AUSTRALIAN ROCK ART AND ARCHAEOLOGY

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The most common approach to pictures is through the assumption that they depict things. When the picture is decoded, it reveals information about the artists' scale of values and interests. There are changes in style through time and space which relate to other aspects of culture - one might instance language - and history. When faced with a picture which one does not understand, the normal reaction is to seek assistance from some better-informed person, who is able to interpret the picture through their knowledge of the cultural context of the picture. They can say what the picture represents, and what it means.

Such have been the methods used by people in their approach to pictures, from their own or other cultures. There are a few additional techniques used to deal with rock art. Although often very complex in practise, these may be stated simply as relative dating and typology. The typology allows comparison with other pictures, and ultimately the construction of stylistic assemblages and phases. Relative dating allows the pictures to be placed in sequence. For prehistoric rock art, the most common method of relative dating is the study of superimposition. These methods are of course adequate for the discipline on whose behalf they were developed, that of Art History.

It is necessary to extend the methods outlined above where there are no living (or documentary) informants from the same culture as the pictures. Informants from any culture which uses the pictures can reliably inform about the use, interpretation, or consumption, of a picture (or any other artifacts in their own culture), whereas archaeologists may restrict their interests to the makers of the artifacts.

Archaeologists dealing with prehistoric rock art have often used approaches more suitable for Art History. If the pictures are prehistoric, in the sense that there are no informants available, it is necessary to extend the methods of Art History. The traditional method has been to seek suitable informants in the guise of Ethnographic Analogy. The apparent need for informants to elucidate the Palaeolithic Art of Europe was an important stimulus to the study of Australian Ethnography at the beginning of this century, as the Aborigines were considered to be Palaeolithic in culture, so it was felt that their customs would be relevant to those of Palaeolithic man in France.

In the second half of this century, prehistoric archaeologists became less tolerant of interpretation and ethnographic analogy as bases for prehistory. Stones and bones and carbon could talk unambiguously about Adaptation and other aspects of Economics: the reliability of data and inferences were

open to test by established rules of evidence, scholarship, and statistics. Such archaeologists were inclined to look askance at art studies which talked about "style", lacked any method of absolute dating (except in the all-too-rare situation where an art object had been covered up by a datable deposit) and relied on ethnographic analogy for its insights, which usually related to aspects of culture for which there was no other information available (and therefore no independent check), aspects such as world view, religion, magic, ritual activities.

"Art" is a pretty complex concept for western societies; one may question the existence of a counterpart in other cultures. Even Typology was suspect, as the study of types could be undertaken for its own sake rather than the elucidation of problems concerned with human behaviour. In the continent of Australia during the 1950's there were fewer than five prehistoric archaeologists. No clear distinction was made between the disciplines of archaeology and ethnography. It is not surprising therefore that a specific hard-edged *archaeological* as opposed to ethnographic approach to *prehistoric* pictures made its first appearance only in 1965 (McMah (Maynard), 1965).

Only in the North and Centre of Australia, in the Kimberlies and Arnhem Land are there informants who have an unbroken tradition of relating to rock art. Over the rest of the continent there are many prehistoric pictures, but no informants with a traditional connection to them. Even superimposition studies are not always applicable. One might hope for relative dating by patination of engravings where they overlap or are close together, but in Western Australia, where the problem has been studied in most detail (Maynard, 1976), a relative dating does not result. Where the pictures were made by applying dry pigment in lines to a rough wall (drawing) the study of superposition is inapplicable, unless wet pigment - as with stencilling - is present. Moreover, many pictures show evidence of a complex series of drawing and re-drawing of the same figure, which may be both above and below an overlapping figure in a different style. This creates a situation whereby, although an ethnographic, traditional approach is entirely suitable where informants are available (and excellent work is being undertaken), a prehistoric and archaeological approach is necessary for the study of the prehistoric pictures on a large part of the continent.

Yet we still must consider what constitutes an archaeological approach. Towards the end of *Analytical Archaeology,* David Clarke distinguishes (1968, p. 648; 1978, p. 479) two "basic propositions of modern archaeology" which "seem to exhort us to take totally opposed views of the same data". The first proposition underlies the cultural ecology and cultural ethnology schools of archaeology; the second, which claims that archaeological data are now detached from their contemporary sociocultural contexts, and the study of artifacts should be freed from the distortions of loose propositions about their former contexts (or meanings).

In Australia the Ethnographic approach was the only one which was applied to prehistoric pictures until the 1960's. In the 1950's it was thought that the human occupation of Australia was entirely Holocene; the main tasks of the archaeologist centred on broadening the ethnographic evidence, which was

very sparse in some areas of the continent. Where competent ethnographic studies had been done, they of necessity reflected the interests of the ethnographer and left some interesting aspects unexplored.

The ethnographic approach to prehistoric pictures has produced some excellent work recently, and it is not my business here to belittle it (Ucko (ed.) 1978, though rapidly dating, is a good summary of work on prehistoric rock art up to 1974). In the 1960's a small number of Australian archaeologists were beginning to look for ways of studying prehistory through the application of purely archaeological (i.e. non-ethnographic) techniques of analysis to the data of prehistoric pictures.

The first such work was a B.A. (Honours) thesis by Lesley Maynard, written in 1965 (McMah, 1965) and unfortunately still unpublished. The general aim of this study "was to produce, first, a typology of the engravings, and second a spatial distribution of the traits, based on typology" (McMah, 1965, p. 7).

The typology used was based on the division into *subjects*. When there is more than one way of representing a single subject and the differences between the forms is considerable, *types* exist. When the differences are not so great, then the differences are *variations* on a single subject-type (McMah, 1965, p. 8-9). McMah used 2890 individual figures.

The most elementary fact of the typology is that the body of figures can be broken up into a number of subjects, such as human figures, kangaroos, fish, etc. Twelve such subjects were chosen, and their distribution was investigated in relation to a grid of the area. The percentage of each subject within each grid unit was expressed in a table, which revealed differences along a north-south continuum as well as an east-west, coast to inland dimension. The east-west grids were about 4 miles apart, and the north-south ones average 12 miles. So each quadrat is about 4 x 12 miles. "A most interesting trend in the distribution of subjects is the increase from North to South of those subjects presumably used by the Aborigines as food, i.e. kangaroo, emu, other animal, other bird, fish" (McMah, 1965, p. 41).

Within this general trend, there is a marked peak in large food animals, kangaroo and emu, in the far north of the study area, and a very high percentage of fish in the area between Port Jackson and Botany Bay. McMah drew the general conclusions from the subject distribution north to south that: "These wide variations in percentage between one area and the rest ... seem to indicate a localised emphasis on particular subjects. A different type of pattern is the generalised tendency of a percentage to increase or decline from north to south, of which there are two examples: food subjects and anthropomorphs. It is possible that this represents the diffusion of an idea or emphasis from one end of the range to the other" (McMah 1965, p. 45).

The subject distribution east-west, which is coastal to inland, introduces a change in environment between the strips, the most important change being proximity to the sea, and thus the availability of sea foods. As one might expect, there is a sharp rise in fish subjects towards the coast, and a decline in other subjects. The distribution of non-food items, particularly anthropomorphs, which cluster in the north and west, is presumably cultural in origin rather than economic.

Fig. 13
Distribution of major Australian rock art sites and styles.
(from Maynard, 1979, p. 98).

Distribution of Stylistic Traits

These refer to the variation between different types within each subject-category. Most of the 400 or so distribution patterns show a random variation between the six areas but there are some definite patterns. "... the whole area is not artistically homogeneous, but shows both gradual change from area to area along the coast, as well as ... numerous localised emphases on particular traits" (McMah, 1965, p. 53).

McMah chose to examine some traits in more detail. "The most usual portrayal of kangaroos is with one foreleg and one hind leg, and with one ear, but there is a trend, increasing from North to South to show the animal with two pairs of legs. The distribution of pairs of ears is slightly different..." (p. 53) as is the distribution of two-eyed kangaroos, and those with other

traits. McMah concludes that there are several patterns of distribution superimposed in her area of study; there is an economic/environmental pattern, and a cultural pattern which may relate to tribal or linguistic distributions, and there is some indication that the "anthropomorphs" or "culture heroes" have a distribution of their own. With hindsight it is clear that McMah's 1965 work was a landmark. The thesis demonstrated that it is relatively easy to use prehistoric rock art for the elucidation of prehistory; that a simple punched-card computer system is adequate to process the material; that pictures as artifact-types may be defined with sufficient rigour to carry out the work; that patterns in the distribution of pictures may be discovered without any need to identify the subject of a depiction (though the possible subjects' names do make useful labels for the type of picture); that those patterns may be explained by interpretation in relation to ethnography and geography. But the patterns are complex, perhaps several different patterns superposed.

Since 1965 there has been no holistic study of the Sydney area pictures in any way comparable to McMah's although what work has been done amplifies McMah's work. In 1968 (Clegg, 1971), I clarified that one trait of *drawings* (as opposed to the engravings McMah studied) shows a differential distribution between the north and south of Sydney which may be parallel to McMah's discovery that kangaroos have two legs in the north, four in the south. The drawing trait is that eels on vertical surfaces point downwards south of Sydney, upwards if they are in the north (there are several eels which point sideways in both areas). This rather odd discovery has stood up the finding of new sites, which confirm the pattern. In another small study (Clegg, 1979), evidence was found that waterways were no barrier to communication; pictures separated by a few kilometres of water are more a like than those separated by a few kilometres of land. In the same paper an estimate was made of the minimum working-hours used to make an engraving: between 2.25 and 2.5 metres of engraved line can be made in an hour. A medium-sized engraved area must have taken at least 101 working-hours.

Although not much work has been done to illustrate the prehistory of the Sydney area through the study of prehistoric pictures since 1965, a great deal of work has been done on developing methods, models, and theory relevant to such studies. Most of this work, although done in Australia with Australian problems in mind, might prove applicable and fruitful in other parts of the world.

Again, the bulk of the work was done by Lesley Maynard (who had changed her name from McMah). The purist archaeological approach assumes prehistoric pictures are in the classical position of artifacts in archaeology. Scattered over the countryside are lots of objects which contain (or so the archaeologist hopes and assumes) potentially interesting information about people in the prehistoric past. It is the prehistorian's task to extract the information and integrate it into some sort of prehistory. Archaeologists traditionally use information about dating, location, typology and classification, association and correlation. Information from these sources is integrated and interpretated by one or more of several techniques, among which is analytical
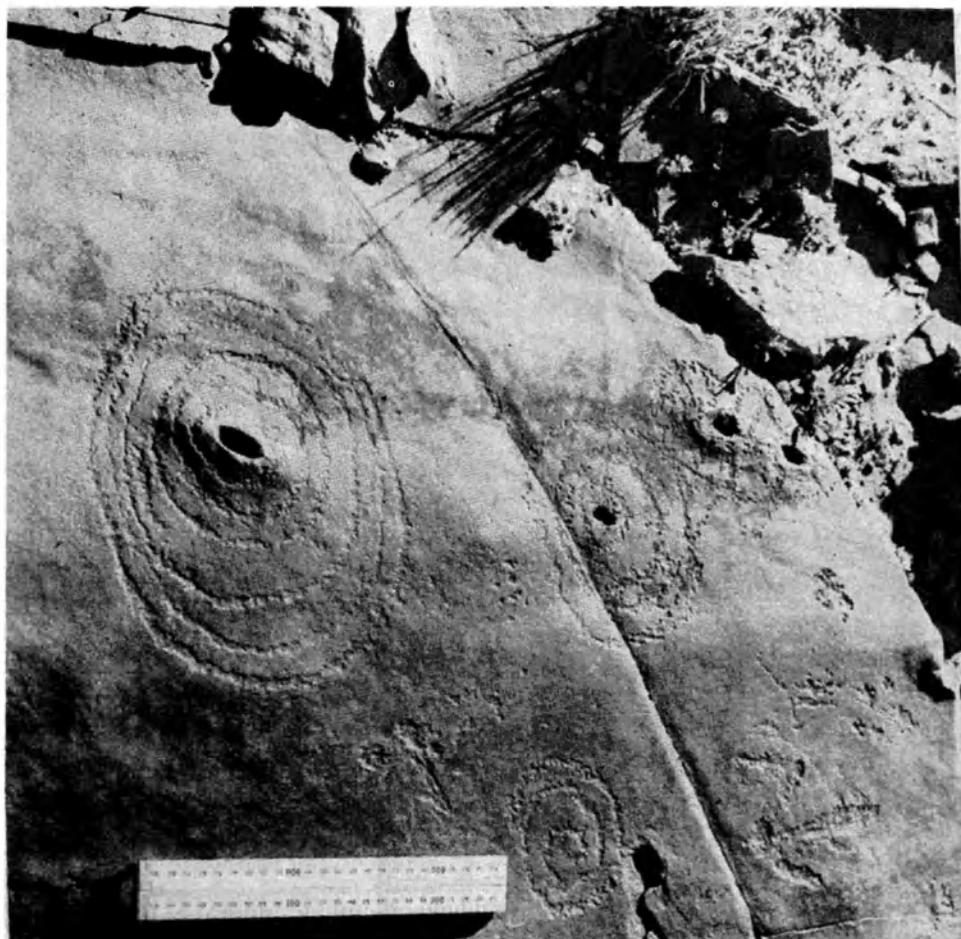
Figg. 14-15
Simple figurative engravings, Panaramitee Hill.

archaeology. We had rejected ethnographic analogy as a means of achieving prehistoric insights, and that seemed to reject also much of the New Archaeology. Even the methods of analytical archaeology had to be interpreted before they could be easily applied to the study of prehistory through prehistoric pictures.

Rock art is very seldom datable by any of the rigorous methods available for other artifacts. The only concrete advantage of pictures is their location information. Normally tied to rock surfaces or shelters, they are well localised. Pictures on any one site need not date from the same time, and pictures cannot be through to "comprise a comprehensive selection from most of the material spheres of cultural activity" (Clarke, 1968, p. 231; 1978, p. 246), so the groups of pictures are Clarkeian "aggregates" rather than assemblages. It is accordingly difficult to determine their strict association; an occupation deposit at the foot of a painted surface may or may not have been left by the artists or those who used the pictures. In the

61

mid-sixties the typology of pictures relied on interpretation, which was rejected by the prehistorian purists. It was necessary to devise a new typology suitable for studies of pictures. So the prehistory purists has to devise a method of typological analysis, and use various methods to raise the standard of the groups and pattering away from that of the aggregate towards the association. There is no point in looking for association or correlation information until a typology, a classification, has been established, so that it is possible to indicate with which phenomena the association with other artifacts or natural phenomena or environmental indicators may exist.

The problems of dating, classification, and typology go hand-in-hand in a chicken-and-egg relationship. Description is basic to classification, typology and chronology, and the recognition and definition of assemblages rather than agglomerations. In May, 1974, Lesley Maynard presented a paper to the Australian Institute of Aboriginal Studies conference (Maynard, 1978) which proposed a system of objectively describing prehistoric pictures. The system involved adequate definitions of various categories of each of Technique, Form, Motif, Size, and Character. The use of this system allows for the definition of picture-types so that pictures may be counted. With slight modifications to the Motif category which permit the elimination of figurative names, the system has proved adequate for all the tasks to which it has been applied as yet.

Historically, it was the dating problem which was first solved on a large scale. The scale was that of the whole continent over an unspecified time-span of at least twenty millennia. In August, 1974, Lesley Maynard read a paper to Symposium 1, the Art of Oceania (Maynard, 1979), on the Archaeology of Australian Aboriginal Art. She reviewed the available reliable dates on the art. "There are only a few absolute dates for Australian rock art, and half of these relate to material which is atypical and therefore nondiagnostic. Thus these dates do not contribute anything to our understanding of the age and sequence of the major art styles" (Maynard, 1979, p. 88).

Her view of style "includes motif and character as well as technique and form" (p. 91), whereas previous attempts were based on geographical distribution and subjective aesthetics or a combination of techniques and forms with dubious superimposition assertions. Maynard's hypothesis is based on "a variety of archaeological evidence, including distribution, absolute dates, other evidence regarding the age of some rock art, quantitative analysis, and some superimposition" (Maynard, 1979, p. 91).

Maynard's conclusions are that "there are, within the whole corpus of Australian rock art, three major identifiable styles which can, at this stage of our knowledge of the material, be placed in a relative sequence. It is not very meaningful to call these units "phases". There is as yet no possibility of defining the limits of duration of the periods in which they were practised, and their distribution, although generally perceptible, is not precisely defined. There are also several styles, and numerous individual sites, which cannot be fitted into this sequence; these styles await further investigation of their absolute age or their relationship with other units. I have called the three major units, in the order in which I believe them to have been used in
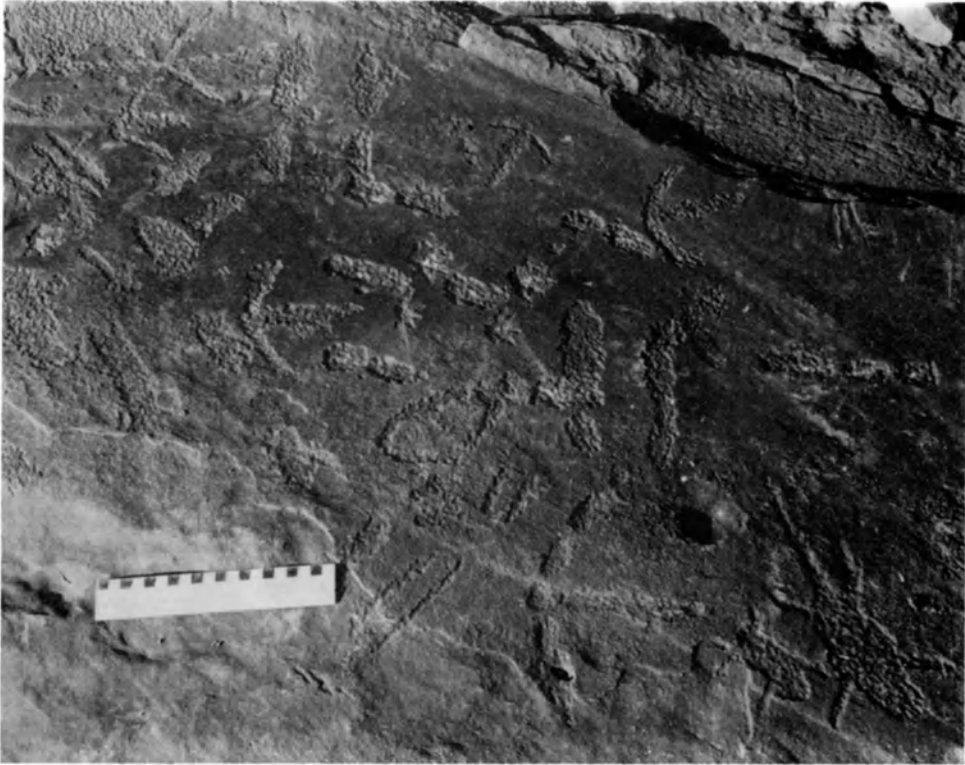
Fig. 16
Simple figurative engravings, Panaramitee Hill.

Australia, Panaramitee style, Simple Figurative styles, and Complex Figurative styles" (Maynard, 1979, pp. 91-92).

Panaramitee Style

It seems reasonable to suppose that the Panaramitee style is more than several thousand years old; minimum dates of 5000 to 7000 years B.P. have been proposed. Classic sites in this style are widely distributed in the arid zone of Australia, and further afield, from Laura in Cape York to Mount Cameron West in Tasmania and from the Blue Montains in eastern New South Wales to the south-west of the Northern Territory. The classic sites each contain several thousand individual figures. "All appear to have been made by pecking (indirect percussion); they are composed of bands and solid forms; most figures measure up to 10 centimetres in height, and there is a very narrow range of motifs, dominated by a macropod and bird tracks and circles, with a smaller number of crescents, groups of dots, human footprints radiating lines, "tectiforms" or line mazes, and a tiny fraction of other nonfigurative designs. Although rare, these "other designs" are sometimes very distinctive and highly variable. Figurative motifs apart from tracks are also extremely rare, and consist mainly of lizards ... The relative proportions of different motifs remained very consistent. Tracks average 62 per-

Figg. 17-18
Large figurative engravings, Sydney are.

64

cent, circles, dots, crescents, and other linear and geometric designs make up 30 percent; all other motifs comprise the balance of 6 percent ...

By extensive field surveys, R. Edwards identified another group of engravings in Central Australia which contain the same type of pecked engravings with the same limited range of motifs ... Quantitative analysis of thousands of motifs at these sites showed that the relative proportions of motifs are almost identical with those derived from the Manunda-Yunta sites approximately a thousand miles away. The maximum degree of difference is 5 percent ... This correspondence strongly suggests that these sites may be regarded as one stylistic unit, despite their wide separation" (Maynard, 1979, p. 92).

Simple Figurative Styles

"Many of the regional styles are dominated by figurative motifs. They constitute 78 percent of the Sydney-Hawkesbury carvings, 81 percent of the engravings in the Pilbara region, 84 percent of the Laura paintings, and 88 percent of cave paintings on Groote Eylandt ... The majority of these figurative motifs conform to a pattern of crude naturalism. Whether a motif is engraved or painted, in outline or in solid form, it usually consists of a very simplified silhouette of a human or animal model. Most portrayals are strongly standardised, human beings are depicted frontally, animals and birds in profile, snakes and lizards from above ... Fine details of anatomy and body contours are not shown, nor is there any representation of surface texture or of any feature within the outline, except eyes (Maynard, 1979, p. 99).

In fact, the *Simple Figurative styles* are simple. There are different styles within the classification; they are around the northwestern, northern, and
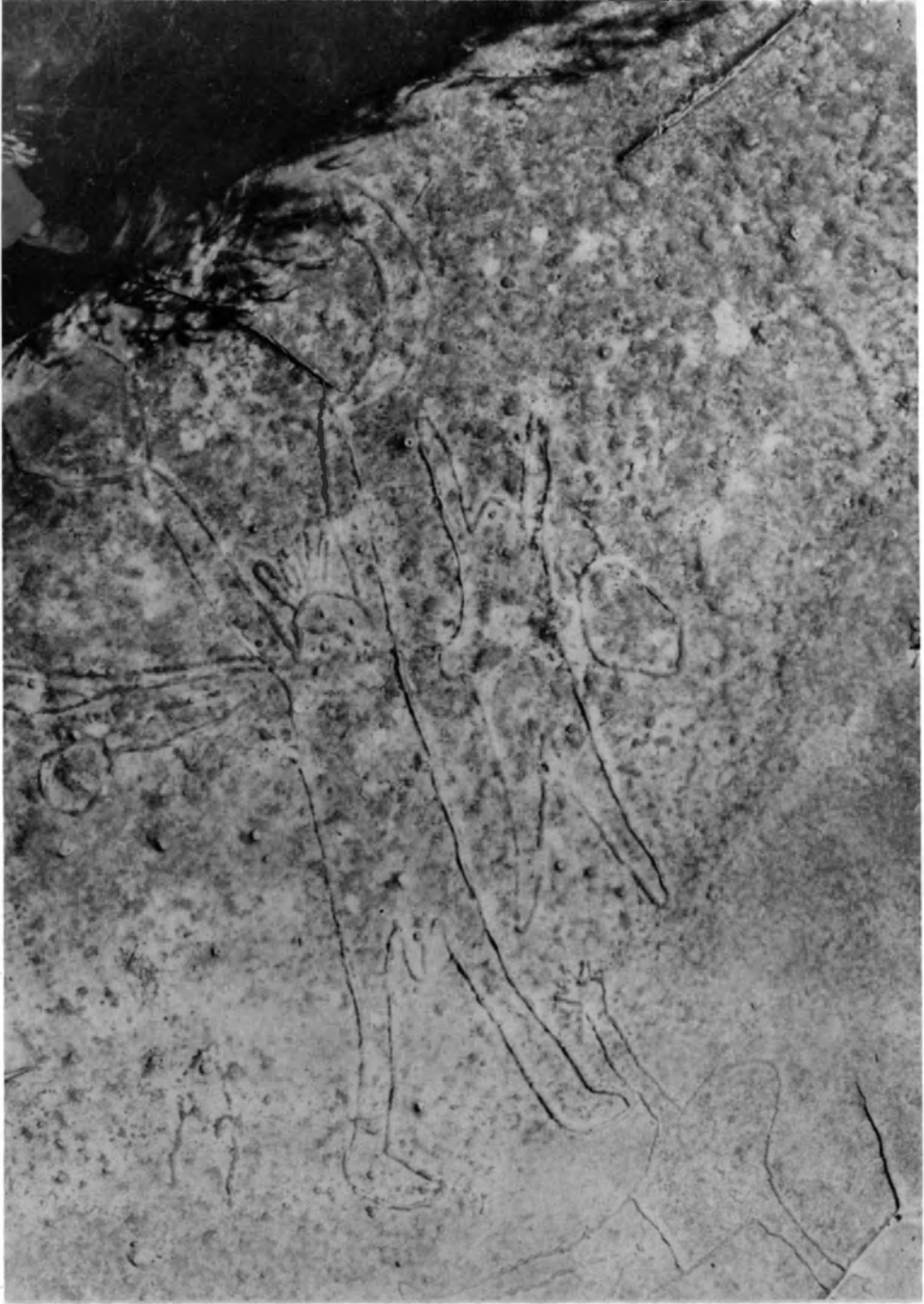
Fig. 19
Large figurative engravings, Sydney area.

eastern peripheries of the continent. Those sites in western New South Wales are the most inland examples. The different simple figurative styles differ in techniques and forms, which are very distracting in a superficial visual comparison, because the differences, rather than the resemblances are most apparent. It is the basic draughtsmanship of equivalent motifs which unite the simple figurative styles. In at least two parts of the east coast, Simple Figurative art is in the most recent style, and incorporates objects introduced by the white invaders in the 18th and 19th centuries. Wherever Panaramitee and Simple Figurative styles coexist, the Panaramitee figures are older.

Complex Figurative Styles

"Complex Figurative styles are found exclusively in the coastal regions of the northwestern quadrant of the continent ... Although these styles are extremely diverse, their common characteristic, and that which distinguished them from Simple Figurative styles is that they are, in some respect, more sophisticated than crudely naturalistic. The Mimi stick figures ... run, they jump, they throw spears, they flap unwieldly bundles of weapons, dilly bags, goose-wing fans. The depiction of action, effective at this level, is totally absent outside the northwest ... Polychrome women, whose anatomy seems to consist of flexible plastic tubes, sway languidly in a gentle, invisible breeze. Extreme versions of this style are contorted human figures whose elongated limbs, torsos, and genitals resemble tangled spaghetti. Sexual themes are common in this art; in the Simple Figurative styles, they are absent or low-keyed ... X-ray paintings ... most commonly feature animals, birds, fish and reptiles. Within the outline of these figures, delicate linework is used to portray internal anatomy - bones, breathing apparatus, the heart, the gut, eggs within the reproductive tract ..." (Maynard, 1979, pp. 100-101). The Wandjina and Bradshaw figures of the Kimberlies, and the Gurangara figures of the Pilbara are each different styles, but equally complex. Wherever Simple and Complex figurative occur, the Simple Figurative is older. Some of the Complex Figurative styles continue up to the present.

The three styles proposed by Maynard made sense for the first time of the overall art history of the continent. The restriction of a study to any one of the styles allows a step towards the definition of picture - assemblages rather than mere agglomerations. Maynard's definitions and descriptions seem at first to break with the definition of prehistoric archaeology as not relying on interpretation: the naming of figures as figurative seems to assume that one knows what is being depicted. But this is not what Maynard wishes to imply. She uses words like Figurative, and words like Kangaroo because they at once raise an image in the mind of the reader. The words are used to communicate the shape of the marks on the rock surface; they are not intended to imply any meaning in the marks. "My use of the name "kangaroo" for a particular figure therefore implies only that the figure reminds me of a kangaroo. It is convenient to use this name in order to distinguish this figure from others which remind me of emus, fish, human beings, boomerangs, and other familiar objects" (Maynard, 1978, p. 396).

I later devised a geometry which would allow the description and definition

of motif-forms without the need of nouns. This is called the Knob and Blob approach, and produces descriptions such as B2R4L (ds) for a frontal man, and BR5L (ss) for a profile kangaroo (Clegg *et al.*, 1977). This geometry solves the problem of interpretation-free definition, but seems to maximise incomprehensibility. This difficulty could be overcome by introducing the ordinary nouns with some convention intended to make it clear that they are being used as *names* which refer to the type only, as opposed to *labels* which refer to type as well as presumed interpretation.

Figures and meaning

In order to work within one of Maynard's large styles, work on a much finer scale, it was necessary to develop some detailed models, methods and typological techniques. The first difficulty is in finding a way to label the types, so that they may be discussed. The temptation is to name figures after common names for what they look like; "man", "banana", "dinosaur", "kangaroo". But such a usage is open to the misunderstanding that the names are labels; that the picture named dinosaur is considered to be a depiction of a dinosaur, and therefore (by a complicated but easy process of extrapolation) that prehistoric Australians knew about Dinosaurs. Alternatively, the figures could be named using some code system, which would describe the shape of the figure but might be difficult and inconvenient as it

Figg. 20-21-22
*Queensland stencils and engravings.*
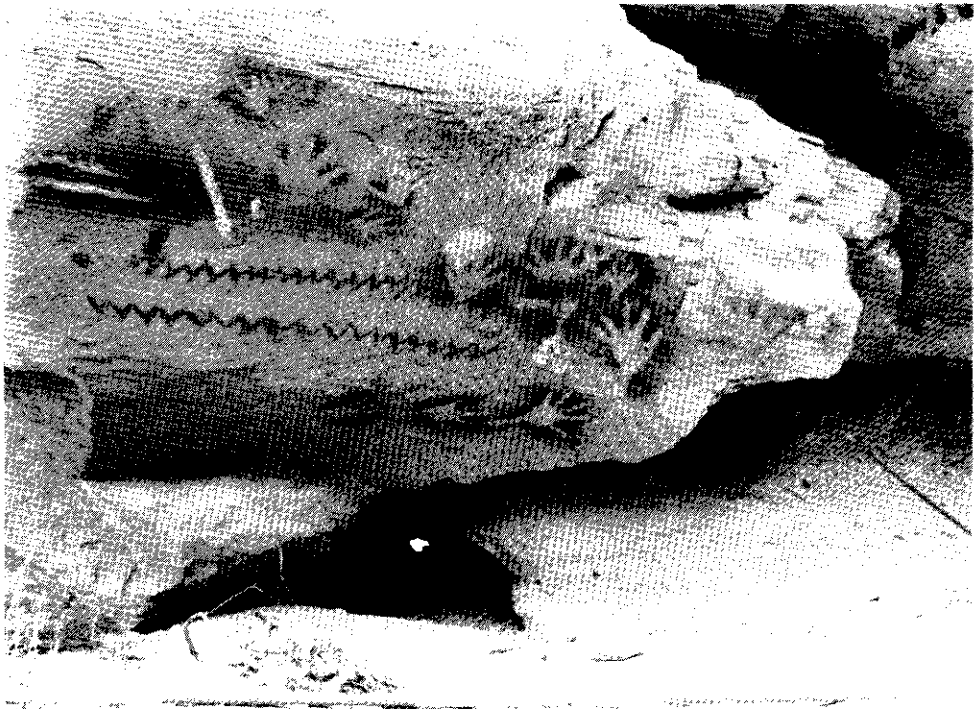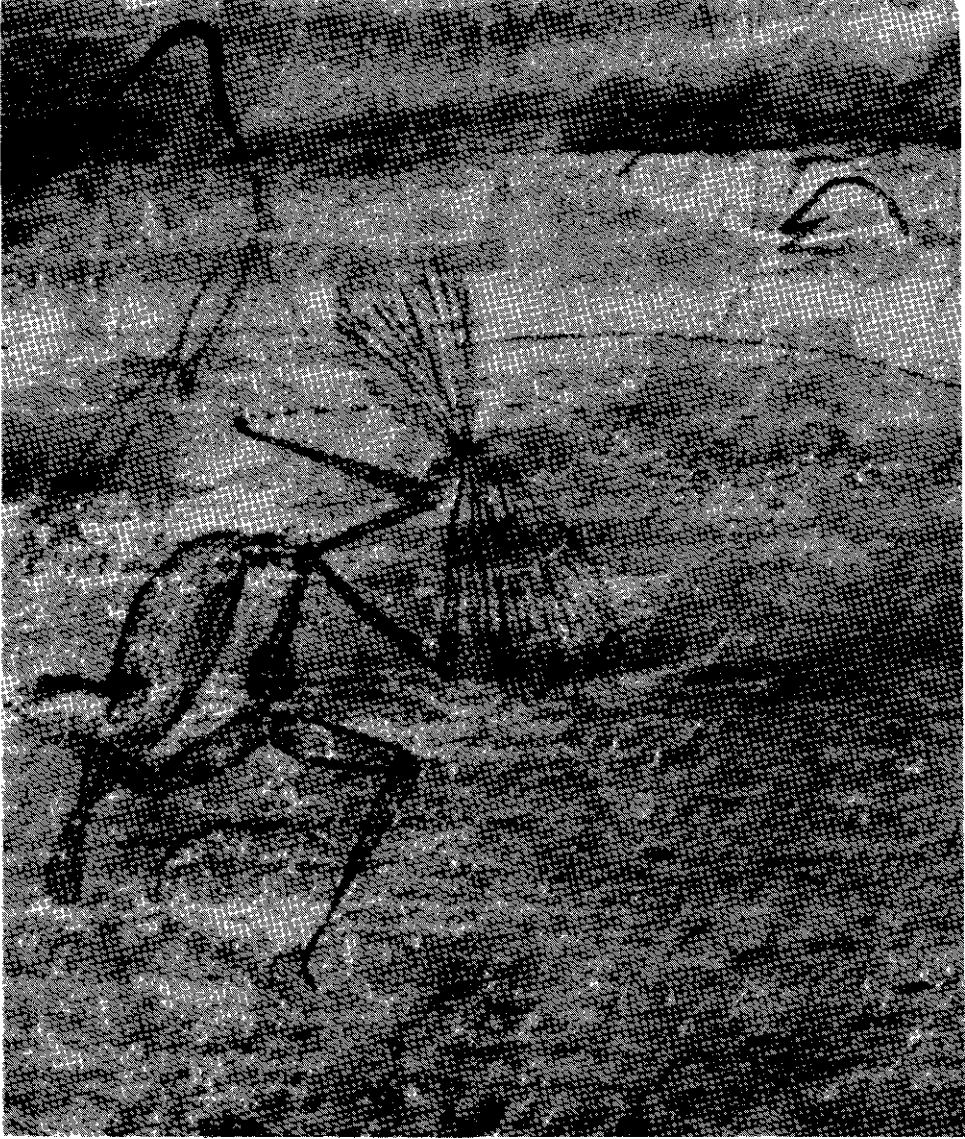
Figg. 23-24
Complex paintings, Arnhem Land.

would appear meaningless to the uninitiated. The simple solution of putting a common name in quotation marks, in order to indicate that it is to function as a name, rather than a label, was rejected on the grounds that quotation marks are occasionally used for emphasis - a reading which would demolish the whole aim of using the inverted commas. The current - but still unsatisfactory - solution, is to indicate that a word is being used as a name rather than a label for some supposed designee by prefixing the word used as a name by an exclamation mark; thus: - !man, !banana, !dinosaur, !kangaroo (Clegg, 1978c).

The second difficulty is in identifying the types and sub-types. In, for example, the Canoelands area, the !men occur on engravings, and in drawings. They are large (over 4 metres) and small (less than 1/2 metre), thin or flat, and of various colours and attitudes. In the past the large ones have been called Culture Heroes, which must be a different type from !man, and the engraved figures were never treated in the same category as drawn ones. There are several equally possible (though not necessarily equally plausible or acceptable) interpretations:

1. The variation is due to types: there are !men, and !culture-heroes, and !dwarves, and !skinny-men, and so on.

2. The variation is stylistic, or cultural: the pictures were made by different people at different times: during one period !men were drawn large, and multicoloured; later they had head dresses; earlier they were engraved life-size.

3. Some of the variation is due to different medium: !men drawn in a shelter tend to be smaller than !men engraved on large expanses of rock in the open.
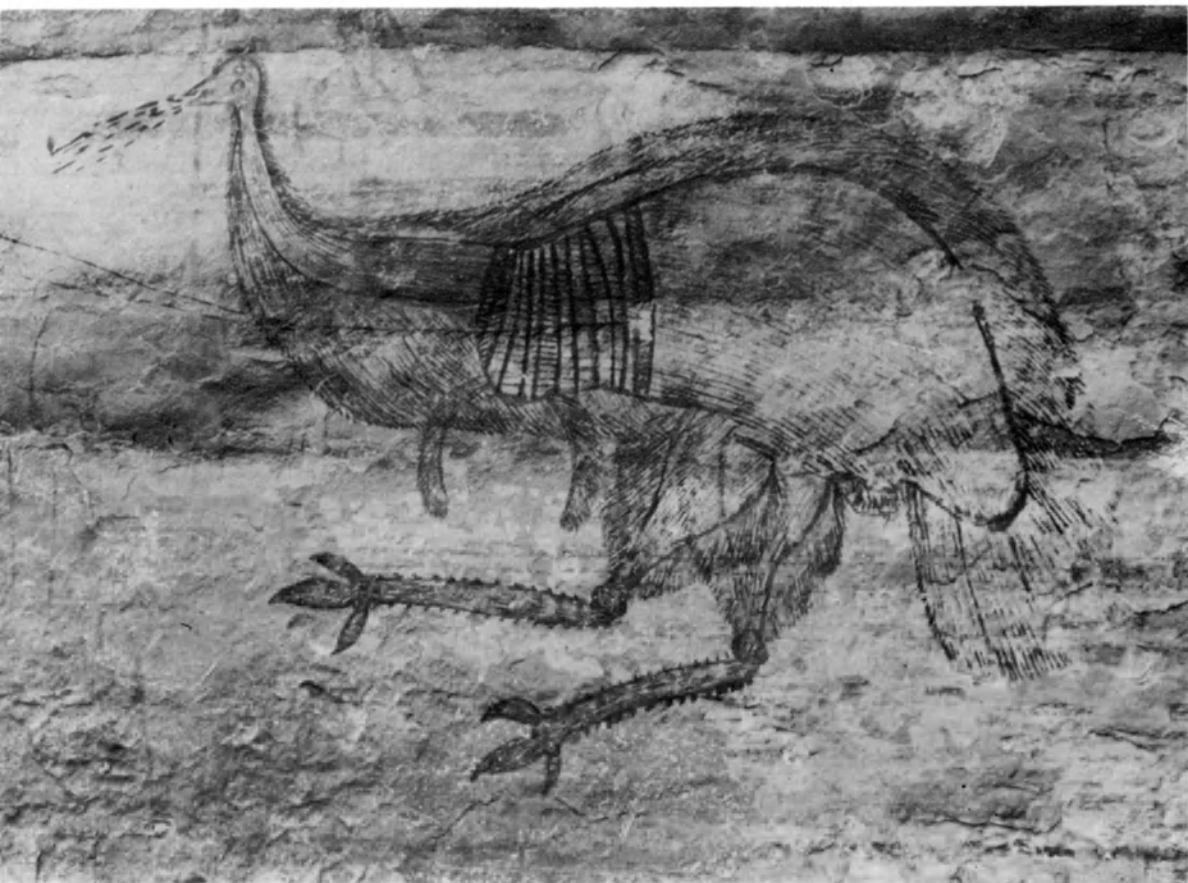
(It is possible that some reader is still inclined to enquire why problems of this sort are not resolved by appeal to ethnography. Such appeal, although not related directly to the Sydney area, complicates the issue further: a picture of a person might really represent their dream-time ancestor, who may be or look like a kangaroo, or a storm; pictures of one object drawn by people of the same settlement but different totems look so different that only a knowledgeable informant could be aware of the congruity of designee; what any one picture represents or means alters with the degree of initiation of the onlooker; there were at least seven different degrees, so each picture may have had seven different meanings).

The third difficulty is related to the second: the types are hard to understand because there are many different possible causes for the variation which exists.

A fourth difficulty is the absence of dating (with the exception of some fine detail produced by superposition involving stencils at one site): the lack of dating precludes recognition of assemblages - which must come from a limited period of time. Even David Clarke's great Analytical Archaeology (1968, 1978) did not seem to offer a way out of the difficulties. This is partly because Clarke's insistence that material culture is the message, and the fossilised behaviour, rather than that the artifacts contain messages, and reflect behaviour, seemed peculiarly unanalytic and inapplicable to prehistoric rock art.

I distinguish the message from the medium in which it is sent. The letter or telephone is not the message, nor even the spoken word, or the written sentence. The message rather is the information transmitted through those media. The encoding, transmission, decoding and reception is a very complicated business (see Saussure, for instance) which we need to ignore - leave as an unopened black box. McLuhan's statement "The Medium Is The Message" was a deliberate paradox, intended to promote through about the effects that the whole Television (or other medium) thing was having on society - where objects and systems like Television and television sets conveyed many messages about upward mobility, use of leisure, and so on without any need to turn them on. These social messages were transmitted as information.

"Oh, it's a hand-written letter which smells of expensive perfume!" is different from the message "Get lost you creep!" which might be written on the letter.

These messages are both conveyed by the same letter, which contains two messages in two languages: perfume/handwriting, and writing. Possibly one might get into a strange loop if one asks whether or not the message is the information, or does it contain/transmit the information? I do not wish to explore that at the moment; my "message" *includes* the information whether or not it *is* the information.

Clarke says that idiosyncratic noise peculiar to each culture-system (information system) (Clarke, 1968, p. 89), by virtue of its idiosyncracity is precisely that variety which encode the messages which relate one culture to another. These idiosyncratic variations are known as Style. But, apart from

recommending multi-variate seriation techniques as analytical tools, Clarke does not seem to have a ready-made model which would do for our purposes. "Most of the difficulties and dangers of seriation techniques, including matrix ordering, arise from our present lack of information about the "behaviour" of well-documented and controlled data. If such information were available then the existing models and procedures could be "built-up" and cumulatively modified to meet the challenge of real data" (Clarke, 1968, p. 457).

So Clarke's suggestion for curing the predicament is to build up models about the behaviour of data, from presumably well-documented and controlled ethnographic observation which is good enough to generalise, or to take as universal until shown otherwise. That was precisely what I did. I used the relatively reliable ethnography European Art history during the last two millennia (the model also owed a great deal to McBurney himself and his writings, for instance McBurney, 1973), which was summarised as a simple four-dimensional model given as a paper in 1974 (Clegg, 1978b; 1981, pp. 212-240) as follows: what causes variation in artifacts?

1. *Personality of artisan.* If different people are given the same task, under similar physical conditions and using similar materials, results of their activities are distinguishable. One artifact is neat and tidy but may not work; another is poorly made, but of some use; a third is very good all-round. Think of the variation between essays written by various students. esays all on the same topic, and using the same bibliography.

2. *The medium.* The materials used, and the techniques which manipulated them. A plastic-handled nail-brush is different from a wooden-handled one, as a result of the materials in use; yet there are also differences which are not simply differences of material, as would be demonstrated if an accurate plaster cast were made of each; the wooden handle has a form different from the plastic one.

3. *Function.* A wooden-handled wire brush is different from a wooden-handled iron frypan even if they are both made by the same person using similar materials and methods - because one is for cleaning paintwork, the other is for frying bacon.

4. *Culture.* Chinese, I believe, use plastic chopsticks for eating with; Americans use plastic forks. They may both be eating the local fried chicken or chop suey, they may both have very similar personalities, yet the artifacts in question are different though made by the same means from the same material, and for the same function.

These four factors influence the production of variant artifacts. They are not necessarily independent, as personality is of course partly a function of culture, and vice-versa. All four are probably interlinked. Yet, neither are the four factors unities; they are galaxies of causes, they are dimensions. Within the dimension culture, there are many cultures, as there are many mediums, personalities and functions.

So far I have presented a simple model which contains information that I imagine most of my readers have known since the year dot. I put it forward

as an aid to the work of archaeologists. How may it be used to help that work?

If we want to know which of our students is the most capable, we subject them all to the same environment, then give them all the same test, and some of us believe that the results of marking that test convey information about the relative capacities of the students. But if we were to subject student Bloggs to a driving course in Winnipeg taught for three years by a megalomanic dwarf, then test Bloggs in his ability to weld aluminium, how revealing would the results of that test be when compared with the test of Smith, who has had a two-week typing course in Katmandu, which is tested by asking Smith to cook a hamburger? I think we would be mad if we were to assert that the results of those examinations tell us about the relative capacities of Bloggs and Smith to ride an elephant.

If we want to know about cultural differences, we should look at artifacts made in the same medium, for the same function, by people of the same personality, but from *different* cultures, thus examining the effects of one variable at a time. Similarly if we want to know about functional differences (some might call them adaptive) we need similar materials, similar personalities, similar cultures - and the differences we get tell us something about function. A 1974 Australian metal car made by a machine is different from a 1974 Australian machine-made metal stove because one is a car, the other a stove. If three of the dimensions are controlled, the variation can be assigned to the fourth.

How can the dimension be controlled in archaeology? Culture could be controlled by the assumption that people living in one place at one time are of the same culture.

Medium can be at least partly controlled because the material of the artifact is known (or may be ascertained) if the artifact is extant, and analysis of its surface tells us a certain amount about how it was made.

Function can be partially controlled, at least sometimes, by direct assumption (food remains are the remains of food), sometimes by association and guesswork (a barbed hook often found with fish remains and never with remains far from any source of fish just might be a fish-hook).

Personality would be difficult to control, but may be treated as "noise" - assumed to cancel itself out - if the sample is large enough (Clegg, 1977, p. 60). This model, used as a set of assumptions rather than testable hypotheses permitted the exploration of various questions posed by prehistoric pictures. Two factors allowed for the (temporary) disposal of the dating problem. The first is Maynard's three-stage style system; if one studies pictures from one stage at a time, then time is at least better controlled than if the stages are mixed. The second is that many pictures show evidence of use on many different occasions, with quite a lot of re-drawing. This leads to the conclusion that they were in use for some length of time, rather than a single moment.

Fig. 25
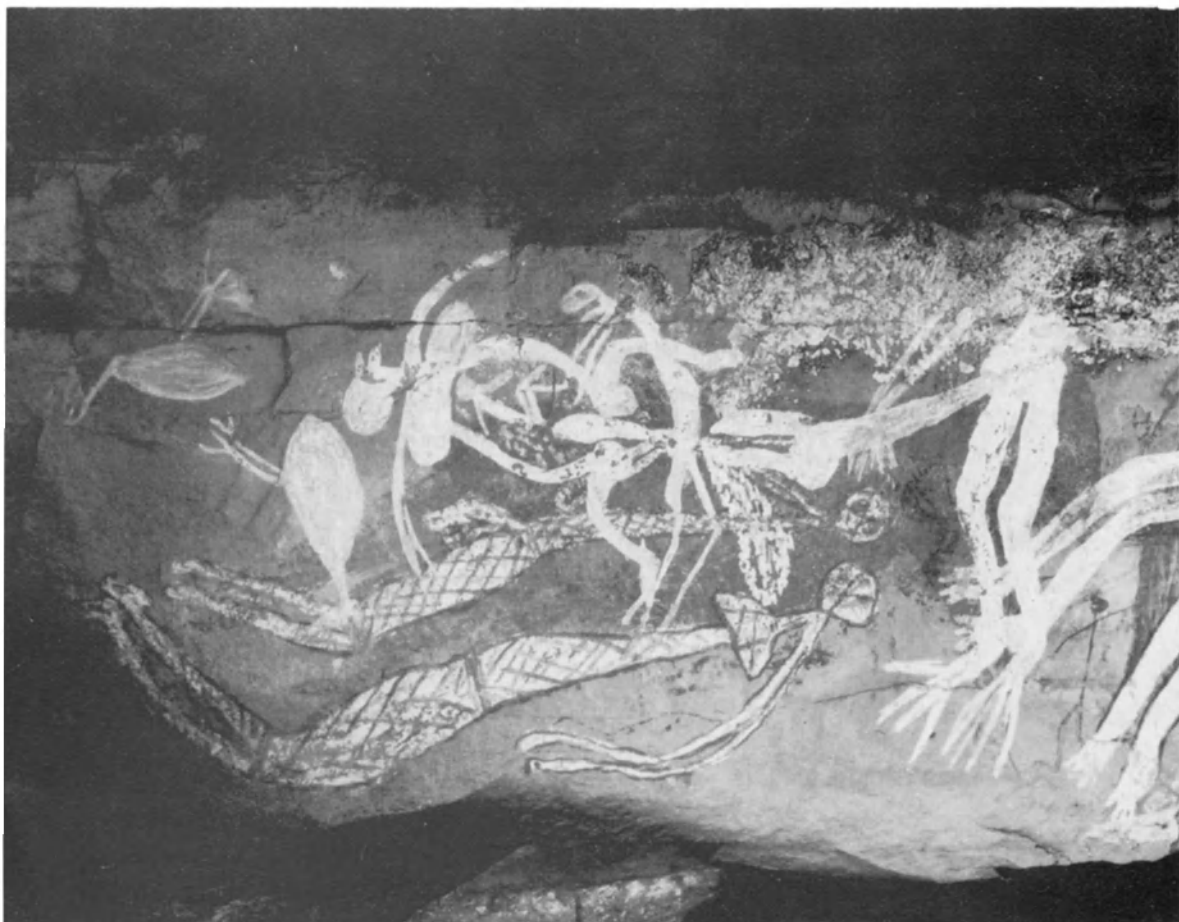*Complex figurative paintings from Arnhem Land.*

The assumption that the pictures were always at least as visible as they now are permits the recognition that the dating difficulty should not hold up work indefinitely, as answers and relevant questions may be obtained within the Maynard sequence.

Clarke's suggestion of using multi-variate seriation techniques allows for the use of tick-box analysis which clusters pictures, and motifs, as well as explaining the clusters by sorting the rows as well as the columns of the matrix (Clegg, 1978a, pp. 72-80; 1981, pp. 240-260).

The problems posed by the people-pictures are now soluble. The different-looking !people at one site are in fact pictures of different beings. Since they are at one site, the differences cannot be stylistic, if they are all drawn, rather than engraved, the differences are not due to differences in medium. When a multi-trait analysis was applied, it turned out that in the site Canoelands one, there were five different taxa of !people (Clegg 1978b; pp. 262-263). If figures were chosen from close proximity, of the same taxon but different media (drawings and engravings) it should prove possible to determine which attributes are the result of differences in Medium, as both culture and function (style and meaning-taxa) have been controlled.

The same model was applied to whole sites, as opposed to single figures within sites (Clegg, 1978a; 1978b, pp. 264-265; 1981, pp. 265-282). A group of sites close together in Cape York was compared with a group of sites near Sydney, some 1500 miles to the south. In this case it was assumed that the pictures must belong to different cultures, so that any resemblances must be due to similar functions and media. It turned out that there were sites in Cape York and Sydney which had similar function (though of course we don't know what they are), and that the group in both areas each contained several pictures of different functions. There is even a tantalizing glimpse of individual artistis: the great resemblance of two !man at *different* sites with different functions suggests that they were painted by the same artist (Clegg, 1978a, pp. 160).

The multi-variate taxonomy approach, using data controlled by the four-dimensional model, allowed several questions to be answered (Clegg, 1978a, examples 4,5,6,7,8,19; 1981, p. 260, examples 4,5,6,7,8,10) of which the most interesting was probably the attempt to diagnose the subject of a drawing by comparing prehistoric pictures with zoologists' drawings of animals they might represent (Clegg, 1978d). A drawing which had been thought to represent a Thylacine (a species which had been extinct in the area of the drawing for many millennia) turned out to resemble a domestic cat (it scored 13/17) more than a Thylacine, for which it scored 15/22 - a result significant at the 90 % level. Further ethnographic observation and experiment compared the compositional habits of non-human primates with those of human and non-human primates share certain rules of composition, including mark the centre, then the corners; avoid the edges. First marks tend to be larger than other marks. These discoveries made it possible to describe the pattern which should arise if pictures accumulated on a surface, while the artists paid no undue attention to those pictures already there, nor tried to make a whole composition for any other purpose (Clegg, 1978a,

Fig. 26
Complex figurative paintings from Arnhem Land.

pp. 133-146; 1981a, pp. 92-125; 1981b). The sites tested so far have a composition which is not the accumulation pattern, nor random, nor even.

There are other people who have been applying archaeological methods to the study of prehistoric rock art in Australia. Although there is, I understand, some very important work in press and in progress, it is Michael Morwood who has published the most important papers in the subject recently. Morwood undertook his doctoral research topic in central western Queensland. He studied 83 art sites and excavated four stratified sites as part of a multi-attribute approach to the prehistory of the region (Morwood, 1981). The carbon dates for excavated material extend well into the eleventh millennium B.P., and the stone artifact sequences confirm the general Australian pattern of a Core and Scraper industry followed by a Small Tool industry, which is superceded by a recent industry. In each excavation pigment fragments were found stratified in the lowest occupation layers. This could be taken as evidence that art was practised as long as the sites were occupied -

although of course pigment has uses other than the making of parietal pictures. Unfortunately there is no way of directly correlating the art on the shelter walls with the datable deposit. Maynard has not classified this particular set of pictures which are predominantly stencil art with linear designs, although it seems to me to fit snugly into the Simple Figurative styles.

Morwood (1980) published the results of his study of 16,347 design elements at 83 sites. He carried out a principal components analysis of the spatial distribution of fourteen colour categories and seven techniques categories. The results were compared with those obtained from superimposition analysis at one very large site, which provided 1180 instances of superimpositioning. Morwood used an assumptive model that contemporaneous art shoud tend to cluster both within and between sites (Morwood, 1980, p. 107). The principal components analysis showed that the colour and techniques do indeed cluster, and the suprimpostion analysis allowed the clusters to be ordered. There were two independent colour clusters: red, purple, orange, yellow, and brown as opposed to white and pink. There are two main technical clusters: stencil, paint, abrade, and imprint in one cluster, and pecked, pecked-and-abraded in the other. When technique and colour were together submitted to a principal components analysis, three discrete spatial groupings were obtained. When combined with the relative dating obtained from the superimposition analysis, a sequence involving two major chances is obtained. In order of appearance these are: 1) pecked and pecked-and-abraded; 2) stencilled, painted, abraded, drawn and imprinted; 3) the predominance of white (Morwood, 1980, pp. 102-107).

These interesting and productive techniques may well be applicable in other areas. The results are in no way conflicting with Maynard's overview, there is even a chance that the first period, with pecked-and-abraded and pecked techniques may relate to Maynard's Panaramitee style. This should be determinable when an analysis of motif-types is available.

The purpose of this paper is to demonstrate how fruitful the study of prehistoric rock art purely as archaeological data has become. The methods used are those familiar to prehistorians who normally restrict their interests to stone artifacts and other excavated material. If the prehistoric pictures are ignored, an opportunity to include "a comprehensive selection of types from most of the spheres of cultural activity" (Clarke, 1968, p. 231; 1978, p. 246) has been passed over, and another chance to understand prehistory missed.

Riassunto: In Australia si trovano molti milioni di figure preistoriche, realizzate sia con l'applicazione di materiale su una superficie (dipinti, grafici, disegni in rilievo o in silhouette), sia con l'asportazione di materiale da una superficie (incisioni, sculture). Gli studi iniziali di tali figure consistevano nel registrarne alcune e nel cercarne un'interpretazione da fonti documentarie o ancor viventi.

Nell'ultimo ventennio, ci si è accorti che un'informazione che proviene da una località a 2000 chilometri di distanza da un determinato sito non è sempre valida per questo, e che notizie raccolte non più di 200 anni fa non sono necessariamente corrette per un oggetto fabbricato addirittura 40.000 anni fa. Così, rispetto a queste figure preistoriche, si sono

sviluppate domande di carattere puramente archeologico e al tempo stesso metodi tecnici per rispondere ad esse. Si cerca perfino di fare a meno della parola "arte", che porta con se l'idea di cornici, di vetrine, di direttori di gallerie e di turisti.

Una sequenza semplificata di stili si è rilevata. Quello più antico è lo stile "Panaramitee": consiste in incisioni che sembrano tracce d'animali e cerchi; è diffuso nel centro del continente e pare assai omogeneo. Gli stili cosiddetti "Figurativi Semplici", in contrasto, sono variatissimi: si trovano per tutto l'arco che va dal 5.000 a.C. fino all'arrivo degli Europei due secoli fa. Il nome deriva dal fatto che in essi ricorrono figure che, pure somigliando a persone ed animali, sono realizzate in maniera semplice e statica. Gli stili detti "Figurativi Complessi" contengono figure ornate e dinamiche, e sono di epoca relativamente recente. Sono limitati al nord ed all'ovest del continente.

Si sono sviluppate tecniche per la classificazione e la tipologia di figure preistoriche per mezzo della "multivariant analysis". Mirando all'oggettività, sorge la necessità di trovare un modo di riferirsi alle figure senza implicazioni interpretative. Questa difficoltà si è superata introducendo il segno !, dove il punto esclamativo appare come prefisso a nomi come !donna, !canguro!, !banana, volendo dire che la parola così disegnata indica la forma apparente della figura senza connotazioni interpretative.

Ricerche su queste basi cominciano a portare frutto con la registrazione di variazioni di stile, piccole ma significative che si possono delineare (in un'area gli !animali hanno due !gambe, mentre in un'altra ne hanno quattro), sebbene si eviti di parlare di confini tribali o linguistici.

Il lavoro di correlare stili artistici ed altri reperti (scavati o da scavare) continua.

Résumé: En Australie il y a des millions de figures préhistoriques réalisés soit en ajoutant des matériaux à une surface (peinture, dessins, arrangements de pierres), soit en enlevant des matériaux à une surface (gravures, sculptures). Au début, ces "figures" étaient étudiés en enregistrant certains d'entre elles et en cherchant une interprétation à partir de documents ou d'informants. Au cours des dernières vingt ans il a été réalisé que des informations vieilles d'au maximum deux siècles n'étaient pas nécessairement adéquates pour des découvertes pouvant dater d'il y a 40.000 ans et que des informations existantes à des milliers de kilomètres pouvaient ne pas être directement applicables les unes aux autres. Des questions archéologiques doivent se poser devant des tableaux préhistoriques et des techniques archéologiques peuvent être utilisée pour y répondre.

Une série de styles très simplifiée et très ancien: le style "Panaramitee". Il consiste en gravures ressemblant à des empreintes d'animaux ou à des cercles; il est répandu au centre du continent et semble très homogène. Les styles "Figuratif Simple", par contre, sont très variés. Ils ont probablement jusqu'à 5.000 ans. Ils derivent leur nom de la frequence de dessins qui ressemblent à des êtres humains ou à des animaux mais qui sont simplement dessinés sans beaucoup de mouvement. Les styles "Figuratif Complexe" présentent des personnages et des animaux ornés, exécutant des mouvements. Ces styles sont relativement récents et ne se trouvent qu'au nord et à l'ouest du continent.

Des techniques ont été développées pour la classification et la typologie des tableaux préhistoriques pour analyser des multivariantes. Dans tout effort d'objectivité, on est confronté au problème de trouver un moyen de parler des tableaux sans implication d'interprétation. Cette difficulté a été surmontée par l'introduction d'une convention: lorsqu'un point d'exclamation est ajouté comme préfixe à des noms, par exemple !femme, !kangourou, !banane, cela indique que le nom se rapport à la forme du dessin, mais ne porte pas de connotation interprétative quelconque. Les travaux à partir de ces prémisses commencent à porter leurs fruits, sous la forme de petites différences stylistiques qui indiquent de clairs modèles (des !animaux dans une région ont deux !pattes; dans d'autres régions ils en ont quatre) et qui ont une importante signification préhistorique, bien que l'on évite de parler de frontières tribales ou linguistiques. L'entreprise de rattacher d'autres traces humaines (fouillables) à un certain style artistique avance à grands pas.

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