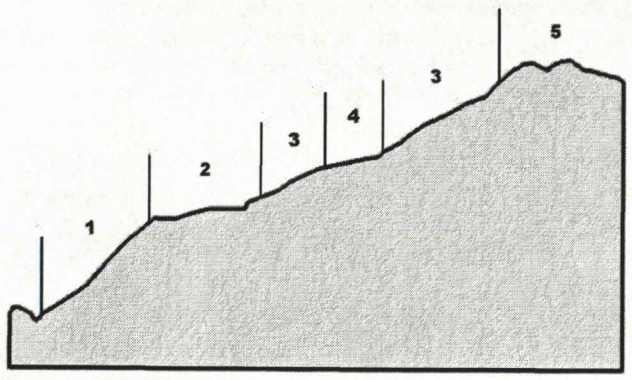

Figure 5: Ideal profile of the study area with the Units of Relief.

The *breaking down* of objects under study is best seen in the treatment of the physical environment. We have basically worked with the following components (see Fig. 4): relative altitude, slopes, type of terrain, distribution of water courses, traditional land use and actual use. From the combination of this series of data, we have defined a new study object and called it *Units of Relief* (in Fig. 5 an ideal topographical profile of the area is shown, and the distribution of each of these units is indicated). Five units were isolated:

1. Slopes above rivers covered with forest.
2. Low and open land, valleys. These are infrequent and are very localised. There is a concentration of intensively used land and of population within these areas.
3. Lateral mountain sides, land with extensive use, today mainly reforested.
4. Flat interfluvial surfaces producing wetlands or marshes.
5. Rocky hilltops with light or non-existent soil cover, used either extensively or not at all.

Moving up one stage in the analytical process, the combination of these elements enables us to obtain new objects of study: these we have called *Relief Sectors*. There are three of these: (see Fig. 6)

1. Central area, with open shapes and clear areas of occupation, with a wide surface occupied by Unit 2 type land.
2. An area, to the East, associated with steep hillsides (Units 1 and 3).
3. An area which repeats, to a lesser degree, the previous characteristics.

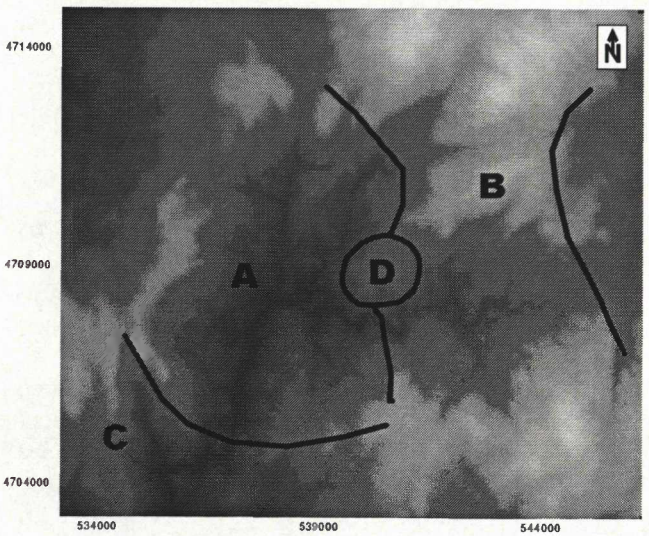

Figure 6: Relief Sectors over a DEM of the study area.

Once the essential forms of the physical space of the working area have been broken down, we are in position to move to a new phase of analysis, incorporating the correlation of the two types of study objects: the physical matrix and archaeological record. We will not go into detail about this analysis, which must basically include the following types of correlation and seek significant similarities or differences:

1. Hill forts-units-sectors
2. Inscriptions-units-sectors
3. Villages-units-sectors
4. Parish limits-units-sectors

6 Results

The results derived from this analytical process may be classified into two main categories, the first preceding the

second: description (static hypothetical models) and interpretation (dynamic significant models).

6.1 Description

The first stage in the analytical process is simply to observe the most significant results from the analysis through a simple succession of descriptions which, at this stage of the analytical process, gives rise to hypothetical models for the different contexts which have been analysed:

1. For the oldest of the cultural contexts studied -- the Iron Age -- two different types of landscape exist together: the occupied landscape, revealed by the presence of hill forts, and the non-occupied landscape, far from settlements, where inscriptions are found (see Fig. 2). Each of these spatial forms is marked not only by different elements of the record, but also because it related to different physical forms (Units of Relief). The second also coincides with the point where differentiated physical formations meet (Relief Sectors).
2. The next cultural context analysed -- the traditional rural world -- provided a new model of spatial occupation. This model, in general terms, is quite similar to the occupation space in the Iron Age. For this period we also know something about the system of judicial boundaries. These follow a certain rationality (connected with water courses and Unit 3 and 5 – type lands). This rationality, however, is clearly and strangely broken in a single point, where the parish limits go beyond the barrier imposed by the river Lérez (note7).
3. The comparison between the two previous points allows us to highlight the similarity between the settlement spaces in both periods, the similarity of patterns of occupation, and the use of the environment in inhabited areas. Logically, important differences also appear, some of degree (an increase in the density of occupation, and an increase in pressure upon the environment) associated with others which are structural and basic and can be used to distinguish between socio-cultural contexts: passing from a fortified model of settlement to another, open, model.
4. Another important point for the comparison of these models is that a singular and significant point in the landscape is marked in both, and this is based on particular physical features, these are cultured in different ways at each moment (inscriptions vs. parish limits), but clearly significant for both periods. This new correlation thus offers a degree of coincidence and difference which is similar to that presented in the previous point for the space of the settlement.

6.2 Interpretation

The final stage consists of giving significance to the previous models, producing an interpretation which allows a wide-ranging understanding of the relationships between the different elements which are superimposed in a precise physical space and which leads, through the sum of various landscapes, to a new landscape to which we have access today. In our case we may offer two types of interpretation:

1. The coincidences we have shown between the two models of landscape analysed should not lead us to think directly in a linear continuity of cultural contents throughout different stages, but that the differences between them should also be considered. In this way one sees the answer to organisational and relative patterns with the environment which are *similar* (in both cases we are dealing with complex rural societies, with similar ways of exploiting their surroundings) but neither of these situations is identical or evolutionary (hill forts compared to villages, inscriptions compared to limits without artificial reference).
2. Concurrences may also indicate the possibility of the recognition of a *sacred landscape* in the area, renewed in the Iron Age and reinterpreted in the traditional rural world. This recognition is possible not only through the reading of two inscriptions of a votive nature (precise objects and not landscape), but above all through their contextualisation with the rest of the objects analysed: space and archaeological record belonging to different contexts.

This is, broadly speaking, where we must finish. Obviously there are many other possibilities of interpretation, and we could drive our lecture to many different ends. But if we are trying to be as close to data as possible, interpretations should stop where data begin to be blurred.

Notes

1 This text is a specific development of part of a larger paper (Parcero *et al* forthcoming). For this reason I am not the single author of the text, but must acknowledge my colleagues Manuel Santos and Felipe Criado. Obviously I am greatly indebted to both

2 Only one of the hillforts has been excavated, demonstrating an early period of occupation and abandonment, within the first Iron Age (8^{th}-6^{th} centuries B.C.) (Álvarez 1986).

3 Compared to other parts of Europe (Hogg 1975, Bewley 1994, Collis 1984), the Iron Age in the north-western Iberian peninsula is characterised by the fact that only fortified settlements exist (hill forts). Also, fortification is a feature almost exclusive to the Iron Age and is only repeated, with notable differences, in the Middle Ages.

4 In this way the changes which occurred in the rural environment from the 1950's and 1960's may be avoided. In any case, it should be remembered that Galicia is a region with an urban and industrial development that has been limited until quite recently. Therefore the survival of traditional ways of life until the middle of this century, and in some areas until even more recently, is noteworthy. The study area also lacks significant nuclei of population. We may therefore consider that this distribution of population until the middle of the 19^{th} century is quite similar to that which existed in the Middle Ages.

5 The parish boundaries may be traced back to, at least, the Middle Ages (XI-XII centuries).

6 We have used IDRISI for Windows 2.0 package developed by Clark University, MA, U.S.A. For the production of the DEM of the study area we used Surfer for Windows 32 v.6.04 from Golden Software Inc.

7 This point is not simply a parish boundary, it is also an episcopal boundary (from at least the XVII century) and for municipalities (from their origin in the XIX century).

Bibliography

Bermejo Barrera, J C, 1990 From the archaeology of religion to the archaeology of simbolic forms: theoretical and methodological foundations. *Dialogues dHistoire Anciene* 16-2, 211-230.

Bewley, R, 1994 *Prehistoric Settlements*. London, Batsford-English Heritage.

Bradley, R, Criado, F, Fábregas, R, 1996 Rock art and the Prehistoric Landscape of Galicia: the results of field survey 1992-4. *Proceedings of the Prehistoric Society* 61, 347-70.

Collis, J, 1984 *The European Iron Age*. London, Batsford.

Criado, F, 1995 The visibility of the archaeological record and the interpretation of social reality, in Hodder, I. et alii (eds.). *Interpreting Archaeology*. London, Routledge, 194-204.

Hogg, A H A, 1975. *Hillforts of Britain*. London, Hart-Davis, Mac Gibbon.

Méndez Fernández, F, 1994 La domesticación del paisaje durante la Edad del Bronce gallego. *Trabajos de Prehistoria* 51-1, 77-94.

Neustupný, E, 1995. The significance of facts. *Journal of European Archaeology*, 3-1, 189-212.

Parcero Oubiña, C, 1995 Elementos para el estudio de los paisajes castreños del Noroeste peninsular. *Trabajos de Prehistoria*, 52-1, 127-144.

Parcero, C, Criado, F, and Santos, M, Forthcoming Rewriting Landscape: incorporating sacred landscapes into cultural traditions, *World Archaeology*, 1998

Prieto, P, Cobas, I, 1995 From landscape to pottery: spatial regularities on Material Culture. Paper presented at the First Annual Meeting of the European Association of Archaeologists (Santiago de Compostela, 1995).

Contact details

César Parcero-Oubiña
Grupo de Trabajo en Arqueología del Paisaje
Departamento de Historia I
Universidade de Santiago de Compostela
15703 Santiago de Compostela
SPAIN
email: phcpar@usc.es