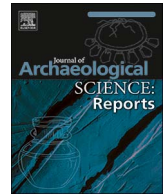




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An approach for understanding site location preferences on Pas River Basin during Late Magdalenian. Landscape analysis of Las Monedas cave

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ABSTRACT

Research on Upper Paleolithic hunter-gatherer societies has traditionally been based on the analysis of archaeological remains resulting from daily activities. However, the selection of a site and its functionality expresses a set of social paradigms from these human groups. The development of specific methodologies and especially a theoretical framework have enabled research on the locations of sites understood as an important dimension of archaeological research. The aim of this paper is to examine the location variables that characterize the settlement of Middle Pas Basin. Las Monedas cave contains an important Paleolithic graphic ensemble dating from the Recent Magdalenian. The lack of a stratigraphic sequence leads us to believe that its occupation could be related with Recent Magdalenian levels from El Castillo cave. By means of settlement pattern analysis we explain the relations between these sites and the others from Monte Castillo.

1. Introduction

Traditionally, studies of Paleolithic societies have been focused on the identification and characterization of archaeological remains without paying attention to the landscape as a socialized element. However, the occupational contexts cannot be understood -cave, rockshelter or open air site- as simple containers of materials. The choice of a particular place for settlement is not a trivial matter. Geographic and geomorphological variables that characterize the site are involved in the selection of the site. Therefore all formal and placement factors can be understood as an archaeological record. In addition to the formal characteristics, the placement, the access to resources, control of strategic points or the living conditions of the landscape are also important issues in the choice of the settlement and must be integrated into the studies of these Paleolithic societies (García-Moreno, 2013a; García-Moreno and Fano, 2011, 2014; García-Moreno *et al.*, 2014; Fano and Rivero, 2012; Costamagno and Fano Martínez, 2005; Jones, 2010).

These studies acquire more significance when the functionality of the sites could be known. Intra-site analyses allow, in a tangible way, the identification of activities developed in each site and, at the same time, the ability to attribute functionality (Corchón *et al.*, 2014; García-Moreno *et al.*, 2014; Eriksen, 1997). The lack of an adequate methodology to address this problem has meant that the assignment of the

functionality to the majority of sites lacks a solid foundation on which to construct a valid discourse (*cf.* Utrilla, 1994; Conkey, 1980). Selection of a determinate settlement versus other sites also has implications for social issues that transcend quantifiable data. The symbolic importance of landscapes is also a very relevant factor in the settlement patterns, but sometimes could remain unknown (Tilley, 1994; Criado Boado, 1993).

In this paper we investigate the living context of the Middle Pas Basin during the Recent Magdalenian. In order to understand settlement patterns of Magdalenian societies, variables that characterize the Pas Basin landscape will be analyzed (Fig. 1). The application of a specific methodology designed to address these questions requires the use of GIS (García-Moreno and Fano, 2011, 2014; García-Moreno *et al.*, 2014). This research will focus on characterizing the factors that determine the occupation of Las Monedas cave. The Upper Paleolithic occupation of this site is limited to the decorating phase from the Recent Magdalenian, without further evidences of habitation. On the contrary, other sites of the same karst, as El Castillo cave, preserve an extensive stratigraphic sequence and different phases of rock art, which proves a continuous occupation.

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Fig. 1. Location of the caves analyzed.

2. Las Monedas cave and other Recent Magdalenian sites of the Middle Pas Basin

2.1. Geomorphological context

The Pas Basin is located in the central zone of Cantabrian region, bordered on the south by the Cantabrian Range and on the north by the Cantabrian coast.

The Cantabrian region is a territory characterized by its strong relief. It comprises three differentiated units: the Cantabrian Mountain, a front of alpine origin with an altitude of around 2000 m in this region; a pre-littoral platform with some mountain formations originated by the sedimentation of soft-sediment; and a coastal region, which is characterized by dune littoral systems and estuaries of greater amplitude given the calcareous Mesozoic materials of the substrate (Hoyos Gómez, 1989).

These territories are characterized by formations of Mountain Limestone (Namurian limestone). This was eroded by different river basins, oriented S-N, in favor of substrate fractures (Hoyos Gómez, 1989; Cabrera, 1984). These river basins run in a short space between 25 and 50 km, from the source of the river to the mouth.

The short distance between the mountain range and the coast results in a narrow littoral fringe that encases the fluvial system. Consequently the region is compartmentalized in the different river basins, perpendicular to the coastline.

The Pas basin responds to these general characteristics, but its formation dates to the Quaternary as a result of erosive, rather than glacial processes (Cabrera, 1984). Along the course, the river runs oriented E-W from the mountain landscape (High Basin). In the Middle Basin and the estuary and coastal platform flows perpendicular to the coast.

All these landscapes present different biotopes. The diversity of biotopes was certainly a relevant factor for the Paleolithic societies that inhabited the region. The different scenarios provided a broad spectrum of resources. That is an essential element for understanding the mobility dynamics of Paleolithic societies (Fig. 2).

2.2. Archaeological context: Upper Paleolithic human occupations at Monte Castillo

Las Monedas Cave (Cantabria) is located in Monte Castillo, as a part of a group of Paleolithic deposits and decorated caves. This karst has three other decorated caves dating to the Upper Paleolithic (El Castillo, La Pasiega and Las Chimeneas), and another cavern with occupations from the Middle Paleolithic (La Flecha).

According to the data available to date, the Magdalenian occupation of the middle valley of the Pas River is largely restricted to the caverns of Monte Castillo. For this reason this study is limited to the four main caves of this hill. It should be stressed that, Magdalenian societies were not the first to colonize this landscape.

The oldest evidence of human presence in Cantabrian region can be found at El Castillo Cave. The lower layers (24 and 25) of this cave's long sequence belong to the Lower Paleolithic (Cabrera, 1988; Cabrera

and Neira, 1994). The Middle Paleolithic is more widely represented in the caves of the karst. Well exemplified at El Castillo (Cabrera, 1984), occupations from this period have also been identified in the cave of La Flecha (Freeman and González Echegaray, 1967). Finally, Mousterian artifacts have also been found in the caves of La Pasiega (González Echegaray and Ripoll Perelló, 1954) and Las Monedas (Carrión and Baena, 1998). The Aurignacian and Gravettian periods are represented in the archaeological sequence of El Castillo (Cabrera, 1984), but also on the walls, with the existence of many figures from the Early Upper Paleolithic. It is also probably present at La Pasiega, where some of the representations seem to fit better in an Early Upper Paleolithic style (González Sainz and Balbín Beherman, 2010), but in this site no archaeological layers from that period were identified. Solutrean and Lower Magdalenian occupations have also been recognized in both caves (Cabrera, 1984; González Echegaray and Ripoll Perelló, 1954) and some figures of their parietal sets could correspond to that periods. In Las Chimeneas cave, the absence of any archaeological context makes it more difficult to understand the chronology of the decorative phase/s. Traditionally, they have been suggested to represent a single phase, dating to the end of the Solutrean, on the basis of the style and the "homogeneity" of the rock art (Leroi-Gourhan, 1965). Direct dating by ^{14}C -AMS of two paintings has, however, led to a two different results (c. 16,300 and c. 15,200 cal. BP, respectively) both of which were more recent than expected (Moure Romanillo et al., 1996). Therefore, the chronology of Las Chimeneas parietal art remains under discussion.

Aside from Las Monedas cave art there are other samples that indicate the presence of Recent Magdalenian societies. At El Castillo cave, Recent Magdalenian occupation corresponds to level 6 of the stratigraphic sequence (Cabrera, 1984). Several graphic representations inside of the cave were also associated to this period.

In addition to those stylistically dated, several figures of this set have been dated directly by ^{14}C AMS. These data proved that at least five of them were made during Magdalenian (Valladas et al., 1992; Moure Romanillo et al., 1996). In the cave of La Pasiega, vestiges of the human presence during the Recent Magdalenian were identified. Although in the archaeological excavation no layers from this period were found -only Solutrean and Lower Cantabrian Magdalenian (González Echegaray and Ripoll Perelló, 1954)-, inside the cave there are numerous examples of representations from Recent Magdalenian. Stylistically identifiable motifs of the Recent Magdalenian are spread along the four galleries of the cave (A, B, C and D), although there is a special concentration in Gallery C. Two figures of this area were dated directly, providing both a result from this period (Moure Romanillo and González Sainz, 2000).

3. Materials and methodology

Las Monedas cave was discovered in 1952 by a local inhabitant, who reported to the Administration and several specialists. The same year, fieldwork began and a series of brief articles notifying the discovery and the relevance of rock art were published (González Echegaray, 1952a, 1952b; Ripoll Perelló, 1952a, 1952b, 1953, 1954,

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