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Chronology of western Pyrenean Paleolithic cave art: A critical examination

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ABSTRACT

The last two decades have witnessed considerable advances in chronometric approaches to cave art, specifically with the application of new dating techniques (AMS ^{14}C, U-series, Thermoluminescence). In this paper we assess all the currently available chronological information (numerical dates, stylistic comparisons between portable and cave art, the immediate context of art and its relationship with archaeological strata and wider artistic styles) pertaining to cave art of the western Pyrenean and eastern Cantabrian regions, in order to summarize the evolution of art in this important area. The data allow only an imprecise definition of a broad chronological framework for the area of study: at present we cannot define precisely the origins of figurative cave art in the area; the earliest (Pre-Magdalenian) cycle is characterized by basic figures in which, frequently, only the outline is represented. By contrast, in the later (Magdalenian) cycle the figures are naturalistic and realistically composed. The critical analysis of available chronological information is necessary in order for us to advance towards the construction of more solid and less subjective frameworks for the development of art.

1. Introduction

Over the last two decades research into Paleolithic cave art has mostly focused on the application of numerical dating, particularly AMS ^{14}C, more recently Uranium series, and occasionally Thermoluminescence (TL) (Pettitt and Pike, 2007; Ochoa, 2011; Pike et al., 2012; Valladas et al., 2013, 2001). Of these, AMS ^{14}C has been the most common technique, and has provided much valuable information. Despite this, however, a large number of AMS ^{14}C dates obtained for art in the Cantabrian region contradict archaeological data; many of the dates produced are post-Paleolithic in age, and when one takes into account results on multiple samples taken from a single graphic figure the results are frequently inconsistent, i.e. statistically distinct from one another (Ochoa, 2011). Such contradictions can be ascribed to the different composition of each sample; the presence of bacterial communities within them, and various other processes that could have contaminated each sample (Hoyos, 1993; Hedges et al., 1998; Fortea, 2000, 2007; Scharebereiter-Gurtner et al., 2002; Balbín-Bermann et al., 2003; Pettitt and Bahn, 2003; Valladas and Clottes, 2003; Valladas et al., 2005; Pettitt et al., 2009; Combier and Jouve, 2012). Another distinct issue is the relationship between the carbon dated (i.e. the production of the charcoal) and the process of using it to create the art of concern, which may not be straightforward (Pettitt, 2008).

The U-series dating of calcite flowstones (stalactites) with demonstrably clear stratigraphic relationships with cave art will provide minimum (*ante quem*) and maximum (*post quem*) dates for the art. Thus, because it is critical that the stalactites have a clear and unambiguous relationship with the art, sampling of stalactites for dating must be precise, as the stratigraphic relation between the sample and the art must be unchallengeable (Pike et al., 2012). The importance of the U-series method is that it can provide dates for engravings and figures traced with non-organic pigments that have hitherto been undatable. The application of the technique has been particularly important for figures that have been ascribed to pre-magdalenian periods on the basis of non-chronometric information (Breuil, 1952; Leroi-Gourhan, 1965), and thus form an important independent check on our assumptions. Today, the accuracy and precision available for the resulting measurements allows us to work with much smaller samples than even those of a few years ago (Hellstrom, 2012), and even to obtain a series of dates in

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stratigraphic order through a section of calcite (Pike et al., 2012). This method requires a previous evaluation of the quality of the calcite that has been selected for dated, as expressed by H. Valladas (in Balter, 2012).

TL dating, which requires similar attention to the quality of flowstones and their relationship to art as U-Series, has as yet been rarely applied to cave art. Results obtained with this method can be questioned on the grounds of the method's precision with a standard deviation typically around 10%– due to the difficulty of measuring the radiation dose (α, β and γ) in samples that have been continuously exposed to the air (Beneitez et al., 2001).

Traditionally other non-chronometric methods have been applied with varying success to date the execution of Paleolithic cave art (GRAPP, 1993; Lorblanchet, 1995; Pettitt and Pike, 2007; García-Díez and Ochoa, 2013). The stratigraphic covering of depictions by a datable archaeological layer; the relation of the depictions to the height of the cave's floor; archaeological materials that can be demonstrably related to the artistic activity; and the formation of geological deposits in association with the art can all contribute to relative estimates (maximum and/or minimum dates) of the age of the art's production. For this reason, a firm understanding of the chronology of cave deposits and the sedimentary processes that contributed to their formation are essential starting points. Traditionally, the immediate context of the art –and often, erroneously, cave's occupational context– has been used to establish phases of artistic activity, although it is critical that the relationship between the art and its spatial and archaeological context is established on the basis of a clear material link –i.e. pigments (ochre, manganese, charcoal) used for art and spilled into archaeological strata; objects (bones, shells, stones) used to contain or prepare such pigments for use; or tools recovered from archaeological strata demonstrably used to create engravings. Only by doing so can one be certain that there is a clear relationship between the archaeological strata and the artistic activity. Parietal stratigraphy (the superimposition of figures) was the first relative dating method (Alcalde del Río et al., 1911; Breuil, 1952), although while the intellectual foundations of the method are sound, its limitations must be considered, as it can only indicate stratigraphic relationships and cannot specific how much time has passed between the execution of each separate phase of depictions. In many cases a long time lapse is assumed, although this does remain to be demonstrated. Following the observation of superposition, the formal stylistic comparison between parietal art and portable art recovered from datable archaeological contexts is one of the most commonly employed relative dating methods. This technique deploys formal stylistic and technical criteria in the search for formal similarities between specific examples of art, in cases where the natural of such depictions has not been conditioned by specific techniques of production and/or the nature of the cave walls. Accepting this premise, the method proposes that similar artistic styles should be broadly synchronic. Through the combination of stylistic comparison and parietal superimposition, researchers have been able to suggest a number of specific stylistic series (phases) and organize these into regional sequences. Following such phases, cave art can be assigned to broad chronological periods, even if in most cases its precision is limited.

The last few years, therefore, have seen major advances in the chronological understanding of cave art, but the complex problems regarding sample contamination, contradictions between the resulting chronometric ages, ambiguous relationships between the sample and the depiction selected for dating and, finally, the specific nature of cave art render it essential to consider the widest set of available information when adopting a critical approach to cave art.

2. Objectives

The main objective of this article is to (i) evaluate the currently available chronological information for the Paleolithic cave art sites of the western Pyrenean and eastern Cantabrian region, and (ii) summarize, with the available information and its limits, the evolution of cave art in this area.

3. Regional setting and Paleolithic cave sites

We take as our sample all sites containing Paleolithic cave art located in the western Pyrenean region, ranging from the western half of the Pyrenean range and its zone of immediate influence, the eastern area of the Cantabrian region. The geographical nature of this area (Fig. 1) suggests that it was a natural space for

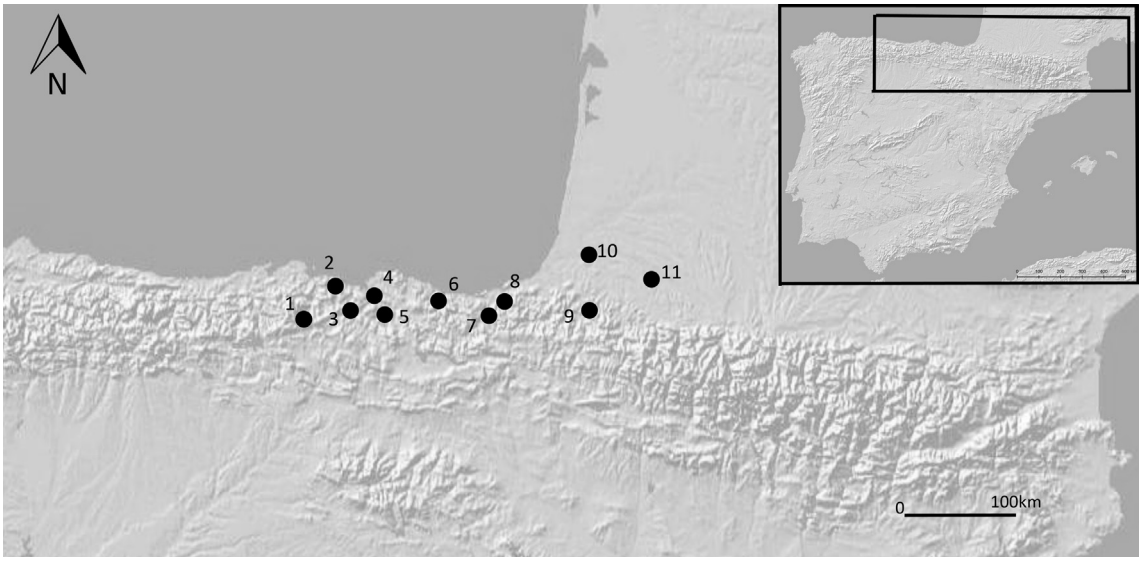

Fig. 1. Location of the caves with Paleolithic cave art in the western Pyrenean region. 1. Covalanas, La Haza, El Mirón, La Luz, Cullalvera, Pondra, Arco A, B, C, Venta Laperra, El Rincón, Sotarriza, Morro del Horidillo; 2.Urdiales, El Cuco, La Lastrilla, Juan Gómez, Grande; 3.Arenaza; 4.Santimamiñe, Antoliñako-koba, Lumentxa; 5.Askondo, Atxuri; 6.Praileaitz, Astigarraga; 7.Ekain; 8.Altxerri, Aitzbitarte IV; 9. Alkerdi; 10. Isturitz, Oxocelhaya, Erberua; 11. Etxeberri, Sinhkole, Sasiziloaga, Sainte-Colome (Tastet).