

Dating and taphonomy of Pleistocene rock art

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Abstract: *In this broad overview the corpus of world rock art is defined and compared with the known distribution of Pleistocene rock art. The discrepancies are related to relative research efforts, to the taphonomy of rock art, and to issues relating to the age estimation of rock art. As each of these factors is examined, it becomes apparent that there have been significant distortions in the ways Pleistocene rock art has been characterised and defined. Most particularly, the taphonomic distortions remain inadequately understood and their effects are identified and explained.*

The first qualified attempt to quantify the world's surviving rock art was undertaken by Anati (1984), who arrived at the estimate that the existence of over 20 million motifs has been *demonstrated* worldwide, and that a grand total of 'well over 50 million' rock art figures can safely be *postulated* (Fig. 1). Since then, much survey work and countless new reports and discoveries have occurred, and yet Anati's rough estimate has stood the test of time (*cf.* world map in Chakravarty & Bednarik 1997: 201). With all the progress we have seen in our knowledge of world rock art since the early 1980s, today's estimate would still be that there are certainly in excess of 50 million rock art motifs, and quite possibly even more than 100 million.

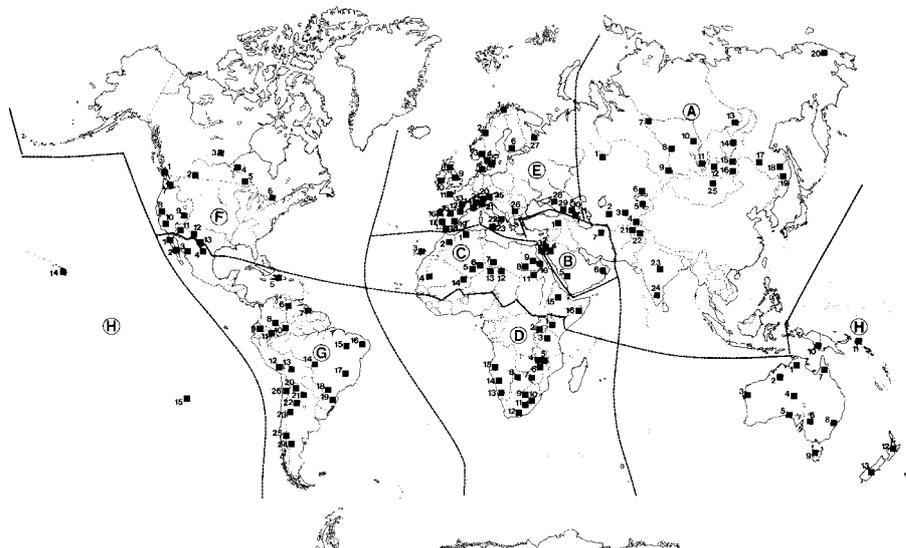


Fig. 1. Emmanuel Anati's world map of rock art of 1984.

These are, however, very unevenly distributed around the globe. Today, the world map of rock art is much more complete, although there remain very major gaps in it still, especially in Asia, Africa and perhaps Latin America. However, it seems justified to observe the very obvious unevenness in the way it is distributed (Fig. 2). There are some manifest limitations of where it could be expected to occur: it can only be found where rocks are exposed, and where people lived. One might add that it would be

expected to find the greatest concentrations of rock art where, historically, the densest human populations existed. This, however, is obviously not the case. On the contrary, most of the world's major corpora occur in arid or semi-arid regions that are not assumed to have supported high population densities. It would then appear that the two main factors determining today's distribution patterns are the occurrence of the practice of making rock art on the one hand, and the taphonomy acting on this body over time. Clearly, not all past societies have created rock art, and some of those who did may have been far more productive than others. That is evident through reasonable extrapolation from ethnography, and needs to be considered as one key determinant in quantification. The other factor, taphonomy, demands a more detailed examination.

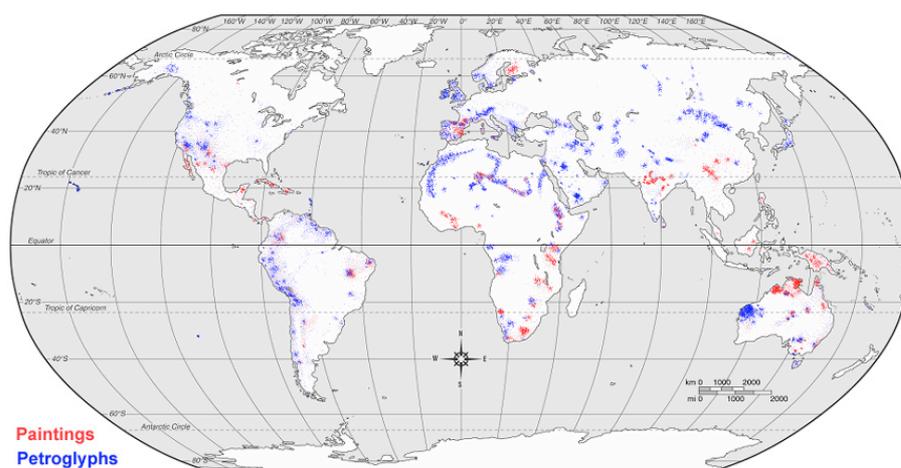


Fig. 2. The global distribution of known rock art sites.

The preferential survival of rock art in deserts is attributable not only to their low rainfall and high ambient pH regimes, but often precisely to the lack of human population centres, which means significantly lower exposure to potential iconoclasm. To some degree the same may be said of cave sites, because many societies tend to have cultural avoidance practices relating to caves. But there are still more intricate considerations.

Consider the fact that some of the largest regional bodies of rock paintings or pictograms are those of southern Africa, India, Brazil and Australasia. Between them they account easily for more than half the world's pictograms. What is it that links them?

Rather unexpectedly, the answer is found in geology. These four regions, together with the Antarctic, formed the supercontinent Eduard Suess named Gondwanaland well before continental drift was considered (Fig. 3). Apart from the occurrence of similar plant fossils, one of the factors demonstrating the ancient connection were the similar geological strata, particularly the successions of sandstone facies in these four regions. Of all the rock types, these sandstones happen to be the most suitable for facilitating the formation of rockshelters, and sandstone is also one of the best media to absorb paints applied to rocks, especially those based on iron pigments. It then comes as no great surprise that the extensive sandstone regions of Gondwana have promoted the survival of rock paintings. Similarly, the preservation of petroglyphs is often entirely dependent upon ferromanganese accretionary deposits

that are not sustainable in low-pH environments, so this form of rock art is found mostly in desert and semi-desert areas.

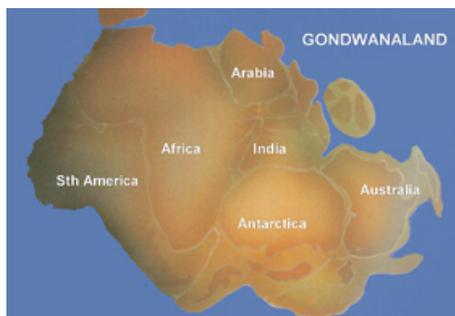


Fig. 3. Gondwanaland about 360 Ma ago (Carboniferous).

Taphonomy

These are just some of the variables determining the taphonomy of rock art, which in turn determines the composition of the surviving corpus of world rock art. Present distribution or apparent changes in rock art 'styles' over time are not necessarily functions of economic, environmental, cultural, social or even religious factors (Tangri 1989). Neither is apparent stylistic continuity proof for cultural (or any other) continuity. Even if it were it would be of no help, in view of archaeologists' ambivalence as to where style resides in an artefact (Conkey & Hastorf 1990). In contrast to other variables, style does not exist until it is perceived to exist. Thus direct correlation between 'quantifiable' archaeological 'data' and rock art poses serious problems, and the lack of reliable dating for nearly all rock art in the world only aggravates these.

To make matters worse, the principal tool in the archaeological analysis of rock art, statistics, is scientifically invalid when applied to quantitative rock art data. Taphonomic logic (Bednarik 1994a) decrees that such data can only be relevant in describing a present state of a corpus of rock art; they are not directly related to the archaeological significance of the art. The most serious limitation of statistical analyses in palaeoart research is that posed by the inherent subjectivity of the data. Irrespective of the actual method used, statistics that address the content of rock art corpora always involve a taxonomy of motif elements, because the grouping of motifs perceived to be similar is a prerequisite for such treatment. Yet any such taxonomising process is entirely based on the iconographic perceptions or graphic and depictive conventions defining the researcher's own system of reality, and does not necessarily reflect the artists' graphic cognition. Therefore it should be expected to be false.

The second major encumbrance of statistics of rock art is the severe limitation imposed by its taphonomy. Taphonomy (Efremov 1940) deals with the logical underpinning of the idea that the quantified characteristics of a record of past events or systems are not an accurate reflection of what would have been a record of the live system or observed event. Without the use of taphonomic logic and concepts such as *taphonomic lag-time* or *taphonomic threshold*, very limited scientific understanding of rock art is attainable (Fig. 4). Most rock art can be assumed to have been lost over time; hence the extant rock art is a result primarily of taphonomic processes, and secondarily of art production. Thus the *cultural* significance of extant

statistics is subordinate to their *taphonomic* significance. Perceived trends in the ways rock art presents itself to our subjective perception and cognition are often presented as evolutionary, chronological (by circular argument) or empiricist evidence. In addition to geomorphological biases, many other factors can also greatly distort the statistical characteristics of rock art. Among them are location, recorder's bias, historical responses to alien iconographies, or indeed any process that contributes to the degradation of the art. In short, no rock art represents a random sample of a tradition, style or culture. Lithology, site morphology, micro- and macro-climate, site biology and a host of other taphonomic factors have all contributed to selective survival and to alterations of both the appearance and statistical characteristics of the surviving corpora. Any interpretation using variables such as distribution, location, style or technique is doomed to failure unless informed by taphonomic logic.

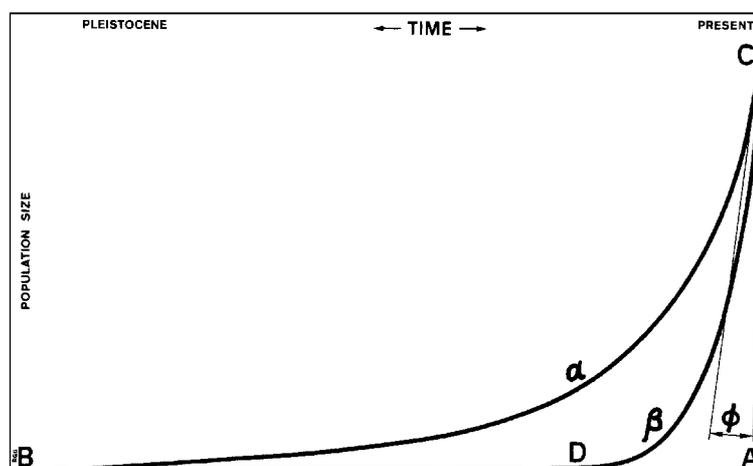


Fig. 4. The principles of taphonomic logic.

The most debilitating aspect of rock art taphonomy, whatever the physical, biological or chemical processes responsible for it may be, is that it distorts evidence systematically rather than randomly. It selects the most deterioration-resistant forms for survival so that its truncation of the record is highly discriminate. The forms of rock art that can survive longest are paintings and engravings in deep limestone caves with their stable speleoclimate; and at open sites deeply executed petroglyphs on the most weathering-resistant rock types, preferably occurring in favourable climatic settings. It is at once obvious that all rock art credibly attributed to the Pleistocene falls into these two categories.

Dating and other flaws

The issue of Pleistocene rock art is rendered even more complex by our continuing inability of securing reliable dating of most rock art. With few exceptions, such as the carbon isotope determination of beeswax figures (Taçon *et al.* 2004; Morwood *et al.* 2010), rock art age estimations so far presented are generally experimental, ranging from the credible to the fictitious (for critiques see Bednarik 1996, 2002). In that respect I draw your attention to the presentation in this symposium by Paul Taçon and Michelle Langley. In particular, the attribution of rock art to the Pleistocene, on whatever basis, remains in many cases most tenuous, and one of the reasons for

this outside the traditional distribution of Franco-Cantabrian cave art is that the discipline has developed distorted expectations of what should constitute Pleistocene rock art. Across Eurasia, a practice has developed of considering any motifs of semi-naturalistic animals, especially equine and bovine figures, to have to be of the Pleistocene. In some cases, such as in Mongolia, this is even proposed where the zoomorphs clearly postdate the most recent glacial striations on the panels concerned. In others, such animal figures occurring in conditions of high-kinetic fluvial narrow valleys of very soft rock, subjected to rapid erasure by suspended-load quartz sands are attributed to the Pleistocene. This is despite their degree of erasure, calibrated by engraved dates, indicating a recent historical antiquity (Bednarik 2009).

Therefore the present perception of what is or is not Pleistocene rock art, globally, is also greatly distorted by false datings, often based on stylistic perceptions and similar subjective variables. Finally, there is the issue of relative regional research efforts, which has also contributed significantly to distortions concerning this topic. It is evident that the number of books, scholarly and non-scholarly publications produced about the most intensively studied corpus of any rock art, the French and Spanish cave art, would far exceed 10,000 titles. It has created an expectation, a perhaps subconscious belief, that this is the principal body of Pleistocene rock art in the world. Other Ice Age corpora, by comparison, have been almost ignored. For instance, on present evidence it appears that the largest surviving corpus of Pleistocene rock art is that of Australia. But apart from my own pitifully inadequate efforts, there is not a single publication dedicated specifically to the generic issue of Pleistocene rock art in Australia. Similarly, there has only been one publication on the generic topic of early pan-Asian palaeoart (Bednarik 1994b). The situation is even worse in Africa, where at present there is no publication dedicated to a pan-continental review of Pleistocene palaeoart.

At this stage, the distortion is already incredible. If there were such a severe geographical bias in another discipline, say, plate tectonics or palaeontology, we would certainly reject that discipline as farcical, as biased and as lacking in any credibility. If 99.9% of the scientific literature on plate tectonics were dealing exclusively with one small region, say, France and northern Spain, we would totally reject that discipline as being unrepresentative and unsound.

But to illustrate that the present condition is even worse in our field, let us consider the possibility that my rough estimates of the number of Australian petroglyphs are right in terms of order of magnitude. If it were correct that there are at least one million Australian petroglyphs surviving from the Pleistocene, that would indicate that in one country alone, there is between twenty and fifty times as much such material as there is in south-western Europe. It also means that we have, in very round figures, perhaps two or three publications per motif about Franco-Cantabrian art, but there are only two publications reviewing the issue of the much larger Australian Pleistocene corpus of early rock art, so the distortion is in excess of one to a million. Similarly, with only one publication attempting a pan-continental review of Asia, the largest continent, this is so hopelessly inadequate that the point should not need to be demonstrated. This is truly a spectacular distortion, showing that this specific field is in dire need of major and revolutionary revision.

But that is only part of the problem. For over a century, the academic system of knowledge production and consumption has refined the message that 'art' began

with the Upper Palaeolithic evidence of Franco-Cantabria. The only site cited as a possibly Middle Palaeolithic production was La Ferrassie, with its sepulchral cupule block over juvenile Neanderthal burial No. 6 (Fig. 5). In Australia, all rock art produced by people of the Pleistocene and early Holocene is undeniably the work of traditions of Mode 3 technocomplexes. It belongs, in the parlance of European researchers, to Middle Palaeolithic contexts. Australia was settled by Middle Palaeolithic seafarers from Asia, who retained their Mode 3 industries until mid-Holocene times. In the case of Tasmania, Mode 3 continued right up to British colonisation around 200 years ago, therefore all rock art of Tasmania, necessarily, could be defined as Middle Palaeolithic (Fig. 6). There are simply no Upper Palaeolithic elements or modes of production. This means, then, that there is many times as much surviving "Middle Palaeolithic" rock art in just one country, than there is Upper Palaeolithic in France and Spain.

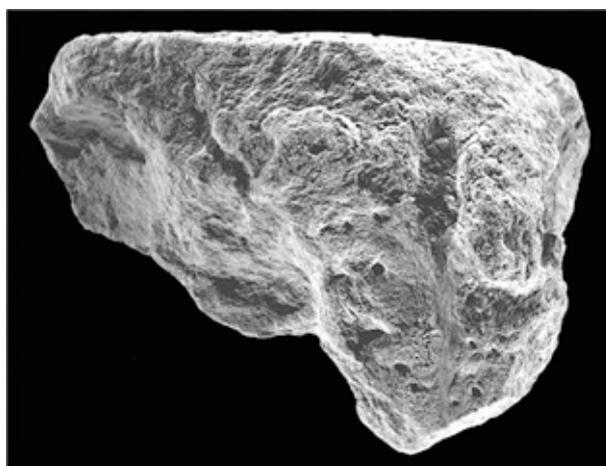


Fig. 5. The sepulchral cupule block from La Ferrassie Neanderthal burial.



Fig. 6. Tasmanian cupules, BT-3 site, Meenamatta.

At this stage it becomes apparent that the falsities that have been propagated about the generic subject of Pleistocene rock art are so extensive that the entire construct based on the popular archaeological folklore are merely a house of cards. For instance, almost no graphic art of this period outside the Franco-Cantabrian core area is figurative, there are only two or three notable exceptions (Bednarik 1993). Other "Palaeolithic" graphic art is almost exclusively noniconic, and resembles the art of the Jarawas of the Andamans. But it has been discovered recently that the Jarawas' children have superb figurative drawing talent (Fig. 7), and that these people may regard iconic depiction as juvenile or non-serious (Sreenathan *et al.* 2008). By the same token, it has been shown that there is ample forensic support for the proposition that much if not most of the Franco-Cantabrian cave art is the work of children and teenagers, while there is no evidence at all that it is substantially an adult art (Bednarik 2008a). For over a century we have been subjected to concepts emphasising the gravity of this corpus, its meaning and cultural roles, yet on reflection none of these notions are compatible with the actual evidence. Indeed, taphonomic logic implicitly rejects the very idea that this is a cave art, replacing it with the demand to see this corpus as the small surviving remnant of many traditions that usually found expression in many media, but managed to survive only in the unusual environment of limestone caves. In short, most of the strongly held beliefs about this cave art appear to be without any scientific support.



Fig. 7. Drawing abilities of the Jarawa boy Enmay.

Pleistocene rock art

It is from this revolutionary perspective that we need to reconsider the generic question of Pleistocene world rock art. First of all, we need to accept that if any rock art has survived from this earliest period of hominin history, it is only under most unusual conditions of preservation, and it is in fact surprising that any has survived at all. We would do well to preface any consideration of this subject with the idea that far less than 1% of all the rock art ever produced in the Pleistocene has survived to the present. Next, we need to ask: what were the conditions that enabled such rare survival? It is only from that perspective of viewing the surviving remnants as the result of long-term taphonomy that we may legitimately consider questions of distribution, location, style or technique of any rock art we may be inclined to attribute to the Pleistocene. Or to restate: the scientific study of Pleistocene rock art has not yet begun. It will begin when researchers learn to approach the issue from a scientific rather than intuitive and subjective perspective. Just as it is impossible to know what object is depicted in palaeoart, it is impossible for the highly conditioned, brainwashed modern human observer to obtain any valid comprehension of the meaning, significance or interpretation of this symbol system. A modern European is totally and fundamentally incapable of comprehending the construct of reality determining the world inhabited by, for instance, a traditional Aboriginal savant. Only the overbearing ontological views of Europeans prevent them from accepting this truism. Yet the producers of graphic symbols produced tens of thousands of years ago are far more remote from us culturally, cognitively and intellectually, yet the figurative rock art seems to communicate with us — or so we tend to think. We need to escape the gravity pull of our own cognitive, academic, cultural, linguistic and intellectual conditioning before we can attempt this task, and we need to begin from a scientific base.

This may explain why archaeological explanations of the human past tend to be mistaken, and are usually refuted. Consider, for instance, the claim that the advent of cognitive hominin modernity, marked by the appearance of art-like products, coincides with the invasion of Africans in Europe thirty or forty millennia ago. Not only

is the empirical basis of this notion false, because art-like symboling, in the form of many types of exograms (Donald 1991), occurs long before that time. This absurd model has no genetic, cultural or palaeoanthropological evidence in its favour (Bednarik 2008b), yet for the past thirty years it has dominated human evolution and Pleistocene archaeology to the point of almost eradicating any opposition. A whole generation of archaeologists had to endure being brainwashed with the African Eve mistake, one of the most imprudent archaeological blunders in history. One has to be very optimistic to expect such a poorly based discipline to ever become consistently credible.

The Pleistocene rock art of the world provides excellent evidence against the replacement hypothesis of Protsch, Stringer et al., but it has remained largely ignored so far. It offers Lower Palaeolithic examples from India and possibly Africa (Fig. 8), and a massive corpus of Mode 3 petroglyphs from Australia. By comparison, the Mode 4 traditions of south-western Europe are not of great importance because they are only a small piece in the overall puzzle. Most pieces of this great puzzle have not yet been found or considered, and a comprehensive story of Pleistocene rock art will not be written for another century. Indeed, if we do not begin to view this subject in the balanced perspective it deserves, it may take a great deal longer. And to do so we need to appreciate that most such rock art has ceased to exist — and why.



Fig. 8. Oldest known rock art of Africa, Korannaberg, Kalahari.



Fig. 9. Tentative world map of known Pleistocene rock art occurrences.

The global distribution of Pleistocene rock art remains therefore unknown. However, we are not entirely without relevant information, and we might consider the issue on the basis of currently available data. If we tried to depict the known or reasonably assumed world distribution of Pleistocene rock art we could create such a map (Fig. 9). This is still empirically based, but we need to remember that there are severe limitations involved in such a pursuit. It does, however, help to gain a more balanced view of the subject, and it certainly helps in re-focusing our endeavours in this field. Most certainly, a map of the global Pleistocene rock art will look very different in a hundred years from now, but this is a first step to securing it.

REFERENCES

- ANATI, E., 1984. "The state of research in rock art. A world report presented to UNESCO". *Bollettino del Centro Camuno di Studi Preistorici* 21: 13-56.
- BEDNARIK, R. G., 1993. "European Palaeolithic art — typical or exceptional?". *Oxford Journal of Archaeology* 12(1): 1-8.
- BEDNARIK, R. G., 1994a. "A taphonomy of palaeoart". *Antiquity* 68: 68-74.
- BEDNARIK, R. G., 1994b. "The Pleistocene art of Asia". *Journal of World Prehistory* 8(4): 351-375.
- BEDNARIK, R. G., 1996. "Only time will tell: a review of the methodology of direct rock art dating". *Archaeometry* 38(1): 1-13.
- BEDNARIK, R. G., 2002. "The dating of rock art: a critique". *Journal of Archaeological Science* 29(11): 1213-1233.
- BEDNARIK, R. G., 2008a. "Children as Pleistocene artists". *Rock Art Research* 25(2): 173-182.
- BEDNARIK, R. G., 2008b. "The mythical Moderns". *Journal of World Prehistory* 21(2): 85-102.
- BEDNARIK, R. G., 2009. "Fluvial erosion of inscriptions and petroglyphs at Siega Verde, Spain". *Journal of Archaeological Science* 36: 2365-2373.
- CHAKRAVARTY, K. K. and R. G. BEDNARIK, 1997. *Indian rock art and its global context*. Delhi: Motilal Banarsidass, and Bhopal: Indira Gandhi Rashtriya Manav Sangrahalaya.
- CONKEY, M. W. and C. A. HASTORF (eds), 1990. *The uses of style in archaeology*. Cambridge: Cambridge University Press.
- DONALD, M., 1991. *Origins of the modern mind: three stages in the evolution of culture and cognition*. Cambridge, MA: Harvard University Press.
- EFREMOV, J. A., 1940. "Taphonomy: a new branch of paleontology". *Pan American Geologist* 74(2): 81-93.
- SREENATHAN, M., V. R. RAO and R. G. BEDNARIK, 2008. "Paleolithic cognitive inheritance in aesthetic behavior of the Jarawas of the Andaman Islands". *Anthropos* 103: 367-392.
- TAÇON, P. S. C., E. NELSON, C. CHIPPIINDALE and G. CHALOUPKA, 2004. "The beeswax rock art of the Northern Territory: direct dating results and a 'book of record'". *Rock Art Research* 21: 155-160.
- TANGRI, D., 1989. "Science, hypothesis testing and prehistoric pictures". *Rock Art Research* 6: 83-95.