**DATING ROCK ART BY ARCHAEOLOGICAL REASONING - AN ANTIQUATED METHOD?**

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The background to this paper is provided by an investigation into Chauvet Cave (Chauvet *et al* 1995). Due to scientific dating, this cave is generally thought to date to the Aurignacian period despite this being in stark contrast to knowledge of the development of Ice Age art that has been gained through archaeological methods (Züchner 1995a, 1996, 1999). However, we are not going to deal with the Chauvet Cave itself but instead discuss which archaeological methods are apt for determination of the age of Palaeolithic rock art. The common attitude to these methods is that they are highly subjective whereas, as a rule, scientific dates are accepted as objective and reliable. Owing to the uncritical belief in science (cf. Rosenfeld, Smith 1997), the importance of which is undoubted, the other possibilities available to archaeology for dating rock art are losing ever more support. Here, what is being referred to is “archaeological methods”, rather than “stylistic dating” or suchlike, in order to ascertain that when determining the age of rock paintings in effect the same procedures that are common and successfully used in prehistoric research can be adopted. Unfortunately, these are not always applied with the necessary precision, which leads to misjudgements that in turn make some scholars doubt the method itself. Occasionally the chronological scheme that was developed by Leroi-Gourhan on the basis of archaeological studies (Leroi-Gourhan 1965) is presented as proof of their failure. Even if one does not agree with the chronological positioning of some paintings and cave complexes, the chronological scheme is basically correct. That means that the method and the results must not be rejected as a whole. Instead, singular errors must be corrected.



Hi, old fellow, what's your age? 30 000 BP or 20 000 BP? -- Sorry, I was drawn by Albrecht Dürer in 1515 AD.

A big problem is the fact that nowadays, in most cases, rock art is no longer seen as an integral part of prehistoric cultures but as an independent unit. The effect is that *Art Mobilier* (portable art) is normally not included in the considerations leading to the dating and interpretation of rock art. This separation of the different kinds of artifacts did not yet exist in the generation of Breuil (1937), Obermaier (1912) Kühn (1929) or Graziosi (1956). It is a phenomenon of later decades. Even the important congress “L´art des objets au paléolithique”, Foix 1987, (Clottes 1990) did not change this attitude.

A detailed presentation of an “archaeological” chronology of Upper Palaeolithic rock art and its justification would require a very large amount of pictures, the space for which is not available here. However, this is not the intention. Instead, it is the methodical questions that will be discussed. Basically, the same procedures have been applied since the discovery of rock art and described several times (e.g. Breuil 1906, 1952).

About ten years ago it was possible for the first time to gain radiocarbon data from minimal samples of the charcoal used by the painters of the Ice Age (e.g. Valladas *et al* 1992). As the majority of the results corresponded to the age that was to be expected based on general considerations (Züchner 1993) this gave immediately rise to the assumption that one had found an “objective” way to determine its age. At about the same time microorganisms enclosed in the rock varnish were dated successfully. It seemed that here too had been found a way to determine the exact age of petroglyphs.

Following the 2nd AURA Congress at Cairns, Australia, in 1992 a congress report with the programmatic title: “*Rock Art Studies. The Post-Stylistic Era or Where do we go from here?*” was published (Lorblanchet & Bahn 1993). Where this way is actually leading now and we will be in future is still a contentious issue (Cacho Toca & Gálvez Lavín 1999; González Sainz 1999; Lorblanchet & Bahn 1999).

The following discussion refers exclusively to the art of the Upper Palaeolithic in Europe, where the interrelations between rock art and portable art and the general development of cultures provides particularly good results. In other regions we are confronted with other problems which have to be solved in other ways.

Regarding “direct dating” Robert Bednarik, among others, takes an extreme position: he battles for his conviction that only a picture that has been dated by scientific methods is reliably dated and that all other statements regarding its age are subjective and therefore to be rejected (Bednarik 1992, 1994a,b). He even goes so far as to consider Lascaux to be undated (Bednarik 1996) and very probably to be postglacial because, in his opinion, the fauna that is depicted does not comprise any glacial but only Holocene elements. However, he does not take into consideration that bones and stone slabs decorated with the respective animals – as well as of some of Lascaux’s signs – occur in the settlement layers, which means that there is nothing to contradict a quaternary age.

Most authors prefer scientific dates on principle, even if they are in stark contrast to the results of traditional studies. Jean Clottes, for example, after initial calls for archaeological and scientific results being thoroughly weighed against each other (Clottes 1997), has been swayed by the radiocarbon dates which have convinced him that the art of Chauvet Cave is of Aurignacian origin (Clottes *et al*. 1995; Clottes 1996a,b, 1998, 2001). But all the facts suggest that the cave was decorated during a longer period of time spanning from the Gravettian to the Middle Magdalenian (Züchner 1995a, 1999). If there are not any radiometric dates available as in Lascaux, Trois Frères and many other caves, the same authors assign them without any comment to certain cultural periods that were determined using the classic methods (e.g. Lorblanchet 1997).

The present author is of the opinion that scientific dating is only one of several methods that must be compared critically with others. Each method has strengths and weaknesses that do not insignificantly depend on the respective development in research. Lorblanchet and Bahn – at first advocates of radiometric dates – recently also seem to have been distancing themselves ever more from their uncritical acceptance (Lorblanchet & Bahn 1999).

The question about the “correct” dating and the reliability of scientific and archaeological methods can certainly have deep impacts that are not only of academic importance. Here are two examples:

*Chauvet Cave:* The assumption that the paintings of Chauvet Cave stem from the Aurignacian and are the earliest art know has culminated in sensational statements in the press such as: *“History of art and thus the history of mankind have to be rewritten”*. 100 years of archaeological investigation are thus portrayed as being made in vain because of some radiocarbon data. If we accept that similar situations may be repeated at any time, this renders comparisons based on forms and types senseless regardless of whether they belong to paintings, pottery, bronzes or other artifacts.

*Foz Côa:* In Central Portugal the largely virgin, blooming district of Foz Côa was almost sacrificed to a gigantic dam project, beside other reasons, because the obviously Upper Palaeolithic engravings (Züchner 1995b) had been “scientifically dated” (Baptista 1999) to only a few decades, centuries or at best a few millennia old. This meant that they were not worth being preserved as World Heritage. The discussion, sometimes very emotional and controversial, was summarized in a voluminous report in 1998 (Zilhâo 1998).

In Foz Côa the “direct dating” proved wrong because excavations at the lower course of River Côa resulted in the discovery of engravings covered by sediments. The basic layer contained Gravettian, the uppermost Late Palaeolithic, artefacts. The reliability of these results is still denied by some scholars who claim that the sediments and artefacts covering the rock are a secondary deposit from recent erosion, a fact that seems evident to them only because of the pictures’ fresh appearance (Simôes de Abreu & Bednarik 2000). That there are also some sites with heavy weathered rocks is simply ignored in the respective literature. In fact the sites of Foz Côa are among the most important cultural heritage of the Upper Palaeolithic, sharing all essential features with the cave sanctuaries. In spite of the fierce battle fought by “rock art specialists” against this cultural heritage, the construction of the dam was successfully stopped and instead an archaeological park was created.

**Scientific and archaeological dates: What are the possibilities and the problems?**

**Scientific methods**

*Rock paintings:* Today, radiocarbon dates can be gained from minute samples of charcoal. It is taken for granted that the age of the colour pigment and the act of painting are identical. However, this assumption is only true at first glance because a colour pigment can be made from subfossile wood that is frequently included in river terraces. This means what is primarily determined is the age of the colour pigment but not necessarily the time of painting. But even in the latter case the precision of the measurements is never sufficient enough to identify the order of paintings in a cave, the history of a site’s development, with the desired exactness.

*Rock engravings:* For the determination of weathering crusts which formed before and after the engraving, microorganisms that are enclosed in these crusts can be extracted. It is taken for granted that this rock varnish grows quickly and only once and that, in the course of this process, microorganisms are enclosed and remain unaffected by any external influence. This premise was fundamental in the discussion about the age of the engravings of Foz Côa (cf. Zilhâo 1998). But there is no proof and it is actually highly unlikely because dates from beneath lichen colonies give a significantly younger age than those directly adjacent to them. Everyone working in the Sahara will confirm that one and the same rock may have a different desert varnish at its opposite faces and that it may weather and form anew. The same phenomenon can be observed in Siega Verde (Balbín Behrmann *et al*. 1991), an Upper Palaeolithic open air site not too far from Foz Côa. In addition laboratories have produced pretty arbitrary results (Beck *et al*. 1998).

**Archaeological methods**

*Selfdating*: Rock art is self-dated when it shows a certain object, a certain symbol, or an extinct animal species whose age is known. In contrast to the Bronze or Iron Ages, in the Upper Palaeolithic this will as a rule provide only a rough point of reference. Examples that could be cited are certain signs (rectangles, lattices and tectiforms) whose occurrence has been established in portable art. The sequences of Grotte d’Isturitz, of Cueva del Parpalló (Villaverde Bonilla 1994; Züchner 1997) and some other sites offer many points of reference that are most important in this respect.

*Context*: Occasionally, rock paintings are dated on the basis of their connection with other findings. Putting them in context with layers of settlements as a rule provides a *terminus ante quem*, seldom a *terminus ad quem* as is normally assumed albeit erroneously. For example, the question as to how old the engravings in Pair-non-Pair really are remains ultimately unsolved: were they made by people who were standing erect in front of the rock wall at the time of Aurignacian or by people who, at the time of Gravettian, had to crouch already because sediments were starting to grow above the painting zone (Delluc & Delluc 1991, 1999)? Certain circumstances would even require one to assume a *terminus post quem,* namely in the case that the back wall of an rock shelter collapsed after the formation of the layers of settlements and the boulders, owing to their weight or changes in position, dug into the sediments. For if that happened the difference in time between the last person walking there and the act of painting is uncertain: the painting can have been made before, during or after the respective layer of settlement. This seems to be very likely, for example, in the case of the painted boulder of Abri Blanchard which, without any knowledge of the findings context (that is badly documented anyway), you would think to be from the Gravettian like the rock shelters next to it rather then from Aurignacien of the site itself (Delluc & Delluc 1991, 1999).

*Superposition:* Superposition of pictures may suggest tendencies in development which facilitate the establishment of relative chronologies for an unknown time range (cf. El Castillo: Alcalde del Río *et al*. 1911, Figs. 106 & 148). If these changes in the way an animal is represented occur at several sites, and in portable art as well as cave art, it can then be assumed that they show a general trend and are thus typical of their time and culture and not dependent on random factors.

*Combinations:* As a rule rock paintings and engravings are not connected with each other in any noticeable way. Like the hoards of Bronze or Iron Age from moors, rivers or fountain shafts they can have been “deposited” on a single occasion or in the course of an unknown range of time (Züchner 1993). But when certain motifs, types of pictures and symbols regularly occur together or exclude each other, they give hints about whether they are from the same or different periods. The composition of the fauna and symbols in Lascaux or Le Gabillou from the Upper Solutrean and Badegoulian would be absolutely unthinkable for the Magdalenian sites of Font-de-Gaume, Rouffignac or Niaux. Taken together with other observations, this provides points of reference for a relative and absolute chronology.

*Style and stylistic analyses:* It is often believed that the stylistic dating of rock art is based on the subjective assumption that art has developed from simple, primitive beginnings to ever more realistic and technically more elaborated works. The pictures would be put into this succession according to their “development level” just as into a typological sequence. Breuil’s chronological system (Breuil 1906, 1952) and to a lesser degree Leroi-Gourhan’s system (Leroi-Gourhan 1965), are to a certain extent based on these ideas. However, such a method can at best serve to determine the relative position of a certain picture between others of similar appearance in one and the same site. The widespread rejection of “stylistic” dating today probably has several reasons which have nothing to do with the method itself but instead with the fact that it is unclear what is actually to be understood by “style” and because “stylistic analyses” are usually superficial to an extent that would never be accepted in prehistoric research, classical archaeology, history of art and linguistics (cf. Apellániz & Calvo Gómez 1999).

“*Style*” is frequently used in the sense of “epoch”: Leroi-Gourhan’s “Styles I-IV” are cultural units, just like the “Romanesque ”, “Gothic” or “Renaissance” periods. Used this way the term says just as little about the special characteristics of a concrete piece of art as the terms “naturalistic” or “abstract”. *Here, style means to us the specific way in which a certain subject is presented*, be it in a painter’s personal handwriting or in accordance with the conventions among a group, in a region or an epoch. Every artist, no matter how extraordinary, depends on the appearance of his real or imaginary subject and on the conventions of his community. The representation always differs in some way from the model; it is never identical with it (GRAPP 1993; Surre 1997). The “spotted horses” of Pech-Merle are just as “naturalistic” as those of Trois-Frères, Les Combarelles or Ekain but they still differ very clearly from nature, emphasising certain elements whilst reducing others. They adapt to the idea of an artist and his times. The expert immediately recognises whether a bison or a horse is from Périgord, the Pyrenees or Northern Spain.

In this respect an “*analysis of style*” means the identification of conventions regularly repeated in space and time, basically being nothing else than the definition of types and subtypes usual in prehistoric research. An “analysis of style” - in different varieties and with different names - is generally and very successfully used in the history of art, linguistic research etc., provided it is applied with the necessary precision. Apellániz in particular has made an effort in the last few years to identify criteria intended to facilitate an objective and understandable description of style (Apellániz 1984, 1991, 1992, 1999; Apellániz & Calvo Gómez 1999. See also: Otte & Remacle 2000; Guy 2000). But a trained eye and experience are the best tools.

*Dating by style:* A closer look at cave art shows great differences in the way animals are depicted. They are partly determined by certain regularly repeated conventions and also partly by the message of the picture. An example for the latter case will be the “spotted horses” of Pech-Merle. They are so skilfully drawn that the artist would certainly have been able to get the proportions of head and body right. Nevertheless the heads are far too small. They were reduced because of their insignificance for the meaning of the picture, as were the “*femmes-bisons*”, the women’s silhouettes of Pech-Merle, whose heads were not depicted because only the body was important to define the “woman” in general (Leroi-Gourhan 1965, p.362, fig. 367-371).

The existence of regional and chronological conventions for the depiction of animals is a well-known fact. It should suffice to point out how much the paintings of Covalanas, La Haza or La Pasiega look alike and how much the paintings of Dordogne (e.g. Font-de-Gaume), the Pyrenees (e.g. Niaux, Trois-Fréres) and the north of Spain (e.g. Ekain, Altamira) differ from one another, although similar basic tendencies can be identified. However, supra-regional conventions in the depiction of animals allow comparisons sometimes covering large distances, as do more complex signs whose legibility requires rules known from afar (e.g. “Le Placard” signs, “claviforme” signs and females of type “Gönnersdorf”).

Parietal and portable art of the Upper Palaeolithic have numerous features in common, both formal and in content, of which only two examples will be cited here. The engravings on small stone plaquettes in Enlène or Labastide do not differ from those on the walls of their respective cave sanctuaries: the same person could have made them (Bégouen & Clottes 1990; Simmonet 1990). The development of the style and of the signs within the long stratigraphic sequence at Cueva de Parpalló is repeated in different contexts. Those close connections facilitate chronological statements regarding the age of identical rock paintings and symbols. They give points of reference in a development, saying that a certain phenomenon was known at a certain time, but not whether it had possibly begun earlier and continued to be used. Here it is important to find new points of reference that limit the respective time frames.

To argue for a style of pictures requires a discussion of as many different details as possible: which species of animal is represented, what does it look like in nature, how is it represented, what is its attitude (standing, walking quietly, running, jumping), which details are shown and which are omitted etc. (Züchner 1975)? To isolate one detail as a chronological marker may be misleading: the M-line demarcating the dark back and the pale belly of a horse has a very long history. It can be used only in correlation with other details. Different techniques can be used at the same time: painting, engraving, relief. This means that technique is not a stylistic criterion by itself*. Only the sum of details can provide reliable results.*

In conclusion, we have different archaeological instruments at our disposal, which allow us to date rock art. Just like all other methods, archaeological methods are of course not immune to errors either. However, they are definitely not based on subjective assumptions, and are therefore, in my opinion, neither antiquated nor outdated. A scientific method whose possible errors are not yet sufficiently known should not be preferred uncritically. Instead, results that have been gained by different methods should be thoroughly weighed against one another in order to come to reliable conclusions.

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