Although agriculturally marginal, the Guadiana river basin has been an axis of connection between the Mediterranean and Atlantic shores of the Iberian peninsula. Nevertheless its archaeological landscape remains mostly hidden. Little effort has been put into regional-scale survey in comparison to other peninsular regions. In this paper we show recent work carried out by the Institute of Archaeology of Merida in this direction. Intensive survey results from the area surrounding the archaeological site of Cancho Roano (Zalamea de la Serena, Badajoz) are analyzed. Our aim is to find a balance between flexible and quick recording methods, and the detailed study of artefact distributions. A wide range of archaeological finds was detected, including very low density scatters. Problems related to ground visibility in pastoral areas, site definition and dating of materials will be discussed. Finally we will consider interpretation of the results in terms of land exploitation during Protohistoric and Roman times.

1. Introduction

In a recent synthesis of the current state of archaeological survey (Ruiz Zapatero 2004), it was noticed that, despite the good health of this type of studies at a European scale, the Spanish panorama presented numerous deficiencies and uncertainties. The 1980s and 1990s saw a stage of enthusiastic embrace of field surveying; a generation of researchers critical of the academic tradition of their teachers formed high expectations regarding its potential for the understanding of people-environment interactions. This was accompanied by a growing awareness of the need of exhaustive documentation on a regional scale for the development of protection and management policies.

However, the increase of field surveys over the years has not been as strong as was hoped at the time. The autonomous regional governments have developed data bases and procedures for the recording of new sites, but have not backed a sustained effort outside the areas affected by infrastructural and urban development. Cases like that of the Community of Madrid, with a systematic and complete survey coverage of its territory, are exceptional (Velasco 2000). Although there have been important academic research projects in which field surveys played an important role, most of these have focused on particular periods, especially prehistory and protohistory.

Another important constant is the limited concern with the specification of methodology, depriving us of the possibility to weigh the validity of the data presented. In consequence, strong regional imbalances persist. There is, for example, abundant information for areas like the Guadalquivir valley (see a comprehensive sample of these activities at www.ujaen.es/centros/caai/) and the coastal plains of Levant (Bonet Rosada & Mata Parreño 2001) and Catalonia (Sanmartí 2001). In contrast, there are still few initiatives to penetrate the mountainous and economically marginal areas, in which fieldwork poses more difficulties and provides fewer rewards in terms of finds (Ruiz del Arbol Moro 2005). This causes an unequal understanding of the historical evolution of the various peninsular landscapes. We are still far from being able to sketch broad diachronic developments in extensive areas.

2. Looking to the far west: survey projects in Extremadura

We want to illustrate this theme here by presenting the situation in one specific area: the peninsular southwest, and in particular the region of Extremadura. Although this region has been the object of several systematic field surveys, it cannot be said that there were strong links between the different projects, or that they have been properly published.

The most intensively studied part of the region has been the middle course of the Guadiana river. Prehistorians interested in Chalcolithic settlement patterns developed systematic work along the valley and across a series of tributary streams (see a description of the survey at www.departamento.us.es/dpreyarq/web/vhp1.htm). More selective work has been done looking for the location of protohistoric tumuli (see below; Duque Espino 2007). By contrast, a great part of the region is occupied by mountainous terrain covered by Mediterranean oak woodlands (the so called dehesa). In these areas only selective surveys were conducted, aiming to identify characteristic set-
lement types like Iron Age hillforts. This work has been mainly guided by toponymy, aerial photography and local informations. An interesting sampling experiment was developed by Martín Bravo (1994) in order to assess the probability of finding sites in flat areas. However, the surroundings of some of these settlements have provided evidence of intense occupation. This concern for the off-site record is reflected by the undertaking of intensive surface surveys within a radius that, more or less explicitly, is identified with the natural area of resource catchments. This kind of survey was carried out around the Middle Iron Age settlement of Villasviejas del Tamuja (Botija, Cáceres; Hernández, Bravo & Galán 2009) and the early Iron Age building of La Mata (Campanario, Badajoz; Rodríguez Díaz 2004).

Within this context, from the end of the 1990s, a research program has been developed by the Merida Institute of Archaeology that focuses on the archaeological survey and analysis of the Serena region in Extremadura (fig. 1). This work departs from a long-term study of a very singular archaeological site: the protohistoric building of Cancho Roano (Celestino Pérez & Jiménez Ávila 1993, Celestino Pérez 1996, 2003). Detailed knowledge of this enclave, excavated in its totality, unavoidably led to the need to explore its territorial context by means of intensive field survey. In the face of the fierce debate over its function, we hoped to obtain a complementary view from the surrounding territory.

We bounded the survey using a 3 km buffer around Cancho Roano (fig. 2), departing from the assumption that there would have existed some kind of interaction between the building and the nearby contemporary sites. We also assumed that the distribution of the latter could tell us something about the productive and social logic that governed this relationship. The overall objective of this work was, however, to study the evolution of the agrarian landscapes of the area from prehistoric times up until the most recent past. Indeed, a key aspect of research into the history of human occupation in the region is the apparent collapse of the population in the 5th century BC, following the violent destruction of Cancho Roano and other monumental buildings of the area.

3. Intensive survey in the Serena region
3.1 Methodology
The methodology followed in the intensive survey tried to achieve a balance between quality of data and work investment. We were fully aware of the limitations that would arise from ignoring the fuzzy boundaries between the archaeological sites and the ‘background noise’ detected between them. The survey thus set out to record the density of surface items throughout the entire landscape. Our specific procedures employed the current agrarian field boundaries as the basic working units. The location of materials was marked and recorded with GPS...
receivers. Clusters of up to five fragments and/or materials that showed no clear concentration were recorded as point features. When it was possible to define a clear scatter, the finds were recorded as an area feature.

As a complementary measure, the entire survey area was subjected to random sampling, intended to verify the reliability of density estimations produced by this type of study. For this work we used a recording system that enables the easy location and delimitation of the areas to be sampled, and the fast recording of the requisite information. Sampling units were outlined as circles of 15 m radius, their coordinates pre-loaded in a GPS receiver and then located in the field by navigation. Once found, the sampling area was defined with the help of a tape measure. A fixed time was established to search and recover sherds inside. Forms were designed to obtain a detailed description of the sampled area (land use, ground visibility, topography…). We took away every sherd, and description and quantification of the materials was carried out in the laboratory.

An additional approach based on remote sensing techniques proved to be very successful. The fusion of Landsat TM and Spot Pan images of the survey area pointed to several places of interest: NDVI values showed abnormal moisture in nine locations, seven of which were confirmed as protohistoric sites by ground verification (Nieto Masot et al. 2003).

3.2 Data analysis: general procedures
Although for various reasons the analysis of the ceramic materials has not yet been completed, we have enough information to begin our analysis of the spatial distribution of the finds. The first step has been to define variables that in our opinion may indirectly reveal patterns of location and occupation of the landscape. A central aspect has been to verify the hypothesis that Cancho Roano was placed in a very special location. To explore this hypothesis, the degree of accessibility between the building and the surrounding sites was explored, and topographic prominence and cost weight in time units were quantified. The visual relationship between Cancho Roano and its surroundings was analysed by calculating of cumulative viewshed values for all of the sites.

With regard to the distribution of the evidence throughout the entire survey area, we have analysed variables relating to the potential productivity of the terrain. A scale of suitability was designed on the basis of available parameters (distance to elements of the hydraulic network, drainage capacity of the soil, slope, potential sun exposure, and underlying geology). The strategy followed in the search for patterns first required the characterisation of point distributions. Density maps and tests such as Nearest Neighbour analysis were carried out to enable us to observe the existence of significant clustering. Tests were then applied to independent samples in order to explore the possible role of particular landscape parameters in the formation of these clusters. The distribution of variables describing the contents of the material scatters (weight and number of fragments) was analysed, as well as the characteristics of the terrain in which they were located. For each period, the population was set to the totality of locations with archaeological finds. However, the differences between the more diffuse and the more consistent scatters were also analysed. In both cases, the actual archaeological distributions were compared against randomly generated samples. Finally, we compared the information belonging to protohistoric and Roman chronologies.

Beyond the confirmation or negation of the existence of differences in the spatial distribution of settlements and potential resources, we wanted to calibrate the intensity of the correlations, between them, although this part of the study has yet to be elaborated.

Figure 3 – Survey methods employed: a. full coverage survey; b. sampling survey.
3.3 Protohistoric settlement around Cancho Roano

As a result of the survey numerous traces of Iron Age settlement were identified that we were careful, at first, not to interpret as ‘sites’. In some cases these formed clear clusters, while in others it is more likely that the materials are evidence of the exploitation of the territory in the form of places of restricted activity or field manuring.

An initial visual approach to the protohistoric colonization of the study area can be performed through the creation of density maps. As can be observed (fig. 5), once this calculation is carried out for the totality of finds, we can define a series of areas of maximum density in the tributary streams of the Cagancha and along this river within a radius of approximately 1km around Cancho Roano. We can define at least three *foci* that should be identified as small ‘sites’. The chronology of these groupings has been determined with some degree of certainty. Materials such as amphorae and grey ware are well dated from the early 7th century to the early 5th century thanks to excavation contexts such as at Medellín and at Cancho Roano itself. It cannot however be excluded that other materials of less diagnostic value, documented in some of these places, may in fact correspond to later occupation phases, particularly...
of Roman date. But as we have seen, there exists a much larger number of sites, up to 11, that can also be framed within the same chronology. This number does not take into account the important concentration of materials within 200-250 m from Cancho Roano itself, whose assessment is problematic. On the one hand, it is reasonable to interpret this material as the ‘halo’ of residues that a continued occupation produces at most habitation sites. However, it cannot be ruled out that much of it is caused rather by the numerous disturbances and alterations to the area, including the transport of earth from the excavation of the building itself.

The global distribution of protohistoric materials at a five kilometres range from Cancho Roano displays little intensity, and is mostly associated with the fluvial system. This obviously points to a tendency for the location of settlements to prefer the least prominent areas with the greatest drainage capacities. A look at the distribution of distance-to-watercourses indicates that this tendency is stronger in the case of the more important scatters (fig. 6).

There is, in any case, little topographic contrast in the landscape, and human occupations did not stand out visually in their immediate surroundings. In fact quite the opposite turned out to be the case: considering the average elevation of the locations, a non-random behaviour can be suggested which is confirmed by the results of independent sample tests. The building of Cancho Roano itself, for example, is camouflaged in the terrain, right next to the riverbank of the Cagancha.

3.4 Land exploitation and rural power in the Guadiana valley

Constructions similar to Cancho Roano (although with a much less clear religious component) can be found throughout the middle course of the Guadiana river (Rodríguez Díaz et al. 2004b, Jiménez Avila 1997, Rodríguez & Ortiz 1998). These have been interpreted as rural palatial residences, where the monumentality of the buildings contrasts with the low visibility of a great number of surrounding sites with protohistoric pottery (fig. 8). The latter are usually located in flat, open places close to small streams, and do not show evidence of defensive works or other large structures. Quite often their surface record includes sets of saddle querns and storage vessels. Excavations of some of these show very small, domestic-scale agricultural activities (Rodríguez Díaz et al. 2007), and they are currently interpreted as small farms managed by peasant families dependent on the authority of the ‘palaces’. The dispersed nature of this population could, indirectly, enable us to delimit the aristocratic domains. Agricultural colonization in this area was achieved by these rural centres of power, which have been considered as the centres of great fundi. This constitutes a remarkable difference with the settlement dynamics in other parts of the peninsula, like the upper Guadalquivir valley during the Early Iron Age, which are characterized by a strong process of nucleation in urban settlements.

At the end of the 5th century this vigorous rural flourishing was interrupted by the abandonment of the monumental buildings. The excavation at Cancho Roano shows evidence of a ritualized and well-planned destruction of the building by fire, and the nearby site of La Mata was also destroyed by fire. Following this collapse, the visibility of the Middle Iron Age occupation in the La Serena region is very low. We know about a small number of fortified villages identified by selective survey in strategic places along the main rivers and mountains, but evidence for single farms is nearly absent. The preliminary examination of the pottery collected during our survey suggests, however, that a small number of the small sites around Cancho Roano survive during this period. This evidence of continuity should widen our perspectives on the study of scattered rural habitats after the end of the monumental buildings. Research carried out in Central Alentejo (Portugal) show a similar phenomenon of humble continuity, after a peak in rural settlement during the first Iron Age (Mataloto 2004).
The Serena landscape seems to remain quite empty during the 4th and 3rd centuries BC, or at least there is a lower population density, mostly concentrated in hillforts. But at the end of this period, with the Roman conquest, we can observe again two clear and new occupational phenomena. First, a series of large and fortified settlements were developed, that can be identified as *oppida*. These seem to be related to the exercise of strategic control over the territory; the one closest to Cancho Roano is Magacela (Rodríguez Díaz & Ortiz Romero 2003). Second, selective survey has identified an ensemble of buildings of large stone masonry whose function is disputed (Ortiz Romero 1995, Ortiz Romero & Rodríguez Díaz 1987, Rodríguez Díaz & Ortiz Romero 2003). These very small structures consist of quadrangular towers surrounded by one or more walled enclosures. Their occupational sequences begin in the 2nd century BC.
and continue through to the Imperial period; one such site is located at a short distance (700 m) from Cancho Roano.

We cannot expand much on the behaviour of the Roman finds distributions. Independent sample tests do not point to the existence of significant changes in topographic prominence values compared with protohistoric finds. The R values of nearest neighbour analysis are quite similar in both periods. However, the average distances between settlement traces indicate a greater degree of clustering than in protohistoric times, while the less well-defined scatters are more abundant and more widely dispersed than in the previous period.

4. Discussion

We will close this paper with a brief commentary on some of the problems encountered and on future research lines. Regarding the field survey, a recurring problem was the existence of strong contrasts in ground visibility. Most of the area was occupied by open oak woodland, often left fallow or under pasture. To avoid this bias, we opted to revisit fields that had not been ploughed during the first reconnaissance. However, some non-cultivated areas could not be surveyed at all. No corrective index was adopted for land use or ground visibility.

The issue of site definition is also problematic. Traditionally arbitrary thresholds tend to be set to establish ‘significant’ groupings in the density of finds, but we feel that its hardly possible to set clear boundaries, especially in areas with some nearby small clusters. A quantitative approach based on raw counts per surface unit must be complemented with a more detailed recording. Sometimes what is considered a ‘site’ according to the number and density of sherds, reveals a pattern of size, roundness and fragmentation that rather suggests off-site activities like manuring. The need for geoarchaeological studies is equally pressing, if we want to refine our understanding of the significance of the surface scatters and to calibrate the magnitude of the alteration processes.

Another fundamental need is for a more intensive study of the materials recovered in order to date the scatters. The lack of typological parallels causes great chronological ambiguity over long periods, and the sequence at Cancho Roano spans approximately 300 years. Even more urgent is the problem of the low visibility of particular periods, such as the Second Iron Age which finds itself ‘squashed’ between two phases characterised by a much more obtrusive and monumental record.

Finally, we would like to repeat that the difficulty of establishing comparisons with other nearby survey projects is a major determining factor in the persistence of our ‘hidden’ landscapes. Differences in the theoretical and methodological backgrounds have led to the use of very different recording criteria and categories of analysis. This is, for example, the case with the intensive field survey in the surroundings of the building of Mata de Campanario, with a similar chronology to Cancho Roano and located only 18 km away (Rodríguez Díaz et al. 2004a). It is remarkable that, even when applying the same ‘magnifying glass’, the use of different methodological and analytical filters perpetuates the imbalances in our understanding of the historical evolution of the landscape.

To conclude, intensive survey around the site of Cancho Roano has provided us with a detailed picture of the archaeological distribution in a limited space. This task was conditioned by the previous development of research, and it is now imperative to consider a broader view by means of extensive field surveys. This is currently our main objective. Recent campaigns are offering new results. The aim is on the one hand to calibrate the representativity of the archaeological record in different landscape units. On the other hand, we hope to cover sufficiently large spaces in order to assess the existence of territorial structures throughout time.
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