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PERSPECTIVES OF KOONGINE CAVE AND SCIENTISTIC ARCHAEOLOGY

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Frankel's (1986) paper in this journal reports some preliminary results of his archaeological investigation of caves in the lower southeast of South Australia. His project is a major, long-term endeavour to examine the regional prehistory, date the recently discovered cave art, and investigate chert sources, stone-working techniques and economic systems of the area. Such a comprehensive study is long overdue in a region that possesses the largest surface concentrations of stone artefacts in Australia, and that has seen countless superficial projects, especially by artefact collectors, but on the whole very little sustained effort. Hence I enthusiastically welcome Frankel's work in the area, but I would like to comment on certain aspects of his article.

Frankel's first results suggest two occupation episodes in the area, one between 9,000 and 10,000 years B.P., the other between 5,000 and 6,000 years ago. Earlier, and without the benefit of excavation, I had proposed that in Malangine Cave, 'figurative motifs and abraded grooves ... are superimposed, apparently during the early Holocene' (Bednarik 1985:84); and that 'the later [style, being of shallow incisions] could perhaps be in the order of 5,000 to 5,500 years old' (Bednarik 1985:86). Frankel (1986:76, 78) cites my 1985 paper, but apparently did not notice that his main findings concerning the antiquity of the region's human occupation were foreshadowed in it. Instead of acknowledging the agreement between my tentative dating of the art and his dating of the habitation debris, and enquiring how I could have possibly arrived at my postulates without archaeology, he merely observes that the absence in his test pits of charcoal older than 10,000 years would suggest that the finger markings in the adjacent Koongine Cave (which clearly predate the other marking traditions in the caves, rendering their placing in the Holocene rather difficult) are not of Pleistocene age. It should be noted that I have not claimed a Pleistocene antiquity for the Mount Gambier finger markings in my publications cited by Frankel, always describing them as undated.

Before considering why Frankel, and before him Tindale (1957) and Luebbers (1975, 1978) have managed to obtain dates from the early part of the Holocene, but none from the Pleistocene – when the general region must be assumed to have been occupied during the earlier period, at least intermittently – it seems timely to examine some points of logic. First, a few questions. Why do some prehistorians think:

a) that there is a high degree of probability that two types of traces of human activity refer to the same occupational episode when they happen to occur at the same site;

b) that there are reasons to assume that use episodes (e.g. petroglyph production) in a cave or rockshelter necessarily resulted in the deposition of charcoal; or

c) that the sedimentary record at a rock art site necessarily spans the history of the site's use?

Some prehistorians do not seem to appreciate the concept of occupation foci (Bednarik 1988a). The probability that two types of traces of occupation at one site are contemporaneous is perhaps a million times greater at some random location on the featureless Nullarbor Plain than in, for instance, Koonalda Cave, which was a focus of much activity. So the higher the rating of a site as a focus of prehistoric use, the less the chances that specific traces of activity are contemporaneous. Rockshelters and caves rank particularly high as foci for prehistoric attention (recent avoidance of caves in Australia notwithstanding; Bednarik 1986a). Moreover, they are also 'favoured localities' of prehistorians' activities, for obvious reasons. Thus the effects of one selective process are being greatly amplified by another. To select from a favoured locality two traces of human activity, such as rock art and charcoal, and to pronounce them contemporary in the absence of any proof is illogical, because the statistical probability of this being correct is not much better than nil.

Flood's (1987:94) extensive work on the Koolburra Plateau in north Queensland has shown that 48% of the rock art sites there have no sediment deposits (nor traces of occupation) at all, while another 16% have sediment cover over less than a quarter of their floor area. Stone artefacts were observed on the floor of only four percent of the art sites. If sedimentation in a shelter without any floor deposit were to commence now, will archaeologists in a thousand years hence, upon finding Flood's plastic lens cap in the basal horizon, conclude that the shelter's art dates from the 20th century? If we were to apply Frankel's logic at Koongine Cave to Flood's 48% of art sites lacking any sediment we should have to deduce that their rock art cannot exist.

Then there is this all-pervading intimation in the archaeological literature that human presence in a site is principally documented by charcoal, which particularly in Australia merely amounts to poetic licence. Why must there be charcoal at any art site, contemporary with the art – unless the site happens to be in complete darkness? Then again, why does charcoal have to indicate human occupation of a site, including a cave, in a country that is more susceptible to bush fires than any other? In some countries with identical climate and similar vegetation (e.g. northeast Brazil), wildfires are almost unknown (Bednarik 1989a), because timbers there burn so poorly, and it is in such regions that the presence of charcoal does suggest human involvement.

Charcoal is not the only type of evidence prehistorians are prone to accept as being of anthropic origin, whenever it is found at an occupation site. A variety of other phenomena they would certainly ignore if found elsewhere are inevitably and enthusiastically pronounced as 'archaeological evidence' when they occur at an occupation site: animal scratches in caves, scratched stone 'plaques', the 'intentional' positioning of objects, deposits of iron oxides ('ochre') in sediments are some further examples. Having just argued that two specific activity traces at a 'favoured site' are extremely unlikely to be contemporaneous (the likelihood of them being of the same

age behaves in fact statistically inverse to a site's popularity or 'conspicuousness'), how should I respond to the archaeologists' tendency to attribute natural phenomena to a human involvement **precisely because they occur at a 'favoured site'**? One begins to experience a profound helplessness when considering how to address such a massive lack of logic. After also considering the various aspects and effects of selective survival of all archaeological evidence, the operation of institutionalised archaeology as a biased, self-serving political system (Thomas 1982), and the ethnocentricity and extreme subjectivity particularly of non-structuralist archaeology, one can understand the fundamental doubts of many of its practitioners, ranging from senior academics (Bray 1988; Steinbring 1988) to students (Tangri 1989). And one considers suggesting to archaeologists that astrology or the consultation of tea leaves or animal entrails might be viable alternatives to some of the scientistic models that are occasionally presented as research results!

But to return to a more sober report, Frankel's paper in *AA*. It is not evident to me that the series of radiocarbon dates from Koongine Cave (Frankel 1986: Table 1) with its several 'anomalies' represents an orderly sequence. I find it more plausible that it reflects the effects of the phosphate mining operations that have reportedly taken place in the cave in the 1920s, or other disturbance of the sediments. The postulated mining activity may have been discontinued when the rock mass originating from a roof collapse was uncovered. The roof fall has apparently truncated panels of parietal markings which means that excavation beneath this buried rock mass is more likely to provide information about the rock art's **minimum** age than test pits in probably disturbed deposits. The sequence of events depicted in Figure 1 illustrates this.

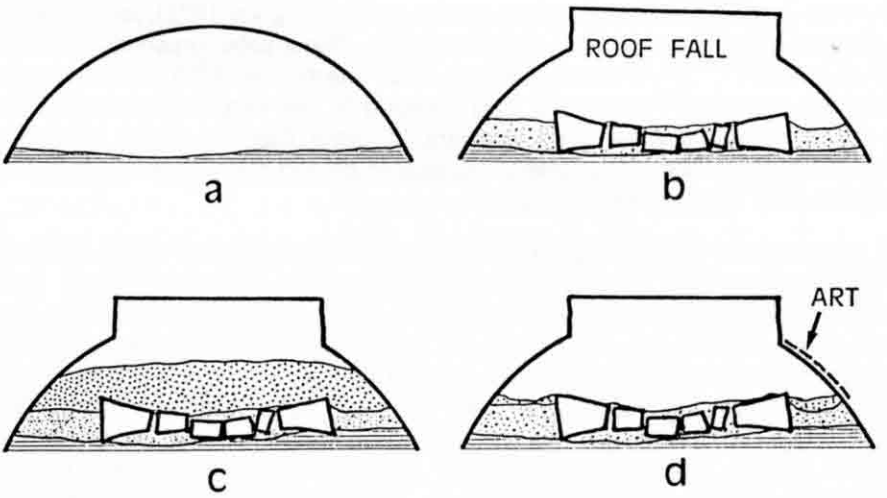

Figure 1 Schematised sections through central part of Koongine Cave, depicting the apparent sequence of events:

- **a. Early sedimentation**
- **b. Roof fall is followed by further sedimentation**
- **c. Recent, apparently Holocene sedimentation**
- **d. Partial removal of cave fill for fertiliser**

The roof fall has truncated the rock art panel, and thus postdates the markings.

Frankel (1986:83) arrives at the conclusion that the absence of charcoal of an age exceeding 9,700 years suggests that the finger markings in the cave are not of Pleistocene age. Since finger flutings have been considered to be among the earliest rock art in Australia (and in Europe; for summary, see Bednarik 1986b) I would like to review his tentative pronouncement here.

Artificial lighting is not required in the cave, and natural lighting would have been even better during early times when the sediment level was considerably lower than at present. My speleoclimatic work in many caves (as part of the most sophisticated speleo-habitability study ever conducted, in prep.), including Malangine, suggests that air residence times in Koongine would have been a deterrent against the use of fires in the cave's interior – these would have been most likely restricted to the entrance area. It does not necessarily follow that Frankel's samples are not derived from hearths, merely that they need not necessarily date the horizon in which they were found (even ignoring recent disturbance). Due to its low specific gravity relative to other sediment, charcoal has a tendency to remain at the top of a deposit, through trampling; it is easily transported by both wind and water; and it tends to accumulate in hollows on the floor. Once stratified, such lenses are indistinguishable from hearths. I believe that much charcoal found in Australian sites originates from natural fires; moreover, it may not always be of the same age as the stratum in which it resides. Conversely, the same applies to lithics, osteal and shell finds, which are often the residue of deflated strata.

There are two ways of looking at the evidence from the Mount Gambier caves: empirically, mechanistically reject as 'anomalies' whatever does not fit into the model; or by holistic and logical rationalisation. I prefer the latter. Prior to 10,000 years ago this was not a coastal area, but an inland karst plateau (Marker 1975), totally waterless and with probably little vegetation (Dodson 1975). The aquifer, presently 15 m above sea level at 20 km – 30 km inland (Holmes and Waterhouse 1983), would have been much lower in the late Pleistocene, and we need to ask what incentive there would have been for the coastal plain dwellers to enter this no doubt hostile karst environment, which was occasionally devastated by ash rains from volcanic activity (Blackburn *et al.* 1982; Sheard 1978)?

There was one: during this period, the plateau's caves and sedimentary silica outcrops may have been the region's only accessible silica sources (Bednarik 1981). Today's enormous wealth of stone tools and debitage is attributed entirely to a simple natural process. Once the sea rose to its Holocene level it began eroding chert nodules from the horizontal, tabular seams just at the plateau's edge. Kelp tends to attach itself to these nodules, causing them to be 'torn loose and rafted onto the beach' (Witter 1977:52). This process formed two embankments along the coast, up to two metres high. One is at the present high water mark, the other, about 2.5 m higher, marks the transgression in the first half of the Holocene. They contain tens of thousands of tons of high-grade cherts, the raw material of the Gambieran industry (Clark 1979). By its very nature this resource only became available in the Holocene so the Gambieran can only be Holocene. Any radiocarbon dating of it can only be a confirmation of what geomorphology, demographic reasoning and logic have already postulated. Deflated living floors of a Gambieran industry occur along the early holocene shoreline embankment, but only on its landward side, which suggests that they are related to the transgression (Bednarik 1981).

In the well-watered parts of southeastern Australia, human occupation was well established by 30,000 B.P. (consider Florentine and Shannon Rivers in Tasmania, Maribyrnong River in Victoria, Willandra Lakes system in N.S.W.) and it would be unrealistic to assume that the now submerged coastal corridor near Mount Gambier, which would have had an abundance of artesian wells and coastal springs (Holmes and Waterhouse 1983: Fig.4), was never settled prior to 10,000 B.P. – especially subsequent to the ecological upheavals in the continent's central regions. Palaeolithic people (I use the term deliberately) 'are generally credited with a penchant for near-coastal, riverine and lacustrine environments' (Bednarik 1989a). My silica patination study (Bednarik 1980:52) resulted not only in an explanation of the patina-forming process and various new quantitative assessment methods, but also indicated that along the coast from Portland to Robe, stone tools occasionally occur in the Pleistocene red sand sediments (Witter's 'terra rossa', 1977). Typologically they are not Gambieran, but resemble the Kartan, and while the tools of the former are only lightly patinated (patina thickness Pt never exceeds one to two millimetres), the older lithics are always patinated right through, even when they are over five centimetres thick. (The huge chronological hiatus between the two industries was recognised by me long ago; Bednarik 1980:64). Significantly, they are not made of the crypto-cristalline, flint-like silicas of the coastal deposit, but of the poor-quality, coarse cherts that occur in caves and inland outcrops, where they were extensively quarried (Bednarik 1986a). It is therefore likely that, prior to the establishment of the massive coastal Holocene deposit of sedimentary silica nodules, chert was obtained from the petrologically inferior deposits in often dark and dangerous localities, by the Bassian Plain dwellers of the Pleistocene. We can reasonably assume that their visits to the Mount Gambier karst were brief, specific-purpose expeditions. The probability of locating any occupation deposits (including charcoal) of that period is so remote that I consider any attempt to secure Pleistocene charcoal in the area futile. Frankel's comments about the absence of Pleistocene dates in a few test pits should be seen in that context.

One of the several aims Frankel has set himself is to date the rock art in the caves. He has succeeded in providing **supplementary** evidence for the dating of the two Holocene components of the art in Koongine and Malangine Caves, which completely corroborates my earlier, quite tentative dating attempts (Bednarik 1981, 1984a, 1985). He has not provided evidence that the finger markings 'are not of Pleistocene age' (Frankel 1986:83). The people of southeastern Australia are thought to have produced deeply carved circles and other archaic motifs 30,000 years ago (Nobbs and Dorn 1988), and 'tortoise-shell patterns' such as those found in several Mount Gambier caves are possibly well over 30,000 years old in Cape York peninsula. The early phase of this long tradition not only occurs in the Mount Gambier cave sites, but it also crossed Bass Strait (Aslin *et al.* 1985; Aslin and Bednarik 1984). Yet whenever the circle tradition and the finger line tradition occur together in a cave, the former is significantly younger, being 'chronologically separated from the latter by most of the tectonic changes that are now apparent in the cave' (Aslin and Bednarik 1984:41). Moreover, nearly all the structural adjustments in the Australian caves with finger markings, including floor subsidence, roof falls, collapses and displacements, occurred **after** the finger markings were produced (Bednarik 1986b; I exclude of course the five known occurrences of recent finger markings). For instance, the floor subsidence in Orchestra Shell Cave, which occurred probably long before 6,500 B.P.,

postdates the markings (Bednarik 1989b; cf. Hallam 1971), as does the final roof fall in Koonalda Cave. At the latter site, also a subterranean silica mine, evidence of human presence extends well beyond 31,000 years B.P. (Gallus 1971, 1986) and it extends beyond 17,000 B.P. at New Guinea 2 Cave (Ossa, pers. comm.). Moreover, most of the speleothem growth in caves with finger lines postdates them, and there are several sites at Mount Gambier where they are sandwiched between cutaneous travertine deposits. As already mentioned, my conservative minimum dating of the second petroglyph generation at Malangine Cave to the early Holocene, perhaps indirectly confirmed by Frankel's data, renders it difficult to accommodate the significantly older finger markings also in the Holocene (see Bednarik 1984a: Fig.3). Further afield, the digital fluting tradition (not to be confused with the later 'macaroni tradition', Bednarik 1986:35–6) is generally assumed to date from the early part of the Upper Palaeolithic, but may well be much older (Bahn 1984; Bednarik 1984b). Since the recent discovery that even Late *Homo erectus* practised mark making (Mania and Mania 1988) it has become feasible to seriously consider the possibility that the first colonisers of Australia already possessed a pan-Eurasian marking tradition (Bednarik 1988b), and that there is actually a connection between the finger markings of Europe and those of Australia – something I had not considered likely only two years ago.

In view of these considerations the opinion that an absence of Pleistocene charcoal in the disturbed deposit of one cave suggests that none of the art in that cave could be Pleistocene seems premature. It would seem far more logical to doubt that it can really be pure coincidence when the population density in a coastal area suddenly and dramatically 'rises' in immediate response to a sea level rise that inundated former coastal plains! When reviewing his hasty pronouncement in the light of the considerably more extensive relevant evidence Frankel might perhaps wish to give any anomalies the special attention they deserve; in the positivist's world, anomalies may not be more than a nuisance, but they determine the fabric of reality in the real world.

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