

Refutation of stylistic constructs in Palaeolithic rock art

Robert G. Bednarik

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Australian Rock Art
Research Association,
PO Box 216,
Caulfield South, Vic. 3162
Australia.

Abstract This paper describes the first experiment of applying a series of dating methods at a single rock art site in a "blind test". The rock art in question, in northeastern Portugal, had been unanimously attributed to the Upper Palaeolithic by stylistic comparison. Four independent assessments have produced the identical result that the rock art is in fact of the second half of the Holocene, and mostly under 3,000 years old. This finding is compared with other recent dating results which together show that stylistic dating is not an admissible method of determining the age of Palaeolithic art.

Keywords: Côa valley, Petroglyphs, Dating, Radiocarbon, Microerosion.

Résumé La réfutation des constructions stylistiques dans l'art rupestre paléolithique

Cet article décrit la première expérience sur l'application d'une série de méthodes de datation à un seul site d'art rupestre sous forme d'essais indépendants. L'art rupestre en question, au NE du Portugal, était attribué unanimement au Paléolithique supérieur par comparaison stylistique. Quatre évaluations indépendantes ont produit des résultats identiques à savoir que l'art rupestre date en fait de la deuxième moitié de l'Holocène, étant principalement âgé de moins de 3 000 ans. Cette découverte est comparée à d'autres résultats récents de datation qui montrent tous que la datation stylistique n'est pas une méthode admissible pour déterminer l'âge de l'art paléolithique.

Mots-clés : Vallée de la Côa, Gravures rupestres, Datation, Radiocarbonate, Microérosion.

Version française abrégée

On résume les résultats d'une série d'essais indépendants pour établir l'âge de l'art rupestre récemment découvert au long de la Côa, une rivière portugaise. Les nombreuses gravures (gravées et piquetées) étaient assignées à l'ère du Paléolithique supérieur. Malgré son acceptation générale par la discipline, cette datation est clairement contredite par les résultats indépendants de quatre scientifiques spécialistes de la datation. Leurs résultats ont régulièrement démontré que la plus grande partie de l'art a moins de 3 000 ans et qu'une grande proportion date des deux derniers millénaires. Seules quelques représentations sont d'origine néolithique.

Ces découvertes font suite à la déclaration récente que des peintures de la Grotte Chauvet, en France, ont un âge entièrement différent de celui qui leur est donné sur une base stylistique (Clottes *et al.*, 1995). Des contradic-

tions similaires ont été remarquées avec plusieurs autres essais récents de datation d'art paléolithique. Cette preuve par accumulation de témoignages confirme que les critères stylistiques ne permettent pas d'attribuer l'art à une période particulière du Paléolithique supérieur. Le cas de la vallée de la Côa indique que même le style paléolithique, dans son sens générique, ne peut pas être reconnu avec certitude par les spécialistes de l'art paléolithique.

Le style perçu en archéologie est établi par les expériences cognitives et le conditionnement du sujet. Les indices ou les traits stylistiques utilisés par les archéologues sont des schèmes entièrement subjectifs qui n'existent que dans leur propre imagination. Il n'y a pas de preuve indépendante démontrant qu'ils existent dans la réalité extérieure, ou que les artistes muets les auraient partagés. Ceux-ci

Note

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nous indiquent seulement la façon dont, grâce à leurs connaissances, les archéologues organisent l'art pour percevoir des contrastes et des similitudes, mais ils ne nous disent rien à propos de l'art même.

L'implication de ces résultats est que les schèmes chronologiques de l'art paléoli-

thique, dérivés principalement de la perception stylistique des archéologues, sont très peu fondés. Nous ne pouvons pas établir l'âge de l'art rupestre simplement à l'aide de la conjecture stylistique, et nous ne sommes pas même capables d'attribuer de cette façon avec confiance l'art au Paléolithique.

INTRODUCTION

One of the most enduring features in the study of the Palaeolithic rock art of Europe has been the use of stylistic dating in establishing chronological frameworks for this corpus of prehistoric art. These were then correlated with the presumed cultural periods of the Upper Palaeolithic, and the divisions so determined have constituted the parts of any chronology of Franco-Cantabrian rock art.

In this system it is assumed that the theoretical constructs of archaeologists concerning cultural divisions and similarities correspond to real cultures of the Old Stone Age. These constructs are based almost entirely on subjectively perceived tool types, mostly of stone implements, and only rarely on cultural indices. The cultures of human societies are based on cultural parameters, of which in the case of Palaeolithic periods only art has survived in meaningful quantities. Tools, by contrast, do not themselves define cultures, although cultural variables may have contributed to their characteristics. The very precarious argument of archaeologists can thus be expressed as a claim that they are capable of effectively defining those aspects of utilitarian objects that are culture specific. Since the tool-based cultural divisions are accepted without demonstration of such an ability, the postulate involves circular reasoning and remains unfalsifiable.

The more important problem, however, is that the styles archaeologists perceive are their own theoretical constructs, they are not self-evident entities out there in reality

(Conkey and Hastorf, 1990). This applies to styles of stone tools as much as to those of rock art. Archaeologists have imposed their invented stylistic categories on Palaeolithic rock art for a full century now, using terms like "Middle Magdalenian style" or "Aurignacian engravings" as if they had real chronological meaning, and implying that they were capable of differentiating tangible art traditions stylistically. This is doubly absurd: not only are the technological taxonomies of the Pleistocene cultures culturally invalid—and the cultural sequences should be defined by cultural indices rather than technological ones—but also the stylistic designations of art traditions are entirely self-confirming. The fact that one can differentiate taxonomic entities one has oneself invented does not validate them.

The chronological models of Upper Palaeolithic European rock art created throughout the twentieth century are all incompatible, and none conform with the evidence as it is currently available. The model most frequently cited in recent decades is that of Leroi-Gourhan (1971). He perceived a succession of stylistic traditions that developed from the iconographically simplest to the most complex art forms, commencing perhaps 30,000 years ago and ending about 10,000 years ago. The recent dating evidence from just one site suffices to reject his model entirely. According to his scheme, the rock art in the recently discovered Chauvet Cave in France would be of the Magdalenian, being one of the most sophisticated assemblages we have of European Palaeolithic art. The stylistic dating offered for it initially was 17,000 to 21,000 BP

(Clottes, 1995), and the art was attributed to the Solutrean. It has since been shown convincingly that at least some of it is over 30,000 years old (Clottes *et al.*, 1995). This renders all models of Palaeolithic art evolution redundant, because it had not been assumed that any complex rock art was produced during the early Aurignacian, let alone ultra-sophisticated rock art such as that in Chauvet Cave.

THE CÔA PETROGLYPHS

The Chauvet Cave dates have demonstrated that stylistic attribution of Palaeolithic art cannot be relied upon, as had become apparent earlier at several other sites, such as Cougnac, Cosquer Cave, Pech Merle and Zubialde Cave. Of even more serious consequences to the credibility of archaeological claims about the stylistic dating of rock art are the dating results from the Côa valley in northeastern Portugal. A series of over a dozen sites of animal engravings and peckings were found on open air schist outcrops in the course of the construction of a hydroelectric dam and were stylistically designated to the Upper Palaeolithic (Bahn, 1995; Clottes, 1995; Marshack, 1995; Rebanda, 1995). There was complete consensus on this point by all specialists on European Palaeolithic art, except the present writer who advocated that the art be dated scientifically (Bednarik, 1994, 1995 *a*). The Electricidade do Portugal, on whose land the sites are located, arranged a series of blind tests by several rock art dating scientists in May and June 1995. The participants agreed not to communicate with each other until their independent findings were tabled.

Ronald I. Dorn (USA) and Alan Watchman (Canada) explored the possibility of detecting carbonaceous and other matter in the accretionary mineral deposits covering the petroglyphs that might help in dating, e.g. by providing radiocarbon dates. Fred Phillips (USA) sought to apply cosmogenic radiation dating to determine when the rock panels themselves were first exposed to radiation, using the concentrations of ^{36}Cl for this purpose. Robert G. Bednarik (Aus-



tralia) used microerosion analysis to estimate the age of individual petroglyphs, and a microscopic technique called "internal analysis" to determine what tools some markings were made with and in what direction, and to establish superimposition sequences.

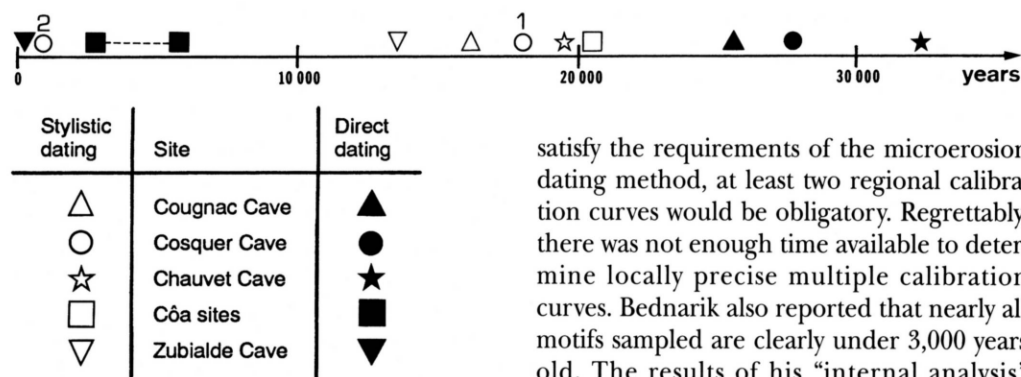
DATING RESULTS ON THE CÔA

The radiocarbon dates Watchman (personal communication July 1995) obtained by accelerator mass spectrometry indicate extensive contamination by graphite, which occurs as an accessory mineral in the schists. Accretions on a railway quarry face that is only 100 years old yielded a radiocarbon content suggesting an age of about 6,500 years. Similarly, results from four engravings implied a significantly greater age than those from the adjacent, unengraved surface. The source of the contamination was located in a thin weathering rind at the base of a brown silica accretion. A preceding grey to white amorphous silica accretion was found to be free of the contaminant. It was used to determine the minimum ages of three petroglyphs, which were all under 1,000 years BP. Watchman determined that the brown silica's colour is caused by the inclusion of silt, which he attributes to environmental changes related to the introduction of intensive cultivation of the steep hill

Fig. 1 Microscopic scanning for microerosion dating and internal analysis in progress at Penascosa panel 3, Côa valley, northern Portugal. The naturalistic animal figures are under 2,000 years old.

Scrutation microscopique pour datation par la microérosion et analyse en cours au panneau 3 de Penascosa, vallée de la Côa, dans le Nord du Portugal. Les représentations naturalistes d'animaux ont moins de 2 000 ans.

Fig. 2 A comparison of stylistic designations and subsequent direct dating information for five supposedly Palaeolithic rock art sites. The earliest component is considered in the case of Cougnac, Cosquer and Chauvet Caves; the art in Zubialde Cave was found to be modern; the stylistic designations of Cosquer Cave are those of J. Clottes (1) and D. Vialou (2). (Sources: Clottes *et al.*, 1992; Bednarik, 1992 *b*; Lorblanchet, 1994; Clottes *et al.*, 1995.)



Une comparaison des désignations stylistiques avec l'information plus récente sur la datation directe pour cinq sites d'art rupestre supposés paléolithiques. Le composant le plus ancien est considéré pour les Grottes de Cougnac, Cosquer et Chauvet; l'art de la Grotte de Zubialde a été établi à l'époque moderne; les désignations stylistiques de la Grotte Cosquer sont celles de J. Clottes (1) et de D. Vialou (2). (Sources: Clottes *et al.*, 1992; Bednarik, 1992 *b*; Lorblanchet, 1994; Clottes *et al.*, 1995.)

slopes above. His radiocarbon dates established the first appearance of the brown accretion about 1,700 years ago. Since most of the Côa petroglyphs are coated only by this recent deposit, and not by the earlier, graphite-free silica he proposes that they date from the last two millennia.

The raw dates produced by Dorn range from under 2,000 years to about 6,000 years, but in view of Watchman's contaminated raw results (from about 3,000 years to almost 7,000 years) it is obvious that most of the rock art is of very recent millennia. This is confirmed by the preliminary radiation exposure ages of Phillips, which suggest that some of the rock faces themselves are only a few millennia old.

Bednarik sought to establish a framework of age through relative degree of weathering, in order to select the oldest motifs for microerosion dating. He found greatly different states of weathering and established a sequence of art traditions. The figures that are of the stylistically "most Palaeolithic" appearance were consistently found to be the youngest in the sequence, while the oldest do not resemble Palaeolithic art at all. The oldest motifs are schematic peckings rather than engravings, and they occur on only two very eroded panels. One of these few figures yielded a series of micro-wane measurements whose broad cluster was tentatively placed into the quartz calibration curve from Lake Onega, Russia (Bednarik, 1992 *a*). The tentative date determined in this way is $E6500 \pm 2000$ years BP, and while this result is probably correct it should not be taken out of its experimental context. To

satisfy the requirements of the microerosion dating method, at least two regional calibration curves would be obligatory. Regrettably, there was not enough time available to determine locally precise multiple calibration curves. Bednarik also reported that nearly all motifs sampled are clearly under 3,000 years old. The results of his "internal analysis" (Marshack, 1986; d'Errico, 1994) were that some presumed Palaeolithic figures were in fact made with metal tools. Others were demonstrated to have been produced with stone points. Many details of the art production were clarified and a sequence of three different treatments (shallow incision, pecking, deep abrasion) was consistently identified (fig. 1).

THE IMPLICATIONS

With this dating information concerning the Côa rock art it becomes finally imperative to review the traditional practice of assigning age estimates to rock art on the basis of subjective stylistic speculations. This tradition derives from the belief of some students of rock art that they possess the ability of detecting chronologically significant stylistic markers in prehistoric arts. There is no evidence that this belief has any sound basis in reality, or that the stylistic clues perceived by archaeologists have any historic validity. The beliefs of archaeologists are entirely based on their own cognitive, intellectual and academic conditioning, and on cognitive taxonomies created without cognitive or cultural knowledge of the cultures that used these systems of graphic expression. These taxonomies are confirmed only by circular reasoning and it is becoming increasingly evident that they often fail when subjected to outside testing, such as that provided by dating methodology.

Figure 2 illustrates this by comparing recent direct dating estimates with the previous stylistic datings of several sites. While

there can be epistemic problems even with the direct dates (Bednarik, 1995 *b*), they are still reliable as estimates of magnitude, whereas the stylistic datings evidently bear no relation whatsoever to reality: they appear to be quite random and irrelevant.

While this discredits all past and present chronological constructs of Palaeolithic rock art, such a finding was to be expected. There is no archaeological consensus about what style is (Conkey and Hastorf, 1990), where it resides, what its role is in archaeological taxonomies, or how we could come to terms with it in a quantifiable, falsifiable, repeatable or objective fashion. Style is not accessible to scientific definition, it is a subjective dimension that does not exist until it is perceived to exist. Decisions about style are made on the basis of individual "experience" and iconographically guided intuition, *i.e.* on an entirely untestable basis. The perception

of style by archaeologists may tell us much about the cognitive, intellectual and academic conditioning of archaeologists, but we cannot be sure what it might be capable of telling us about past imagery.

The immediate implication of this finding is that the cultural attribution of most of the approximately 300 sites of supposedly Palaeolithic rock art known in Europe, which have been dated only on the basis of stylistic speculation, need to be reviewed. It is no longer acceptable to speak of Palaeolithic styles unless these are defined in objective and falsifiable terms. The wider implication, however, concerns the traditional concepts of archaeology and the way they are permeated by assumptions about style, be it the style of stone tools, ceramic vessels or ivory figurines. Archaeology has to either formulate its stylistic taxonomies as testable propositions, or abandon them.

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