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PETROGLYPH MOULDS AND ETHICAL STANDARDS

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In a recent contribution to this journal, Diamond (1990) compares the method of producing petroglyph moulds from latex-based materials with that of using aluminium foil, expressing his preference for the former - on the basis of convenience.

The International Federation of Rock Art Organisations (IFRAO) condemns methods of physically enhancing rock art for recording, and methods involving the application of chemically non-inert substances that are not regularly applied to the art under normal, natural conditions (such as water on a pavement of petroglyphs normally exposed to the rain). Since there are alternative and non-subjective methods of recording available nowadays (such as electronic enhancement; eg Rip 1983), the chemical contamination of rock supports, and of any precipitates or accretions that may be present, through enhancement substances (water, motor oil, chalk etc) has become unacceptable. Similarly, the use of chemicals of any description, as it was indeed advocated only a few decades ago for moulding purposes, is no longer permissible "unless the recorder can give an assurance that the substance being applied to the rock surface, and the small-scale chemical reactions it will induce, are fully compatible with all of the methods researchers of future centuries will bring to the task of assessing rock art" (Bednarik 1987). I believe that no researcher in New Zealand, or anywhere else, is capable of giving such an assurance.

In the 1960s, the method of producing latex casts from petroglyphs was promoted not only in New Zealand, but also, among other countries, in Australia (eg McCarthy 1969:68). Fortunately these practices found only very limited application at that time (it can be said to Diamonds's credit that he has not used the method himself since 1959), and within a decade they were critically reviewed and their detrimental effects recognised. Not only is latex moulding mechanically damaging to almost any type of rock surface, extensive studies of patinae showed, for example, "that the high alkalinity of latex (around pH 10.6, depending on its solvent content) should be seen as a deterrent for using that medium" (Bednarik 1979:30). Accretionary patinae are of crucial importance in present and future rock art research, and their susceptibility to even minor variations in the pH environment is well known today.

In view of the recent dramatic increase in the number of sophisticated analytical methods in areas such as rock art

dating it would be absurd to try and predict the types of methods rock art researchers will bring to these tasks in the 21st century, let alone those of subsequent centuries. The last few years have seen the introduction in this field of the direct C-14 method, cation-ratio determination, AMS dating of human blood binder and other organic traces, extender analysis, microerosion analysis, racemisation of amino acids, carbonate precipitate analysis, uranium series dating, cosmic radiation studies, granular massexfoliation analysis, thermoluminescence dating, oxalate analysis and others. Dozens of methods are either in use, being tested or are on the drawing board, and many more will no doubt appear in due course. Most of them are of a geochemical nature; they can be expected to be accurate only if the chemical microenvironment of the art remains uncontaminated. The professional rock art vandals of the 20th century (Bednarik 1990a, 1990b) would be answerable to the researchers of future centuries if they continued the indiscriminate application of chemicals to rock art.

Let us look at an example to better appreciate the problems involved. Rock varnish is a biologically deposited ferromanganese accretion which often forms on petroglyphs. Cation-ratio dating (Nobbs and Dorn 1988) utilises the differential leaching rates of the calcium, potassium and titanium cations of this cutaneous deposit, by calibrating them against the radiocarbon content in the varnish. If the deposit in question is exposed to calcium carbonate, as is the case when a varnished petroglyph is chalked in, minute traces of  $\text{CaCO}_3$  are likely to be retained interstitially or molecularly bonded, which will not only distort the crucial cation-ratio (through the chalk's calcium), but also lower the equally crucial, and extremely small, radiocarbon content. Since we cannot know the extent of contamination we will either obtain invalid results, or reject results as inaccurate. We are thus effectively limiting the analytical options of future generations of researchers with each and every event of contamination, often in the course of projects which are not even of any scientific value or relevance. Serious rock art researchers reject recordings obtained by chalking, considering them to merely reflect the recorder's bias and interpretation; they are often not a record of the rock art itself, but a record of the recorder's cognitive responses to an alien graphic system.

In reference to Diamond's comparison of the latex and foil moulding methods I should mention that his description of the former is inadequate as he has omitted a crucial step in the preparation process. But I will not divulge further details here because no aspect of such a method should be disseminated in a published form. Clegg's (1983) method of using aluminium foil is indeed, as Diamond states, more cumbersome, but it does not affect the geochemical environment and is therefore vastly

superior. It has been endorsed and used by some of the world's foremost rock art researchers (eg Steinbring in press). I have seen inept latex moulding in various parts of the world, and have in some cases advised the people concerned on correct procedures (eg at a Brazilian site that was threatened by destruction). Only three weeks prior to writing this response, while acting as a consultant of the Irkutsk Centre for the Preservation of the Historical-Cultural Heritage, I examined petroglyphs on the upper Lena (central Siberia) that bear the scars of recent, unauthorised latex moulding. At Vozobiovo (near the village of Zhigalovo) this has changed the reflective properties (colour) of the patination from the 2.5-5YR hue range to the 10-5R hue range (Munsell Chart), indicating significant alterations in the state of the iron components (Bednarik and Devlet in prep.). Much of the latex had remained on the sandstone surface, adhering to recesses and around the periphery of the affected area. When I carefully removed samples of these latex residues with tweezers, many sandstone grains adhered to the back of the flakes. Latex moulding not only destroys much of the analytical potential of a petroglyph, repeated inept attempts may result in the slow destruction of the petroglyph.

The use of any of the several 'direct' petroglyph casting techniques (as distinct from the 'indirect' method used by Kelvin Smibert in Australia) is to be strictly limited to institutional projects conducted by specialist personnel. More specifically, archaeologists are reminded that their training does not cover the conservation or management of rock art, and least of all the scientific study of prehistoric art which is a specialist discipline today.

The International Federation of Rock Art Organisations has recently proposed two measures to eliminate undesirable methods in rock art recording. Firstly, the editors of all rock art periodicals should categorically reject any paper that is based upon objectionable practices (this has already been widely endorsed, and announcements to this effect have appeared in France, South Africa, India, U.S.S.R., Canada and Australia, with many more to follow). Secondly, the organisers of rock art conferences should announce in their pre-conference literature that slides, posters or reproductions obtained by interfering with rock art may not be shown in any presentation.

One way to see this matter in a better global perspective is to consider Article 4 of the Code of Ethics of the Sociedad de Investigación del Arte Rupestre de Bolivia:

Las sustancias potencialmente destructivas como los moldes de latex, la tinta para "rubbings", la tiza, etc. no se aplicarán en las superficies de las rocas. En ningún caso se mojará las pinturas rupestres, pues esto aceleraría el proceso de la desintegración del soporte.

It may not be reasonable to expect rock art conservation and protection standards in New Zealand to match those of Australia (Bednarik 1989, Ward 1989) in the near future, but perhaps New Zealand could strive to emulate those of Bolivia.

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