SYMPOSIUM 5

L’ART PLÉISTOCÈNE EN AUSTRALIE
PLEISTOCENE ART IN AUSTRALIA
EL ARTE DEL PLEISTOCENO EN AUSTRALIA

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**Symposium 5**

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Dating early Australian pictograms

Graeme K. WARD

Abstract

There is extensive, if little publicized, evidence of ancient cultural representations in rock shelters and open sites throughout Australia. While dating of this imagery remains problematic in many instances, there is growing evidence that a significant proportion survives from the Pleistocene period. Bednarik has reviewed the history of research and evaluated recent evidence of Australian rock art of the Pleistocene, especially petroglyphs. It is pertinent to consider this research with particular emphasis on painted representation.

This survey of pictograms¹ shown or argued to date to Pleistocene and pre-sea-level stabilization periods in Australia draws heavily, and necessarily selectively, upon others’ original work and this is acknowledged. There are many more data, issues and debates than could be covered in a short conference presentation. It is an attempt to cover the main developments and concerns without being comprehensive in order to provide –as suggested– an introduction to the subject for a European audience, and to raise some matters of general importance. The subsequent papers in this section will provide more comprehensive and detailed presentation of many of the matters touched on here. Surveys of the dating evidence for Australian rock art have been written or incorporated within discussions of dating results by Rosenfeld (1993), Bednarik (1996, 2002, 2010), Rosenfeld and Smith (1997), Ward and Tuniz (2000), O’Connor and Fankhauser (2001), Watchman (2001), Gillespie (2002) and Franklin (2004).²

1. Pleistocene Australia and sea levels

Our focus here is the Pleistocene –a period differentiated from preceding and subsequent periods in terms of what are argued to have been major climatic

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¹ Pictogram –“a rock art motif that involved an additive process in its production, such as the application of paint, dry pigment, beeswax.” Cf. pictograph – “a writing character of figurative appearance, representing a word or syllable; a hieroglyph.” IFRAO Rock Art Glossary. AURA, Melbourne <mc2.vicnet.net.au/home/glossar/web/glossary.html> (accessed 2012/02/04).
² Bibliographic notes: For those with limited access to published materials, much reference is made to a recent textbook by Peter Hisock (2008). As this paper was being finalized, a useful review by Langley and Taçon (2010) appeared in print; an appendix lists several hundred age determinations: “supplementary information” <www.australianarchaeologicalassociation.com.au/node/4078> (accessed 2012/02/04).
changes. Beginning students of Mankind learn that there is ample evidence of this in the northern hemisphere; and that the Pleistocene/Holocene change is accompanied by very significant changes in the ways of life of human societies.

The Pleistocene was a period of fluctuating glacial cycles, of severe Ice Age conditions, separated by short warmer periods. Oscillations in global sea levels tracked glacial cycles with greater amounts of water becoming trapped in polar ice caps and large glaciers in the Northern Hemisphere during colder phases. While the Southern Hemisphere appears to have been less glaciated, it is clear that reductions in sea level—over the last 140,000 years—exposed large regions of continental shelf that are presently below sea level.

These sea-level changes joined continental Australia to the islands of Tasmania and New Guinea (but not to all of island Southeast Asia). At about 70,000 years ago sea levels were sixty metres below their present levels. Very much lower sea levels resulted in a shorter sea distance to cross between Asia and Greater Australia. Illustrations of Pleistocene climatic conditions and geographic relationships can be seen in various publications; in his recent account of Australian archaeology, Hiscock (2008) has provided illustrations of the relationships between varying oxygen isotope ratios and the height of global sea-levels as indications of climatic change over the past 140,000 years (2008: 22), and a depiction at sea level of -130 metres of Greater Australia incorporating New Guinea and Tasmania (2008: 23). Extensive regions of coastal shelf were exposed—particularly in the north and west of Australia—and available for occupation during the period of 50,000 to 60,000 years ago when modern humans probably occupied Australia (2008: 44).

**Last Glacial Maximum**

Between 25,000 and 15,000 years ago a hyper-arid phase of the Last Glacial Maximum saw a large proportion of the Australian continent, particularly in the interior, become both cold and arid. The Centre was probably incapable of supporting human life. In the next 5,000 years climatic conditions ameliorated, and human groups resettled the interior. At the same time, the sea was flooding parts of the continental shelf. What we now know as the islands of New Guinea and Tasmania became separated from the mainland. Large areas of shallow sea were created, notably off the coasts of northern and north-western Australia. In the latter case, for example, the submerged continental shelf was in parts more than 200km wide, and various small islands were created. (Gillespie 2002: 456 has provided a useful depiction of Greater Australia from the time of LGM to the present.)

**2. Pleistocene/Holocene change in Australia**

The Pleistocene/Holocene boundary appears to be less well defined climatically in Australia than many other places in the world, and possibly was less significant in terms of human history. It is probable that the influence of the rise in sea levels and their stabilization by at least 6,500 years ago were more important.

**“Palaeolithic”/“Neolithic”**

The Pleistocene/Holocene change in the ways of life of human societies has often been summarized as the changes from the “Palaeolithic to the Neolithic”. However, we know that this transition was not necessarily the same or as significant everywhere in the world. Some have argued that the “Palaeolithic” continued in
Australia until—and, indeed, after—European contact, and moreover, that there were “Neolithic” practices evident in the Australian “Palaeolithic”. For example, ground stone tools were in use in northern Australia about 25,000 years ago (e.g. Hiscock 2008: 110). Savannah grasslands were systematically modified; grasses and other flora were to some degree cultivated and their characters modified; it is argued that the range of fauna was drastically reduced and altered by human intervention, including by anthropogenic fire regimes, during the Australian Palaeolithic.

One would not want to give the impression that Australia’s early indigenous inhabitants were an “unchanging people in an unchanging land.” (Pulleine 1929) We know that they were not, and research over the last half century strongly has put to lie to this early contention. But we should question whether the climatic difference between the Pleistocene and Holocene were reflected in the way of life of the early inhabitants of Australia as much as has been found elsewhere in the world.

3. Conditions during period from 50,000 to about 10,000 years ago

If, in Australia, the Pleistocene/Holocene boundary is less dramatic than found in the northern hemisphere and the “Palaeolithic”/“Neolithic” differentiation is misleading, the effect of the climatic and environmental changes associated with gradual warming and sea-level rise, and stabilization by about 7,000 years ago, still had significant impacts upon regional human populations. To continue the Western Australian example, earlier accessible sources of an Eocene chert were submerged, and lack of access to this raw material is reflected in its absence from the later archaeological record in the southwest of Western Australia.

There were changes to the pattern of vegetation across the continent. Large areas of eucalyptus forest re-colonized the south, while tropical vegetation, reflecting a monsoonal rainfall pattern, was established across the north of the continent. This resulted in significant impacts upon human societies. Eucalyptus forests contain few edible food plants and, archaeologically, such regions appear to have become abandoned. However, northern regions became more habitable and were reoccupied, and the arid interior—re-vitalised with inland lakes and ephemeral rivers—was settled, with the use of new resources reflected in the archaeological record.

It may be that, about 7,000 years ago, with the migration of population groups from the now inundated continental shelf, and access to increasing environmental resources in the north and centre, it was not long before the carrying capacity of the continent was reached.

Several sets of archaeological data tend to support this view of increased population pressure:

– occupation of previously unsettled environmental niches
– maximizing of lithic resources
– marked reduction in the size and weight of individual stone artefacts
– development of regionally diagnostic artefact types, including bi-facially pressure-flaked projectile points.

Somewhat before and during this period there was a marked change in the range of fauna that human groups might have sought as prey.
Megafauna

It has been argued that the majority of Australian megafauna from all climatic zones started to become extinct about the same time that the original occupants spread across the continent. Debate continues as to whether these initial settlers were directly responsible for the demise of the megafauna or indirectly contributed to various extinctions over an extended period. (For non-Australianists the figure provided by Hiscock 2008: 64 may suffice to provide an understanding of the range and relative sizes of the megafauna, which appear to have ranged from less than 1 to about 2.5 metres in height at the shoulder; also Roberts 2010.) The debate about megafaunal extinctions generally has been conducted in conjunction with projects addressing problems of dating the time of earliest human settlement and the last manifestations of various megafauna.

Life in Pleistocene Australia

Earlier modelling of prehistoric lifeways almost inevitably were based in a view of "simplicity, uniformity and conservatism" (Hiscock 2002: 102) in the Pleistocene, followed by a Holocene period of greater complexity and "intensification". This simplistic view prevailed despite a wide range of different environmental conditions and changes over time during the Pleistocene.

Pleistocene artistic life, for example, was seen to demonstrate cultural conservatism and homogeneity. Maynard (1978, 1979) divided Australian rock art into three stages. In the earliest, called “Panaramitee”, motifs were formed by breaking through the weathered surface of ancient boulders to expose fresher material of a different colour. Typical motifs appeared to be footprints of common animals, kangaroo and emu for example. Because most was weathered and widespread it was the earliest form of cultural expression, and typical of the hypothesized cultural conservatism of that period. Later rock art included painting as well as carving and displayed regional differences in style; it was thus more variable and “complex”. It confirmed a more diverse and rich Holocene archaeological record in contrast to the “unchanging” simplicity, pan-continental uniformity and conservatism of the Pleistocene.

But Pleistocene environments varied across Australia and through its tens of thousands of years, as, we are finding, did the diverse economic, technological and other cultural adaptations to them. The “Panaramitee style”, it has subsequently been argued, was a series of regionally distinct styles rather than a single tradition, differing spatially, and over time, in the frequency of different kinds of motif.

Dating aspects of pre-sea-level stabilization period

As elsewhere in the world, in attempting to date early settlement, the limits of the radiocarbon timescale at about 40,000 years BP were quickly reached. The ability to analyse small sample sizes of charcoal and bone using accelerator mass spectrometry (AMS) has extended the usefulness of the technique. Thermoluminescence (TL), optically stimulated thermoluminescence (OSL), electron spin resonance (ESR) and other methods have been applied.

Currently accepted ages obtained using multiple analytical techniques place human settlement by about 45,000 years ago at several sites: Devils Lair in the southwest, Carpenters Gap and Riwi in the northwest, Malakunana in the north, and Mungo (Willandra Lakes) in the southeast (reference maps have been provided by...
Gillespie 2002: 456; Flood 2004: 12; Hiscock 2008: 46; Bednarik 2010: 98). Application of a similar range of methods has shown that most components of the distinctive Australian megafauna from all climatic zones became extinct during the time that human populations spread across the continent—whether or not human predation or climatic change was directly responsible—with little reliable evidence for any megafauna surviving later than this time (Gillespie 2002; Roberts 2001, 2010).

While the minimum securely dated time for human occupation of Australia is about 45,000 years ago, we can suppose from the dating evidence available that modern humans probably occupied Australia during the period 50,000 to 60,000 years ago.

4. Evidence for ancient rock-painting

In these contexts—of climatic and environmental change over the last 60 or 50 millennia, the late Pleistocene and Holocene, that the Australian continent is thought to have been occupied by humans, the influence of the Pleistocene/Holocene border and the importance of the stabilization of sea-levels about 7,000 years ago—what is the evidence for any major differences revealed in the pictograms dated to this period?

Throughout much of Australia, rock carvings—exemplified above by the weathered Panaramitee motifs—are considered by many as typical of the mode of representation of the Pleistocene inhabitants of Australia. Earlier, rock-painting was thought to be absent from this period. Any study of the antiquity of rock-painting, of course, must take into consideration the prospects for its preservation over tens of thousands of years. Opportunities for preservation are poor at open sites and many shallow shelters. Preservation depends upon the type of rock, the characteristics of the paint used, and the micro-environment of the painted surface (Bednarik 1994). Under particular climatic conditions, the formation of stabilizing silica skins over a rock surface can preserve a painted image. These conditions are most likely to be found areas of in northern Australia subject to abundant rainfall.

Whatever the limitations of climate and depredations of the elements over time, there are significant numbers of rock-paintings in Australia that can be argued by various criteria to date to early periods.

Examples of indirectly dated early pictograms

If we share the perception of the likely significance to ancient societies of the opportunities provided by the stabilization of post-glaciation sea levels, then an earlier and influential study by George Chaloupka (1984) is of particular relevance.

Chaloupka defined a sequence of changes in the flora and fauna depicted in Arnhem Land rock-shelters, a significant proportion argued to belong to periods before the Holocene rise in sea-levels. The differentiation uses the geologically-defined Holocene rise in sea-level, after which occurrence, it was argued, painters depicted marine and swamp animals of the present-day environment including salt-water crocodiles and fresh-water fishes. These post-sea-level depictions contrast markedly with another suite of images that clearly represent a pre-sea-level rise environment with Ice Age flora and fauna. The earliest phases of the sequence show object imprints, including hand-prints; then images of grasses and large animals, naturalistically represented (Chaloupka 1984: 16), among which were identified extinct species, the Thylacine, the Tasmanian Devil and possible megafauna (Chaloupka 1984: 18, 23). In the next stage were depicted distinctive human figures.
carrying weapons, some apparently clothed, and running or leaping – the “Dynamic figures” (Chaloupka 1984: 32). Chaloupka’s third phase is typified by anthropomorphic figures represented with the characteristics of bush food, yams in particular (1984: 39); these were followed by the well-known “x-ray figures”, then motifs that demonstrated contact with Western culture (Chaloupka 1984: 43). Chaloupka described the later styles as “Estuarine” –due to the partially inundated environment of the Arnhem Land lowlands– the Wetlands. The “Pre-estuarine” styles represented a period of lower sea levels. There was less available in the way of chronometric dating available then. Chaloupka’s estimates of chronological ages for the various stages were informed by geologist’s dating of the sea-level rise. The earlier stages he estimated to be of Pleistocene age (Chaloupka 1984: 16). While Chaloupka’s model has been reworked (e.g. Lewis 1988) the essential outline remains.

If Chaloupka’s sequence might be seen as representing “merely” pre- and post-sea-level change depictions, there are other ways in which evidence of ancient rock-painting can be inferred and there is increasing evidence of “Pleistocene” period rock-painting. A few examples will suffice to demonstrate this. But first –to consider instances other than from rock art of symbolic representation in the ancient past of Australia– perhaps one of the more striking examples is the burial of the WLH3 individual at Mungo in the southeast of the continent and dated to 40,000 years ago that was covered with ochre, as attested by the red stain in the sands surrounding the skeleton (Bowler et al. 2003; Hiscock 2008: 126).

In several sites, lumps of ochre –“crayons”– have been recovered from ancient excavation levels. Their faceted surfaces indicate that they have been used in the preparation of pigments for painting. While body-painting is a widespread indigenous Australian practice, so is rock-painting and many such finds have been at painted shelters. Faceted ochre was found in the lowest levels of the sandstone rock-shelters of Malakunanja II and Nauwalabila I in western Arnhem Land in most levels including those dated by OSL to between about 45,000 and 61,000 years ago (Roberts et al. 1994). Some questions have been raised about the associations and the dating results but both show some consistency (e.g. Hiscock 2008: 36, 43). At Puritjarra in the Western Desert evidence of occurrence of fragments of ochre throughout the deposit has been interpreted to indicate that rock-paintings were made at this site for a period of more than 40,000 years of occupation there despite the fact that none of the earlier paintings have been preserved (Hiscock 2008: 124). Such patterns and similar interpretations exist for other shelters of Pleistocene age.

Andrée Rosenfeld (Rosenfeld et al. 1981) argued that paintings at the Early Man shelter (near Laura, Cape York Peninsula, northern Queensland) could be indirectly (but minimally) dated from adjacent 13,000 to 15,000 year-old sediments wherein petroglyphs were buried (also Bednarik 2010: 102; Cole & Watchman 2005). At the Carpenters Gap 1 site, a painted rock-shelter in the Napier Range of the Kimberley region of Western Australia, an ochre-covered slab of roof-fall was excavated from strata dated by AMS radiocarbon analysis to between 33,000 and 43,000 years ago, thus suggesting a minimum age for the painting (O’Connor 1995; O’Connor & Fankhauser 2001). O’Connor saw (2001: 287) the find as adding to

“…a growing body of data that indicates the widespread use of ochre –and by implication art– as an aspect of the earliest human occupation of widely separated and environmentally diverse regions in Australia.”
“Direct-dating” of pictograms

More direct evidence has been obtained from “excavation” of datable constituents within painted surfaces themselves. “Direct dating” techniques have been applied to the problem of securely dating petroglyphs in Australian limestone contexts since the 1980s (Bednarik 2002, 2010: 96, 102). Alan Watchman (1990, 2000) pioneered direct dating of silica, particularly oxalate, accretionary deposits, using carbon isotope methods. It is important to reflect that few pigments themselves can be dated directly; only the organic materials in oxalate-rich layers can be directly dated by AMS analysis of minute quantities of charcoal or other organic material able to be collected. It is this technique that has been seen as most successfully applying to pictograms, to the extent of demonstrating multiple layers of paint and identifying pigment residues in mineral skins hidden below the surface (Watchman 1992). Where these layers bracket a painting, they may provide a secure date for the presence of pigment and possibly of a painted motif.

The oldest directly dated paintings were reported by Campbell and Watchman from a painted wall at the Walkunder Arch shelter site in the Laura area (Cape York Peninsula, northern Queensland). They used direct and indirect dating methods to investigate the age of pictograms. Watchman subjected to AMS radiocarbon analysis the charcoal and oxalate minerals obtained from surficial accretions covering rock-paintings. Watchman’s microscopic “excavation” of a sample of the painted wall revealed a sequence of laminae – mineral layers and remnant pigments – that provided organic material for ten AMS analyses. He obtained a conformable sequence of AMS results from a crust only 2.11 mm thick; the age estimates span approximately 26,000 radiocarbon years from about 30,000 to a little less than 3,000 years ago (29,700±500 to 3340±60 years BP), within which were three painting episodes (Watchman 1993; Watchman & Hatte 1996; Watchman & Campbell 1996; Watchman 2000; Campbell 2000: 81 Table 1). The details are shown by the microphotograph used in the paper by Campbell (Fig. 1).

The radiocarbon analyses of the organic content are stratigraphically and internally consistent. They date specific painting episodes within this series from a little more than 28,000 to about 10,500 radiocarbon years ago.

The results provided a date for the earliest evidence of the application of a pigment to a rock-shelter wall. It was when published one of the oldest pictograms then identified. Watchman wrote (1993: 472):

“…the Laura south pictograph is slightly younger than pictographs in the recently discover Cosquer Cave [near Marseille, France (Clottes et al. 1992)] it strongly suggests that human cognitive development in the use of pigment to leave marks on rocks was not only a pre-Glacial European phenomenon, but was simultaneously Australasian.”

On the other side of the continent, in the Kimberley region, several researchers have attempted to date rock-paintings. Bert Roberts has applied optically stimulated luminescence (OSL) and AMS analysis techniques to determine the age of mud-wasp nests associated with rock-paintings and to understand their past environments (Roberts et al. 1997). Such nests contain materials suitable for dating using these techniques – quartz grains and organics respectively – whereas the pigments from which paintings are made usually do not. Robert’s OSL results provided dates for fossilized nests overlying paintings.
Most paintings were minimally dated to within the last few thousand years; parts of two nests were dated to about 17,000 years ago. Some nests also provided enough pollen for AMS determinations: all results were within the last millennium. The older nests were claimed to be associated with a particular style “mulberry-coloured” anthropomorph (but there appears to be some doubt of this attribution — “the painting is so weathered and superimposed by later figures that [its attributes] can also be regarded as indiscernible and problematic.” Watchman 2001: 318) Watchman’s analyses, using AMS, of “mulberry-coloured” figures and a superimpositionally earlier image category at sites in the same area (Watchman et al. 1997: 25) suggests that both types of image “are probably mid-Holocene or slightly younger in age” (Watchman 2001: 318).

Comparable results were obtained for similar figures in

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3 KERC5 core 17,500±1800; KERC4 whole nest 23,800±2400 and 16,400±1800 (Roberts et al. 1997: 697, Table 1).
4 OSL ages for the same nests are <200 years, so that there is no significant discrepancy between the C-14 and OSL chronology. The same is also true for a much older (c. 30 ka) nest, as reported by Yoshida et al. 2003. The pollen grains were C-14 dated, and the quartz grains were OSL dated, to around 30 ka. This nest was not associated with any rock art. The purpose of the study was to see if nests could survive for tens of millennia, which would seem to be the case.
5 Between 3880±110 and 1430±180 BP (Watchman et al 1997: 25, Table 1).
6 In a recent paper, Pettigrew and others (2010), extrapolating wildly, appear to accept that this type of pictograph is between “46,000 […] and 70,000 years old” and that, considering this antiquity, it is remarkable
adjacent regions including Keep River (Taçon et al. 2003) and the Fitzmaurice (Watchman et al. 2010). Roberts’ 17,000 BP date has been much quoted as representing the period of the “Gwion” or “Bradshaw” paintings for which the region is notable; it appears to bolster the view wished by many of the very early dating of the Gwion suggested by superimposition studies (only one category of image appears to be older in the Kimberley) and the oft-claimed but countered view that these images were unknown to modern Indigenous peoples (senior Ngarinyin claim otherwise: Ngarjno et al. 2000).7

Bednarik (2002: 1221–1222, n.d.) discussed several problems with the application of luminescence dating to petroglyphs and pictograms, considering various difficulties and, for the Kimberley results in particular, the lack of a Pleistocene painting tradition elsewhere in the world where rock paintings have “survived in such large numbers of motifs outside of caves.” While these first attempts to introduce luminescence dating into rock art science “deserve every encouragement”, the results needed “…to be considered carefully. […] as with any pioneering endeavour of this type it is important that archaeologists exercise the requisite restraint in interpreting such preliminary and experimental results. […] such results remain quite provisional, even in their order of magnitude, until they can be tested or the concerns can be dismissed.”

The AMS methods in their application to rock art are not without a similar range of concerns – as Watchman has stressed in various accounts (e.g. 1997; cf. Bednarik 2002: 1223–1226, n.d. 2). What is most pertinent here is that the limited suite of results available for these sites require sceptical as well as restrained interpretation. To establish reliable ages for ancient rock art Watchman called for not only multiple sampling (1997: 31) but also (1997: 33)

“…the systematic and scientific use of a combination of dating methods carried out by separate research teams working independently on finely laminated rock surface accretions […] on stratified floor deposits, and on paint components.”

Richard Gillespie (2002), in reviewing evidence for dating of the earliest occupation of Australia, was firm in his requirement: he sought human occupation layers dated not only by multiple age estimates but also by some combination of overlapping methods for the interpretation to be acceptable; in 2002 he found only five places where results fulfilled his criteria. While Gillespie’s criteria are extremely limiting, it may well be that, awaiting further and more secure evidence, we too should be cautious in our interpretation of all dating results for rock art.

that these paintings, “…often exposed to sun and rain, can be vivid and with high contrast, even though they have never been repainted.” They report instances where the original paint “…has been replaced by a biofilm of living, pigmented micro-organisms whose natural replenishment may account for the longevity and vividness of these ancient paintings.” The lack of mineral pigment in Gwion images has been noted before and the biofilm explanation may well account for the distinctive appearance of these images, but the poorly considered claims of antiquity do their argument a disservice.

7 During his expedition to the western Kimberley in 1891, Joseph Bradshaw, who made recordings of the distinctive Gwion rock paintings also reporting encountering local persons wearing examples of the distinctive headdresses similar to those represented in the painted imagery (1892: 100, 99), a link that appears to have escaped his consideration and that of most others invoking his name. McNiven and Russell (1997, 2005) have provided a discussion of the “appropriation of indigenous pasts” and the continuing interpretation of the “strange paintings” and “mystery races” that they see as justifying European colonial activity and “refuelling a diffusionist debate, [and that] has resurrected a colonialist standpoint”; also Redmond (2002) for informed comment.
Discussion

In this review, apart from setting the climatic and geographical context of occupation of Pleistocene Australia and providing some examples of “indirect dating”, the concentration is on the application of archaeometric —“direct”— dating and limitations of some methods, rather than stylistic approaches for which other types of limitations have been demonstrated in Australia as elsewhere. The archaeometric research results so far are involving, and the several applicable techniques show considerable potential for dating pictograms where the climatic and other conditions are favourable. Have they produced satisfying results? A problem with Watchman’s approach (as he himself noted –1977: 32) is that, while we may be more confident with the dating results of the application of this technique, that we know within reasonable limits the likely date of the pigment applied to a rock-face which has been caught between two layers, we may not know anything about the character of the painting itself: its extent, its style, or clues to what is being depicted. The presence identified at the bottom of Watchman’s “excavation” of an acceptably small sampling area of a painted surface is itself a minute sample of a painting —a posthole excavation taken to a “nano” level— where area excavation is required for the adequate identification of the subject matter and any insight into the intention of the painter. We might be excited by early results for pigments identified two millimetres below the painted surface but, if this indicates a purposeful application of pigment, what was being painted? Even with one hundred-fold sampling we may not have an answer to this most pertinent question.

Evidence from ?long-dead birds

Perhaps more satisfying evidence for many will be the identification of early pictograms from their subject matter, particularly that suggested by the recognition of extinct megafauna. Such an instance, just months before the conference at Tarascon-sur-Ariège, received coverage in Australian media.

The ABC headline read: “Scientists say an Aboriginal rock art depiction of an extinct giant bird could be Australia’s oldest painting.” (Masters 2010) The report described a red ochre painting depicting two large birds with their necks outstretched. A palaeontologist was said to have confirmed that the animals were the megafauna species *Genyornis*. This giant goose-like bird was said to have become extinct more than 40,000 years ago. Archaeologist RG Gunn, long researching with technical colleagues and Traditional Owners in central Arnhem Land, was reported to have said that

“…the details on this painting indicate that it was done by someone who knew that animal very well. […] if it is a Genyornis […] it would be the oldest dated visual painting that we’ve got in Australia. Either the painting is 40,000 years old, which is when science thinks Genyornis disappeared, or alternatively the Genyornis lived a lot longer than science has been able to establish.”

The bird in question is to hand (Fig. 2):
In a presentation to the Australian Archaeological Association in December 2010, Gunn argued cogently for the interpretation of the painting as an example of *Genyornis newtoni*, finding the portrayal in concordance with the palaeontological evidence, but modifying its likely time of extinction with the observation that it could have survived in some small areas until up to 25,000 years ago8 (Gunn et al. 2011).

So back to “indirect dating” —if the item of Australian megafauna arguably depicted here was indeed not extinct until between forty and 25 millennia ago, if the circumstances were favourable for such longevity of representation, and if the depiction was not made later from “inter-generational memory”..., then the painting must be so old. And we can see it all.

Is the choice between being more sure of a chronometric date through the application of “direct dating” techniques but knowing very little of the subject, on the one hand, and, on the other, seeing much of the original image but being less sure of the age due to the limitations of “indirect dating”? The two are not necessarily mutually exclusive: where there is only a single layer of painting on a rock surface, a dated sample may be argued to date that painting. And it may be hoped that Gunn and his Arnhem Land research colleagues would pursue any opportunity for the application of direct dating methods as an independent test of their conclusions about the age of the painting. But where, as is frequently the case in Australia, there are

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8 There have been numerous examples of “identification” of Australian megafauna from pictograms and petroglyphs, many problematic; Gunn et al. (2011) have provided a useful review. However, an extended critical review of the many claims for representation of ancient megafauna among Australian pictograms and petroglyphs is lacking; given some example of clear mis-identification, and claims for longevity of survival of pigment —and rock surfaces themselves!— far in excess of what might be expected in various environmental circumstances, a degree of scepticism is warranted in consideration of various claims.
many painting events represented on the same surface (e.g. Watchman 1992) underlying imagery may be difficult to discern in its entirety or at all. In this case, a secure age-estimate for lower layers may be considered to be of limited value beyond indicating that a painting event happened about that time. Then other approaches may be seen to be attractive despite their limitations. The dilemma is probably not restricted to the pictograms of ancient Australia.

**Summary**

Modern humans probably occupied Australia during the period 50,000 to 60,000 years ago. The minimum securely dated time for human occupation of Australia is about 45,000 years ago. Most components of the distinctive Australian megafauna became extinct between then and the later Pleistocene; whether from exclusively climatic factors or a combination of climate and human environmental modification is the subject of continuing debate.

Subsequently, the picture is somewhat blurred. There is a less clear Pleistocene/Holocene boundary as might be argued exists elsewhere. Rising sea levels and lessening aridity prompted population movements and required –by about 7,000 years ago– abandonment of extensive continental plains and adaptation to new environments with new communities of plants and animals. These changes, however, were less dramatic and far-reaching than the adaptations required elsewhere where a pronounced Pleistocene/Holocene boundary is evident. Similarly, there is no dramatic transition from the Palaeolithic in Australia. It appears that the pressures that resulted in the development of the some of various aspects of human economy and society that we recognize elsewhere as comprising the Neolithic were less experienced on the island continent.

Opportunities for preservation of pictograms are poor at open sites and many shallow shelters. In northern Australia, subject to abundant rainfall, the formation of finely laminated oxalate crusts or lustrous siliceous skins over a rock surface can stabilize and preserve a painted image. There are significant numbers of rock-paintings in Australia that can be argued, by various criteria, to date to early periods.

In Australia, aspects of symbolic representation including rock-painting can be dated by indirect and direct methods to more than 40,000 years ago.

In the sequence of changes in the flora and fauna depicted in some Arnhem Land rock shelters, a significant proportion was argued to belong to periods before the Holocene rise in sea-levels, after which painters depicted marine and swamp animals of the present-day environment; the “Pre-estuarine” paintings clearly represent a pre-sea-level rise environment. In northern Queensland paintings were indirectly dated to about 18,000 years ago. Painted roof-fall in a Kimberley excavation has been dated to about 40,000 years ago. The oldest –circa 25,000 years BP– directly-dated evidence of rock-painting (charcoal and oxalate minerals in surficial accretions subjected to AMS radiocarbon analysis) has been reported from another Queensland site.

Watchman’s direct-dating approach is limited in that, while we may be more confident that we know within reasonable limits the likely date of the pigment applied to a rock-face that has been caught between two oxalate or silica layers, we might know little about the character of any painting itself. Perhaps more satisfying evidence for many will be the identification of early pictograms from their subject matter, particularly that suggested by the recognition of extinct megafauna reportedly
extinct by at least 25 millennia ago. Researchers are faced with a dating dilemma probably not unique to ancient Australia.

Acknowledgments

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**Quote this article**

Pleistocene rock art: a colonizing repertoire for Australia’s earliest inhabitants

Jo McDONALD and Peter VETH

Abstract

A recent paper discussing the arrival of modern humans into Australia 50 ka argues that rock art was one of a suite of behaviours which would have facilitated the colonization of the most arid continent on earth. In this paper we discuss the social mechanisms and likely art correlates for that behaviour. The distribution of Australia’s earliest art throughout the arid zone—and its cultural continuity in that environmental context—are discussed.

We have recently argued that rock art played an integral role in the information exchange systems deployed by colonizers of the most arid continent on earth—Australia (McDonald & Veth 2011; Veth et al. 2011). We have also argued that there is good evidence for regional diversification in the use of material symbols in the pre-LGM record in Australia. The successful colonization of the arid and semi-arid core of Sahul in this time period has broader implications for the use of art as a social signifier. In this paper we re-analyze the earlier debates on the chronology for rock art use in Australia—recasting this not as an evolutionary trend (Maynard 1979) but rather as a necessary component in the colonization of a naive landscape and then successful adaptation to a range of environmental niches. By contextualizing this early rock art into other aspects of the Pleistocene archaeological record, we argue it is possible to theorize the use of rock art at this early period—despite the elusiveness of dated assemblages.

Previous models of Australian rock art

In the 1970’s Lesley Maynard provided a tri-partite schema for Australian rock art (building on the earlier work of e.g. Edwards 1971) and the widespread belief that there was an ancient engraved tradition across the arid zone (e.g. Basedow 1914). Maynard’s model saw an evolution from a pan-continental stylistically-homogenous (i.e. non-figurative) Panaramitee style assemblage of engravings/petroglyphs replaced by a set of regional Simple Figurative styles and regional Complex Figurative styles. The complex and simple figurative style(s) are either petroglyphs or pigment and in a few regions are dual media art bodies (e.g. Sydney: McDonald 2008). Complex figurative styles were seen as only occurring in the north and northwest of Australia. Maynard’s model was explicitly evolutionary:
Although she allows for the co-existence of different styles in different parts of the continent, the notion of a developmental sequence is implicit […], indeed it is quite explicit in her final analysis. (Rosenfeld 1991: 136)

In the 1990s serious critique of the Panaramitee set in –fuelled by the proliferation of regional studies around the continent (see debate on chronology in *Rock Art Research* 1988; and Rosenfeld 1991, 1993) and by the advent of AMS and other dating of the various components of rock art around the continent. These earlier criticisms have been compounded by more detailed analysis of “Panaramitee” sites (e.g. Franklin 2004) and the proliferation of regional research projects, which have further demonstrated regional stylistic difference in most parts of Australia. The main problems with the model are seen as (and see Bednarik 1995, 2010b and this CD; Franklin 2004; Rosenfeld 1991):

– the definition of the style was too wide (including material which was both structurally and formally diverse) and yet too narrow (in its insistence on restricted technology and likely age);

– that regionally diverse styles were demonstrably present in the Pleistocene (at that time, the dynamic figures from Arnhem Land, the non-figurative integrative systems from north-east Queensland, as well as track and circle systems in the arid zone);

– and there was evidence for continuity of the ancient track and circle (and other non-figurative) motifs up to the recent past/present in central Australia.

While the problems of the tri-partite model have been clearly explicated, increasingly complex patterning which continues to be identified across the continent has stymied the development of a better model –and this seems likely to be because the diachronic pattern present across the continent is not unidirectional; but more episodic and mosaic-like in its patterning.

What is clear is that there is an older –predominantly geometric– art form present across Australia, which is replaced in some areas by one or more figurative art vocabularies; while in other areas this iconography appears to endure. The timing for the introduction of different elements into the art graphic through time is no doubt a continuing point of departure for many rock art researchers –and the dating of the earliest aspect of this is still wide-open for debate (and the development of suitable and replicable dating techniques), most researchers these days consider that there is a Pleistocene art signature in Australia, and the debate is more about what this can tell us about the earliest inhabitants of this most arid country on earth.

**The colonization of Sahul**

When people moved into the semi-arid and arid interior of Sahul circa 45,000 years ago, surface water was abundant and conditions were considerably more benign than they are now (Hiscock & Wallis 2005; Veth *et al*. 2009). Evidence relating to the economic, technological and social strategies employed by these colonizing populations is limited, but has been interpreted as indicating highly flexible territorial arrangements and subsistence activities (Veth 2005). It also suggests that a focus of people’s activities was on large, freshwater lake systems which would have provided an array of predictable aquatic resources.

The rapid dispersal of the colonizing populations into an array of different habitats, points to the existence of complex information exchange systems that enabled parent and daughter populations to maintain existing social networks and small colonizing...
populations to establish new networks as well as pass on information about the location and distribution of resources (Balme et al. 2009; Veth et al. 2011). The establishment and maintenance of social networks would have been particularly important for the long-term survival of small, dispersed and highly mobile populations in semi-arid and arid habitats characterized by spatially and temporally patchy resources (cf. Smith & Hesse 2005; Veth 2005).

Part of Pleistocene Sahul now lies beneath the ocean, but perhaps of greater consequence in constraining the recovery of evidence for the earliest rock art is the nature of the art sites and the landscapes in which they are found—and the way that people have used these. Low energy geomorphic settings which allow continuous accumulation of sediment without major changes in temperature and moisture are needed to preserve organics over many thousands of millennia. The limestone caves of Palaeolithic Europe are of course perfect repositories for this type of evidence. In Australia, however, petroglyphs and paintings tend to occur—not in deep caves—but in shallow sandstone or quartzite rockshelters on surfaces that are open to the elements and where long-term preservation is less likely. The deep limestone caves in Australia occur across a southern arc (e.g. Devils Lair, Nullabor Plain and Mt Gambier): these are the exception to this: and indeed it is in these contexts that some of the earliest symbolic behaviour (rock art and mobiliary art) has been demonstrated (Bednarik 2010a). But these relatively few deep caves do not appear to have provided the same sort of loci for continuous social action over long periods of time, as is witnessed in Europe. And many have argued that finger fluting is more a visual manifestation of a gesture rather than a system of referential symbols (Rosenfeld 1993: 77).

The types of material markers employed, and the contexts in which they were used, have an obvious effect on the probability that they will enter the sedimentary record. Ornaments and complex tools imbued with high social value were undoubtedly curated, transported and/or recycled and consequently, entered the archaeological record infrequently. Judging from the frequency with which broken slabs of engraved or painted rock are recovered from dated stratigraphic contexts, they too had a low probability of entering the sedimentary record, albeit for different reasons. Direct dating of the mineral skins that cover rock paintings and petroglyphs has been attempted in Australia, but the number of reliable age determinations is still limited (Watchman 2001; Cole & Watchman 2005; Smith et al. 2009) and few of the oldest paintings contain organic materials that could be dated using radiocarbon. This affects our ability to effectively assess the extent of ancient symbolic systems.

Despite the factors affecting the survival and visibility of past information exchange systems, the early Pleistocene records of Australia and New Guinea preserve a variety of such evidence. We have discussed this substantial body of evidence in our recent papers (Balme et al. 2009; Veth et al. 2011) but we summarize the relevant data here, particularly as this is in contrast to other reviews of Upper Palaeolithic traits (Brumm & Moore 2005; Habgood & Franklin 2008).

Identity markers

Items of personal adornment that arguably functioned as identity markers and helped to mediate intra- and/or inter-group interactions have been recovered from widely dispersed pre-Last Glacial Maximum sites. Two of these sites are in the semi-arid zone of north-west Australia. At Mandu Mandu Creek, 22 cone shell beads older
than 32,000 BP were recovered, while at the Kimberley site of Riwi, 10 tusk shell beads were dated to c. 30,000 BP (Balme & Morse 2006). The Mandu Mandu beads have perforations and edge damage consistent with their having been strung. The Riwi beads also have evidence of suspension edge damage as well as the remains of fibre and ochre colouring. On New Ireland, a perforated shark’s tooth from Buang Merabak (Leavesley 2007), dated to between 40,000-28,000 BP was recovered, while bone beads from Devil’s Lair, in south-west Australia, have been dated to 19,000-17,000 BP (Dortch 1984).

![Fig. 1](image.png)

**Fig. 1.** Locations of sites in Sahul that contain early evidence for symbolic behaviour (from Veth et al. 2011: Fig. 2).

**Ochre processing**

Ochre is preserved at many Australian pre-LGM sites, but we restrict our discussion here to those sites that contain facetted ochre, grindstones that were used to process ochre, or slabs smeared with pigment. A painted rock fragment recovered from Carpenter’s Gap in the Kimberley has been dated to 42 ka (O’Connor & Fankhauser 2001) and evidence for the grinding of ochre has been recovered from
Malakunja 2 and Nauwalabila 1 in Arnhem Land, the lower levels of which are dated by OSL to 53 and 59-53 ka (Roberts et al. 1994). Younger sites with evidence for the processing of ochre are scattered across the continent (Fig. 1).

**Long distance movement of material**

The extent of people’s social networks is documented at a number of pre-LGM sites by evidence for long-distance movement of materials (Fig. 2).

![Map of Sahul showing the evidence for long distance movement of high social value materials dated to >25,000 years and the areas in which Pleistocene art is found (from Veth et al. 2011: Fig. 3).](image)

Ochre has been recovered from many Pleistocene sites, but only a few of these occurrences have been sourced. The oldest evidence for long-distance movement of ochre used in a ritual context is the ochre that decorated the Mungo III cremation, between 42,000-38,000 BP. The nearest source of ochre is in the Barrier Range, 250 km from Lake Mungo. In central Australia, ochre sourced at Karkurr was moved 125 km to Puritjara between 32-18,000 BP (Smith et al. 1998), while the closest source for the ochre recovered from the 25-22,000 year-old levels at Mandu Mandu was 300 km away.

Un-worked pearl and baler shell are present in the 28-19 ka levels at Widjinggarri when the coast was 200 km away, and baler shell is present in the 30-19 ka levels at Carpenter’s Gap, when the coast was more than 100 km away (O’Connor 1995).
nearest coastline was 500 km away from Riwi 30 ka when shell beads were transported to the site.

**Complex tools**

Complex tools including boomerangs appear in the earliest Kimberley pigment paintings and stencils (the irregular infill animal period) with subsequent phases of Bradshaw figures (or Gwion Gwion: Doring et al. 2000) demonstrating increasingly complex weaponry (Walsh 2000). Complex tools are also recorded amongst dynamic figure pigment art in northern Australia (Chaloupka 1993). Although dating of these art styles is not conclusive, an OSL date suggesting a minimum age of 17 ka for one Bradshaw/Gwion Gwion painting (Roberts et al. 1997) and studies of style, motif and environment (e.g. Lewis 1988; Chaloupka 1993; Chippendale & Taçon 1998) suggest that these could reasonably be expected to be Pleistocene (see below).

In those same paintings dilly bags are also depicted showing the presence of a fibre technology. Fibre is rarely preserved in early archaeological deposits but other evidence from the region suggests its critical importance in the development of complex technology. Fibre was almost certainly used as a fastening component in the colonization watercraft that had to cover long distances and strong currents. The presence of large deep-water fish in Timor at the site of Jerimilai and from the New Ireland site of Buang Merabak, both dating to about 40 ka, implies deep-sea fishing techniques. The use of nets has been invoked to explain the abundance of fish of uniform size within single use middens preserved in Pleistocene sand dunes bounding an inland lake in western New South Wales (Balme 1995). The Riwi and Mandu Mandu beads with evidence for stringing are further confirmation of the role of fibre in complex artefact design.

**Regional art traditions**

Much of the extant body of painted and engraved art in Sahul is of unknown age, and most of it is undoubtedly Holocene in age. However, the art from at least four areas includes likely Pleistocene components: the early paintings from Arnhem Land (Lewis 1988; Chaloupka 1993; Chippendale & Taçon 1998), the Kimberley (Roberts 2000; Roberts et al. 1997), the early paintings and petroglyphs from Cape York peninsula (Rosenfeld et al. 1981; Morwood 2002; Watchman 1993; Cole & Watchman 2005) and engraved arid zone assemblages some of which include “archaic faces” (Fig. 2). The art from each of these areas is quite distinct, and indicates that symbolic differentiation of populations from different parts of the arid zone likely took place before the LGM (McDonald 2005; see also Franklin 2004). These are not formal definitions of “art traditions” but refer to geographic location or well-known studies of the art (e.g. archaic faces (Dix 1977); Kimberley (Walsh 1994); Arnhem Land (Chaloupka 1993); Cape York (Rosenfeld et al. 1981).

In the Cape York Peninsula, age determinations for pigment minerals contained in the oxalate crusts show that paintings were likely being produced in this region 32.6-29 ka (Watchman 2001). This pigment may have been part of a stencil or a painting and no stylistic information exists for this “art”. Similarly, excavation at Sandy Creek 1 indicated that this site was first occupied 34 ka ago, and that painting was a feature of site use throughout the entire cultural sequence, while in Sandy Creek 2 a rock painting was direct dated to 27 ka (Morwood 2002: 270). Engraved art in this part of Queensland is also known to be late Pleistocene in age: at Early Man Shelter, buried
engraved art on the back wall of the shelter (tracks and geometric designs) was dated to a minimum of 15.7 cal. BP (Rosenfeld et al. 1981), while a similar age was obtained at Sandy Creek 1. At Green Ant Shelter, a date of 10 ka was obtained for a buried slab with patinated petroglyphs (Flood & Horsfall 1986). The point to be made about the dated engraved art in this region is that it is all minimum ages, dependent upon subsequent sediment build up in rockshelter locations.

On the Arnhem Land plateau four phases of painting have been distinguished on the basis of content and stylistic conventions. Several phases pre-date the post-glacial rise in sea level, an inference based on the depiction of extinct animals in the earliest paintings and the fact that contemporary marine and swamp fauna are depicted only in the most recent paintings (Lewis 1988; Chaloupka 1993; Chippendale & Taçon 1998). There are marked discontinuities between the different phases of painting, reflecting changes in the environment as the sea flooded the Arafura Plain. A recent find in the Katharine area—a depiction of now extinct Genyornis, has provided further evidence of pigment art being depicted around 40 ka (Gunn, quoted in Australian Geographic, June 1, 2010). Archaeological and paleontological evidence for the extinction of Genyornis in Australia is between 40-50 ka (Field & Wroe 2007).

In the Kimberley region, an OSL age determination of 17.5 ka on a mud wasp nest that overlay a pigment figure (Roberts et al. 1997; Roberts 2000; Walsh 2000) suggests that this art tradition was well established (at a minimum) a few thousand years after the LGM. Several paintings in the Kimberley have now been interpreted as depicting the extinct carnivore Thylacoleo carnifex (Akerman 2009; Akerman & Willing 2009). One of these is consistent with the early large naturalistic phase (Akerman and Willing 2009), while the other is associated with an early Bradshaw figure, with the human and striped marsupial separated by a multi-barbed spear (Akerman 2009). If this depiction has been interpreted correctly as Thylacoleo carnifex then it suggests considerable antiquity for this art as there is no available evidence for Thylacoleo more recent than 44,000 and 42,000 years ago (Turney et al. 2001).

In many parts of the arid zone, a distinctive suite of petroglyphs has been documented. While being a broadly homogeneous style (Edwards 1971; Maynard 1979), variation in the proportions of motifs depicted suggests regional differentiation within this widespread graphic tradition (Franklin 2004; McDonald 2005). These petroglyphs are undated but most of them are heavily weathered, patinated and otherwise altered by geological processes. Thus, they are widely regarded as old (Edwards 1968; Dix 1977; Walsh 1994: 68-74; McDonald 2005), although none has been uncontroversially dated (Reneau et al. 1991; Watchman 1992, 2000). “Archaic faces” found amongst this art tradition have been interpreted as demonstrating the extent of a regional networks in this distinct graphic tradition (McDonald 2005).

This differentiation of art styles relatively early in the continent suggests that symbolism was used to mark identity over areas much wider than has been documented by the chance (firmly dated) occurrences of personal ornaments or fragments of ochre. While shell ornaments are likely to have demonstrated personal relationship role levels within the social groups, the marking of places through painting and/or petroglyph would have indicated the relationship of the artists to their country—both to members of the society and to outsiders. In both respects, symbols seem likely to have conveyed information important to the successful colonization of the arid and semi-arid regions.
The fact that an older –predominantly geometric– arid zone art form present across most of the continent, is replaced in some areas by one or more figurative art vocabularies should form the continuing focus for research. The fact that this iconography has endured in the arid zone should similarly provide a significant focus for continuing research. Many researchers –including Bednarik in this pre-conference publication– have expressed incredulity that a rock art style might persevere from the Pleistocene through the Holocene and indeed to the current day. The challenge to current research in Australia is not only to date the earliest art in Australia; but to continue to disentangle the ethnographic realities of a recursive rock art tradition; to understand how people use an iconographic style –to attempt to explore the patterning in this with a view to understanding the deep past.

Acknowledgments

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The Gwion or Bradshaw art style of Australia’s Kimberley region is undoubtedly among the earliest rock art in the country – but is it Pleistocene?

Mike DONALDSON

Abstract

The spectacular and finely executed paintings of human figures that became known as “Bradshaws” intrigue all who see them in the remote rock shelters of Western Australia’s Kimberley. In the sequence of Kimberley rock art, these figures, termed Gwion Gwion or just Gwion by some Aboriginal groups, clearly pre-date the Wandjina paintings that form part of the region’s ongoing Aboriginal culture, and which dates back almost 4000 years. Although dating these figures remains elusive, a single tantalizing optically stimulated luminescence date of sand grains from a mud wasp nest that overlies “Gwion-style” paintings suggest a minimum age of 17,500 years for the art work.
The Kimberley region of north-west Australia is a largely wilderness area almost the size of France (Fig. 1). The richness of the area’s rock art has been appreciated for many years, and there is a strong continuing indigenous culture relating particularly to the spectacular Wandjina paintings. However, Wandjinas represent just one of many art styles that occur throughout the Kimberley (e.g. Crawford 1968; Walsh 1988; Flood 1997; Morwood 2002; Donaldson 2007).

Fig. 2. Early Kimberley Irregular Infill Animal painting of a fish, 40cm long.

Fig. 3. Kimberley art panel of typical Sash Gwion figures illustrating complex superposition. The panel is 2m wide.
DONALDSON M., The Gwion or Bradshaw art style of Australia’s Kimberley region is undoubtedly among the earliest rock art in the country—but is it Pleistocene?

Fig. 4. Kimberley Wandjina figures represent cloud spirits and form part of a continuing cultural tradition dating back almost 4000 years. The central face is 30cm wide.

Fig. 5. Post European contact art depicting 17th century pipe-smoking Dutch sailors in a rowing boat equipped with rowlocks and oars. Bigge Island, Kimberley coast.
The paintings span a period of many thousands of years, and four distinct periods are recognised (e.g. Welch 1999; Walsh 2000):

- early naturalistic animals with irregular painted infill (Fig. 2);
- Gwion or Bradshaw figures (Fig. 3);
- Wandjinas (Fig. 4);
- Post-European contact art (Fig. 5).

Post-European contact art dates from perhaps the mid 17th century, and Wandjina art has recently been confirmed to date from almost 4000 years ago (Morwood et al. 2010). Reliable dates for the earlier art styles remain elusive, but some results suggest the Gwion paintings are at least 17,500 years old (Roberts 2000).

**Gwion paintings**

Since the first publication of sketches by pastoralist/explorer Joseph Bradshaw (1892), the finely painted small red human figures from the northern Kimberley region of Western Australia that became known as “Bradshaw figures” have fascinated and intrigued all who see them. Bradshaw likened the paintings to early Egyptian art, and did “not attribute them to the present representations of the Black race” (Bradshaw 1892).

Other early reports only intensified European interest in these paintings: a Palatine missionary, Father Worms, who worked in the Kalumburu area in the 1930s, quoted a Gwini elder as “of the opinion that another people, who occupied this district long before their arrival, produced them” (Worms 1955). Noted Australian anthropologist Charles Mountford, although he never visited the Kimberley, commented on drawings of these figures made by entomologist Gerald Hill in 1909, and stated them to be “the finest examples of aboriginal art, in which action is portrayed, known to the writer” (Mountford 1937).

The paintings were termed “Bradshaw paintings” by the Frobenius Expedition in 1938, in the absence of any Aboriginal word for the distinctive figures (Schulz 1956). The term has been widely used since then (e.g. Crawford 1968; Stubbs 1974; Walsh 1994, 2000; Flood 1997; Morwood 2002) but in recent times there has been a preference to apply an Aboriginal name, **Gwion Gwion** (e.g. Doring 2000), or Gwion (Bednarik 2000) for these figures. **Gwion Gwion** is a Ngarinyin name and other Aboriginal groups use different terms for the figures such as **giro giro** (Worms 1955) and **bramba bramba** (Crawford 1968), which led researcher Grahame Walsh to retain the Bradshaw name in his detailed study (Walsh 2000). Welch (1996, 1999) preferred the simple descriptive terms “Tasselled Figures” and “Bent Knee Figures” to Walsh’s “Tasselled Bradshaws” and “Sash Bradshaws”. In the 1990s, four Ngarinyin lawmen (**munnumburra**) worked with film-maker Jeff Doring to record some of their cultural associations with Gwion Gwion paintings, partly to support Native Title claims to large areas of land in the north Kimberley (Doring 2000). This publication describes the Gwion paintings as sacred evidence of ancestors (junjun) and an important part of the **Wunan** tribal law system. Doring's informants say that this connection was not previously discussed with non-Aboriginal people because it was considered too secret to divulge.

The term “Gwion” is used here in the general sense for this group of paintings, in preference to “Bradshaw” following Doring (2000) and Bednarik (2000).
Description

Gwion paintings depict elegant human figures, typically 40 to 50cm high but rarely up to 2m high. Although the paintings are very finely executed with precise brush strokes, gender is rarely depicted and there is no facial detail, but leg and arm musculature is commonly clearly defined, as is foot and ankle detail, shoulders, and stomach paunch (Fig. 3). The figures are adorned with a variety of body, head, leg and arm ornamentation including belts with various items hanging from them, long conical headdresses, and leg and arm bands. They typically carry several boomerangs and often also a bag or fan-like item. Doring (2000) identifies many of these items as adornments still used in ceremonies and dance.

Two researchers in particular, Grahame Walsh (1994, 2000) and David Welch (1990, 1993, 1996, 1999, 2007), have studied these paintings in detail and established their own, albeit quite similar, terminology for them. Walsh recognised two main types: “Tassel Bradshaws” and “Sash Bradshaws”. He also identified many minor variants, but differentiated all the Bradshaws from other commonly associated small red painted figures, which he referred to as “Elegant Action Figures” and “Clothes Peg Figures”. Welch (1996, 1999) referred to these paintings as “simple figures” and “Straight Part Figures”. Walsh’s stylised depiction of these art styles is shown in Figure 6.

Tassel Gwions (Fig. 7) are characterised by elaborate tassels, identified as feathers (yululun) by Doring (2000), hanging from the arm pits, shoulders or waist. Numerous other accoutrements such as bangles, armlets, headdresses and held items including boomerangs and bags are also typical of this group. They are painted with the finest attention to detail, clearly by skilled artisans using sophisticated brushes and pigments.

Sash Gwions (Fig. 8) are simpler figures characterised by distinctive three-pronged sashes hanging from a waist band or belt, or (rarely) held in the hand. Ngarinyin people call these walbud and identify them as possum or kangaroo skin garments (Doring 2000). Body shape is more robust than in Tassel Gwions, and there are distinctive sets of accoutrements including what Walsh (2000) refers to as a “Tuft Armband” and “Chilli Armpit Decoration”.

Fig. 6. Walsh’s (2000) “Erudite Epoch” sequence (simplified): A. Tassel Bradshaws; B. Sash Bradshaw; C. Elegant Action Figure; D. Clothes Peg Figures.
**Fig. 7.** Tassel Gwion figures with characteristic body accoutrements including tassels, arm bands, and detailed leg musculature and stomach paunch. These paintings have been pounded by later (pre-European) people apparently in an attempt to erase the previous culture.

**Fig. 8.** Sash Gwions with waist and arm pit sashes, conical headdresses, and boomerangs. The adult hand stencil provides a scale.

**Fig. 9.** Tassel Gwion figures in red and yellow-brown pigments on the same rock surface suggest original differences in pigments used rather than fading due to weathering.
The paintings vary from deep purple-red to red and reddish-brown, brown, and even yellow-brown. This colour range is in part due to the degree of weathering suffered by paint pigments on the rock surface, in particular the amount of exposure to direct sunlight and rain (Fig. 3). However some panels include both red and brown figures where the degree of weathering and exposure appears to be uniform (Fig. 9). Most Gwion paintings have been subjected to prolonged weathering and most have clearly faded to some degree.

Doring (2000) suggests that the bark of the *mamandu* tree (not identified botanically) was used as fixative and dye for the red colour of Gwion paintings. However, in the limited studies of Watchman (1997), red coloration was found to be due to the iron oxide hematite, and the characteristic purple-red colour of some Gwion figures, described as “mulberry hue”, was identified as due to jarosite, an iron sulphate. Yellow and brown paint is mainly the hydrated iron oxide goethite, or a mix of goethite and hematite. These findings do not preclude the use of organic materials as fixatives for these paint materials.

Gwion paintings are mainly on vertical rock surfaces, less commonly on rock shelter ceilings. A notable feature of Gwion art sites is that they are typically small rock overhangs with irregular rocky floors high up on escarpments, sites that would be totally unsuitable for habitation.

Elegant Action Figures (Fig. 10) show great sense of movement and portray kneeling and sitting positions as well as running and hunting scenes. The figures are typically small (less than 40cm high) and carry multi-barbed spears and boomerangs. Several researchers have commented on the similarity of these figures with the Dynamic Figures (*Mimi*) of Arnhem Land (e.g. Flood 1997).

![Fig. 10. Elegant Action Figures portray a great sense of movement and the panel illustrates the increased weathering with distance from the protective overhang above.](image-url)
Clothes Peg Figures (Fig. 11) are so named because of their resemblance to old wooden clothes pegs. (Welch (1990, 1999) refers to these figures as “Straight Part Figures”). They are static figures, typically 30 to 50cm high, painted in red ochre but commonly with blank areas where one or more pigments have weathered away; in particular, hands, feet, waist belt, and headdress detail is often missing. Rare examples with some remaining yellow and white pigments in these areas indicate the figures were multi-coloured. Clothes Peg Figures are generally shown with associated multi-barbed spears and spear-throwers, which is notably different to the items carried by or associated with the Gwion figures.

**Fig. 11.** Clothes Peg Figure, 50cm high, with pigment missing from hands, feet, waist and head area, and a large item, presumably a woven bag, hanging from the neck. A multi barbed spear (at upper right) is a characteristic accessory of these figures.

**Relative chronology**

Most observers have recognised that the Gwion paintings are of some antiquity, based on their faded appearance, over-painting by other art styles (Fig. 12), and the fact that Aboriginal people did not relate them to their existing Wandjina culture at the time of early European contacts.
Fig. 12. Sash Gwions overpainted by now very faded Wandjina-period paintings of large human figures (red and white legs only visible).

Welch (1996, 1999) and Walsh (1994, 2000) documented many examples of superposition and established a relative chronology for the Kimberley rock art. Walsh (2000), on the basis of extensive field observations over several decades, placed the Kimberley art styles into Epochs and Periods, further subdivided into distinct groups:

**Archaic Epoch**
- Pecked Cupule Period
- Irregular Infill Animal Period
  - Hand stencils
  - Boomerang stencils
  - Positive hand prints
  - String, feather & grass prints
  - Paintings (animals, plants, humans)

**Erudite Epoch**
- Bradshaw Period
  - Tassel Bradshaws
  - Sash Bradshaws
  - Various other minor Bradshaw forms
  - Elegant Action Figures
  - Clothes Peg Figure Period

**Aborigine Epoch**
- Clawed Hand Period
- Wandjina Period
Walsh’s relative chronological sequence has been broadly confirmed by more recent observations (e.g. Donaldson 2007, 2011), and it is clear that Gwion figures represent one of the oldest art styles in the Kimberley. Walsh highlighted the inferred large time interval between the Gwion art and the vastly different Wandjina paintings which remains part of continuing Aboriginal culture. However, Welch (2007) argues for continuity of tradition from people depicted in early Gwion art to historic and current Aboriginal ceremonial dress, and Doring (2000) documents continuity of at least some aspects of ceremonial attire from Gwion paintings to the present time.

Absolute chronology

Occupation of Australia has been reliably dated to at least 60,000 years ago (at Lake Mungo in the southeast of the country; Bowler and Price 1998), and dates of 55,000 to 60,000 years have also been recorded from Arnhem Land in northern Australia (Roberts et al. 1994, 1998; O’Connor 2007). In the southern Kimberley, O’Connor (1995, 1999, 2007), McConnell & O’Connor (1999), and Balme (2000) have documented occupation dates of at least 40,000 years in the limestone ranges. Importantly, an ochre-covered rock from O’Connor’s Carpenter Gap excavation in the Napier Range dates to 39,000 years and is the oldest indication of rock art yet discovered in the area (O’Connor & Fankhauser 2001). Rainsbury (2009) summarised archaeological research results for the Kimberley from 37 documented excavations and dates obtained from various materials associated with some of the major art styles.

Direct dating of Kimberley rock art has used AMS radiocarbon techniques to establish that Wandjina paintings (containing carbon as the black pigment) and Wandjina-style beeswax images date from the present to almost 4000 years (Morwood 2010; Watchman 1997). Dating the older art has proved more difficult: Watchman (1997) dated some carbon-bearing silica accretions over some Tassel Bradshaw paintings as about 1400 years, and an accreted calcium oxalate layer associated with paint from a “Cane Bradshaw” as 3880 ± 110 years. These may be minimum ages relating more to the time of mineral accretion over the paintings than the date of painting.

Roberts et al. (1997) used optically stimulated luminescence (OSL) to date quartz grains from a mud-wasp nest overlying a Bradshaw painting. This gave an age of 17,500 years which would therefore be a minimum age for the painting. The OSL technique is yet to be firmly established as a reliable and accurate dating method and until further dates corroborate this single result and calibrate it against more established techniques such as AMS radiocarbon, the age of the Gwion paintings remains unknown.

Conclusions

One OSL date clearly does not provide conclusive evidence of a Pleistocene age for the Gwion figures. However, together with the relative chronological sequence, degree of weathering, and the difference in material technologies compared with later art styles, there is still the possibility that the art is of Pleistocene antiquity. Current research on north Kimberley art sites by University of New England and Wollongong University staff and students will hopefully answer some of these questions over the next few years.
DONALDSON M., The Gwion or Bradshaw art style of Australia's Kimberley region is undoubtedly among the earliest rock art in the country – but is it Pleistocene?

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Quote this article
How old is old looking? The Dampier petroglyphs in review

Ken MULVANEY

Abstract

In public forum, the age of the Dampier Archipelago petroglyphs of the Pilbara region of northwest Australia is cited as in the order of 25-30,000 years. Clark (1978), based on the presence of a mineral coating (desert varnish), believed that a component of the rock art must be older than 17,000 BP. Others, including Lorblanchet (1983, 1992), assessing the weathered appearance and degree of patination, certainly regard the petroglyphs as having a Pleistocene antiquity. In this paper, the pattern of weathering is assessed in relation to the lithology (gabbro and granophyre) on which these petroglyphs are produced, and motif subject and stylistic range exhibited. Based on associated data, including archaeological information, climatic and environmental factors, and ethnographic parallels, the Dampier petroglyphs are placed into a temporal sequence that likely spans the late Pleistocene and Holocene.

The Dampier Archipelago lies on Western Australia’s Pilbara coast, extending over an area of 1,456km² (c. 300km² actual landmass) into the Indian Ocean (Fig. 1). These islands are the easternmost of a chain of islands that extend from Exmouth Gulf, 335km to the west southwest. They are the only islands which comprise intrusive igneous rock (gabbro and granophyre) and basalt lava (Donaldson 2011), providing exceptional, weathered surfaces on which the petroglyphs are preserved. The progression of weathered rind (erosion rate) is among the lowest measured anywhere in the world. This, in part, explains the abundance of the rock art, more importantly it allows for the likelihood of preserved ancient rock art. During the Pleistocene this area was a series of high rugged hills set within a vast plain. It was following the Last Glacial Maximum (LGM) and the associated rise in sea level that these higher landforms became the islands of the Dampier Archipelago some 9-6,000 years ago (Fig. 2).

No systematic and complete survey has been conducted of the Dampier Archipelago petroglyphs. However, investigations to date show this area to be one of the richest concentrations of petroglyphs in the world (Bednarik 2007; Mulvaney 2010; Veth et al. 1993; Vinnicombe 2002). Not only in shear number (500,000 to 1,000,000 individual petroglyphs), but in the range of subjects, forms and techniques displayed. This diversity covers the spectrum of motifs which may be broadly grouped as Geometric (shape-like), Anthropomorphic (human-like), Zoomorphic (animal-like) and Spooromorphic (track-like), comprising many hundreds of distinct motif types within teach of the overarching divisions (Mulvaney 2010).
The Pilbara is a region of Australia rich in petroglyphs, with distinct local variation displayed (Fig. 3). One of the earliest documented references about Australian Aboriginal rock art relates to Depuch Island, just 90km east of the Dampier Archipelago (Stokes 1846; Wickham 1843). Further eastward, around Port Hedland, are the petroglyph sites on limestone outcrops (McCarthy 1962). Others of the better known sites occur along the Fortescue River and Yule River (McNickle 1984; Wright 1968). There are also the painted rockshelter sites of the Hamersley Range (Walsh
Lesser known sites are scattered throughout the Abydos Plain, the Chichester Range and Hamersley Range. This is an area covering some 182,000 km$^2$ of diverse topography and surface expression of geology, the pattern of rock art, to an extent, reflecting this. However, the Dampier Archipelago is a location where the specific combination of petrology and ecology presents a unique circumstance for the development and preservation of its rock art.

Archaeological investigations of shell middens provide evidence of occupation throughout the last 9,000 years. This pattern is reflective of the post-glacial marine transgression, the formation of the archipelago and the availability of marine resources. There is one date, c. 21,500 BP, from a shell fragment retrieved from a rocky slope containing petroglyphs, which suggests a greater antiquity for human presence in the area. Evidence from other parts of the Pilbara indicates that people were in the region at least 35,000 years ago (Brown 1987; Law et al. 2010; Slack et al. 2009). Just how this may relate to the production of the Damper petroglyphs, their antiquity and temporal patterning is examined through relationship of superimposition and physical condition of the petroglyphs, keyed to specific events and lines of evidence.

Attempts to date the petroglyphs have not proved successful, especially so in reference to the Dampier rock art (e.g. Dragovich 2000). The very nature of the petroglyphs, how they are constructed and their open, exposed situation, preclude...
many of the conditions necessary for direct dating. Clarke (1978) had theorised about possible ages relating to the development of a mineral rock coating he identified as “desert vanish”. The conditions for its formation being hyper-aridity, a situation Clarke (1978) postulated as relating to the LGM (c. 22-17,000 BP). However, without reliable dating of organic carbon trapped within or under this mineral coating, the relative age of petroglyphs remains unresolved. In an analysis of some 3,400 petroglyphs in the area south of Withnell Bay (see Fig. 1), I attempted to address this question of Pleistocene age for rock varnish formation (Mulvaney 1982). Rock varnish was present within a small percentage of the petroglyphs (12% n=408), while many more truncated the varnish (34% n=1156). Comparison of motif subjects correlated with many of the macropod, elaborate non-figurative and certain of the anthropomorphic (human-like figures) motifs covered with the rock varnish, while marine subjects and simple human forms cut through the coating. Despite being unable to obtain an age determination for the rock varnish formation, nor to estimate approximately when it may have formed, the subject dichotomy observed in the Withnell Bay sample does provide a strong indicator that some of the rock art predates the formation of the Dampier Archipelago around 7000 BP.

Without options of direct dating the Dampier petroglyphs, what remains is relative association of temporal indicators to provide some insight. During the 13m² Skew Valley midden excavation (see Fig. 1) four petroglyphs and a fifth rock, “bearing a groove only” were exposed (Lorblanchet 1992: 41). The associated shell layers burying the petroglyphs provide a minimum age as between 2700 and 4000 BP. One of these panels depicts a group of side profile stick figures, another of a curvilinear design, the other two of human stick figures of different design (Lorblanchet 1992). None of these are diagnostic of any specific artistic tradition or style, providing little but a minimum age for rock art on the Burrup.

Two distinct stratigraphical layers were identified within the shell midden, the upper dated from approximately 5100 to 2300 BP, the lower from 7800 to 7200 BP (Lorblanchet & Jones 1979: 466). The lower layer comprises gastropods (Terebralia sp.) and a low density stone artefact component of flakes and small number of scrapers. *Anadara*, a bivalve, dominates the upper layer and there is the appearance of quartz rather than reliance on the local granophyre, with backed artefacts. This transference pattern in shellfish species dominance is repeated across the archipelago, indicating a change around 5000 BP, which may also relate to a shift in petroglyph production. However, change in rock art production does not necessarily indicate the emergence or arrival of a replacement people, but it can be indicative of cultural adjustments.

Occurrence of superimposition and the condition of weathering of motifs provide the most opportune means of identifying temporal patterns. The circumstance of where one motif overlies another provides a mechanism to investigate temporal relationships. The petroglyphs occur on the rock surfaces of the block structured weathered slopes (Fig. 4); they are not confined to single bedrock exposures or rockshelters. A factor of this open, extensive occurrence of suitable canvases for rock art placement is that a relatively small percentage (c. 5%) of superimposed petroglyphs arises. Fortunately the unprecedented extent of petroglyph production ensured that 557 pairing of motifs as under and over were sampled for analysis. Utilising superimposition in combination with a measure of weathering condition (contrast-state), establishes a basis of constructing a temporal sequence. However, as Keyser (2001: 124) cautions, “only when a number of stylistically distinct motifs
are consistently superimposed in the same order at a series of different sites can a generalized chronology for a region’s rock art be developed”.

Fig. 4. View along one of the valleys at the northern end of the Burrup, showing the general position of petroglyphs.

Fig. 5. Examples of the contrast-state conditions, with oldest, more weathered at left to most recently produced petroglyphs at right.

To establish a sequential relative chronology, it is not sufficient to merely recognise that the motif underneath must predate the overlying one; it is how much earlier was its production that needs to be ascertained. Passage of time is marked by the degree of re-weathering of the motif, thus a five state measure of weathering
condition, based on the contrast between the motif surface and adjacent (unmodified) rock surface was recorded. The principle is that the longer the time-span from producing a petroglyph, the closer its surface colour will be to that of the adjacent, non-engraved rock surface, thus of low or no contrast. More recently produced petroglyphs will be of high contrast (Fig. 5). To rule out other factors which might determine contrast-state, trends of location, aspect, dip, technique and depth of petroglyphs were analysed from a 5,650 motif sample from 17 locations across the archipelago (Mulvaney 2010). This analysis confirms that the gauge of contrast, a measure of weathering, is a factor that correlates with time related processes, rather than with underlying rock condition, location or inclination. The only other constant is that motifs on gabbro have a tendency to lower contrast-state more than comparable motifs on granophyre.

In addition to a general sequence marked by contrast-states and superimposition, the occurrence of thylacine (Tasmanian tiger) motifs in the Dampier rock art (see Mulvaney 2009) allows some anchoring of the chronology. Depictions of thylacines are also recorded from the Kimberley and Arnhem Land. In these two areas they appear in the earlier art phase (e.g. Murray & Chaloupka 1984), while dingoes only appear in the later period rock art. Indications are the thylacine became extinct on mainland Australia around 3500 BP (e.g. Partridge 1967), which provides a minimum age for at least some of the art. With sea-level rise following the LGM, the Dampier Archipelago formed some 7,000 years ago; so, it is likely that the majority of marine subject images post date this occurrence. The data (see Mulvaney 2010) suggests a general trend from terrestrial lower-contrast to marine higher-contrast in the faunal depictions. There is also change in the way of graphic representation of both geometric and anthropomorphic motifs, from complex and intricate design elements to general, uncomplicated graphic arrangements. Consistency in the pattern of the data supports the contention that the rock art reflects the local environment and, at the least, there are petroglyphs that are older, produced prior to the formation of the islands, yet others that are newer, produced once the marine environment became established.

Investigation of specific motif types demonstrated that a number of graphic elements appeared in the Dampier Archipelago rock art assemblage at different times. Some of these were relatively short lived (e.g. complex geometric design), while others were produced over extended periods (e.g. concentric circle). Broader archaeological and paleoclimatological data for the region suggests a number of significant events and changes, providing a logical framework for comprehending the temporal sequence in the rock art. Conditions prior to, during and following the LGM, shifts in the stone tool and dietary evidence are some of these. The pattern of superimposition and changing motif repertoire indicates that one of these shifts in artistic expression is tied to changes in the dry land/marine regimes of the archipelago.

Five major rock art phases (artistic traditions) are indicated by the evidence. The earlier phases, based on absence of marine subjects and their weathered states, are probably Pleistocene in age and the oldest may well date prior to the LGM (i.e. >22,000 BP). Phase one comprises complex geometric design, “Archaic Face” and disarticulated blob-head figure motifs (Fig. 6-8). This is followed by a significant change in structure, subject and situation of the petroglyphs. The Phase two suite of rock art is characterised by outline, pecked and abraded motifs, especially key subsistence species like emu and kangaroo, which are large and placed in
prominent, highly visible locations (Fig. 9). An increase in the range of subjects,
forms and situation of motifs characterises Phase three.

Fig. 6. Three examples of complex geometric designs, relating to the earlier identified petroglyph tradition,
located at the one site on the Burrup, right hand motif includes a face-like arrangement.

Fig. 7. Selection of “Archaic Face” motifs, relating to the earlier identified petroglyph tradition: a-b. from
Rosemary Island; c-d. from north end of Burrup; e. from a site near King Bay.

Fig. 8. Examples of the so called “Climbing men” motif, relating to the earlier identified petroglyph tradition,
located at three sites (Climbing Man, Deep Gorge, Happy Valley) 14km apart, showing the extreme weathered
conditions of these ancient motifs.
Fig. 9. Selection of large emu and macropod motifs, characteristic of the second phase or artistic tradition of the Dampier petroglyphs.

Fig. 10. Examples of the range in fish and turtle motifs, identified with the later, marine associated artistic traditions of the Dampier petroglyphs, showing the relatively unweathered, high contrast-state of the motifs.

The subsequent rock art traditions are directly associated with the formation of the Dampier Archipelago during the Holocene (c. 8000 BP). These petroglyphs of the marine associated rock art phases are of higher contrast-state, less weathered than motifs of the earlier artistic traditions. The proximity of marine resources is reflected in the petroglyphs and other archaeological evidence. In addition to the depictions of marine fauna (primarily fish and turtle; Fig. 10), human figures, in group scenes and dynamic representations, are displayed in association with graphic elements such as boomerang, dance wands and headdress (for contemporary Aboriginal cultural
sensibilities these motifs are not depicted in this article). These material culture items have parallels with contemporary and ethnohistorical records of ceremonial performance. Such petroglyphs suggest an antiquity of at least several thousand years for such cultural practices.

Weathering state provides an indication of the relative antiquity of the Dampier Archipelago petroglyphs. It is established that the weathering rates of the gabbro and granophyre, at approximately 0.2mm per 1,000 years, are amongst the lowest rates measured throughout the world (Pillans et al. 2008). However, just how old the old looking petroglyphs are is less certain. Based on detailed analysis of a sample of the rock art (Mulvaney 2010), it is suggested that the Dampier Archipelago petroglyphs span more than 20,000 years of production, only ending with the disruption brought about by the coming of European settlement in the region in the 1860s. The old looking rock art could be more than 25,000 years old, and may yet prove to be as old as the presence of humanity in the region.

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**Quote this article**

Ancient art and modern Australians: evidence for continuity in an Aboriginal knowledge system

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Abstract

Two absolute dating methods have been used in south-central Cape York Peninsula to date pre-Historic rock art —dating of rock art materials by association with stratified deposits and AMS $^{14}$C dating of rock surface accretions. A body of published research indicates a long sequence of Aboriginal rock art and the occasional survival of late Pleistocene art in rock shelters. This paper 1) outlines the contexts of, and evidence for, enduring art practice in the region from the late Pleistocene to the modern period and 2) discusses some of the general features and implications of the data. Contrary to reports of cultural distance between purported ly “old” rock art and modern Aboriginal people, research in the Laura region points to the ongoing relevance of ancient art.

Key words: Cultural deposits, AMS $^{14}$C, continuity, longevity, colour, non-figurative, figurative, ancestral connections

Fig. 1. The study area, Laura region, Cape York Peninsula

Archaeological research in southern Cape York Peninsula has produced evidence of continuing art practice from the late Pleistocene period (for the Laura region see Cole et. al. 1995; Cole & Watchman 2005; and see David et al.1999 for a wider outline including results from the Chillagoe area). The research has involved standard radiocarbon methods of dating rock art and/or or rock art materials by

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association with stratified deposits, or AMS $^{14}$C dating of rock surface accretions associated with engravings and paint. In the Laura (Qinkan) region, the modern anchor for the sequence is provided by “contact” subjects in rock art, the presence of cultural materials associated with the early contact period (c. 1873-1920) and oral history.

Outcomes of this type of research in Cape York Peninsula include: development of hypotheses on the antiquity and sequencing of the rock art tradition, the testing of cultural sequences and the iteration of models of past patterns of land and resource use, social organization and demographic change. Some of the research has been connected with explaining temporal variations in the cultural (and rock art) record (e.g. David & Chant 1995; Flood & Horsfall 1986; Morwood & Hobbs 1995a, 1995c; Rosenfeld et al. 1981). The aim of this paper is to investigate another feature of the chronological and spatial data – evidence of continuity in this ancient tradition. Rosenfeld (1981: 87) raised the topic when she argued for the continuity of the Early Man non-figurative engraving style over “a very long time”. With the progressive accumulation of data, a sense of continuity remains, leading Cole and Watchman (2005) to identify this as a significant theme in regional prehistory. The focus here is 1. to trace the hypothesized pattern or trend in detail with reference to sites in the Laura (Quinkan) region for which there is a range of published chronological and contextual data, and 2. to consider some implications of these patterns.

Sources of data

Age estimates for rock art (“direct dates”) were obtained in a long-term, regional program of research into rock art materials and rock surface accretions (see Cole & Watchman 2005 for research methods, protocols and updated results). The latter research was an offshoot of an ongoing regional project of site survey, recording and analysis (Cole 1995, 1998; Cole et al. 2002) which, together with Alan Watchman’s research into tropical rock surface weathering and rock surface accretions (e.g. see Watchman 1993, 2001), and other archaeological research in this region (e.g see
Morwood & Hobbs 1995) provided important contextual data. As indicated by Cole & Watchman (2005), because direct dating methodology was based on the micro-
analysis and AMS $^{14}$C (accelerator mass spectrometry radiocarbon) dating of
mineralized accretions (oxalates and silica crusts) which overlie the selected motifs,
the AMS $^{14}$C measurements provide minimum ages only for rock art.

Of 12 rock art sites excavated in the Quinkan region (Flood & Horsfall 1986;
Morwood & Hobbs 1995b, 1995c; Rosenfeld et al. 1981), six have been reported as
having evidence of occupation in the late or terminal Pleistocene period (Table 1).
Although the discovery of buried rock art was rare, the archaeologists recovered
many pieces of utilized pigments from stratigraphic sequences. Rosenfeld et al.
(1981) linked such deposits with patterns in rock art, although Morwood & Hobbs
(1995c: 765) adopted a more cautious approach, stating that “Fragments of used
pigment indicating some type of painting activity go back to 30,000 BP at Sandy
Creek 1 and the base of Mushroom Rock.”

Patterns recorded in cultural deposits on the modern floors of Laura rock shelters
suggest that utilized pigments (usually striated or faceted pieces of red and yellow
ochres) occur in association with medium to large assemblages of art (i.e. >40 motifs
– Cole 1998). In several shelters samples of pigments occurring in surface deposits
were found to be identical in colour and composition with paints used on top
superimposition layers, i.e. these pigments were used to create the most recent
paintings (Cole 1995). While D’Errico & Vialou (2007) have been unable to find
stratigraphic links between rock paintings and archaeological layers in Brazil,
there are indications that such links exist in Cape York Peninsula art sites (e.g. see David
et al. 1999; Morwood & Jung 1995; Rosenfeld et al. 1981). In any case, widespread
ethnographic evidence of the highly integrated nature of Aboriginal symbolic culture
(e.g. see Berndt & Berndt 1982: 50; Morphy 1991) suggests that archaeological
distinctions between different types of visual culture such as body painting, artefact
painting, rock painting etc. are probably irrelevant. Based on such evidence this
study takes the position that faceted or striated pigments found inside rock shelters
are associated with rock painting in these sites.
Evidence of an art tradition from late Pleistocene to modern times

In the oldest dated sites, cultural sequences range from c.15,000 BP to 34,400 BP (Morwood & Hobbs 1995b,1995c) through to the modern period. In five of these sites pigments were used from around the time of initial occupation. In four of these sites and in another, unexcavated site, direct dating and associated research points to ongoing art practice from the late Pleistocene to the late Holocene period (Cole et al. 1995; Cole & Watchman 2005; Watchman 1993). Post contact paintings or stencils (e.g. of horses, pigs, steel axes) and artefacts made of glass and other introduced materials provide evidence of Aboriginal use of these sites in the nineteenth century or even later. This range of evidence for periodic or continuous art practice from the late to terminal Pleistocene to the modern period is described and grouped below according to its locality and particular site context.

Laura Deighton plateau

The sandstone plateau between the Laura and Deighton Rivers was intensively used by Aboriginal people in the contact period, c. 1873-1920s (Cole 2004). Surface materials which appear to be of relatively recent and/or contact period origin include art materials (e.g. utilized pigments, a paintbrush), organic materials such as wooden artefacts, scarred ironwood trees and artefacts made of glass and metal (Trezise 1971; Cole 2004).
Early Man rock shelter, excavated in the 1970s by Andrée Rosenfeld (Rosenfeld et al. 1981), is located on sloping terrain of the Laura Deighton plateau east of the Laura River. At the base of the excavation at the rear of the shelter a panel of linear, non-figurative designs (mainly pits, tridents or bird tracks, and rectilinear mazes) is covered by deposits dated to 13,200±170BP (ANU-14), a date which provides a minimum age for the engravings. A slab with an engraving of a bird track was associated with deposits dated to 4,060±80BP (ANU-1444).

On the southern section of the rear wall of the shelter above ground level is a frieze of weathered engravings which follows the general style of the buried engravings. A date of 1275±95 BP was obtained from a sample of oxalate from the base of the crust which overlies part of a linear design which incorporates elongated bird tracks and circles (Cole & Watchman 2005). The disparity in age estimates and the stylistic continuities of the wall engravings and the excavated engravings which were buried to a depth of 1.3m, point strongly to the continuing use and relevance of this style over thousands of years, a hypothesis initially proposed by Rosenfeld et al. (1981). As fragments of utilized ochre were found from basal to upper occupation levels, the use of paint inside the shelter co-existed with the early (and evidently ongoing) production of engravings. On the rear wall of the shelter to a height of c. 2m above floor level an extensive panel of superimposed paintings and engravings may provide evidence of successive phases of art over the last few thousand years.

A cluster of rock shelters known as the “Possum complex” is located 1.5km to the northwest of Early Man on a low escarpment of the Deighton River. Many of the shelters contain rock paintings with apparently “freshly” applied paints, scatters of stone artefacts, grinding surfaces, remains of hearths, and, beyond the dripline, culturally modified (scarred) trees. The main shelter, named by local Aboriginal consultants as “White Snake Story place”, contains numerous paintings including a long white serpent motif which curves around the shelter walls.

An overhang 20m to the east has a sandy floor with the remains of a hearth, a few paintings on the rear wall and, on a wide ledge near floor level, an area of engraved pits, bird tracks and linear designs. Beside the shelter is the trunk of a fallen ironwood tree which bears axe cut marks made in the recent past by food gatherers in the process of removing honey from a native beehive. A result of 8500±60 BP was obtained for a sample of oxalate at the base of the crust inside one of the fully patinated, deeply carved pits on the low ledge (Cole & Watchman 2005). Oxalate from the base of a crust sample obtained from a shallow, star shaped engraving nearby was found to be much more recent in age, 2195±55 BP.

Mushroom Rock shelter is one of a cluster of rock shelters located amongst a sandstone outlier at the foot of the Laura Deighton plateau, on a sand plain beside the Laura River. In excavating the deep, sandy deposits of the shelter Morwood et al. (1995) located pieces of (mainly red) pigment throughout the sequence. On the basis of TL (thermoluminescence) dating they concluded that the initial use of the shelter occurred prior to 40,000 years ago. The corpus of superimposed paintings on the walls and ceilings is typical of the region’s late figurative art style (probably dating from within the last two thousand years, Cole 1998). The top layer of paintings includes a stencilled steel axe in white which may date from around the time of the Palmer gold rush in the 1870s. Apart from some small grinding hollows on a ledge, there is no evidence of engraving at the site. However an unprovenanced sandstone slab which was recovered from cultural deposits in an earlier excavation (Morwood et
al. 1995) is covered in cupules, providing evidence of engraving at some time in the past.

The Little Laura and Mossman Rivers

The Little Laura and Mossman Rivers rise in the rugged sandstone plateaus north of the Palmer River and flow east to join the Laura River. The Sandy Creek cluster of rock art sites is located in the Little Laura River catchment, some 30km west of Mushroom Rock. As the area is on the fringes of the Palmer River goldfields it became a focus for goldfields transport routes and mining camps. Consequently the colonial impacts on Aboriginal people in the nineteenth century were immediate and severe.

Excavation of the major rock art site, Sandy Creek 1, by Morwood et al. (1995) provided evidence of periodic Aboriginal occupation from at least 34,400 BP into the European contact period. Ochres were found throughout the stratified cultural deposits. The recovered fragments included two striated pieces of red pigment dated to 32,000 BP and two fragments of yellow dated to 25,900 and 28,000 BP respectively.

Inside the shelter is a detached boulder engraved with a striking rectangular design which incorporates pits. A sample of the oxalate crust which covers the engravings and extends across the top and sides of the boulder was dated at 9160±70 BP, indicating a minimum age for the engravings (Cole et al. 1995). Oxalate crust overlying a nearby engraved radiating form was dated to 2810±BP. Traces of red and yellow pigments were found at the base of the oxalates. The suite of figurative paintings at Sandy Creek 1 includes a red snake painted over black organic material. As the latter was dated at 738 BP (Cole 1998) the snake represents a much more recent phase of art at the site. The most recent phase of painting activity may be represented by a pale pink anthropomorph which has been painted using material from a termite mound inside the shelter.

In the adjacent shelter Sandy Creek 2 cultural deposits recorded on the surface included a retouched piece of bottle glass dating from 1873-1900. In the buried cultural deposits pieces of utilized ochre were found to extend from the late Pleistocene into the contact period (Morwood et al. 1995). The walls of Sandy Creek 2 are painted with motifs in Quinkan figurative style; there are few superimpositions and no visible indications of apparently older phases of art. However, Watchman (1993) dated oxalate laminations in association with red paint particles in a micro-excavated sample of crust from the rear wall. The dates for these laminations (6655±80 BP, 15-16,000 BP and 24,600±22 BP respectively), were interpreted as evidence of periodic painting from c. 25,000 years ago.

As in the case of many major rock art sites at Laura, Magnificent Gallery in the Mossman River catchment has a panoramic aspect overlooking a wild and dissected landscape, in this case the gorges of the Mossman River. Cultural deposits of relatively recent origin include grindstones with deposits of ground pigments, cached wooden artefacts and pieces of resin. The walls of the shelter contain some 400 heavily superimposed paintings and stencils in Quinkan figurative style. Analysis of samples taken from yellow pigment found on a grindstone inside the shelter and from a painting on the top superimposition layer indicated that the paints are identical (Cole et al. 1995), lending support to the hypothesis that at least some of the top layer of paintings are likely to be of very recent origin. However a row of deeply
pecked, patinated pits and some encrusted red pigment motifs may point to earlier phases of art practice. Based on the analysis of excavated deposits Morwood and Jung (1995) concluded that use of the shelter began c. 15,000 BP and continued to c. AD 1875. Morwood and Jung (1995) dated a sequence of (mainly red) pigment use from c. 11,500 BP with a pronounced peak at around 10,000 BP.

**Strands of continuity**

Evidence cited here suggests that a tradition of visual culture existed throughout the entire period of Aboriginal history in this part of Cape York Peninsula. At this stage we don't know where the first artists came from, but it seems that the use of coloured pigments for purposes of depiction was embedded in Aboriginal culture more than 30,000 years ago.

If the regional “rock art sequence” is deconstructed, two apparently parallel strands emerge –continuities and discontinuities in timing, geography and style. As indicated by other researchers, non-uniform patterns in the antiquity and deposition of cultural deposits, rates of ochre recovery and contrasts in art style have been used as sources of archaeological data for reconstructing and explaining the past. However, the longevity of the tradition and the repeated, long term use of key places, techniques, materials and motifs also warrant explanation.

**Longevity**

The development and maintenance of the rock art tradition was supported by an abundance of natural resources. For example the raw materials for paintings and stencils were readily obtained from high quality, locally available earth materials (ochres and clays) of the kind which can be seen extruding from the ground in the vicinity of many rock shelters (see Cole & Watchman 1996; Watchman et al. 1992; Ward et al. 2001 for detailed compositions of Laura earth paints). These materials were processed using local stone and applied using brushes and adhesives made from local plants (Cole & Watchman 1992). The sandstones of the Laura Basin provide smooth, fine-grained rock supports, and the long term weathering of the sandstone escarpments and massive outliers created a remarkable rock shelter landscape which supported the seasonal system of movement and land use. Importantly, sandstone aquifers (freshwater soaks and springs) provided reliable water in a tropical region of variable, seasonal rainfall. Rock shelters would have been crucial to land use in the late Pleistocene when conditions were cooler and wetter (Morwood & Hobbs 1995a).

Here, as in other parts of Australia, the basis of Aboriginal culture including the system of land/people relationships was ancestral law. According to this law clans owned their own languages, totems, songs, dances and designs which connected them with their lands and Stories (Rigsby 1997, 2002). An important understanding was (and is) that the Stories (the spirits of the ancestors or the “Old People” who include the recently dead) live on the land in their own places (e.g. see Rigsby 1980, 1997, 1999). In this way rock paintings are part of the ancestral law—they are Stories and their sites are Story places which retain the footprints of the Old People (G. Musgrave pers. comm. 2000).

Obviously attempts to link such modern, ethnographically documented belief systems with the “meaning” of rock art are perilous. However archaeologists have linked archaeological patterns in art with functional patterns in territorial behaviour.
such as the expression of social and group identity (Morwood 1988) and the “socializing” of the landscape (Taçon 1994) and with cognitive patterns such as the Indigenous knowledge system or the “Dreaming” (David et al. 1994). The evidence of continuity which indicates not only that rock art was created in a patterned way in the pre-historic landscape but that some stylistic patterns were maintained for many thousands of years, suggests not only that social and communicative systems were involved but that symbolic practice was firmly anchored in ontology, as were modern cultural systems.

A major aspect of continuity is the use and re-use of key sites (known by modern Aboriginal people as “ancestral” sites) over the millennia into the nineteenth century. The modern rock art tradition as it is known from contact subjects (horse, pigs, policemen, steel axes) was practiced in these ancestral sites in the face of violent warfare against British colonists (Cole 2004). The perpetuation of the ancient tradition during such tumultuous times and its function in supporting Aboriginal identity and unity (Cole 2008) is an indication of the place of rock art at the heart of the cognitive system.

Fig. 4. Recent figurative style rock paintings at Laura (horse motif on left)

Colour

In a monograph devoted to the “archaeology of colour” Jones and MacGregor (2002) and others demonstrate the significatory power of colour in visual and material culture, sometimes with reference to ethnographic examples. In Australia the cognitive significance of coloured pigments has been widely documented as an essential ingredient of Aboriginal culture (e.g. see Chaloupka 1993; Jones & Meehan 1978; Morphy 1991). Gage (2000: 5) for example notes how the use of traditional pigments by Australian Aborigines “is closely bound up with their origins in the land”. In this was the long sequence of pigments and paint fragments recovered from Laura sites provides access to a timeline of symbolic values which are otherwise poorly reserved in the archaeological record.

Currently, the oldest evidence of graphic depiction consists of red and yellow paints applied long ago to shelter walls. Although the form of late Pleistocene
painting is probably now irrecoverable due to taphonomic processes, the significance of symbolic practice using coloured pigments as an ancient and persistent feature of rock shelter life is irrefutable. As silica covered anthropomorphs (Quinkan Timara figures) in red (and possibly yellow) paint appear to have minimum age of c. 6500-7200 BP (Cole & Watchman 2005) it appears that the colourful, spirit figure style (and an associated belief system) projects back in time beyond the mid-Holocene, a period which has been widely identified as the setting for the limits and origins of figurative style (Cole et al. 1995; David et al. 1999; Morwood & Hobbs 1995c; Rosenfeld et al. 1981).

Pits (cupules) and non-figurative designs

The term “pit” was adopted by Rosenfeld et al. (1981: Fig. 21) to describe small, circular depressions which in the Laura region are characteristically arranged in clusters or rows. They occur widely in rock shelters on ledges, boulders and walls, usually measure c. 2cm in depth x c. 5cm diameter and resemble some of the examples illustrated by Bednarik (2008). These motifs occur in the late Pleistocene engraving repertoire along with non-figurative designs. Based on the dates for pits at Possum shelter and visual estimates of weathering in other sites (Rosenfeld et al. 1981), these engravings are evidently typical of early style, not only here but across Australia (Bednarik 2010a). However as there is also evidence of unpatinated and/or reworked pits (pers. obs; Rosenfeld et al. 1981) it is clear that they had ongoing relevance in Cape York Peninsula.

Given the number of non-figurative engravings such as radiating forms which have minimum age estimates dating to the late Holocene, Rosenfeld’s hypothesis of a later complex of non-figurative engravings is supported (and see David et al. 1999). However as the “later” forms include complex Early Man type designs as well as simpler motifs the claims for a distinctive early style have become less convincing. Clearly a non-figurative tradition persisted for thousands of years into the late Holocene period.

Fig. 5. Encrusted engraved pits/cupules at Possum shelter dated using AMS ¹⁴C methods)
Symposium Australie

Fig. 6. Shallow non-figurative engravings including radiating form at Possum shelter (dated using AMS $^{14}$C methods)

Conclusions

The sequential evidence of continuous art practice presented here may be exceptional in terms of its range: buried engravings and rock art materials, masked paintings and engravings, “modern” paint materials and a large assemblage of surviving rock art which concludes with a blend of traditional and modern subjects. However, it is likely that equally long and complex scenarios were played out in rock shelters across northern Australia, in Arnhem Land and the Kimberley (e.g. see Balme 2000; O’Connor & Fankhauser 2001; Schrire 1982; Watchman 2001).

Existing models of regional prehistory which integrate changing patterns in stone artefacts with demography and environmental history have drawn on apparent variations in rock art style from the late Pleistocene to the Holocene to support their hypotheses. However, as chronological data has accumulated the temporal boundaries between figurative and non-figurative styles have become blurred, suggesting that aspects of symbolic continuity have been overlooked in previous chronological models. With regard to comparing the styles of Pleistocene and Holocene rock art, following Bednarik (2010b and this CD) “The question of taphonomy is central.” The kinds of Pleistocene rock art which survive in this region are predictable –deeply cut engravings in sheltered conditions (Bednarik 2010a). The ancient pigment motifs in reds and yellows of unknown form are either masked by rock surface accretions or were otherwise lost a long time ago.

Although rock art sites were not initially occupied in unison and there were subtle, non-uniform variations in parts of the archaeological record over time (Morwood & Hobbs 1995a), the long lasting connections to places and the apparently non-wavering commitment to marking rocks across the millennia point to very powerful and enduring symbolic relationships to the land and its materials. These patterns are entirely in tune with modern Aboriginal knowledge systems and values which stress the ancient and continuing nature of ancestral law and its foundations in the Storytime (elsewhere known by Aboriginal people as the Dreamtime) and the land. As a postscript to this long scenario, in 2010, Aboriginal traditional owners continue to live in this area and care for their land and culture.
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The nature of Australian Pleistocene rock art

Robert G. BEDNARIK

Abstract

The corpus of known Australian rock art of the Pleistocene is thought to be many times the size of that of any other continent. However, it has so far been inadequately defined or characterized, and its study as a specific phenomenon has been almost completely neglected. The historical reasons for this are explored and it is endeavoured to present a preliminary inventorial outline of the massive corpus of Australian Ice Age rock art. The lack of formal criteria for recognizing such palaeoart as well as the lack of credible age estimates and some dating controversies have contributed to the general lack of knowledge about this corpus, as have archaeological misconceptions about perceived styles. The general characteristics of Australian Pleistocene rock art are explained and illustrated.

Some of the most popular assumptions about Pleistocene rock art are (a) that it defines the birth of art-like productions; (b) that it is largely a phenomenon found in limestone caves, and thus related to some cultic activities connected with such sites; (c) that it was of great cultural importance to its creators and is somehow connected with their religion; (d) that it is essentially a phenomenon of the Upper Palaeolithic period; and (e) that it is a phenomenon primarily of south-western Europe. The most interesting aspect of these characterizations is that all of them are apparently falsities:

(a) Art-like or symbolic productions/objects called palaeoart begin with the Lower Palaeolithic period in the form of portable engravings, petroglyphs, proto-figurines, beads and pendants, manuports and pigment use. Consequently such materials do not begin to appear 30 or 40 ka ago, but at least ten times as long ago (Bednarik 2003).

(b) The location of Pleistocene rock art in caves is of no interpretational consequence; it is a taphonomic phenomenon. Moreover, most surviving Ice Age rock art occurs out of caves.

(c) Much if not most of the Franco-Cantabrian cave art, by far the most thoroughly studied such corpus, was made by children or youths, and there is no credible evidence that any of it was made by adults. Most human tracks in these caves are by young people, as are all hand stencils and most finger tip markings and most finger flutings (Bednarik 2008a). Therefore there is empirical support that the art may express the concerns of adolescents, and there is no such support for seeing it as a primarily adult art.

(d) The body of Australian rock art attributed to the Pleistocene is many times the size of that of Europe, but in Australia it belongs entirely to Mode 3 technocomplexes.
(i.e. “Middle Palaeolithic” traditions); therefore globally the surviving Pleistocene rock art is mostly a Mode 3 phenomenon (sensu Foley and Lahr 1997).

(e) The known Pleistocene rock art of Europe comprises several thousand motifs. The presumed Pleistocene rock art in the rest of the world dwarfs this number significantly. In Australia alone, it may be in the order of a million motifs.

It follows that what we have been indoctrinated by for over more than a century is essentially a mythology that is in urgent need of correction before a balanced investigation of global Pleistocene rock art can even be commenced. This is greatly hampered by the incredible disparities in the available published record. Whilst we have many thousands of books and articles, both academic and non-academic, about the Franco-Cantabrian rock art, numbering well in excess of actual art motifs, the rest of the world remains largely unexplored in this respect. For instance in Asia, we have a single publication addressing the topic on a pan-continental basis (Bednarik 1994a); in Australia the situation is no better; and in Africa, the subject has not been considered at all in such a format. Thus the distortion is such that this subject cannot be regarded as having been addressed in any credible fashion until now, and this conference will be a failure if that state of affairs were to persist into the future. Such an imbalance would not be acceptable in any scientific field, and it should not be accepted here.

In a small contribution to improving this state of inadequate information, the continent of Australia will be considered here. Globally, taphonomy has ensured that only two forms of rock art are capable of surviving from the Pleistocene: paintings and petroglyphs in highly protective environments (i.e. in deep caves); and very deep petroglyphs on open sites of extremely weathering-resistant rock types, especially in arid and semi-arid regions. The oldest rock art so far found occurs in places meeting both these variables: deep petroglyphs in quartzite caves in India.

This simple rule renders it easy to spot false claims, but it also facilitates an initial appreciation of which rock art occurrences are likely to be of the earliest periods. Cave art that is thought to be of the Pleistocene remains at this stage limited to SW Europe and southern Australia; open-air rock art of such antiquity has been demonstrated from southern Africa, India and from Australia. In all cases the latter is limited to deeply pounded percussion petroglyphs on very resistant rock, such as well-metamorphosed quartzite, and to very dry climates. The forms these very early petroglyphs occur in are generally non-figurative, and they are limited to a fairly restricted range of motif forms that, interestingly, show significant global similarities. This palaeoart is dominated by cupules, linear grooves, circles, convergent lines motifs (the latter are prominent also in MSA mobiliary art) and, in Australia, a repertoire of circle mazes and variations.

**Dating of early Australian rock art**

Although the idea of Pleistocene rock art in Australia was first mooted within a few years of the general acceptance of such antiquity in Europe (Cartailhac 1902), very little progress has been made in this area during the subsequent century. Herbert Basedow developed these ideas in the first decade of the 20th century and eventually argued cohesively in their favour, presenting several scientific observations to support the proposition (Basedow 1914). The lack of subsequent progress was initially curtailed by the archaeological perception that indigenous Australians had only arrived there recently, within the last few millennia. By the 1960s
this view was conclusively refuted when the first archaeological evidence of a Pleistocene occupation of Australia by humans became available in 1962. John Mulvaney secured a radiocarbon date of about 16 ka from an occupation layer in Kenniff Cave, southern Queensland (Mulvaney & Joyce 1965). Since then, many more dates for human presence ranging up to 50 or 60 ka have been reported from various parts of the continent. The first attributions of rock art to the Pleistocene, however, took almost another two decades to appear, first reported simultaneously from a sandstone shelter (Rosenfeld 1981) and a limestone cave (Bednarik 1981). In both cases there are challenges to these results. The archaeological minimum dating at Early Man Shelter (Fig. 1) was queried by Cole and Watchman (2005), the direct dating at Malangine Cave (Fig. 2) by Bednarik (1999) himself. Nevertheless, there is a variety of circumstantial evidence requiring a Pleistocene age for several occurrences of Australian cave art (Bednarik 1990). For instance, the finger flutings and other petroglyphs in Koongine Cave precede the ceiling collapse about 10 ka ago; and the markings in Koonalda Cave (Fig. 3) must be in excess of 15 ka old as there is no more recent occupation evidence and the site may then have become inaccessible in the final Pleistocene due to subsidence of the sinkhole entrance. In Yaranda Cave, some of the rock art precedes megafaunal scratch marks, when the Australian megafauna is believed to have become extinct between 20 or 40 ka ago. The cave art of Orchestra Shell Cave, too, precedes a subsidence that occurred either in the early Holocene or earlier; and the rock art of New Guinea 2 Cave also may be related to a final Pleistocene occupation. Other evidence suggesting such age for cave petroglyphs is their sometimes close resemblance of Tasmanian petroglyphs, and if they derive from related traditions it must be remembered that Tasmania became sundered from the mainland around 12 ka ago.
Better direct dating evidence has been reported from sites in the extensive Abydos and Spear Hill petroglyph complexes of the Pilbara region (Bednarik 2002). A large series of engraved dates at Spear Hill Site 7 made it possible to create a microerosion calibration curve for the region, which was then applied to a random selection of petroglyphs at the two complexes, which represent one of the largest concentrations known. The motifs were simply selected by their traditional custodians (Fig. 4), and it was clear that there were significantly older petroglyphs at some of the several dozen sites concerned, for instance cupule panels. The oldest age determination was in the order of 28 ka, and there is no doubt that greater ages were represented in some cases.
Fig. 4. Traditional custodian seated next to curvilinear maze petroglyph that is roughly 20,000 years old, and whose meaning he knows, eastern Pilbara.

Another tentative age estimation by direct means places the earliest petroglyph panels at the open-air site Sacred Canyon in the Flinders Ranges in the final Pleistocene (Bednarik 2010). Here, petroglyphs on two vertical cliffs extend up to 7m above the present floor and co-occur with mid-Holocene motifs (Fig. 5). Their height demands that they were either made from scaffolding, or that there were major fluctuations in floor level (Fig. 6).

Fig. 5. Pleistocene and Holocene petroglyphs in Sacred Canyon, Flinders Ranges.
Previously, it has been recognized that paint residues protected by oxalate accretions can also survive from the Pleistocene (Watchman 1990, 1992a, 1992b, 1993, 2000), but on the whole there have been rather few attributions of Australian rock art to the Ice Ages. It has also been recognized that some of the direct dating methods have significant limitations, and many scientific age estimations can lead to errors in their interpretation. There are numerous examples of archaeological misinterpretation of analytical results, many of which are discussed in Bednarik (2010). A recent cautionary experience from the author’s current work is the case of a site in northern Queensland, where a sheltered rock painting has been executed partly covering a silicified wasp nest (Fig. 7). This spatially related feature has yielded a carbon isotope date of 15,720 ± 90 years bp (Beta-278167), which effectively is a conservative maximum age. However, the painting is clearly very young and thought to be about 120 years old, depicting a European human, and occurring in the context of a major “Contact site” (this refers in Australia to the period after European colonization). This shows how easy it is to draw false conclusions from direct dates: unless they refer to the actual target event (sensu Dunnell & Readhead 1988), they can be, and often are, severely misleading.

But it is also fair to say that Australian researchers have shown limited inclination to prematurely attribute Pleistocene ages to younger rock art. This restraint stands in stark contrast to the many hundreds of claims from across Eurasia, from Portugal to China, many of which are without basis. While the Australian moderation is no doubt commendable, to be realistic it is also likely to limit our perception of the extent of early traditions. Here it is perhaps relevant to examine the background for these reservations.
The Panaramitee conundrum

Since the 1970s and 1980s, there has been another retarding factor in the study of Australia’s earliest rock art, the rise of Maynard’s (1979) tripartite model of three sequential styles or phases. These were, in purported order of appearance, the “Panaramitee style”, the “simple figurative style” and the “complex figurative style”. Although it was later widely accepted that the two more recent “styles” could not be upheld as pan-continental, chronologically relevant designations, the Panaramitee concept was maintained and in effect contaminated the chronological framework of Australian rock art research for several decades. Although its basis was refuted (Bednarik 1995), it continued to be applied, taught and defended.

Essentially, the Panaramitee style is supposed to comprise 60% animal tracks, 20% circles, 10% lines and 10% other motifs (including both simple and complex figurative motifs, which renders it impossible to effectively separate from Maynard’s simple and complex figurative styles). However, these hypothetical percentages apply at no site in the geographical core region of this “style”, the area between the Flinders Ranges and Broken Hill. Percentages of these etic categories show no consistencies whatsoever, ranging from 0% to 100% in all groupings. What a careful examination of these many sites does show is that many of them present cumulative assemblages, produced over a long time span and comprising components of greatly differing ages. This is a common feature at major rock art sites around the world: people reacted to previous art production by adding their own work. Consequently it is incumbent upon the archaeologist to attempt separation of the contributing traditions rather than to treat such a composite corpus as a homogenous whole. Indeed, such treatment contradicts the most fundamental canons of archaeology: the separation into chronological components in order to detect changes through time. The “Panaramitee style” is a composite that certainly includes Pleistocene components but also covers the entire Holocene; in fact petroglyphs of this “style” were still produced in the 20th century (Mountford 1976) (Fig. 8).
This insistence by most commenting Australian archaeologists to place petroglyphs they include in their Panaramitee style into the Pleistocene has for many years enforced a false chronological framework that rendered a realistic separation of Holocene from Pleistocene rock art difficult. In some cases this was facilitated by false datings, especially those of Dorn (Nobbs & Dorn 1988; Dorn et al. 1992), which he eventually all withdrew (Dorn 1996a, 1996b). Other factors included the incorrect identifications of objects depicted in the rock art, including giant animal tracks perceived as being of megafauna, of zoomorphs themselves depicting megafauna, or others depicting species long extinct in the area in question. All of these explanations have been refuted (e.g. Berndt 1987; Bednarik 2010).
Australian Pleistocene rock art

If, as demanded here, some of the various traditions of the “Panaramitee style” are of the Pleistocene, then it is crucial—if the objective is to consider chronologically discrete units— to separate these from the Holocene material. This has been resisted until now by the archaeological mainstream of Australia, on the basis of Maynard’s tripartite sequence, which renders it difficult to readily identify the early component. In the absence of large-scale dating programs it may be premature to assess the frequency of Pleistocene rock art in Australia. The question of taphonomy is central to this issue: what kinds of rock art can be expected to survive from the Pleistocene, and under what ambient conditions? It is pertinent that there is no plausible evidence, anywhere in the world, of pictograms or rock paintings having survived from the Pleistocene, except in “fluke conditions”: under mineral accretions or in deep limestone caves. Petroglyphs, on the other hand, can be much more resistant to weathering processes, and on specific rock types and under certain environmental conditions can easily survive longer at open sites. Taphonomy decrees that this applies especially on very hard rocks and in arid or semi-arid regions, and that deeply cut petroglyphs survive longest (Bednarik 1994b). The earliest period seems to be dominated by cupules and linear grooves, followed by circles and circular motifs, sets of parallel grooves, convergent lines motifs and other specific geometric patterns. This trend is not limited to Australia; it may well be universal. The earliest petroglyphs of Asia, Africa and Europe are also dominated by cupules, and those of the Americas by cupules and linear grooves (Bednarik 2008b). Indeed, the pattern is so uniform that these genres of petroglyphs seem to define a Mode 3 or Middle Palaeolithic/Middle Stone Age tradition. Australia was initially settled by Middle Palaeolithic seafarers from Asia (Fig. 10), who in view of the much earlier presence of this rock art tradition in India (Bednarik et al. 2005) can reasonably be assumed to have imported it with first landfall (Bednarik 1997a; Bednarik & Kuckenburg 1999).

Fig. 10. Middle Palaeolithic seafarers on the way to Australia.
The Middle Palaeolithic stone tool technology continues to the mid-Holocene as the core and scraper tradition in Australia, and in Tasmania up to European destruction of traditional society just 200 years ago. Therefore all of Pleistocene rock art in Australia is necessarily of Mode 3 (“Middle Palaeolithic”) provenance, as is all rock art in Tasmania. The latter might provide an initial template of what one could expect to find in Middle Palaeolithic rock art traditions. Tasmanian rock art is dominated by cupules, featuring also circular motifs, including the divided circles and circles with internal barring that are so prominent in the Karake genre (Fig. 11) of the caves of Mt Gambier on the mainland (Sims 1977, 2008; Bednarik et al. 2007). It appears certain that convergent lines motifs, which may resemble bird tracks, are discrete features not intended to depict such tracks.

![Fig. 11. Pleistocene cave petroglyphs of the Karake genre, Karlie-ngoinpool Cave, South Australia.](image)

It is then possible to speculate about the extent of Pleistocene rock art in Australia by resorting to the following reasonable assumptions. Deeply hammered, deeply weathered and deeply patinated non-iconic petroglyphs on particularly erosion-resistant rock are probably of the Pleistocene, as are perhaps most of those found in limestone caves. At open sites these petroglyphs occur usually in arid regions, typically on hard rock types such as various types of granites and other igneous facies that suffer little weathering, and on strongly metamorphosed quartzites. At a rough estimate the proportion of motifs that should be expected to fall into this category is at least 10% of the total Australian petroglyph inventory. Since it is reasonably and conservatively estimated that there are at least ten million petroglyphs in Australia, it follows that over a million could be expected to have survived from the Pleistocene (Bednarik 1997b). To illustrate the point, one single site complex, that of the Dampier Archipelago, is universally thought to comprise one million or more motifs (although none are of the Pleistocene); elsewhere in the Pilbara, similarly major concentrations occur, and some of these may comprise a significant Pleistocene component. The grand total of Pleistocene petroglyphs in Australia may well be higher than the number of surviving Middle Palaeolithic
petroglyphs from the rest of the world (few are known currently, a most notable concentration being that of the southern Kalahari, dating from Fauresmith and MSA times; Beaumont & Bednarik this conference), and it is certainly significantly higher than the total number of motifs so far reported from presumed Upper Palaeolithic or Mode 4 traditions in the rest of the world (well below 50,000, of which only perhaps 5000 are figurative). The latter are almost exclusively a western European phenomenon according to present knowledge—although that proposition also needs to be tested.

However, two fundamental observations follow on from these considerations. Firstly, there is more surviving Middle Palaeolithic (or Mode 3) than Upper Palaeolithic rock art in the world. Secondly, whereas there are great variations among the latter traditions, the earlier ones seem to be defined by considerable uniformities across continents. However, it needs to be appreciated that this could well be a sampling issue, attributable to the taphonomy of rock art (Bednarik 1994b). All of the world’s surviving Mode 3 rock art can be regarded as being of the greatest taphonomic longevity. It should therefore logically be seen as a taphonomically determined remnant population, from which the less deterioration-resistant forms have all been culled. In other words, the apparent uniformity of the Mode 3 petroglyphs is to some degree a sampling artefact, in the same sense as the perceived preference of cave locations for the production of Mode 4 rock art is almost certainly a taphonomic effect. All palaeoart samples of the Pleistocene, be they portable or not, must be regarded as remnant populations that have experienced massive taphonomic truncation, in several senses.

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