

THE ROCK PAINTINGS OF ARNHEM LAND, AUSTRALIA

Social, Ecological, and Material

Culture Change

in the Post-Glacial Period

Darrell Lewis

1988

DEDICATED

**TO THE THOUSANDS OF PEOPLE
WHO RECORDED THEIR VISION OF THE COSMOS
IN THE ROCK PAINTINGS OF ARNHEM LAND**

AND

TO THE MEMORY OF ERIC BRANDL

PREFACE

This study of Arnhem Land rock art was first published in 1988 by *British Archaeological Reports*. Before 1988 only two detailed models of style change in Arnhem Land rock art had been published – the first by Eric Brandl in 1973, and the second by George Chaloupka in 1984. Of the two, only Chaloupka put forward arguments for the age of the various styles and periods he identified. In my 1988 study, I assessed the methodologies these authors used to construct their style sequences. I determined that Brandl's method was the more reliable of the two. Building upon his work, I argued the case for a more detailed sequence of styles, and suggested a new way of dividing this sequence into periods. I also examined Chaloupka's dating arguments and found that most of them did not stand up to scrutiny. I then put forward alternative dating arguments.

While the main focus of my study was on the rock paintings of Arnhem Land, an important aspect concerned a comparison with the early rock art of the Kimberley. I drew attention to a series of remarkable similarities between the early art of Arnhem Land and that of the Kimberley, and argued that there was a temporal and cultural connection between them. I put forward hypotheses to account for this connection, and for the wide divergence between later phases of rock art in the two regions.

Since 1988 the number of scholars researching Arnhem Land or Kimberley rock art has greatly increased, but no one has yet challenged any major aspect of my work. Possibly the difficulty of accessing the original publication has contributed to this situation. Only about 500 copies of *The Rock Paintings of Arnhem Land* were printed, roughly half of which immediately went to libraries around the world to fill standing orders for all *BAR* volumes. Various Australian university and state libraries obtained a copy, and the remaining copies were soon sold out. There never was a second print run, and the only chance most researchers since 1988 have had to purchase a copy of *The Rock Paintings of Arnhem Land* has been on rare occasions when a second-hand copy has become available. This online edition, a free download available to anyone who might be interested, should rectify this situation.

A final note: in this online edition the pagination is different from the 1988 edition. I have also taken the opportunity to correct a number of errors in the text and to add another sub-heading, viz, 'Long-Necked Spearthrowers'. Otherwise, the monograph remains unchanged.

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INTRODUCTION

The great Arnhem Land plateau in the central-north of the Northern Territory of Australia is a sandstone massif of over 20,000 square kilometres (see maps 1 and 2). Under tumbled monoliths and outcrops, and along hundreds of kilometres of cliff-lines and gorges, thousands of rock shelters hold one of the greatest concentrations of rock paintings in the world (see Plates 1-10)¹. Human beings are known to have inhabited this region for at least 25,000 years, and it is likely that occupation is much older, perhaps as old as 40-50,000 years.

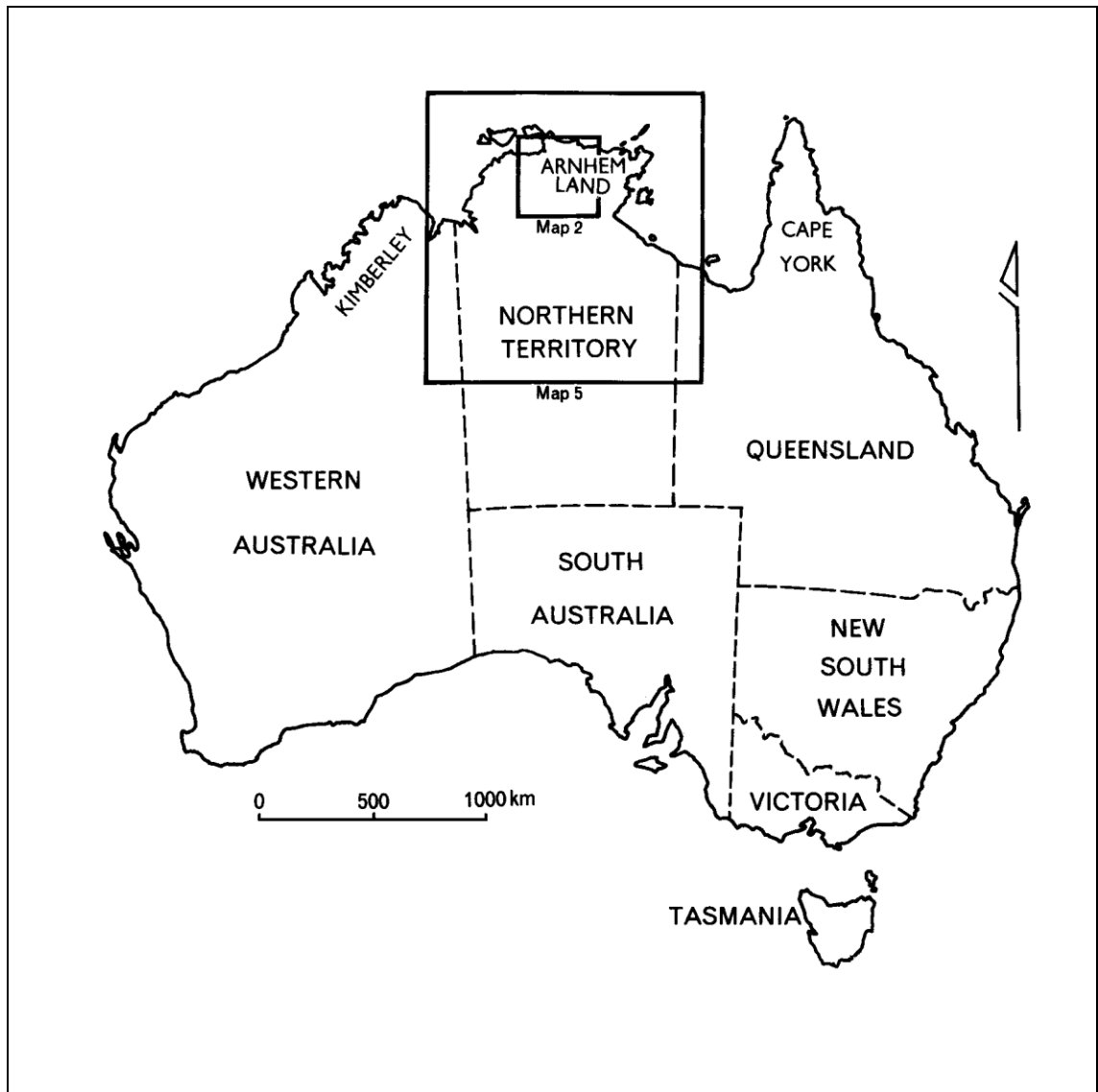
This study is divided into two parts. The first is concerned with ordering and analysing this rich and complex body of rock art. By examining the sequences of styles and the methodological bases of the two major studies to date, I have been able to establish an improved chronology. I have divided the chronology into periods defined by changes in material culture items depicted. The name of the most distinctive material culture item in each period has been applied to that period.

The second part is an analysis which links the art to archaeological and ecological evidence. In proposing dates for the art, I have developed an analysis which depends on theories of the interactions between social and ecological systems. Using the concept that style may be an expression of identity (Hodder 1978), I have linked changes in the art to known changes in the environmental history of the region and to hypothesised social adaptations.

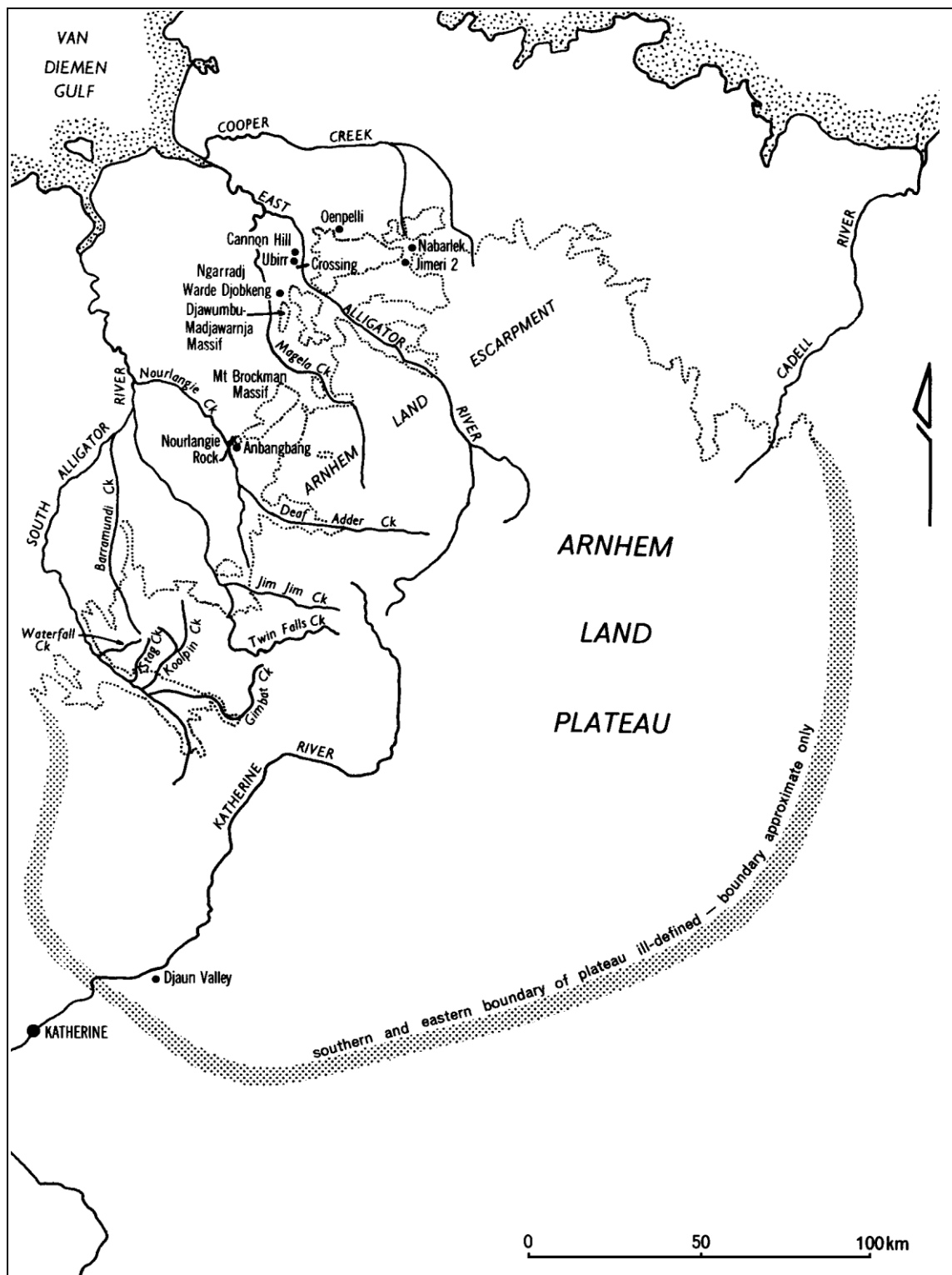
The research presented here is based on published sources as well as on field research carried out over the past 16 years. Most of my field research in Arnhem Land was freelance, but some assistance was provided by the Australian Institute of Aboriginal Studies and by the North Australian Research Unit in Darwin.

It is impossible to thank individually all the people who provided assistance during that time. My special thanks must go to the late Eric Brandl who first encouraged my interest in Arnhem Land art. Dehne McLaughlin dealt with the bureaucratic aspects, and provided transport and laughter, for the many field trips we shared. Professor John Mulvaney has a lot to answer for. Often against the greatest resistance on my part, he guided me through a B.A. honours in prehistory (A.N.U.) and through the writing of the thesis upon which this monograph is based. Dr Andree Rosenfeld was a lecturer, colleague and thesis supervisor, and provided valued advice and support.

For their useful comments, my thanks are also due to Dick Kimber, Luke Taylor, Deborah Rose, Ian Farrington and Robert Paton, all of whom read either my original B.A. thesis or drafts of this monograph. The Department of Prehistory and Anthropology, A.N.U. provided the materials and facilities for the photographic reproductions. My thanks to Warren Hudson for the time and expertise he put into the photographic work, and to Val Lyons for the maps.



Map 1. Modern continent of Australia with inset areas for Maps 2 and 5.



Map 2. The Arnhem Land plateau with placenames mentioned in this study.

PART 1

CHRONOLOGY AND MATERIAL CULTURE

1 ESTABLISHING A CHRONOLOGY

1:1 Mountford's Research

Mountford (1956) carried out the first scholarly study of Arnhem Land rock art. He found that in the view of Arnhem Land Aborigines, the rock paintings could be placed in one or the other of two categories, depending on their perceived origin. Broadly speaking, Aborigines recognise polychrome designs as the creation of contemporary or recent human beings, and monochrome red designs as created by Mimi spirits. From the Aboriginal viewpoint, the term 'Mimi' is neither implicitly nor explicitly a 'period' or a 'style'. Rather, it is a statement concerning the ontology of rock paintings (Brandl 1973:1, 165, 167).

Mountford observed that where the two types were superimposed, those attributed to contemporary humans were consistently painted on top of those attributed to the Mimi spirits. He adopted the Aboriginal name 'Mimi' for the earlier paintings and because there did not appear to be a specific Aboriginal term for recent art, he adopted the European name 'X-ray art' for the most distinctive of these paintings. In various accounts of Arnhem Land rock art since Mountford's time the term 'Mimi' has been used to describe both a period and a style. Likewise, the term 'X-ray' has been used as a general label for paintings in which internal features are indicated, and for other recent paintings that do not have such features. For the purposes of this paper I will continue to use the term 'X-ray art' as a general term for 'recent' Arnhem Land rock art.

1:2 Brandl's Methodology and Chronology

Brandl (1973, 1977) conducted the first major rock art research in west Arnhem Land after Mountford's pioneering work of 1948 (Mountford 1956). Faced with the bewildering complexity of the region's rock art, Brandl (1977:226) concluded that the method generally used to establish a chronology of styles — that of determining the sequence of overlays through visual assessment — would be of limited use. In favourable circumstances, for example, where X-ray style motifs painted in coarse-grained pigments clearly and consistently overlie 'Mimi' figures executed in fine-grained ochres, he found the method to be of value (1973:169, 171-73; see Plates 40, 45). However, Brandl identified several major problems in the use of overlays to determine the sequence of the greater proportion of Arnhem Land paintings — those in various shades of red.

First, according to Brandl (*ibid*: 172), it is not enough to have only one or several examples of an apparently clear overlay. To achieve significant results, numerous examples of one style superimposed by a different style or styles should be located in a restricted area. While such conditions exist in a few locations, Brandl noted that in general, superimpositioning of red ochre art is uncommon (*ibid*: 167). Where figures do overlie others, the styles involved are usually the same or temporally closely related (*ibid*: 172).

Second, in the rarer instances where numerous paintings in different styles are found superimposed, Brandl states that 'The painted wall is then a maze of red lines so that it is practically impossible to say anything definite about the sequence of the designs' (ibid: 174; see Plate 30 for an example of relatively clear overlays of red ochre art).

Third, even in the occasional instance of an apparently clear overlay, 'this indicates little more than the temporal division between them' (ibid: 172, see also 1977: 234). The time difference could be anything from minutes to millennia.

The difficulty and lack of reliability in determining the sequence of overlays may be better understood if the various factors that can contribute to the preservation of red ochre paintings are considered. The lasting quality of a painting depends upon a complex interplay of factors involving the chemical and physical properties of both the pigment used and the parent rock, the climatic regime when the painting was executed and the degree of protection from damage caused by the weather, water runoff, plants and animals, and so forth (Rosenfeld 1985: 10, 14, 46-49). Given these factors, it may be that a painting in a pigment that penetrates deeply into the rock matrix or forms strong chemical bonds with it may eventually appear fresher than a later painting that does not share these qualities to the same degree. Variations in the chemical composition of the rock matrix may also lead to differential preservation of parts of a single painting. Many west Arnhem Land paintings are well preserved in one section and faint or invisible in another (see Plates 24, 28).

An additional twist to this situation highlights the problem of assessing the sequence of superimposed red ochre art. At the Australian Institute of Aboriginal Studies Biennial Conference in 1974, Brandl described several examples of superimposed line drawings in which the overlapping lines had an apparent sequence in one place that was reversed where the lines of the two paintings crossed in another place. An example of this type is shown in Plate 24.

My own observations confirm Brandl's analysis. Once red ochre paintings have bonded to the rock matrix and have been subjected to long periods of weathering, colour changes caused by chemical reactions, and other influences, determining the sequence of overlays through visual means becomes difficult and unreliable (see Brandl 1973: 171-2; Rosenfeld 1985: 13, 48-49; Crawford 1977: 361). Presumptions of clarity must be treated with caution.

Within the body of red ochre (Mimi) paintings, Brandl noticed that some styles of human figures were depicted with hand thrown spears while others were shown with spearthrowers. Because spearthrowers are still in use in the ethnographic present, Brandl made the reasonable assumption that figures with spearthrowers post-date the figures with hand thrown spears. This difference in material culture formed the basis of his 'early' Mimi/'late' Mimi division. Brandl's next step was to analyse the 'artistic conventions' of the styles within his 'early' Mimi, 'late' Mimi, and X-ray art periods. In his words:

the baseline of the scheme is the symbolistic representation. Symbolistic representation, in this context, refers to the particular convention of 'perspective' in single figures as well as in the composition of scenes ... Its manifestation changes in successive order ... so that one can therefore speak of periods or stages which, however, do not constitute an overall development from crude forms to more accomplished ones (1973: 172) ... The adjective 'symbolistic' is an embracing term, denoting the common conceptual base of Arnhem Land paintings on which the various changes are manifested in temporal sequence (1973: 177).

The logic behind Brandl's scheme is that Aboriginal artists created their art within the constraints of particular artistic conventions (ibid: 166). But within the conventions of any particular time, there was room for experiment or individualistic approaches, so that innovations and, eventually, major changes were possible (eg Figure 61; Brandl 1973: 19-21, figures 25-30).

As secondary backup to this scheme, Brandl used other evidence such as technical features of painting, mineral coatings restricted to particular styles (1973: 177), the presence of the extinct thylacine in some styles and dingos in others (ibid: 172) and, in a few instances, subjective assessment of the sequence of superimposed styles (ibid: 174). The net result of this method was that he was able to define a number of generalised trends in the art and thereby to place styles and individual figures in a chronological sequence.

Brandl is usually credited with dividing Mimi art into an early and a late period, and with defining four types of X-ray art (Chaloupka 1984: 12-13; Welch 1982: IV-V). While this is correct, the full extent of Brandl's chronology does not seem to have been generally recognised. In part, this is understandable because Brandl did not provide a hierarchical table outlining his chronology. To clarify Brandl's contribution, his full chronology is presented in Table 1.

In establishing any rock art sequence Brandl warned against simplistic notions of straight line evolutionary models (1973: 177; 1977: 233-234). He further suggested that:

One could expect that [because earlier paintings are preserved on the rocks] a formerly widespread style would recur, more or less frequently, in a later period: a particular style need not die out completely when a new manner of painting captures the imagination of the artists (1973: 167).

According to Brandl, this is the case with the four constructed types of X-ray art that he described (ibid: 167-69) and probably applies to phases 1 and 2 of his 'late' Mimi art (ibid: 174).

1:3 Brandl's Nomenclature

Following Mountford (1956), Brandl (1973) continued to use the term 'Mimi' to encompass the whole range of pre-X-ray art. In reference to Deaf Adder Creek Mimi art, he adopted the prefixes 'early' and 'late', and 'phase 1', 'phase 2', to differentiate his divisions and subdivisions, respectively. In reference to X-ray art, Brandl (ibid: 168-69, 177) defined four 'constructed types' that, he said, 'do not represent a chronological or evolutionary sequence although progressive development from simpler to more elaborate forms does occur.' He named these 'incipient' (type 0), 'simple' (type I), 'standard' (type II), and 'complex' (type III).

Because of his limited sample of Cadell River paintings, and the generally poor state of their preservation, Brandl was able to outline only a generalised chronology of style changes which broadly correspond to the Deaf Adder Creek sequence (1973: 183). He named these, phases 1 to 6. Brandl (ibid: 177) also offered tentative descriptions of a pre-'early' Mimi style and a post X-ray style but did not apply names to them.

Brandl's terms are descriptive either of relative sequence or of stylistic attributes. None bear any formal relationship to archaeological and environmental chronologies as they are now known and his terms are therefore of little use to non-rock art specialists. However, overall his work is of great significance as it marks the first formal attempt to classify and order the wealth of rock art in the Arnhem Land plateau. Brandl was also the first to include both thematic and compositional criteria in his definition of styles. Many of the distinctions he made have held true with more recent discoveries and analyses.

Style	Generalised Description
Tentative pre-'Early' Mimi	<p>a) Weathered, crudely painted silhouettes and outlines that may be dotted, barred, or striped. No X-ray features. Humans, often of monstrous form, usually single figures, but some groups. Various animals including snakes. Dark brown to yellow-red, probably red originally (1973: 177).</p> <p>b) Possibly another style — small red silhouette human figures in composed scenes (ibid: 83, figure 176; 202, documentation for figure 176).</p>
'Early' Mimi	Well-drawn red ochre line drawings of human figures in action, often in composed scenes, usually wearing large headdress, carrying boomerangs and hand thrown spears. Surface details emphasised, no X-ray features. Animals include snakes, birds and mammals, including thylacines (ibid: 172-76).
Mytho-totemic	Probably overlapping 'early'/'late' Mimi division. Well drawn red ochre figures, including the yam/Rainbow snake/flying fox complex, humans with animal features and vice versa. Animal-headed Rainbow snake continues through all subsequent periods (ibid: 172-74, 179-82).
'Late' Mimi (phase 1).	Start of transitional phase between Mimi and X-ray. Monochrome red silhouettes, humans less often in scenes, less action expressed, less concern with surface details. Spearthrower common, boomerangs rare. Lightning beings first appear. Animals still include thylacine (ibid: 174-76).
'Late' Mimi / Incipient (phase 2). / X-ray.	Unpainted space appears in body, 'joint' marks indicated. Human figures usually isolated, static pose, no headdress. Boomerang and thylacine gone, dingo appears — implications for dating (ibid: 176-78).
X-ray art	<p>Incipient Development of X-ray concept through time, but early forms co-existed with later forms. Increasing concern with interior details. Human figures static, often isolated or else in groups, not in composed scenes. Namorodo Spirits appear, Lightning beings more common. Contact subjects appear in later forms. Styles contemporary with X-ray art mentioned but not described (ibid: 167-69).</p> <p>Simple</p> <p>Standard</p> <p>Complex</p>
Post-X-ray.	A recent development contemporary with 'standard' and 'complex' X-ray art. Usually white silhouettes, often crudely painted, some with incipient or simple X-ray features (ibid: 166, 177, 184).

Table 1. Brandl's chronology. Compiled from *Australian Aboriginal Paintings in Western and Central Arnhem Land*. (1973).

1:4 Chaloupka's Methodology and Chronology

Subsequent to Brandl's Published research, Chaloupka (1977, 1980, 1983 and 1984) developed an alternative chronology. He acknowledged only a simplified version of Brandl's chronology ('early' Mimi, 'late' Mimi, and four types of X-ray art), the sequence of which he apparently accepted as accurate (1984: 12-13). He then went on to include, without acknowledgment, a number of other styles which had already been identified by Brandl, and, by using the methodology that Brandl had earlier rejected, added them to Brandl's simplified chronology. Finally, Chaloupka divided his chronology into four periods. In his most recent comprehensive account of his methodology, Chaloupka (1984: 54) states that his chronology:

was achieved by first identifying the individual styles and establishing the order in which they were superimposed. This was followed by an analysis of their subject matter, which revealed the presence of certain subjects in one or more styles and their absence in others. By correlating these factors with the known environmental changes, and their consequences, and also with the archaeological and historical evidence, the rock art styles were divided into four main periods: the Pre-Estuarine, Estuarine, Freshwater and Contact.

Chaloupka identified six styles in the pre-estuarine period and three others which occur throughout the estuarine, freshwater and contact periods. He mentioned several other types of paintings that fall within the estuarine, freshwater, or contact periods, but does not deal with them in detail. He argued that his chronology spans a time period of at least 18,000 years (1984: 17) and, in his chronological table, suggested that some motifs may be up to 35,000 years old (ibid: 16).

Chaloupka's stated methodology in his 1984 monograph appears to be somewhat different from that which he described in a previous publication (1983: 5-6). There, Chaloupka stated that he placed the styles in chronological order *after* he had analysed the contents of each stylistic unit he had recognised. Whichever sequence of steps Chaloupka actually used, the baseline of his scheme is the visual assessment of the superimpositional sequence of different styles.

Once so assessed, Chaloupka placed each style in consecutive order — that is, in a straight line evolutionary model. However, as Brandl (1977: 233-34) had previously pointed out, there is no reason to believe that only one style of art is produced at any given time. Indeed, Chaloupka has found his 'post-dynamic figures', his 'simple figures with boomerangs' and his 'yam figures' superimposed on the earlier 'dynamic figures' style but not on each other in the order he places them (1984: 13). In a later chapter of this paper I will present evidence which suggests that these three styles may well be contemporaneous.

Years B.P.	Phase	Style	Major or Identifying Subject
35,000		Object imprints,	Hand and grass prints, thrown objects, Palorchestes
20,000	Naturalistic	Large naturalistic animals and humans	Zaglossus, Tachyglossus, thylacine, macropods, rock python, freshwater crocodile.
	Dynamic Figures		Human beings, animal-headed beings and other anthropomorphs, macropods Tachyglossus, rock python, stencils: hand of three middle finger convention, boomerangs, clubs, spears.
	Stylisation	Post Dynamic Figures	Mainly human beings, some macropods,
	Schematisation	Simple figures, with boomerangs	Mainly human beings, some using fighting pick.
	Naturalistic	Yam figures symbolism	Anthropomorphised yam, phytomorphised animals: flying fox, birds, short-necked turtle, Rainbow Snake, abstract symbol of segmented circle.
9,000 7,000	Intellectual realism	X-ray descriptive	Barramundi, mullet, estuarine catfish, saltwater crocodile, Lighting Man, stone headed spear
1,000	X-ray decorative		Magpie geese, didgeridu,
150			Macassan praus, buffaloes, European boats, horses, guns, sorcery paintings
	Casual paintings		

Table 2. Chronology after Chaloupka (1984: 16).

1:5 Chaloupka's Nomenclature

Compared with Brandl, Chaloupka (1984) engages in a markedly different approach both to classifying and ordering the rock art, and to naming different styles and periods. First, he queries the term 'Mimi' as a description of pre-X-ray art, and points out that paintings depicting Mimi spirits occur in X-ray style, both as rock paintings and on currently produced bark paintings (Chaloupka 1977: 245). As a result of this, he believes that confusion may arise between paintings of

Mimi spirits on the one hand, and paintings **by** Mimi spirits on the other. Chaloupka also argues that as the term 'Mimi' includes a great variety of styles, the name should be discarded and each recognised style be assigned its own label.

These arguments have some merit. I believe that the point concerning the diversity of styles within the Mimi art complex is valid. On the other hand, the difference between paintings **of** Mimi spirits, and paintings **by** them, is sufficiently clear that any reasonably informed person should not be confused. Considering that the term 'Mimi' is already established in the literature, and reflects the Aboriginal understanding of the rock art, I suggest that rather than discarding the term completely, it should be retained as a general term to encompass the 'era' of pre-polychrome art, rather than to refer to a particular style.

The criteria Chaloupka uses to name styles are quite varied, relating, as the case may be, either to subject matter (eg 'yam figures'), to form (eg 'dynamic figures'), to age relative to other styles in the sequence ('post-dynamic figures'), or to a combination of some of these ('simple figures with boomerangs'). The inconsistent nature of the criteria yields an equally inconsistent nomenclature.

In addition, some of the terms Chaloupka has devised are confusing or misleading. For instance, he uses the term 'dynamic figures' to describe Brandl's 'early' Mimi figures, but styles of 'dynamic' human figures occur in other periods of rock art (e.g. the figures from the Oenpelli district, described in 3:5 below). Similarly, he uses the term 'decorative X-ray' to describe a variant of X-ray painting that Brandl had previously labelled 'complex X-ray art' (1973: 168). The basis of Chaloupka's term lies in his assumption that Aboriginal artists 'lost interest' in the internal organs and filled the body of the subject with patterns that were 'purely decorative' (1984: 46). However, Brandl's informants stated quite the contrary (1973: 168) and Taylor's (1987a) work confirms that Aborigines consistently interpret these patterns as internal anatomical features.

Finally, there are serious problems with the periods Chaloupka identifies in his chronology and hence with the names he has applied to them. These problems are discussed in detail in chapter 6.

1:6 Chronologies: Brandl and Chaloupka Compared

The methodologies Brandl and Chaloupka used to establish their relative chronologies of Arnhem Land art styles vary significantly. Brandl warned of the problems of using superimpositioning as a primary means to determine a sequence of styles and used instead the identification of changes in 'symbolistic representation' as his primary research method. In spite of Brandl's warning, Chaloupka has relied primarily on the visual assessment of superimpositioning to establish his chronology. The unreliability of this method may be the reason for some of the unexplained changes Chaloupka has made in the ordering of his various styles (see 2:2).

In spite of their different approaches, the styles that both researchers recognise in common seem to occur in the same order in their chronologies, with the exception of the yam/Rainbow snake/flying fox complex.

From Table 3 it can be seen that there are several areas of difference. First, Chaloupka has identified three styles not described by Brandl. One of these, the 'grass prints, hand prints and thrown objects style', definitely has no counterpart in Brandl's scheme. However, it seems probable that the two other styles, Chaloupka's 'post-dynamic figures' and 'simple figures with boomerangs', were subsumed by Brandl in the earliest stage of his 'late' Mimi period. My reason for believing this to be the case is as follows.

The human figures in both of these styles carry boomerangs and a 'hooked stick' which Chaloupka interprets as a fighting pick. Although Brandl saw the disappearance of the boomerang and appearance of the spearthrower as marking the change from 'early' Mimi art to 'late' Mimi art, he nevertheless classified some figures that possess the boomerang as 'late' Mimi art (1973: 175). Brandl does not illustrate or otherwise differentiate these figures, but from my own observations in the field it is a virtual certainty that the figures in question also possessed a 'hooked stick' that Brandl interpreted as a spearthrower, thus leading him to classify them as 'late' Mimi (phase 1). In other words, Brandl's 'late' Mimi figures with boomerangs and Chaloupka's 'post-dynamic' and 'simple figures with boomerangs', are the same or closely related types. In this context, Brandl's 'spearthrower' and Chaloupka's 'fighting pick' are almost certainly different interpretations of the same artefact represented in the art.

Second, Chaloupka does not appear to recognise any equivalent to the bulk of figures that constitute phase 1 of Brandl's 'late' Mimi art. That is, Chaloupka does not recognise figures associated with spearthrowers but not associated with X-ray features of any kind. Chaloupka appears to have subsumed such figures in his 'early X-ray convention'.

Third, there is a major difference concerning the relative position of the Rainbow snake/yam/flying fox complex. Brandl suggests that it is, in part, contemporary with his 'early' Mimi figures (ie Chaloupka's 'dynamic figures') and that it continues into his 'late' Mimi period (1973: 173-4). Chaloupka states that the complex appears after his 'simple figures with boomerangs' and before the appearance of X-ray art (1984: 34). That is, Chaloupka has the complex first appearing towards the end of what Brandl terms 'late' Mimi art.

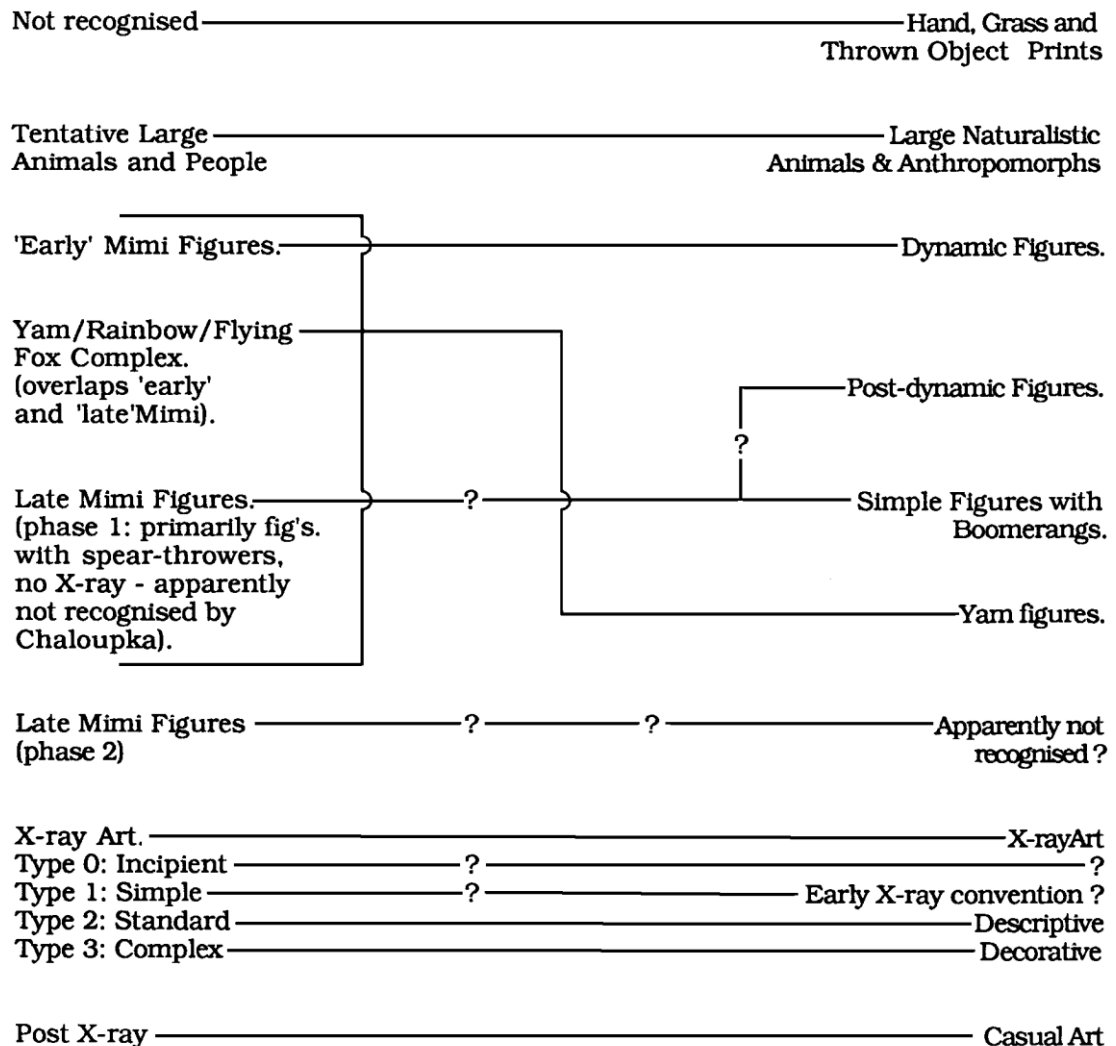
Brandl (1973)**Chaloupka (1984)**

Table 3. Brandl's and Chaloupka's chronologies correlated.

1:7 Methodology Used in this Analysis

In reference to the use of superimpositioning, my own experience of Arnhem Land rock art strongly supports the value of Brandl's method. For this reason, I regard Brandl's chronology as the more reliable scheme and use it as the basis for several sections of this paper. I also follow Brandl (1973: 72) in how I define 'style':

'style' is used here in its most general sense. It simply denotes a distinct manner of painting or, in other words, a particular group of paintings with common characteristics that distinguish it from other such groups of

paintings. 'Stylised' means that these common characteristics or traits are emphasised.

My own methodology is based on human figures and their associated material culture items. My focus on material culture items, particularly on hunting and fighting weapons, is based on the assumption that different artefact assemblages can be temporally ordered. There can be no doubt that some material culture items appear while others disappear from the art. For example, boomerangs are present in early styles while spearthrowers appear in later styles. In a few instances artefacts have a limited appearance in the art. My approach is to identify artefacts that have at least one temporal boundary and then to identify the stylistic features of the human figures, spirit figures, animals and other motifs depicted with that item. Once such stylistic features have been identified, it is then possible to classify many depictions that are not shown with the specific material culture item. This approach also allows paintings that are associated with material culture items but which are stylistically ambiguous or unique (eg Figures 66, 205), to be placed in a relative chronology of **periods**.

Jones (1985: 218) posed the hypothetical argument that in Arnhem Land, ground-edge axes were invented, abandoned, and reinvented. He evaluated and rejected such a possibility as 'unlikely' and described the argument as 'cumbersome'. In contrast, Chaloupka (1984) argues that some artefacts appear, disappear, and reappear through time (see 2: 2). I hold the same view as Jones. Some items do have a first and a last appearance in the art (see below), but it is most unlikely that any appear, disappear, and then reappear again.

The overall trends in the art that Brandl (1973) defined may be divided into periods based on major changes in the material culture inventories depicted. In defining periods it is not necessary to attempt to order every recognised style that may fall within any given period. This latter task will require a great deal more study before being satisfactorily concluded.

In chapters 2 and 3, I will attempt to resolve the differences between Brandl's and Chaloupka's chronologies. In the first of these chapters my concern is the identification of the 'hooked' artefact. In chapter 3, my concern is to place the figures associated with 'hooked sticks' more precisely within Brandl's chronology, and to reassess the chronological position of the Yam/Rainbow snake/flying fox complex.

2 IDENTIFYING 'HOOKED STICKS'

Human figures that wield 'hooked sticks' are common in Arnhem Land rock art and are of widespread distribution. Some of the 'hooked sticks' can be identified as spearthrowers because the 'hooked stick' and a spear are held together with the butt of the spear articulated with the hook (eg Figures 178 and 179).²

Figures depicted carrying both boomerang and 'hooked stick' are never shown with a spear set for launching in this manner, nor are they ever directly associated with any type of unambiguous spearthrower. When a 'hooked stick' is not depicted with a spear set for launching, it could represent a spearthrower, a fighting pick, or perhaps some other artefact. In such instances, precise identification of the 'hooked stick' must depend on other contextual information.

'Hooked stick'/boomerang figures are described in some detail below. Briefly, they are consistently small, rarely more than 70 cm tall, and are often very carefully painted; minor details may be clearly indicated. The inclusion of minor details sometimes extends to the associated weaponry and may provide contextual information for identification of the 'hooked stick'.

2:1 'Hooked Sticks' with Boomerangs

The 'hooked sticks' associated with boomerangs exhibit common characteristics. Almost all have a reasonably straight shaft of uniform width, indicated by a single stroke of paint. Many have a knob depicted at the base of the handle (eg Figures 69, 77 and 78). The angle between the shaft and the 'hook' is consistently acute, usually in the order of 35 to 50 degrees, and there is rarely a feature that could be interpreted as hafting material between the shaft and the 'hook'. Many examples are very carefully executed but in none is the 'hook' clearly indicated as a sharp point. Such fine detail may well be impracticable given the relatively small size of most depictions of 'hooked sticks' but there is one very large and carefully painted figure (unique in size and in style), that carries a 'hooked stick' large enough for the precise shape of the blade to be indicated (Figure 66). In this instance the 'hook' is blunt.

The length of the 'hooked sticks' relative to the boomerangs directly associated with them is varied. Some 'hooked sticks' are shorter than the boomerangs while others are much longer (cf Figures 77 and 84 with Figures 69 and 83). In some examples the 'hook' extends from the handle a short distance from the distal end (eg Figures 75, 85, 87).

In their formal characteristics as represented in the art, the 'hooked sticks' associated with boomerangs are often indistinguishable from 'hooked sticks' that have the butt of a horizontal spear articulating with the hook. Such differences as do occur between the two classes are not mutually exclusive. For example, in each instance a knob may be indicated at the base of the handle, but on the 'hooked

sticks' with boomerangs this feature is depicted more frequently. Likewise, the draughtsmanship involved in the production of the 'hooked sticks' with boomerangs is generally, but not always, finer than on the unequivocal stick-like spearthrowers. Alone, these differences do not enable one class of 'hooked sticks' to be differentiated from another.

The differences noted above have not been taken into account by other researchers. While none dispute that a 'hooked stick' with a spear poised for launching is a spearthrower, in other contexts 'hooked sticks' have been interpreted differently by different researchers and assigned to different positions in chronologies of art styles. The various accounts of 'hooked sticks' in the rock art are summarised below.

2:2 Previous Interpretations

In 1956 Mountford published line drawings of several hundred paintings from the Oenpelli district. Among the many material culture items depicted are two 'hooked sticks' that he identified as spearthrowers (1956: 119 figure 18e; 124 figure 21j). However, neither implement is associated with a spear so Mountford's interpretations may not be correct.

Brandl (1973: 175) states that the beginning of 'late' Mimi art is marked by the appearance of the spearthrower. He further states that, 'The new implement displaces, as it were, an old one: **no post-LM1** ['late' Mimi 1] rock paintings have been found that clearly depict the boomerang' (my emphasis). In other words, in phase 1 of Brandl's 'Late' Mimi art, some figures possess both the boomerang and the spearthrower while in phase 2, only the spearthrower is present.

Some of the human figures in Brandl's 'late' Mimi art carry 'hooked sticks' that are clearly identifiable as spearthrowers (eg 1973: figures 92, 93, and 104) but the only illustration he provides where both the boomerang and a 'hooked stick' occur together is from a composition in his 'early' Mimi style (ibid: figures 40, 74). In this context the 'hooked sticks' captured his attention because they were otherwise unknown in the usual weapon assemblage of that style and because they were painted with a cruder technique and in a darker, more intense shade of red than the rest of the 'scene' (ibid: 195, documentation for figure 75). Neither Brandl nor his Aboriginal informants were able to identify these artefacts with certainty. With some qualifications, Brandl suggested both the spearthrower and the hooked boomerang as possible identifications, but because of the difference in colour and painting technique, he suggested that the implements might 'have been added at a later date.' This last point is undoubtedly correct.

Although Brandl does not describe or illustrate any figures which have a 'hooked stick' and a boomerang as part of the original composition, such figures have a widespread distribution and are relatively common. It therefore seems highly likely that he knew of their existence. The figures with boomerangs that he

relegates to 'late' Mimi art phase 1 are almost certain to be examples of such figures, in which case he interpreted the 'hooked stick' as a spearthrower.

In 1977 Chaloupka identified as a probable spearthrower a 'hooked stick' associated with a 'large naturalistic animals and anthropomorphs' style (1977: 249) and a subsequent 'dynamic figures' style (ibid: 255). In later papers, Chaloupka extended and rearranged his chronology, reinterpreted the 'hooked stick' as a fighting pick, and relocated the initial appearance of this artefact several times (cf 1977, 1980 and 1983). In his latest scheme (1984) he has it probably first appearing 15,000 or 20,000 years ago during his 'large naturalistic animals and humans' style, disappearing for several thousand years during the subsequent 'dynamic figures' style, probably reappearing during his 'post-dynamic figures' style and definitely in use during his 'simple figures with boomerangs' style.

In this latest scheme Chaloupka specifically mentions only the disappearance of the boomerang from the art (1984: 42). The implication is that after its probable reappearance in the 'post-dynamic figures' style, the 'fighting pick' continued in use through all subsequent styles. Although Chaloupka first identified the 'hooked stick' as a spearthrower and later as a fighting pick, nowhere does he offer evidence for either identification.

The problem is clear. Some 'hooked sticks' are indisputable spearthrowers; others, more or less identical in form but without a spear set for launching, have been identified, variously, as a fighting pick, a spearthrower, and possibly a hooked boomerang. In the following section an attempt is made to clarify this problem. My methodology is to establish the range of possible 'hooked stick' artefacts in the ethnographic record, and to examine 'hooked sticks' in the context of their relationship to various styles of figures and associated material culture items.

2:3 Hooked Artefacts in the Ethnographic Record

At least three and possibly four categories of hooked artefact have been recorded in Arnhem Land or in neighbouring regions. These are hooked boomerangs, bird-headed clubs, fighting picks, and spearthrowers. In the following section their formal characteristics are described and the possibility that they might be depicted in the art as a 'hooked stick' is assessed.

2:4 Hooked Boomerangs

Hooked boomerangs resemble conventional boomerangs with the addition of a hook or beak that extends at about ninety degrees from the convex side of one end (see Figure 95-e). According to Davidson (1936a: 94-95), at European contact hooked boomerangs were made in northern Central Australia and were traded as far as the Katherine River, the Kimberleys, and into South Australia (see maps 1 and 4). Hooked boomerangs were also made on Mornington Island (Memmott 1979: 134). The one published example of a Mornington Island hooked boomerang

I have seen (Carrick nd., 23, figure 132) differs from the central Australian examples in several respects, most notably in that the hook is somewhat longer, and broader across the base.

In the ethnographic present small numbers of conventional boomerangs are being traded into eastern Arnhem Land where they are used solely as clap sticks (Warner 1958: 490; Thomson 1949: 64) but no record exists of a hooked boomerang in the Arnhem Land area. Boomerangs or boomerang-like objects are almost totally absent from what can be reliably regarded as 'recent' Arnhem Land rock art (see Figure 262 and Plate 35 for possible examples). They certainly do not form part of the usual weapon complement of recent styles of human figures and the few possibly recent boomerangs are not shown in use as weapons.

In certain early styles conventional angled and curved boomerangs are commonly depicted being carried by human figures. In contrast, comparatively few paintings have been found where a non-conventional type of boomerang or boomerang-like artefact is depicted (Figures 11-19). Stencils of conventional boomerangs are commonly found in the same shelters as these early styles of painted figures (see Figure 43). Non-conventional boomerangs or boomerang-like artefacts are also seen among the stencils; they are uncommon but widespread (Figures 44-49). A few of these resemble hooked boomerangs but none have the hook extending from the wing of the boomerang at anything less than ninety degrees (see Plate 16 and Figures 48, 49).

On several grounds, the unidentified 'hooked sticks' in the art are unlikely to be representations of hooked boomerangs. First, they are consistently shown with a straight, narrow shaft and with their hook set at an acute angle to the shaft; hooked boomerangs have a curved 'shaft' and the hook is never set at less than about ninety degrees. Second, the depictions of conventional boomerangs associated with 'hooked sticks' usually have their shape accurately rendered (eg see Figures 78, 88, 98). If the 'hooked sticks' were meant to represent hooked boomerangs, one would expect them to be depicted as accurately as the conventional boomerangs. Third, many of the 'hooked sticks' have a knob at or close to the butt and such a feature is never found on a hooked boomerang. Thus, it seems certain that the 'hooked sticks' in the rock paintings represent an artefact other than a hooked boomerang.

2:5 Clubs

Warner (1958: 489-90) described a 'bird-headed' or 'jabiru-headed' club used in east Arnhem Land as follows:

The jabiru form has been given this name because it both looks like and is painted to represent a jabiru's head. Its shaft, a cylinder two inches in diameter, is about four and one-half feet long ... The head of the club is about one inch long and joins the shaft at almost right angles ... The "beak" of the bird club head is sharpened and used as a hook or pick.

Warner does not illustrate this weapon and, as far as I am aware, his is the only account of it in the literature. It is difficult to believe that a one inch (2.5 cm.) projection would serve to represent a jabiru's beak (in the order of 20-25 cm.) and it is possible that the description he provides is inaccurate. I suspect that Warner's 'club' is in fact identical with the weapon collected in east Arnhem Land by Thomson and described by him as a fighting pick (Figure 95: g). Some of these have the blade made to resemble a bird's head and one was said to represent the beak of a pelican (information from National Museum of Victoria). From Warner's description it is clear that the 'bird-headed club' is used in much the same manner as a fighting pick so I will assess it in the following section.

2:6 Fighting Picks

The most well known and most widespread type of fighting pick is the stone-bladed variety formerly found throughout a large part of central Australia (Figures 96: c, 96: d). It was first described by Spencer and Gillen (1899: 591-92) as a hand to hand fighting weapon consisting of a stone blade set at approximately 90 degrees to a wooden handle. The blade was hafted in the manner of a stone axe, with either a cleft stick or a bent withy as the handle (ibid: 589, figure 117-4 and 5; Davidson 1935: 174, figure 26). The use of a bent withy handle was dominant in the northern areas of fighting pick distribution (Davidson 1935: 171, figure 24, and 174).

At contact, the manufacture of these stone-bladed fighting picks was centred on the Warramanga, Bingongina and neighbouring tribes (Spencer and Gillen 1899: 592; see map 5). According to Davidson (1935: 174) they were traded from this region as far south as Lake Eyre and northward to Daly River. The handles of these picks average 45-50 cm. in length and the blades 15-25 cm.

Although Davidson (ibid) claimed that the bent withy was the only type of handle used in the northern area of fighting pick distribution, in the rock paintings not one of the 'hooked sticks' associated with boomerangs has this type of construction indicated. This is in contrast to depictions of hafted stone axes in early and late rock art periods. These axe depictions have handles shown as either two parallel lines, clearly indicating a bent withy (eg Figure 200), or a single line which could represent a bent withy or a solid stick (eg Figure 264; Mountford 1956: 119 figure 18c; Brandl 1973: 4; 54, figure 105). Instances of stone axes being hafted with single-piece handles are known (pers. comm. Dick Kimber) but they are extremely rare, and the solid-piece handles on axes in the rock paintings are likely to be the result of artistic license. The presence of some obvious bent withy handles on stone axe representations suggests that if any of the 'hooked sticks' had handles of this type, such a feature would probably have been depicted, at least occasionally. It therefore seems reasonable to eliminate the possibility that the 'hooked sticks' are representations of fighting picks with bent withy handles.

In the art, 'hooked sticks' may have a knob indicated at or near the base of the handle (cf Figures 78 and 82). A resin grip is sometimes seen near the base of the handles on fighting picks with split-stick handles. In the art, such a grip could be represented as a knob. Picks with bent withy handles often have binding material around the lower part of their handles. This also could be represented in the art as a knob, but fighting picks with this type of handle have been eliminated from discussion.

I have mentioned that another type of fighting pick was recorded in north-east Arnhem Land by Thomson. Of seven fighting picks in the Thomson collection at the National Museum of Victoria, six have been made from a single piece of wood which forms both blade and handle (eg Figure 95g). The other specimen, manufactured in the more conventional manner with a bent withy handle and a stone blade, was said to have come from the Roper River valley.

In size, the single-piece wooden picks are huge, with handles from 115 to 130 cm. in length and with blades 30 to 40 cm long. Judging from their size, they clearly were two-handed weapons and in this respect they do not resemble the 'hooked sticks' in the art. The angle between the blade and the handle is close to 90 degrees and in this feature also they do not resemble the 'hooked sticks' in the art. Some have the blade shaped to resemble a bird's head and one was said to represent a pelican's beak. Given the 'bird head' feature and their similar size, it seems likely that this fighting pick and the east Arnhem Land 'bird-headed club' described by Warner are identical (see 2:5). None of specimens collected by Thomson has a knob grip on its handle but the small number of surviving specimens precludes firm conclusions.

A number of small single-piece wooden artefacts that resemble fighting picks are present in collections from south-east Australia. Several specimens in the National Museum of Victoria have their blade acutely angled in the manner of the 'hooked sticks' in the art (eg Figure 95: b). These same specimens are roughly made, as is the case with many of the artefacts produced during the nineteenth century for sale to Europeans. They are made of extremely light wood, impractical for use as a weapon. I have not been able to ascertain whether identically shaped artefacts were produced in this region before European contact, but it is nevertheless possible that similar one-piece wooden artefacts were once produced in Arnhem Land, and are represented in the art as 'hooked sticks'.

With regard to the acute angle between the 'hook' and the shaft, the 'hooked sticks' in the art do not resemble ethnographically recorded north Australian fighting picks, all of which appear to have the blade set at approximately 90 degrees to the handle (eg Figures 96: c, 96: d; McCarthy 1967a: 59, figure 36-2; Davidson 1935: 174, figure 26; Spencer and Gillen 1899: 589, figure 117-4 and 5). However, the consistently acute angle in the 'hooked sticks' does not necessarily preclude their identification as a fighting pick.

By way of analogy, and with no suggestion of a direct relationship, I draw attention to the fighting picks from the Southern Highlands of New Guinea (see Figure 96: e). These usually have a single-piece hardwood handle with a cassowary-claw tipped, black palm blade, set at an acute angle of between 50 and 80 degrees and bound to the shaft with split cane (pers. comm. Ian Hughes). While there may be a physical principle involved, there are certainly functional reasons for the particular angle between the blade and the handle. New Guinean informants have stated that fighting techniques with these weapons include a downward blow aimed behind the clavicle (pers. comm. Ian Hughes) and a backwards stroke executed while fleeing from an enemy (pers. comm. Chris Dangerfield). In both cases the acute angle between the blade and handle could facilitate a direct penetration of the blade.

Fighting picks have not been recorded as part of the recent material culture of west Arnhem Land but this does not prove that they were absent in recent times or in the more distant past. Other researchers have conducted ethnographic research in the same region as Thomson (e.g. Warner 1958; Berndt and Berndt 1954), yet Thomson's appears to be the only definite record of the presence of fighting picks.

Although it is possible that at European contact fighting picks were present throughout Arnhem Land, with one possible exception the weapon is absent from recent styles of west Arnhem Land rock paintings. The possible exception is an artefact with a long thin blade extending at a 90 degree angle from a handle (Figure 160). A knob at the junction of the blade and the handle probably represents hafting material. It is perhaps possible that it is a representation of a stone axe with the blade depicted edge-on but the thinness and length of the blade is far more suggestive of a fighting pick. The knob at the distal end of the handle also suggests that the weapon portrayed is not a hafted axe, but it could represent a grip as is sometimes seen on fighting picks with split stick handles.

The weapon is associated with an unambiguous spearthrower. Both weapons are shown being held by a red ochre figure 82 cm. long which, in size and in style, is substantially different from the majority of figures depicted with both 'hooked sticks' and boomerangs. For example, suspended from the face of this figure is a round object that possibly represents a 'spirit-bag' (Warner 1958: plate 1B, opposite page 558) or 'biting bag' (Thomson 1949: 73), a small woven bag which, in ethnographic accounts, Arnhem Land Aborigines held suspended from the mouth when fighting (Warner 1958: 478-79). None of the figures with 'hooked sticks' and boomerangs have a feature that could be interpreted as a 'spirit bag'. This suggests that Figure 160 belongs to the more recent end of the rock art sequence. Similarly, facial features, a huge penis and digits are features commonly found on figures in relatively recent styles but are not a feature of figures with 'hooked sticks' and boomerangs.

The virtual absence of depictions of the fighting pick or of pick-like artefacts in association with unambiguous spearthrowers supports ethnographic evidence that the fighting pick was absent in west Arnhem Land. The solitary example provided

here may represent a rare acquisition from inland rather than a locally made artefact.

There is nothing to indicate that any of the 'hooked sticks' associated with boomerangs are of two-piece construction. There are two alternatives: either the 'hooked sticks' were of single piece construction or the binding was not depicted. In this context it is worth noting that in the contact period, every type of spearthrower in use in Arnhem Land had a detachable peg but when these weapons are depicted in rock paintings the binding material is not often indicated.

Thus, while it does not seem likely that the 'hooked sticks' in the art are representations of stone-bladed fighting picks, it remains possible that they depict an artefact similar to the solid-wood fighting pick of eastern Arnhem Land or the smaller pick-like artefacts from south-east Australia. In addition to the comparative data presented above, it is equally possible that the 'hooked sticks' depict an unknown artefact which was as much like a club as like a fighting pick.³

2:7 Spearthrowers

Spearthrowers of various forms have been recorded over the greater part of Australia since first settlement. In Arnhem Land, at least four types were in use at the time of European contact (see Figure 155: c to 155: f), but only two of these (c and e) resemble the 'hooked stick' depicted in the art. Following the nomenclature used by Cundy (1980), these are 'the north-central cylindrical' and the 'goose' spearthrowers.

Functionally, the two types are quite different but in form they are very similar. The north-central cylindrical spearthrower is essentially a round stick approximately 80 cm. long and about 2 cm. in diameter, usually with a detachable peg bound at an acute angle at one end although in some areas the peg is carved in the solid. Many examples are fitted with a tassel near the butt end (Figure 155: d), a feature sometimes depicted in the rock art (eg Figures 188, 190, 199).

The 'goose' spearthrower has a smaller diameter (1-1.5 cm.) and greater length (100-110 cm.) than the north-central cylindrical, and its peg is usually of moulded resin although some are reported to have wooden pegs. It often has a resin grip set back a short distance from the butt and a few have a tassel similar to those on the north-central cylindrical spearthrower (see Figure 155: e).

Stick-like spearthrowers, more or less identical to the 'hooked sticks' with boomerangs, are depicted in various styles of rock paintings. On formal characteristics alone, many of these stick-like spearthrowers cannot be classified as either 'goose' spearthrowers or north-central cylindrical spearthrowers, nor can they be differentiated from the 'hooked sticks' depicted in the art. However, it is sometimes possible to differentiate on the basis of associated spear types.

Until recently it was believed that differences in spearthrower shape were merely cultural variations. However, in an exhaustive analysis of Northern Territory spearthrower/spear technology, Cundy (1980) argues that optimum performance can only be achieved when spearthrowers of particular design characteristics are used with particular spears. Cundy's findings are dealt with in some detail in 4:5. Here, it is enough to say that the type of spear portrayed in the art may provide evidence for the presence of spearthrowers, as well as evidence for the particular type of spearthrower used.

Cundy's analysis demonstrates that the 'goose spearthrower' has highly specialised performance characteristics and can only be used efficiently with an equally specialised 'goose' spear (Cundy 1980: 189). These spears are short (approximately 140 cm.) and of two-piece construction: an unbarbed hardwood point fixed with resin to a bamboo or reed shaft. The points are proportionately longer than those on other spears, comprising 30% to 50% of total spear length.

When depicted in the art, such spears resemble a plain stick with the resin hafting material indicated as a knob one third to one half of the distance along its length (eg see Figures 241, 254), and a knob at one end which represents resin reinforcing around the hole that receives the peg of the spearthrower. Spears of this type are only depicted in what, on the evidence of style and of associated material culture items depicted, are believed to be the most recent styles of paintings (see 4:5 and 7:4). On this basis it is reasonable to assume that both the 'goose spear' and 'goose spearthrower' belong to the most recent technological period.

Conversely, Cundy (1980: 168) found that the north-central cylindrical type of spearthrower is highly versatile in the range of spears it can efficiently propel. Many of the stick-like spearthrowers depicted in the art are associated with a wide variety of spear-types (see Figures 181, 192, 193).

Confirmation that the stick-like spearthrowers in early styles of paintings are representations of the north-central cylindrical type of spearthrower raises the possibility that the 'hooked sticks' associated with boomerangs also represent a spearthrower of this type. However, technical features of the spears used with the north-central cylindrical (and most other) spearthrowers are significantly different from the spears associated with 'hooked sticks' and boomerangs.

First, recent forms of spearthrower projectiles used by Aborigines often have beeswax or resin reinforcing around the hole in the butt that receives the spearthrower peg. In the art, such a feature is often indicated on the spears depicted with spearthrowers (eg Figures 161, 173, 212; Brandl 1973: 198, documentation for figure 108), but never on the spears associated with 'hooked sticks' and boomerangs.

Second, spears used with spearthrowers often have a composite shaft. In his analysis of spearthrower/spear technology Cundy (1980: 163) found two main reasons for these composite shafts. Because of the physical principle involved in

throwing a spear with a spearthrower, minor irregularities in the wood used for spear shafts are likely to cause shaft failure when the spear is thrown. He suggests that in areas where long pieces of unflawed wood are rare or unavailable, composite spears are necessary to produce a shaft of suitable length without such flaws. With a different spearthrower/ spear combination, Cundy found that composite spear shafts may be constructed to increase throwing efficiency because lighter materials could be incorporated to facilitate a reduction in the mass of the spear (ibid: 100). Of course, both factors could have a bearing on the construction of any given composite spear shaft.

In the rock paintings, spears associated with indisputable spearthrowers (identified by their distinctive shape or their association with a spear set for throwing) often have a knob between the shaft and the blade (eg Figures 156, 189), and sometimes one or two knobs on the shaft, to indicate composite construction (eg Figure 217). This is particularly the case on the spears of the more recent spearthrower figures.

None of the spears associated with the 'Hooked Stick'/boomerang combination have any feature that indicates its use with a spearthrower. Almost all paintings of men with boomerangs and 'hooked sticks' have the same type of spear as that depicted in Brandl's 'early' Mimi period, that is, a one-piece spear with barbs on only one side of the head.

There are occasional exceptions. I have recorded two figures that hold a boomerang, a 'hooked stick' and a multi-pronged, multi-barbed spear (Figures 69, 75; see Plates 22, 23), and two figures with spears that appear to have a uniseriably barbed blade hafted to the shaft (eg Figures 72, 81). One of the latter examples is painted in red and yellow; it is possible that the original figure has been repainted and the hafting feature added at that time. In any case, the presence of a multi-pronged spear presupposes hafting technology but not necessarily the use of the spearthrower.

The spears in 'early' Mimi art are consistently depicted being hand-thrown. In areas of Australia where, at contact, spearthrowers were not used, hand-thrown spears were commonly of one-piece construction. Some had a detachable head, but they rarely, if ever, had a composite shaft (Davidson 1936b: 458). In this respect, depictions of spears associated with 'hooked sticks' resemble hand-thrown spears rather than spears used with a spearthrower. This evidence suggests that the 'hooked sticks' with boomerangs are either not spearthrowers or are a type of spearthrower used with spears of very simple construction. If the latter proposition is correct, we may be looking at a prototype spear/spearthrower system. This possibility is worth further consideration.

The prototype spearthrower, whether introduced or locally invented, may well have resembled a simple 'hooked stick'. Indeed, there is some circumstantial evidence to suggest that this may have been the case. If a Central Australian Aborigine should break his conventional, broad, concave spearthrower, and no spare is readily available, he will immediately improvise a simple spearthrower

from a straight green stick. The peg is carved in the solid and the finished artefact is referred to by Aborigines as 'the old kind'. This label implies that the type made as a replacement preceded the current type and thus may resemble the prototype spearthrower (pers. comm. Dick Kimber).

Similarly, a stick-like spearthrower appears to have been in use in east Arnhem Land before the advent of the current notched lath form (Thomson n.d., cited in Cundy 1980: 171; see 7:4). If the earliest type of spearthrower did resemble a simple 'hooked stick', one could reasonably assume a time lag between its first appearance and the development of more elaborate versions. The same reasoning would apply to the appearance of composite spears and different spearheads. The earliest spearthrower projectiles would resemble the previous hand-thrown ones and this continuity would be reflected in the paintings.

A final point concerns the knob depicted at the end the handles of many 'hooked sticks'. Both the cylindrical spearthrower and the Central Australian spearthrower may have a resin knob at the end of the handle to serve as a grip. On the Central Australian spearthrower this resin often serves as a haft for a stone adze (see Davidson 1936b: 464, figure 4f; Spencer and Gillen 1899: 579, figure 111-3) and it can also help support the spear prior to it being thrown (pers. comm. Dick Kimber).

In many ways these 'hooked sticks' and the spears associated with them fit the characteristics of the hypothetical prototype spearthrower/spear system as suggested above. However, the fact remains that no figure with a boomerang has yet been found with a horizontal spear poised for throwing from a 'hooked stick'.

2:8 Discussion

So far, I have considered the formal characteristics of the 'hooked sticks' and compared them with the formal characteristics of ethnographically recorded hooked weapons. I have also examined the relationship between the 'hooked sticks' and associated material culture items, and compared it to the relationship between spearthrowers and associated spears. I turn now to an examination of evidence for social functions of this artefact.

Among 'hooked stick' figures there are a few compositions highly suggestive of confrontation or dispute resolution rituals (Figures 77 and 78; see 7:2). In these scenes figures are paired and stand face to face with their 'hooked sticks' opposed or held high over each other's head. Because spearthrowers were sometimes used as clubs during fights in east Arnhem Land and elsewhere (Roth 1897: 149; Warner 1958: 484; Thomson 1983: 89) it is not possible to infer that the 'hooked sticks' in the art represent fighting picks or a pick-like club.

In one of the 'confrontation' scenes, and occasionally among figures in other contexts, the 'hooked stick' is held toward the middle of the shaft rather than near

the end (eg Figures 75, 77 and 86). Warner's (1958: 484) data provide an ethnographic analogy:

During a fight or peacemaking duel the [notched lath] spearthrower is sometimes held by the centre of the shaft and is used as a kind of parrying stick to ward off the spears thrown, since [the men involved] have no shields.

Warner (ibid: 485) also states that, in eastern Arnhem Land, the main use of the cylindrical type of spearthrower was ceremonial; it was used to direct the dances and as a kind of baton to keep time to the rhythm.

Unfortunately, there seems to be very little ethnographic information on the fighting pick. This may be due to its comparatively limited distribution in contact times and the apparent cessation of its manufacture 30 to 40 years ago. Clearly its primary use was as a fighting weapon; it may also have served as a knife when occasion demanded.

With respect to the art, one example has been found where a figure appears to have driven his 'hooked stick' into the back of a second figure (Figure 87). If this is what is being portrayed, then in this instance, the 'hooked stick' is being used as a form of fighting pick. In contrast, 'hooked stick' figures are sometimes depicted with their 'hooked sticks' in a particular relationship to their spears which suggests that the 'hooked sticks' may represent spearthrowers. In these examples the figure is depicted holding a hooked stick with its hook poised above the butt-end of a vertical spear (e.g. Figures 79, 98; Chaloupka 1984: 36, figure 15d). The placement of the 'hook' (peg?) of the 'hooked stick' in a position that might suggest a functional articulation is intriguing but not conclusive. In this context it should be made clear that in every art style where human figures are depicted carrying unambiguous spearthrowers, a large proportion of them hold a spear in a horizontal position, with its butt on the spearthrower peg, set for launching (eg Figures 159, 162, 201, 210, and 227). Usually the hand that holds the 'hooked stick' is extended to also hold the spear shaft (eg Figures 170, 171, 178, 182, 236). Less often, figures carry a spear hooked in a spearthrower, but with the spear held vertically, parallel to the body (eg Figures 163, 168, 172, 230; see Brandl 1973: 55, figure 107).

There are at least three possible explanations for the alignment of the 'hook' with the end of an inverted spear. If the 'hooked stick' is a spearthrower, the intent could be to signify that the spear is not being directed in a threatening manner. Equally, the comparative rarity of this positioning may indicate that spear throwing is a secondary function. Alternatively, whatever weapon the 'hooked stick' is meant to represent, the arrangement may be intended only to indicate, graphically, the connection between the spear, the 'hooked stick', and the figure holding it. If the 'hooked stick' is a spearthrower, its unusual positioning raises the possibility that at one time the artistic conventions for showing the functional relationship between spear and spearthrower were different from those which prevailed throughout most of the period of spearthrower usage.

2:9 Conclusions

Figures with 'hooked sticks' and boomerangs form a separate category from figures with unequivocal spearthrowers. In one example a figure appears to be piercing the back of another figure with the 'blade' of his 'hooked stick', an action suggesting that the 'hooked stick' is a fighting pick. In other examples the 'blade' of the 'hooked stick' is positioned over the butt end of an inverted spear. This positioning is highly suggestive of the portrayal of a spearthrower. In one group scene of over thirty five figures, several paired figures wield their 'hooked sticks' in the manner of a hand to hand fighting weapon while one figure has its 'hooked stick' articulated with an inverted spear (Figures 78-80; see Plate 27).

The fact is that the 'hooked stick' cannot be identified with certainty. It could represent a form of fighting pick or hooked club, or it could represent the earliest form of spearthrower. Until this dilemma can be resolved, I will continue to refer to this artefact as a 'hooked stick'. In the next chapter I will show that human figures that hold a 'hooked stick', but do not have a spear set in it for launching or do not also have a boomerang, may be identified as either spearthrower figures or 'hooked stick' figures on other grounds.

3 'HOOKED STICKS' AND THE RAINBOW SNAKE IN THE ARNHEM LAND ART SEQUENCE

The next point to consider is the positioning of 'Hooked Stick' / boomerang figures in the rock art sequence. I will argue that they are located between Brandl's 'early' Mimi and 'late' Mimi styles, rather than within 'late' Mimi phase 1 as he seems to have believed. The key to this argument lies in the various trends from the earlier to the later period that Brandl (1973: 172-176) identified.

The most important trends concern changes in the activities portrayed in the art and the manner in which this information is presented. Of particular relevance are changes in the perspective of individual figures, changes in the frequency of compositions as opposed to isolated figures, and changes in the themes expressed in these compositions.

The majority of 'early' Mimi human figures are fine-line and highly animated renditions of males, with an emphasis on the surface features of the subject (Figures 1-41, Plates 11-15, 22 and 32). The musculature of legs and forearms is carefully depicted but normally the head is only indicated on females (eg Figures 25, 32, 40, 41). Arms are usually attenuated and the lines of the legs are sometimes shown superimposed or crossing at the top of the thighs, as though they are transparent (eg see Figures 1, 19, 32, 40). Crossed legs are also a feature of many of the animals painted in this style (eg Figures 54-60). Almost all 'early' Mimi paintings are painted in red ochre, and there are no clear indications that other colours were used and have subsequently weathered away. At least one has been found painted in white and a few have been found with white pigment superimposed on the red (Brandl 1973: 173). However, with only one example recorded, there is no way of knowing whether the white figure is contemporary with the red figures or a more recent copy. Similarly, it cannot be ascertained whether the white pigment superimposed on the red lines of a few examples was part of the original painting or if it was added at a later date.⁴

Compositions with groups of human figures in motion are frequent (eg Figures 31, 33-38, Plate 15), although isolated or more static figures also occur (eg Figures 1, 3, 4, 40). The relationship between figures in these compositions is often graphically illustrated by the touching or careful overlapping of their bodies and weapons (e/g Figures 31-33). In the scenes thus formed, themes which Brandl (1973: 172-73) interprets as 'ritual' or 'mytho-totemic' are common. Individuals or groups of human figures wearing headdresses, 'dancing skirts', arm decorations and waist belts are often associated with animals, animal tracks or animal-headed beings (eg Figures 22-29, 36-37, Plates 11, 15; see Brandl 1973: 36, figure 73 and 47, figure 89). Occasionally the figures are shown carrying branch-like objects (Figure 36) or are associated with designs that may represent fire (eg Figures 21, 32). Although Brandl (ibid: 172) mentions fighting as one of the activities possibly

portrayed in 'early' Mimi art, no figures have been found where individuals or groups of figures oppose each other in what appear to be scenes of conflict.

In 'late' Mimi art (phase 1) the situation is markedly different. Silhouettes are more common than line drawings and the draughting skill employed is often less accomplished. The particular perspective of showing the legs crossing at the thighs is absent and the head is usually depicted. The surface of subjects is still emphasised but incipient and simple X-ray features are increasingly apparent, becoming common towards the end of Phase 2 of 'late' Mimi art. Isolated figures are more frequent and such compositions as do occur usually involve fewer participants. The animated posture and musculature of the 'early' Mimi figures is far less evident. Monochrome red is still the dominant colour although bichromes and monochrome figures in colours other than red are present.

'Late' Mimi figures are rarely depicted wearing what can be reliably interpreted as headdresses, 'dancing skirts', or waist belts. Large headshapes or objects present on some 'late' Mimi figures were variously interpreted by Brandl's informants as 'implements carried in the hair, or leaves used as camouflage in hunting ... a shock of hair' (1973: 174; see Plate 33 for what is probably a headdress in 'late' Mimi art). The ritual or mytho-totemic themes characteristic of 'early' Mimi art are also only rarely evident. In contrast, explicit conflict scenes are present (eg Figures 161, 212; Brandl 1973: 48, figure 92 and 49, figure 93).

Another trend from 'early' to 'late' Mimi concerns changes in the weaponry. The general trend is from a limited variety to a more extensive variety of weapons. According to Brandl, 'early' Mimi figures have at least one and possibly two kinds of boomerang, as well as a single-piece, uniserially barbed spear. Individuals are often depicted with one or more boomerangs tucked into a waist belt (eg Figures 7, 22). Hafted stone axes are present although rare. Boomerang-like throwing sticks and clubs, not mentioned by Brandl, are also depicted in 'early' Mimi art (eg Figures 11-19).

Of the weapons listed above, only the club, the hafted stone axe, and possibly the single-piece uniserially barbed spear occur in 'late' Mimi art. However, a variety of other weapons make their appearance for the first time. Additions include various kinds of composite spear, several new spearhead types, a variety of spearthrowers, and a variety of objects that may be weapons but which neither Brandl nor his informants could identify with certainty. Some of these may represent clubs. No 'late' Mimi figure has been found carrying a weapon in a waist belt.

3:1 The Chronological Position of the 'Hooked Stick'/Boomerang Figures

Taken as a whole, the 'hooked stick'/boomerang figures exhibit strong affinities with 'early' Mimi figures but the move towards 'late' Mimi art is clear. Compositions with a ritual or mytho-totemic theme — a hallmark of 'early' Mimi art — are still in evidence. Figures in such scenes are still shown wearing

headdresses and 'dancing skirts' although these items are usually depicted in simplified form. Some figures carry 'branches' (e.g. Figures 97, 99, Plate 25). Animals and their tracks are rare while animal-headed beings, and 'symbolic' designs are absent. Many 'hooked stick'/boomerang figures have the musculature of the legs indicated but few, if any, have the head indicated — it is usually obscured by a large headdress or what may be a large shock of hair.

The conventional boomerangs and the spear-type used by 'early' Mimi figures are also used by the 'hooked stick'/boomerang figures, but the boomerang-like throwing sticks are absent. The 'early' Mimi tool kit is otherwise supplemented by the addition of the multi-pronged, multi-barbed, hafted spear and of course, the enigmatic 'hooked stick'. In a few examples, the 'hooked stick' is shown carried in a waist belt (eg Figure 79, 80, 92).

There can be no doubt that boomerangs are all but absent in art styles where unequivocal spearthrowers are present. There is also no doubt that the trend in weaponry is from a limited to a more varied range of arms. The appearance of 'hooked sticks', along with hafted spear blades and multi-pronged, multi-barbed spears, represents an addition to the 'early' Mimi toolkit — the variety of tools has increased but the boomerang has not yet disappeared. The logical deduction is that the new weapons must appear between 'early' and 'late' Mimi art.

Most 'hooked stick'/boomerang figures appear to have been painted in monochrome red. However, some are clearly bichromes (eg Figures 72, 109-111, 116) and others have sections missing, suggesting that they were originally painted in more than the surviving red pigment (Figures 104-111, 113-115, 117-119). In this aspect they exhibit affinities with 'late' Mimi art. The painting techniques used are quite varied. The majority of 'hooked stick'/boomerang figures are painted as either full silhouettes or as stick figures. Fine-line drawings also occur but these are usually of less accomplished technique than 'early' Mimi figures. Again, the 'hooked stick'/boomerang figures appear to be transitional between 'early' Mimi art and 'late' Mimi art.

No 'hooked stick'/boomerang figures or associated motifs have been found that have any type of X-ray feature. The few animals I have found that are clearly associated with 'hooked stick'/boomerang figures have either a plain surface (eg Figure 90) or have surface features emphasised in a manner similar to many animals in 'early' Mimi art (eg Figures 88, 89 and possibly Figure 94). None of the animals or humans associated with the 'hooked stick'/boomerang combination of weapons exhibit the 'crossed-legs' perspective that distinguishes many of the animals and humans in 'early' Mimi style.

One of the most significant differences between 'early' Mimi figures and 'hooked stick'/boomerang figures is the presence among the latter of compositions or scenes in which paired figures stand opposed with 'hooked sticks' or boomerangs raised (see Figures 77, 78). As discussed above, such scenes are suggestive of confrontation or dispute resolution. So far, very few of these scenes have been located; however explicit fighting scenes are relatively common in 'late' Mimi art

and continue through all subsequent periods (eg Figures 161, 212, 236; see Mountford 1956: 164, figure 47; Brandl 1973: 48, figure 92).

3:2 Regional Differentiation

One of the most significant points concerning the 'hooked stick'/boomerang figures is the apparent development of distinct regional styles. In contrast to Brandl's 'early' Mimi figures, which appear to be relatively homogeneous throughout the plateau, 'hooked stick'/boomerang figures show marked regional differentiation. This is not to say that only one style of 'hooked stick'/boomerang figure occurs in any given region or that figures similar to each other do not occur over wide areas. What is meant here by regional differentiation is that in some areas there are styles which are apparently unique to that area. These unique styles may exist side by side with styles of more widespread distribution.

Regional styles have been identified in the areas of Twin Falls Creek and the Djauan Valley. In the Oenpelli-East Alligator River crossing area, there is a distinctive regional style which appears to be contemporary with 'hooked stick' figures but which cannot yet be positively identified on the basis of tool types. A fourth regional style may also exist on the Mount Brockman massif, between the Oenpelli and Twin Falls regional styles, but my sample is too small for definite comment. In the areas mentioned above, as well as near Nabarlek, on the upper East Alligator River, at Deaf Adder Creek, and at Koolpin Creek, there are stylised, stick-like 'hooked stick'/boomerang figures and single figures which cannot be placed in any style (Figures 65-76, 81-93).

Each regional style shows some continuity with the main style of the previous period. In each stylistic unit, a different combination of 'early' Mimi features has been retained and different emphases placed upon them. At the present time very little can be said about the limits of distribution of any one style. In the following section, a brief description is given of each style and representative examples are provided in the illustrations.

3:3 Twin Falls Creek 'Hooked Stick'/Boomerang Figures

In this regional style the artists have given more attention to body proportions and musculature, particularly in the shape of the legs (e.g. Figures 97, 99, Plate 25). Occasionally the body may be depicted in rotund form (e.g. Figures 100-103), and frontal or side view may be used (e.g. Figures 98, 103). Where the artist has adopted a side view, there is usually an allusion to movement in the positioning of the legs wide apart, often with the knees bent (e.g. Figure 97, 99), and in the forward-reaching arms (Figure 97).

All the figures are in red lines; none appear to have been painted in more than one colour. Depictions of material culture include varieties of headdress, waist belts, boomerangs, single-piece spears with barbs on one side of the blade and, possibly,

arm decorations. No figures have been found with a 'dancing skirt'. Some have a large headshape which may represent either a headdress or a mop of hair (e.g. Figures 97, 98; cf. Figure 80 from the Mount Brockman massif). There are both isolated figures and small groups or scenes.

Sometimes the figures in these scenes have been graphically connected by the careful overlapping or touching of parts of the bodies and weapons. In at least two instances, figures are depicted holding branches or branch-like objects (Figures 97, 99). Female figures have been recorded but they are uncommon and are not directly associated with males (e.g. Figure 103).

3:4 Djauan Valley 'Hooked Stick'/Boomerang Figures

These are the most highly stylised 'hooked stick' figures and have the least in common with figures in 'early' Mimi style. In some figures the body and legs appear to be a single vertical red band that tapers towards the extremities (e.g. Figures 105); elongation of the body and legs is often extreme (e.g. Figures 106-108). In some examples the legs are only slightly differentiated (e.g. Figure 106). In others the legs are more clearly separated and these figures resemble a long tuning fork in shape (e.g. Figures 104, 108). In all instances, the head is represented by a vertical circular to ovoid shape.

All the figures recorded have one or more gaps in the body and thus appear to have originally been painted in more than one colour. All that is now evident are those portions of the designs that were originally painted in red. The gaps are usually found between the head and shoulders, less often at the waist and, sometimes, at the ankles (e.g. Figures 104, 108). In none are the arms indicated but some figures have weapons placed alongside the body, roughly level with the shoulders (e.g. Figures 104, 105, 106). These give some idea of the former positioning and length of the arms. Features such as headdresses, waist belts, 'dancing skirts' and genitalia are absent. The only material culture items depicted are boomerangs and 'hooked sticks', some of which are shown superimposed on each other in a manner reminiscent of the way that 'early' Mimi weapons are often portrayed (eg cf Figure 106 with Figure 12).

3:5 Oenpelli 'Hooked Stick'/Boomerang Figures

A highly distinctive type of human figure occurs in the Oenpelli-East Alligator River crossing area (Figures 109-119 and Plates 24, 26). They are characterised by a long sinuous body (often curved into an 'S' shape), well developed musculature of the lower legs, and generally superb draughting skill. Hands and feet are only rarely indicated.

The majority of such figures are monochrome red silhouettes, although line drawings and bichromes also occur (eg Figures 109-112). Figures of this type have also been recorded in yellow, a combination of red and yellow, and in two tones of

red. They were first described by Mountford who published line drawings of a large number of them in 1956.

Two less accomplished variants of these figures have been recorded (Figures 195, 196). These are not as well proportioned and lack the smooth flowing lines of the 'classic' Oenpelli figures. Adding to their less graceful appearance, one is shown with very large hands and the other with large hands and feet, features not seen among the classic examples of this style. One of the figures is shown wielding a 'hooked stick'. The other has a spear set for launching from a stick-like spearthrower (Figure 195) but neither figure is associated with a boomerang. In spite of their similarities, these less accomplished figures and the classic Oenpelli figures may not belong to the same time period.

Within the category of classic figures, isolated examples are uncommon; usually they are found in groups or arranged in complex compositions similar to those seen in the 'early' Mimi period (cf Mountford 1956: 114 figure 12, with Brandl 1973: 47 figure 89). Most of the figures possess a large headshape which in some cases is clearly a headdress (eg Figure 112, Plate 24) and in others, could represent either a headdress or a shock of hair (e.g. Figure 114; Mountford 1956: 125, figures 22a, 22c). Weapons, and material culture items in general, are very rare. Several Oenpelli figures carry boomerangs (ibid: 116, figures 14c, 14e). In the few examples with complete spears, these are usually hand held (e.g. Figure 110). 'Dancing skirts', clubs, axes, and waist belts appear to be absent; dilly bags are either absent or rare (see Mountford 1956: 125 figure 22a).

The dearth of material culture items may be the result of an artistic convention governing the colours for particular parts of designs or for particular objects. Evidence for this exists in the frequent occurrence of gaps or incomplete sections seen on many Oenpelli figures and, in a few instances, on their weapons.

The most common missing section of a figure is the head, or the portion that would connect the shoulders to the fringing portions of a headdress (see Figures 109, 113-115, 118; Mountford 1956: 125, figures 22a, 22c). Other incomplete sections may include the knees, and parts of the arms or legs (e.g. Mountford 1956: 150, figure 36b and 168, figure 50; Welch 1982: 22). It seems likely that these portions were originally depicted in relatively short-lived white or yellow pigment, rather than in red.

In several examples, the shafts of spears associated with Oenpelli figures appear to be missing (eg Figure 119 and Plate 26; Welch 1982: 15). Only barbed spear blades, in the same shade of red as the Oenpelli figures, are now visible on the rock. Other Oenpelli figures are associated with dots, lines and objects that appear to have once formed part of now unidentifiable designs (eg Figure 119 and Plate 26; Welch 1982: 15).

Evidence suggests that classic Oenpelli figures are not contemporary with either 'early' Mimi art or 'late' Mimi art. For instance, although some Oenpelli figures are associated with boomerangs, there are 'early' Mimi figures in the same area (eg

Figures 2, 34). Therefore, the Oenpelli figures are unlikely to be a regional variant of 'early' Mimi art which is otherwise believed to be a homogeneous plateau-wide style.

This contention is supported by the painting technique used for many of the Oenpelli figures. Whereas 'early' Mimi figures are mostly fine line drawings, the majority of Oenpelli and 'late' Mimi figures are full silhouettes. Further, 'early' Mimi figures are almost invariably monochrome red while most Oenpelli figures were originally, and in some cases remain, in more than one colour. Generally speaking, 'late' Mimi figures do not wear headdress but many Oenpelli figures have at least the red sections of such a feature.

The association of 'hooked sticks' with boomerangs in the Oenpelli area is documented by Mountford (1956: 124 figure 21j), but it is not clear whether the artefacts in his illustration are directly associated with the figures alongside them. No classic Oenpelli figures have been found clearly associated with both boomerang and 'hooked stick' or with an unequivocal spearthrower. Nevertheless, when all the factors mentioned above are considered I believe it is valid to suggest that these Oenpelli figures belong in the 'Hooked Stick'/Boomerang Period. This suggestion must be considered tentative until the figures can be positively classified on the basis of associated tool types.

3:6 Summary: Hooked Sticks

Figures with 'hooked sticks' and boomerangs constitute a new period of rock art in the west Arnhem Land sequence. This period is marked by the first appearance of confrontation scenes, as well as, of course, the first appearance of the 'hooked sticks' that remain unidentified. Another material culture item that appears for the first time is the hafted multi-pronged and multi-barbed spear. Perhaps the most significant change is the replacement of the previous plateau-wide style of human figures with an array of regionally distinctive styles.

3:7 Chronological Position of the Rainbow Snake/Yam/Flying Fox Complex

Brandl and Chaloupka disagree on the relative chronological position of paintings of the Rainbow snake and associated motifs. The complex of art in question focuses on stylised representations of Rainbow snakes, yams (primarily *Dioscorea bulbifera*), and flying foxes (eg Figures 120 to 131 and Plates 28, 29; see Brandl 1973: 181-82 for discussion of this motif complex). In this context the Rainbow snake is a composite representation that combines the body of a snake with a kangaroo-like head and with the tail of either a crocodile (eg Figures 121-124) or, less commonly, a fish (eg Figures 125, 126). Generally speaking, in Aboriginal cosmology Rainbow snakes are a snake-like being that lives in waterholes or the sea, and is associated with rain and the cycle of the seasons. From a European perspective, Rainbow snakes have no natural counterpart. Yams, birds, mammals,

reptiles, humans, anthropomorphs and other motifs with yam features are often included in the panel (eg Figures 120, 126, 130) or may be found as isolated motifs (eg Figures 133, 134, 137-139). These subsidiary motifs are often stylised to resemble yams (eg Figures 121, 132, 135) and the yams themselves may be anthropomorphised (eg Figures 140, 141).

Sometimes yams, either stylised or anthropomorphised, may be found in complex arrangements without the Rainbow snake (eg Figures 142-144). Human figures associated with motifs from this complex are non-standardised and cannot readily be related to other known styles (eg Figures 128, 129, 142; see Brandl 1977: 232, figure 17).

All of the figures in this complex are painted in red; both full silhouettes and line drawings are present. Most have been affected by weathering; often sections have completely disappeared. Panels of interconnected motifs may extend over several metres. Individual figures are usually less than one metre in length, but several very large figures have been recorded (eg Figures 133, 146, 147). Henceforth, for convenience, I will refer to the entirety of these paintings as the 'Rainbow snake complex'.

Almost all of the figures in this complex exhibit one or more of several distinctive stylistic traits. Most have small lumps (or dots) bordering the greater part of their edges (eg Figures 120, 130, 135, Plate 28). Brandl's Aboriginal informants explained these as the nodules found on the surface of yam tubers which correspond to ritual body decoration of feather down (1970: 45; 1973: 197, documentation for figure 105, and 199, documentation for figure 135).

Another feature consists of lines which either connect or encircle various figures in the panel (eg Figures 124, 132, 134, 145), or which extend from individual motifs (eg Figures 133, 135, 136, 141). These represent the connecting roots and tendrils of yams (Brandl 1973: 199, documentation for figures 135 and 136). Groups of three or more lines may also be arranged roughly parallel and connected by a line across one end. These patterns of lines are not connected to other motifs but are arranged so that the closed end of the 'parallel' lines faces towards the dominant motif (eg Figures 133, 148).

Sometimes lines or bands that have forked ends and dots or short strokes placed at regular intervals along their length are interspersed among other motifs (eg Figures 120, 142, 147). These appear to be stylised representations of male and female inflorescences found on *Dioscorea* species (cf Figure 142 with Figure 153, and Figure 126 with Figure 154).

Another feature often associated with the complex is a circle divided into quarters or into smaller segments (eg Figures 124, 137). These possibly represent the eggs of the Rainbow snake, a feature which in recent art may be depicted as either an infilled circle (pers. obs.) or as a cross (pers. comm. Luke Taylor). While dots are sometimes depicted on the forearms of 'early' Mimi figures (eg Figures 39, 40; Brandl 1973: 54, figure 105), dotted borders, as well as the lines and crossed

circles, are traits seldom found among other recognised styles. Their presence usually enables isolated motifs to be classified as part of the Rainbow complex.

Apparently related to the Rainbow/yam/flying fox complex is a category of paintings that Brandl's informants said might represent 'spirit beings' (1973: 79-80, figures 168-170, and documentation for these figures on page 202). Stylistic attributes that point toward a connection with the Rainbow snake complex include lines around the body, objects or in some instances, a segmented circle alongside the being, and flying fox-like animals connected to it. Several of these spirit beings are included in the panel of superimposed red art shown in Plate 30.

Paintings belonging to the Rainbow snake complex are common throughout the western half of the Arnhem Land plateau. In the limited amount of research carried out in the eastern half of the region, only one highly weathered painting of a composite Rainbow snake has been recorded (Brandl 1973: 75, figure 160) and it does not preserve evidence of the dotted borders, segmented circle, or extended lines mentioned above. Nevertheless, this example indicates that representations of composite Rainbow snakes have a plateau-wide distribution.

Brandl apparently could not reliably place this complex in his chronology on the basis of 'symbolistic representation'. He states:

It is difficult to place this 'yam people'/Rainbow complex temporally in relation to the 'early' Mimi hunters. In the majority of cases the stylised Rainbow and the 'early' Mimi hunter are spatially separated as if the presence of one motif excludes the other. There are a few instances of overlays ... [It] seems to extend at Mt Gilruth into 'late' Mimi art (1973: 174).

Apart from the sole use of red pigment and the total absence of internal features, the only (inconclusive) evidence he provides for assigning any relative date is based on mineralisation on one panel, and 'late' Mimi designs painted over another, very faded, example.

Chaloupka (1984: 13) claims to have seen five examples where 'yam figures' overlie 'dynamic figures', but apparently he does not have overlays to substantiate his contention that 'yam figures' are younger than his 'post-dynamic figures' and 'simple figures with boomerangs'. Rather than occurring in three consecutive and discrete time periods as Chaloupka suggests (1984: 16, table 1), I believe that his 'simple figures with boomerangs' are 'stick-figure' versions of his 'post-dynamic' figures. These figures constitute a single period in the Arnhem Land art sequence and the Rainbow snake complex (Chaloupka's 'yam figures') possibly appeared late in the period. The key to this claim is found in the material culture associations of the three art categories, and in arguments about the probable functions of the different paintings, discussed in 7: 2.

Very few of the motifs in the Rainbow snake complex are associated with recognisable weapons or other material culture items, but the items I have seen appear to be compatible with the 'Hooked Stick' Period. Five examples from the complex are associated with uniserially barbed single-piece spears or multi-

pronged, multi-barbed spears (Figures 129, 148, 149; Brandl 1977: 232, figure 17; Chaloupka 1984: 39, figure 18f). Eight 'hooked sticks' have been recorded, associated with Rainbow snake complex motifs at four sites (Figures 148-151; see Brandl 1977: 232, figure 17).

Six of the eight Rainbow snake complex 'hooked sticks' have a knob set back a short distance from the end of the handle. Although many indisputable 'hooked stick'/boomerang figures also have 'hooked sticks' with a knob on the handle, only one has been recorded with the knob in this position (Figure 82). The apparent difference between the 'hooked sticks' of the Rainbow snake complex and those of the 'hooked stick' figures, and the absence of either an unambiguous boomerang, an unambiguous spearthrower, or a spear with features that indicate its use with a spearthrower, might be thought to leave the chronological position of the Rainbow snake complex somewhat uncertain. However, one other material culture item has been found that indicates the unity of the complex with the 'Hooked Stick' Period. An anthropomorphic figure associated with typical yam paintings is depicted wearing a headdress of a type commonly seen among figures with 'hooked sticks' and boomerangs, but not present in earlier or later styles (Figure 152 and Plate 28, cf with Figures 75 and 76).

In sum, a number of motifs in the Rainbow snake complex are depicted with weapons that are also associated with 'hooked stick' figures. These are 'hooked sticks', single-piece multi-barbed spears, and multi-pronged, multi-barbed spears. One motif in the Rainbow snake complex is depicted with a type of headdress unique to 'hooked stick' figures. Although the boomerang has not yet been found depicted in the Rainbow snake complex, unambiguous spearthrowers and spears with features associated with spearthrowers, are also absent. In total, the evidence suggests that the Rainbow snake complex falls within the 'Hooked Stick' Period of Arnhem Land rock art. In 7:2 I present an analysis of the 'hooked stick' figures and the Rainbow snake complex which strongly supports this conclusion.

4 PERIODS IN THE ART

Arnhem Land rock art is highly complex and no system of nomenclature will be able satisfactorily to encompass every variable. Although many styles have already been defined, a great many paintings still cannot be placed in existing chronologies with any degree of certainty. Whatever system of nomenclature is devised, there are likely always to be some paintings that will be unclassifiable, or at least, not classifiable with certainty. Nevertheless, it should be possible to provide a systematic nomenclature that can order the majority of existing styles and incorporate other styles as they become defined.

In chapter 1 I argued that the most reliable chronology of Arnhem Land art is that established by Brandl (1973). However, I have shown that two categories of figures should be incorporated into a new period that falls between his 'early' Mimi and 'late' Mimi art. These are the 'hooked stick'/boomerang figures that Brandl appears to have subsumed in the early part of his 'late' Mimi art (phase 1), and the Rainbow snake complex that he suggested overlapped his 'early' Mimi/'late' Mimi art boundary.

It should be noted that these motifs are not newly discovered and that their positioning in Brandl's chronology has not been substantially altered. The positioning of these motifs in a separate period is recognition of their distinctiveness and importance within the corpus of Arnhem Land rock art.

I have termed this new category the 'Hooked Stick'/Boomerang Period, or, for convenience, the 'Hooked Stick' Period. Likewise, I call the human figures within this period 'hooked stick'/boomerang figures, shortened for convenience to 'hooked stick' figures. I have distinguished the regionally distinctive styles of 'hooked stick' figures by reference to established placenames in the areas where the figures occur.

This choice of terminology has not been arbitrary. In the previous major studies of Arnhem Land rock art (Mountford 1956; Brandl 1973; Chaloupka 1984), attention has been focused primarily on the identification and ordering of particular styles. How comprehensible the nomenclature might be to non-rock art specialists, or how useful in correlating the art styles to other archaeological information, has been of secondary concern. Most of the terms applied are inadequate in both respects.

The system of nomenclature I propose here requires a shift in emphasis, away from attempts to define and order individual art styles, and towards the delineation of art periods. Once a set of coherent periods has been established, attention may once again be given to the much more difficult task of ordering the styles that occur within and through these periods.

I suggest that, as far as possible, the nomenclature applied to art periods should:

- a) be comprehensible to non-rock art specialists.
- b) enable the majority of paintings seen on the rock face to be placed in the named periods.
- c) enable the periods to be related to other archaeological data of known age or to be bracketed by dates applied to archaeologically recognizable characteristics in the preceding or succeeding art periods.

4:1 A Systematic Nomenclature

The key to establishing coherent periods within the total corpus of rock paintings is the identification of specific, commonly depicted material culture items that have at least one temporal boundary. Periods should be named in accordance with the identifying feature or marker.

One of the most common motifs in the rock art is the human figure. When the range of styles of human figures is examined, it is clear that specific styles are associated with specific weapon assemblages and that the styles may be grouped according to the weapons with which they are associated. The weapon assemblages change from one style or group of styles to another through either the addition of a new weapon or weapons, or the deletion of one or more earlier types, or both. From each weapon inventory I have chosen the most distinctive commonly depicted implement as the art/archaeological marker to be used in identifying the period.

Brandl's chronology may be divided into four periods based on the criteria outlined above. The earliest of these is the Boomerang Period, followed in consecutive order by the 'Hooked Stick' Period, the Broad Spearthrower Period, and the Long Spearthrower Period. The 'Hooked Stick' Period has already been described above. The basis for the other periods is set out below. As will be shown, there are features in the art which suggest that other periods may be delineated with further research.

4:2 The Boomerang Period

As the name implies, the Boomerang Period is marked by the presence of the boomerang. The following period is marked by the appearance of the 'hooked stick' although the boomerang is still present. In subsequent periods the boomerang is virtually absent.

As the situation now stands, the dominant motif in the Boomerang Period is the particular style of animated human figures that Brandl (1973: 172) called 'early' Mimi figures, and which Chaloupka (1984: 24) has labelled 'dynamic figures'.

These figures have already been described in chapter 3. Apart from the virtually ubiquitous presence of ceremonial paraphernalia, boomerangs and single-piece uniseriably barbed spears, these figures are sometimes depicted with hafted stone axes (eg Brandl 1973: 4 and 54, figure 105), clubs (Figure 21), an unknown fish-like artefact (Figure 20), and unusual forms of boomerangs or boomerang-like implements (eg Figures 11-19). This style of boomerang figures constitutes one of the most highly formalised and easily recognised styles, and is believed to occur throughout the Arnhem Land plateau.

The Boomerang Period also includes a style of human figures which Brandl speculated might pre-date 'early' Mimi figures (eg Figure 42; Brandl 1973: 83, figure 176). In composition, perspective, themes, and material culture associations, these figures are clearly closely related to 'early' Mimi figures. They are comparatively rare but are known from the Cadell River in the east, to Baroalba Creek in the west. Whether they pre-date or post-date 'early' Mimi figures, or served a specialised function within the 'early' Mimi period, cannot yet be determined.

Another category of motifs associated with the Boomerang Period is that of stencils. Placing stencils in a particular art period on the basis of overlays is, of course, subject to all the problems outlined in chapter 1. In some instances, the sequence of overlays is clear but many stencils are painted directly onto the rockface or are in position with other red motifs so that the relative sequence of overlays cannot be reliably assessed. However, the chronological position of many of them can be determined through other methods.

First, particular stenciled objects may have their painted counterpart restricted to a particular style or styles. Second, a stencil may be consistently associated with or in position with a particular art style or motif. Third, some stencils are of objects introduced by Macassans (ie Indonesians) or Europeans and obviously are of recent origin (eg iron axes). The pigment used may also provide clues; while red pigment may be extremely long lasting, white pigment is comparatively short-lived and white stencils are very likely to be of very recent origin.

Using the first method, Brandl (1973: 167) correlated stencils of boomerangs with depictions of boomerangs among figures in what I have termed the Boomerang Period. As well as boomerangs, Chaloupka (1984: 25) correlated stencils of dilly bags, spears, necklaces, and a hafted stone axe with depictions of these items among figures of the Boomerang Period, although most of these items are also depicted in other styles.

Using the second method, Brandl (pers. comm.) associated hand stencils with the three middle fingers closed (eg Figure 12) with figures in the Boomerang Period and other pre-X-ray styles. Chaloupka's research (1984: 25) confirms this positioning in relation to boomerang figures, as do my own observations.

Apart from those items mentioned above, there remains a wide variety of stenciled objects that have not yet been identified or classified in the literature. Most of these are comparatively rare, there sometimes being only one or two examples known. They include several that resemble hooked boomerangs (eg Figures 48, 49; Plate 16), a range of boomerang-like throwing sticks (Figures 45-48), a piece of string (Plate 17), an unidentified fish-shaped or sword-like artefact (Figure 50 and possibly Plate 19), several roughly ring-shaped artefacts (eg Figure 51), small animals (Figure 52), and a number of unidentifiable objects of various shapes (eg Figure 53, Plate 18). Some of these may be directly correlated with depictions of the same artefact restricted to figures of the Boomerang Period (cf Figure 50 with Figure 20 and Figure 46 with Figure 12). Others may be tentatively correlated with the Boomerang Period through their indirect association with the distinctive hand stencil that has the three middle fingers closed (eg Figure 38, Plate 14). Some stencils cannot be assigned to any art period by the methods outlined above, but circumstantial evidence suggests that the majority of stencils in red pigment may belong to the Boomerang Period.

Recent stencils, those in yellow or white or of recent material culture items, are reasonably common, but the majority of stencils that still exist have been executed in red ochre. Many of these are weathered and appear to have bonded to the rockface, features consistent with considerable age.

During the Boomerang Period the dominant weapons were the single-piece multi-barbed spear and the boomerang. Of the two, the boomerang was by far the most commonly stenciled. During later periods a 'hooked stick' and various forms of spearthrower became dominant weapons, yet only a single example of a stencil of one of these weapon types, a notched lath spearthrower, has been found (Figure 256). If, subsequent to the Boomerang Period, stencils were being produced in any quantity, then it is difficult to understand why stencils of 'hooked sticks' or of spearthrowers should not be found today.

In sum, the Boomerang Period is characterised by figures that carry boomerangs and hand thrown spears, but do not possess 'hooked sticks' or spearthrowers. Stencils in red ochre also form a major component of this period.

4:3 The 'Hooked Stick'/Boomerang Period

This period is marked by the appearance of an array of new styles of human figures including some that are restricted to particular regions. Most of these figures can be recognised through the presence of the 'hooked stick' in combination with the boomerang. The material culture of this period is also distinguished by the appearance of the multi-pronged, multi-barbed spear.

The continuing presence of the boomerang might be thought to present problems in differentiating between this period and the earlier Boomerang Period. However, the marked distinctiveness of the boomerang figures, and the absence among them of the 'hooked stick', should allow the different styles to be easily classified as

belonging to one period or the other. Apart from human figures, the period is also marked by the appearance of a complex of inter-related motifs focused on the Rainbow snake in composite animal form.

4:4 The Spearthrower Periods

In Brandl's chronology the appearance of the spearthrower marks the end of 'early' Mimi art (1973: 175). The period of spearthrower use thus begins with 'late' Mimi paintings which eventually developed into detailed X-ray art and other recent styles. The paintings of human figures within the spearthrower period are varied and complex, both locally and regionally. At least one distinctive style is restricted to an area centred on the East Alligator River crossing (eg Figures 241-253, Plate 38; Brandl 1973: 23, figure 39). Other formalised styles are known but I have not discovered a regional pattern such as that which characterises the 'Hooked Stick' Period. I believe that regional differences will almost certainly be identified as more research is carried out in the area, but the criteria for differentiating spearthrower figures may not be solely stylistic.

Variations in material culture provide grounds for suggesting at least one subdivision of the period of spearthrower use and, with further research, other divisions are likely to be identified. The evidence for this subdivision is based on a change in spear and spearthrower technology documented in the art. This change appears to correspond with the appearance of fully developed X-ray art. Cundy's (1980) recent work, mentioned above, provides the key for analysing this change. The issue is one of technological efficiency.

4:5 Spearthrower Technology

Cundy (1980) demonstrates a relationship between specific spear types and types of spearthrowers, showing that this relationship places particular demands upon spearthrower form. He suggests that there is a continuum of spearthrower/spear systems, with a high energy optimisation at one end, and a high velocity optimisation at the other. The availability of construction materials is a limiting factor in the design characteristics of the spears and spearthrowers and, therefore, in the choice of optimisations. Both optimisations cannot be realised in any one spear/spearthrower combination although in theory, intermediate or unspecialised combinations are possible. If spears and spearthrowers are not correctly matched the result may be spear deflection, rotation, or shaft failure.

In the high energy/low velocity system, spears are relatively heavy and short. The shaft of the spearthrower must be heavy and rigid to apply efficiently the greater force necessary to overcome the inertia of a heavy spear. One way of achieving rigidity is by shortening the spearthrower shaft but this then reduces its overall mass. Consequently, the shaft of the spearthrower must be made heavier to maintain the force necessary to propel the spear efficiently; this can be achieved by making the spearthrower broader.

This system does not require great control of spear or spearthrower construction. The short heavy spearthrower used in this system is potentially very versatile in the range of spears it can propel, and may be quite varied in shape. The high energy of the projectiles ensures good penetration.

The low energy/high velocity system, on the other hand, has much more stringent requirements for spear and spearthrower construction. High velocity spears are long, light, and stiff enough to resist buckling when thrown. Likewise, the spearthrowers used in this system must be light, long and rigid, with the mass centered about the wrist end. The best shape to meet these requirements is a roughly rectangular cross-section with the shaft tapered towards the peg end. The range of spear-types that can be used with this kind of spearthrower is restricted.

Cundy predicted the types of spears that should be found with spearthrowers possessing particular design characteristics. Limiting himself to Northern Territory spearthrowers, he checked his predictions against ethnographic records. Of seven types of spearthrower considered, the spears used with six confirmed his predictions. In the seventh example, a 'sabre' form, clear ethnographic accounts were not available. Apart from the 'sabre' type, Cundy was able to classify the Northern Territory spear/ spearthrower combinations into two optimisations, centered on two regions.

In Central Australia, spearthrowers and spears formed a high energy/low velocity optimisation. The spearthrowers used there are short, heavy and broad (see Figure 155: a). In the northern part of the Northern Territory, low energy, and high energy/intermediate spear/spearthrower systems were in use. The 'goose' spearthrower and the 'north Australian notched lath' spearthrower (in particular, the north-west Northern Territory version) are both part of low energy systems while the 'north-central cylindrical' spearthrower is part of a highly versatile system that could be used with both central and northern spear forms (nomenclature after Cundy 1980; see Figure 155: c, d, e, f). His analysis of spearthrower technology in general, and the versatility of the cylindrical type in particular, finds support in the rock paintings.

Brandl (1973: 49, figures 92, 93; 54 figure 104 and 55, figure 107) illustrates a number of examples from 'late' Mimi art in which cylindrical-type spearthrowers appear to be depicted. The spears associated with the spearthrowers in these scenes are hafted and include examples with serrated leaf-shaped points, blades barbed on one side only, multi-barbed, multi-pronged and unbarbed, multi-pronged heads, and an unidentified 'trident' shaped blade with one large point bounded by two smaller points. In short, a wide variety of spear forms are depicted in use with this type of spearthrower (see Figure 177).

The paintings thus support Cundy's suggestion that this type of spearthrower was part of a high energy/low velocity system, capable of incorporating a wide variety

of spear types. The broad spearthrowers and the long spearthrowers, depicted in 'early' and 'late' styles respectively, can likewise be related to Cundy's analysis.

4:6 The Broad Spearthrower Period

The earliest rock paintings of unequivocal spearthrowers appear to document the introduction of a 'high energy/low velocity' spearthrower/spear technology as well as the intermediate system described above. The spearthrowers depicted are of two main types — a broad, relatively short, rounded form that resembles the Central Australian spearthrower (eg Figures 156-172 and Plate 33), and a straight stick-like form that resembles the north-central Australian cylindrical spearthrower (eg Figures 178-200 and Plate 31). Both types may be depicted among a group of figures which, because of the identical colour used, appear to have been painted at the same time (eg Figures 172, 220). Theoretically the north-central cylindrical type, or one resembling it, is likely to have been the prototype spearthrower. Of the types he analysed, Cundy (1980: 166) notes, 'Constructionally this cylindrical spearthrower ... must be the simplest and most easily produced of all the spearthrowers'. While it is a distinct possibility that a stick-like spearthrower is the earliest type depicted in the art, either as the 'hooked stick' in the 'Hooked Stick' Period or in an as yet unrecognised separate period preceding the Broad Spearthrower Period, at present this cannot be demonstrated. All that can be said is that a stick-like form and a broad form seem to appear simultaneously as the earliest examples of unambiguous spearthrowers to be depicted in the rock paintings.

The cylindrical spearthrower is depicted from early to recent style paintings but the broad spearthrower disappears from the art with the appearance of fully developed X-ray paintings. Because the broad spearthrower is the more distinctive of the two, and because it has temporal limits within the overall period of spearthrower use, I have used it as the art/archaeological marker for this period, and named the period accordingly.

At the level of general types, the spears associated with the broad and cylindrical spearthrowers are the most varied of any period in the rock art and some of them appear to be unique to this period. This factor strongly supports the identification of the spearthrowers as high energy types.

Figures 176 and 177 illustrate the range of projectiles depicted in use with broad spearthrowers and cylindrical spearthrowers respectively. Some of these may be technical or artistic variants of one particular type and I have grouped these to elucidate this possibility. A number bear distinctive heads that are unknown in any other period, including the period of fully developed X-ray art (Figure 176: e-j, Figure 177: g-j and o-p). Most of these do not appear to have ethnographic parallels in Australia and cannot be identified as to construction materials, size or use.⁶

One type has a lanceolate blade with serrations (eg Figure 175, see Figure 176: f-g, and Figure 177: i; Brandl 1973: 48, figures 91 and 92). There is no ethnographic record of serrated, lanceolate spear blades made of wood and the closest analogy would seem to be the bifacially flaked, serrated stone points produced in the Kimberley region (e.g. see McCarthy 1967a: 38-40 and figure 21, examples at lower left). As far as is known, serrated stone points of the Kimberley type were never manufactured in west Arnhem Land and their presence there through trade has not been recorded. However, according to R. Berndt (pers. comm.), a serrated point, traded from the Kimberley, was used as a sacred object during a Kunapipi ceremony at Daly River (see Berndt 1965: 191-192 for details of the context in which this point was used).

Although the trade of an occasional Kimberley serrated point into west Arnhem Land would seem to be a likely possibility, the points illustrated in the rock art may have a different origin. For example, Berndt (1951: 160-162) recorded that spears with serrated points were traded into west Arnhem Land from the east, but it is not clear from his account what these points were made from. Schrire excavated a small number of serrated stone points in west Arnhem Land and illustrates a bifacially flaked specimen from Jimeri 2 (1982: 201, figure 77e). If the Jimeri 2 specimen is representative of the others, they all have extremely fine serrations.

At present there is no way of knowing whether paintings of serrated leaf-shaped points represent a locally manufactured or imported artefact. Rock paintings of spears with these points are uncommon but have a widespread distribution. They could offer another key to the dating of the rock art.

Another type (Figure 176: c-d) has a plain lanceolate blade. Conceivably, this might represent a stone point of the kind produced in Arnhem Land from less than 6000 BP until recent times, but the scale and degree of detail included in representations of these spearheads does not facilitate such precise identifications. Furthermore, single-piece spears with wooden lanceolate blades and spears with detachable wooden lanceolate blades are produced in parts of Central Australia (Davidson 1934: 52-53, figure 4), east Arnhem Land (Warner 1958: 487, variety 3), Groote Eylandt (Levitt 1981: 29), and have also been recorded on Bathurst and Melville Islands (Spencer 1914: plate 15-1, opposite page 362), so it cannot be assumed that the lanceolate blade depicted in the art is a stone point.

4:7 Long-Necked Spearthrowers

Returning to spearthrowers, a third type — one with either a rounded, 'squared', or concave-sided body and a long shaft extending from the body to the peg — is also depicted with non-X-ray style figures (see Figures 201-221, Plate 34; Mountford 1956: 173, figure 53; 186, plate 50; Brandl 1973: 48, figure 91; Jelinek 1977: 15, figure 36). Representations of this long-necked spearthrower are particularly common in the Oenpelli-East Alligator River crossing area. One possible example has been found on the northern side of the plateau, near Nabarlek. Others have been found as far south as Nourlangie Creek, but it remains

unknown whether this artefact was in use throughout the plateau. Until this point is clarified through further field research, another division in the art is not advisable. Nevertheless, the possibility that the long-necked spearthrower could constitute another period in the art makes further discussion worthwhile.

The long-necked spearthrower does not appear to have an ethnographic parallel anywhere in Australia. The possibility of artistic license must always be considered, but in this instance the very fine line-control and carefully executed patterns inside the round or squared section of some examples (eg Figures 201-207) suggest that its shape is being accurately rendered and that these are depictions of an archaic spearthrower type. Several examples bear very similar designs inside their borders which suggests that they are not mere infill patterns (cf Figures 202, 203, 204). Whether these patterns represent part of the construction of the spearthrower or a painted or incised design is a problem for future research.

The variety of shapes apparent among long-necked spearthrowers suggests that they were produced during a period of experimentation with spearthrower/spear technology. If this is so it is possible that long-necked spearthrowers were only produced for a short period and were not adopted throughout the Arnhem Land region.

The styles of figures depicted wielding the long-necked spearthrower are different from those that are shown using the broad spearthrower and there is evidence that they post-date or occur at the recent end of the Broad Spearthrower Period. For example, a particular type of trident spear (Figures 176: e and 177: j), carried by figures with broad and cylindrical spearthrowers, does not appear to be associated with the long-necked spearthrowers. Some of the figures with long-necked spearthrowers are painted in relatively short-lived white pigment (Figures 203 and 215). Another has been found with white cross-hatching on a red base (Figure 204). Some are associated with material culture items that are otherwise restricted to more recent styles or recorded in regional ethnographies. For example, Mountford (1956: 173, figure 53) illustrates a group of figures in which long-necked spearthrowers and a didgeridoo (wooden trumpet) are associated (see also Figure 221). Another long-necked spear-thrower figure is shown together with a particular type of club that was still in use in contact times (cf Figure 204 with Figure 95: a; Spencer 1914: 367, and plate 16-4, opposite page 366; Etheridge 1895: 427-430, plate 22). Likewise, Mountford recorded a group of figures depicted with long-necked spearthrowers and with small objects suspended from their shoulders (1956: 186, plate 50). He described these objects as 'sacred bags' that only initiated men could carry (ibid: 183, footnote 71). Similar objects are commonly associated with figures that carry the type of spearthrower still in use today (eg Figures 232, 243, 244, 250). As a final example, Figure 225, a mortuary scene, documents the co-existence of a long-necked spearthrower and a notched lath spearthrower – the latter being the type still in use in northern Australia.

In sum, the Broad Spearthrower Period is characterised by the presence of broad spearthrowers, stick-like spearthrowers, and a wide variety of spear-types. The

spear types include some with serrated lanceolate blades that may represent stone points, and some with trident heads (re Figure 176: e) that have no ethnographic parallel. Neither the serrated type nor the trident type is present in any other art period.

In the north-west of the plateau, if not beyond, a long-necked spearthrower appears to be transitional between the Broad Spearthrower Period, and the Long Spearthrower Period. The wide variety of shapes seen among these long-necked spearthrowers, as well as their occasional association with notched lath and other spearthrower types, may indicate that a period of experimentation in spearthrower design occurred during the transition from broad spearthrowers to long spearthrowers.

4:8 The Long Spearthrower Period

With the appearance of fully developed X-ray style paintings in Arnhem Land, the high energy/low velocity spearthrower/spear system was replaced by a low energy/high velocity spearthrower/ spear technology, although the intermediate system based on the north-central cylindrical spearthrower remained in use. Neither the broad spearthrower nor the long-necked type have been found directly associated with fully developed X-ray art. Instead, human figures in recent X-ray art and associated styles carry the north Australian notched lath spearthrower (eg Figures 226, 254, 255, Plate 36; the 'goose' spearthrower (possibly Figure 240), the north-central cylindrical spear-thrower (Figure 238), and at least five generalised spear types (Figure 257), all of which were used in Arnhem Land in recent times (see Spencer 1914: 356-359). Some of the spearthrower depictions may be representations of the 'sabre' spearthrower but this cannot be determined from form alone.

In addition to their association with fully developed X-ray art, depictions of long spearthrowers are associated with a variety of styles (eg Figures 225-237, 239). One of these is a distinctive type of non-X-ray human figure restricted to the Oenpelli-East Alligator River crossing area (eg Figures 241-253 and Plates 37, 38). These Oenpelli spearthrower figures are usually less than 70 cm. and are painted directly onto the rock face. Some are associated with spears that appear to be tipped with long quartzite 'leilira' blades of the type in use at European contact (eg Figures 242, 243; Thomson 1949: plate 1).

Red ochre seems to be the most common colour used, though examples in white are also reasonably frequent. With the exception of the use of white pigment, the Oenpelli spearthrower figures exhibit similarities with earlier Arnhem Land art styles, but when they are compared with certain polychrome X-ray figures it is clear that the two types are extremely similar, and the material culture items they are portrayed with are identical (cf Figures 241 and 246 with Plate 41). On this basis there can be little doubt that they are either contemporary or temporally close.

There is a small number of other figures that in style and/or in material culture associations are clearly related to figures with long spearthrowers, but which are depicted carrying spearthrowers of different shape (eg Figures 223, 224). These may be further evidence of a period of experimentation before long spearthrowers became the dominant form used in Arnhem Land.

Another class of figures that are associated with long spearthrowers is paintings with sorcery features. Sorcery features include physical distortions and swellings, and barbs or spines protruding from sensitive or dangerous parts of the body (eg Brandl 1973: 83-87, figures 177-182). Brandl (ibid) states that 'motifs concerned with magic and sorcery originated in 'late' Mimi art and developed gaining importance side by side with the X-ray style.'

Technical features indicate that the majority of sorcery paintings are contemporary with X-ray art. For example, many of them are bichromes or polychromes, painted in coarse-grained pigments that form a relatively short-lived surface layer on the rock. However, some are monochrome red painted directly onto the rock face, and therefore could pre-date the period of fully developed X-ray art, as Brandl suggests. Whether painted in monochrome red or in coarse-grained pigments the majority of sorcery figures are not depicted with artefacts, and cannot be assigned to art periods defined on the basis of material culture. However, I have found two paintings where figures associated with long spearthrowers have sorcery features of the type mentioned above (Figures 232, 237). No sorcery features of any kind have been found on figures that can be classified as Broad Spearthrower Period or earlier.

4:9 General Summary of the Spearthrower Periods

It is now possible to argue that at least five types of spearthrower are depicted in the art. Two of these, a broad type and a cylindrical type, are the first unequivocal spearthrowers to appear in the art. Occasionally these are shown in use with spears with distinctive heads that may eventually be recovered from archaeological deposits. While the cylindrical form of spearthrower continued to be depicted until recent times, the broad spearthrower, the long-necked spearthrower, and several distinctive spear types disappeared from the art before the style that Brandl defined as 'standard' X-ray art became established as the dominant style.

The Broad Spearthrower Period incorporates some of the styles which Brandl (1973) defined as 'late' Mimi art, phase 2 of which includes early X-ray paintings (eg Figures 174, 184, 193). The period is characterised by a weapon assemblage substantially different from that depicted in the boomerang and 'Hooked Stick'/Boomerang Periods. With one exception (Figure 158), the boomerang is absent.

The Long Spearthrower Period is marked by a reduction in the number of spear types depicted although the variations in spearhead form within the different

spear categories remains high (see Figure 257). X-ray art in its fully developed form became the dominant rock art style during this period. It seems likely that sorcery art, the large (20-30 cm.) quartzite 'leilira' blades and the specialised 'goose' spearthrower/spear combination also appeared for the first time in this period.

It cannot be determined whether some of the variations within each category of spear types in either of the spearthrower periods reflect artistic license or reality. In this context it is worth noting Cundy's (1980: 173-75) suggestion that the great variation in east Arnhem Land spearheads may reflect social divisions. With further field work it may prove possible to demonstrate social markers in the spearhead variations depicted in west Arnhem Land rock art.

PART 2

ARNHEM LAND ART: A NEW PERSPECTIVE

5 ARNHAM LAND PREHISTORY

As the situation now stands, the only Arnhem Land rock paintings that can be assigned more than a tentative date are those that depict European or Macassan subject matter (eg Figures 267, 269-271, Plates 37, 46, 47), or those where the identity of the artist is known.

There can be little doubt that a significant proportion of Arnhem Land paintings are many thousands of years old. This was recognised by Brandl who, for example, pointed to the occurrence of depictions of the extinct thylacine (*Thylacinus cynocephalus*) as evidence of great antiquity (1973: 2). It is now known that representations of thylacines, as well as some depicting the Tasmanian devil (*Sarcophilus harrisii*), are not restricted to the earliest art period and that some paintings of these animals are likely to be significantly older than others (Lewis 1983; 1986).

Because comparatively little relevant research had been done prior to his major publication, Brandl (1973) did not attempt to relate his chronology to archaeological or other data of known age. In contrast, Chaloupka (1984), with the benefit of a great deal of recent archaeological and related research, has made concerted attempts to date the art and claims that some paintings may be 20,000 or even 35,000 years old. The substance of Chaloupka's dating is examined below. My own estimates are considerably more conservative but there is, nevertheless, reason to believe that some paintings may date from very late Pleistocene/early Holocene times.

Attempts at dating Arnhem Land paintings depend on several important types of evidence. Inferences drawn from variations in sea level over the last 16,000 years and the resulting changes in environment and landform are one type. Others include correlations between the art and dated cultural and faunal remains from Arnhem Land and elsewhere in Australia. Recourse must also be made to ethnographies and recent cultural analyses. Dates for the art arrived at by most of these methods can only be as accurate as the dating of the original evidence. Undoubtedly, future adjustments will have to be made.

As with most interpretations of prehistory, some aspects are the subject of ongoing debate (eg Allen 1987). It is not the purpose of this paper to enter into this debate, a task I believe is better left to those who have been directly involved with excavations and other research in the region. In the following section I will present a summary of the cultural and environmental history of west Arnhem Land as it is now known, focusing on those processes which relate directly to the analysis of the rock art. Those who wish to learn more on this topic are referred, in particular, to the recent studies of Woodroffe *et al* (1986, 1987) and those contained in Jones (1985), upon which the following summary is largely based.

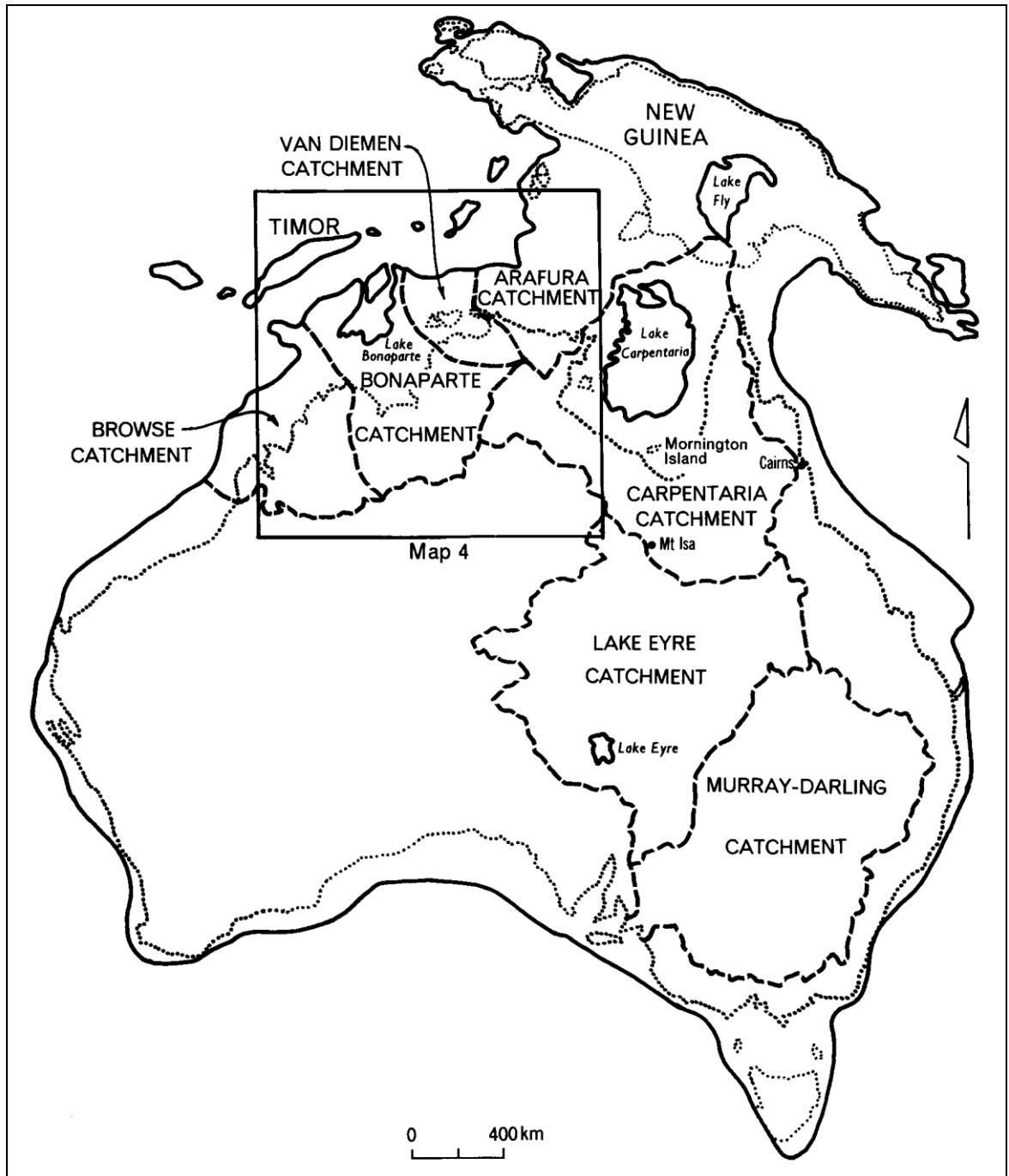
5:1 Environmental Change

At the peak of the last glaciation about 18,000 years ago, vast amounts of the world's water were trapped in massive icecaps and sea level in the Australian-south Indonesian region stood about 130 to 140 m. lower than at present, exposing much of the continental shelf as dry land (Chappell 1976: 14). A great plain connected northern Australia and New Guinea; the coast of Arnhem Land extended up to 300 km. further north than at present, to within 100 km. of Timor and neighbouring islands (see maps 3 and 4; Birdsell 1977: 124-125, table 1). At this time the climate throughout much of Australia is thought to have been considerably more arid than at present. Vegetation in the Arnhem Land area probably resembled the semi-arid shrublands and open woodlands now seen in the Daly Waters/Tennant Creek region several hundred kilometres to the south, although patches of monsoon forest may have persisted in favoured localities such as on deep sandsheets (Hope *et al* 1985: 240) or in the sandstone escarpment (Russell-Smith 1985: 243).

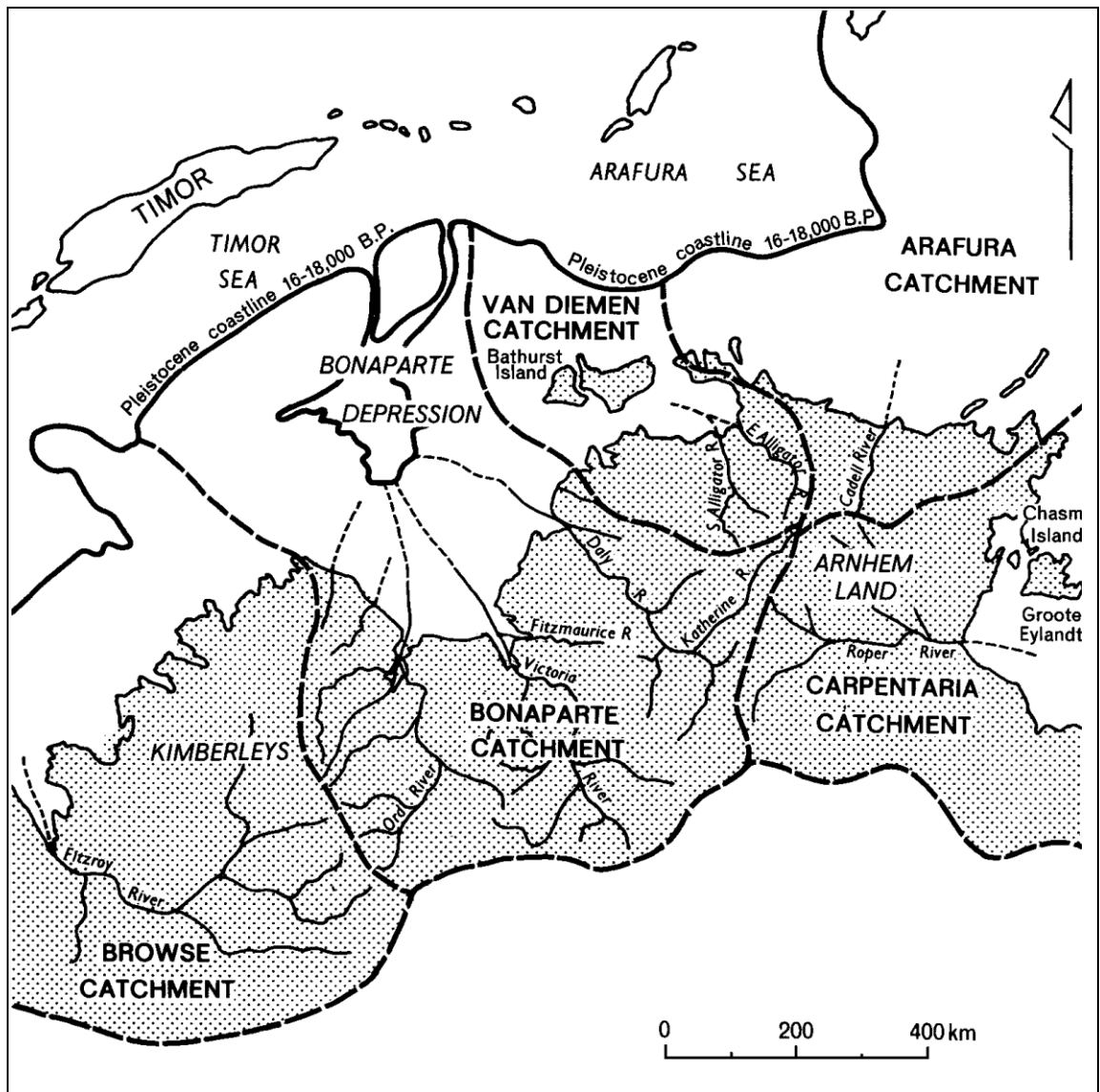
With an increase in global temperatures about 16,000 years ago, the glacial ice-sheets began to melt and the sea began to rise. Evidence suggests that the rate of sea level rise was fairly uniform, although a period of more rapid sea level rise probably occurred between 13,000 and 11,000 BP. To the north of Greater Arnhem Land the sea may have moved inland at a rate of several hundred metres per decade, sometimes locally exceeding this by a factor of 10 (pers. comm. John Chappell). By 10,000 BP the coastline had advanced to within 150 km. of its present location. As the coastline moved inland, precipitation in the Arnhem Land area increased. The increase was slow at first, but became more rapid some time after 10,000 BP (pers. comm. John Chappell).

Major environmental changes occurred as a result of the changing sea level. When the sea was lowest, Arnhem Land rivers flowed through deeply incised valleys. As the sea rose, these river valleys were flooded with salt water and the scene was set for the major environmental changes to come.

To date, the most comprehensive study of this process is that carried out in the South Alligator River valley by Woodroffe, Chappell, Thom, and Wallensky (1986). These researchers believe that the same general processes that they documented in the South Alligator River apply to other north Australian rivers although each is likely to vary to some degree in the details and timing of the changes that occurred (*ibid*: 143). Therefore, in the following brief account I will summarise the findings of the South Alligator River study.⁷



Map 3. The coastline and some of the major drainage basins of 'Greater Australia' at the height of the last glaciation, circa 16-18,000 BP (Compiled from Torgersen *et al* 1985; Fairbridge 1953; *The Macquarie Illustrated World Atlas* 1984: 152; and Van Andell *et al* 1967).



Map 4. Drainage basins in north-central and north-western Australia, circa 18,000 BP. The Mimi art area straddles the Bonaparte, Van Dieman, Arafura and Carpentaria basins, while the Bradshaw art area overlaps the Bonaparte and Browse basins. Also shown are the modern river systems (Compiled from Torgersen *et al* 1985, Fairbridge 1953, *The Macquarie Illustrated World Atlas* 1984: 152, and Van Andell *et al* 1967).

According to Woodroffe *et al* (1986) the prior valley of the South Alligator River 'had a rather flat floor about 10-12 metres below AHD (Australian Height Datum, approximately mean sea level) up as far as Nourlangie Creek' (p. 19). Around 8-8500 years BP, salt water invaded the valley which then began rapidly to fill with estuarine sediments. By this time the glacial aridity had long since passed and the climate in the region was similar to that of the present. Even while the sea was still rising sedimentation rates were fast enough to provide the shallow water conditions necessary for mangrove survival. By 6500 BP a mangrove swamp of approximately 80,000 hectares had developed across the valley floor. This 'big

swamp' existed for little more than 1000 years, disappearing, ironically, because it acted as a giant trap for sediments that gradually filled in the tidal areas it needed to survive. During the 'big swamp' phase the river persisted as a distinct channel.

The transition from mangrove forest to freshwater plains is not well documented but by 4000 years BP the 'big swamp' had virtually disappeared. A sinuous river then flowed across a plain covered with sedges and grasses. By 3000 years ago sediment deposition on the plains was insignificant and the essential features of the modern landform were established. From about 2000 years ago, and especially during the last 1000 years, the sinuous river has been subject to an evolutionary process, transforming into a cusped system. Through a particular process of erosion and deposition, the meanders of the sinuous river are cut off and isolated, eventually creating a mosaic of paleochannels on the floodplains. Isolated from the tidal influence and subjected to seasonal flooding, these channels became resource-rich freshwater lagoons and billabongs.

For at least the past 1000 years the Arnhem Land environment has comprised a mosaic of freshwater lagoons and swamps, estuarine and saltmarsh areas, and various dry land plant communities on plain and plateau. This probably represents the richest environment Arnhem Land has known for at least 20,000 years and has important implications for dating the recent periods of rock art.

5:2 Cultural Remains

Although direct evidence has yet to be found, it is most reasonable to assume that human habitation in Arnhem Land is as old as the earliest known sites in Australia, which are of the order of 40,000 to 50,000 years. Radio-carbon dating of excavated deposits in Arnhem Land confirms human occupation well over 20,000 years ago (Schrire 1982; Kamminga and Allen 1973; Jones and Johnson 1985) but in several instances occupation deposits extend well below the deepest dated material, and the antiquity of these sites may approach 30,000 years or even more (Jones and Johnson 1985: 182; see also Schrire 1982: 108, 238).

At sites along the plateau margins and in valleys leading into it, at least two, and possibly three successive cultural phases have been recognised. At a general level the stone industry (or industries) earlier than circa 5-6000 BP are characterised by scrapers (Jones 1985: 297). According to Jones (*ibid*) the period from about 18,000 to perhaps 30,000 BP is characterised by large flaked tools typical of the 'Australian core tool and scraper tradition' found at many sites across the continent, but distinguished from it by the presence of ground-edge axes. The scrapers and utilised flakes in the period from about 15,000 to 6000 BP are more generalised and may be typologically unspecific, but this apparent difference from the earlier tradition needs further study.

Ground-edge stone axes, or fragments of them, as well as ochre pieces, sandstone slabs with ground facets, and mortars (grindstones with circular depressions), apparently occur from the earliest levels, to the most recent levels of occupation

(Jones and Johnson 1985: 218; Schrire 1982: 108). The presence of pigments in Pleistocene levels is paralleled in other Australian sites (Mulvaney 1975: 279). In Arnhem Land it is quite possible that these pigments were used in the production of rock art, but this cannot be proven and they provide no direct evidence for the antiquity of the existing paintings or, indeed, for the practice of rock painting.

According to Jones and Johnson (1985: 206), the second phase of stone tool technology began with the appearance of unifacial and bifacial stone points about 5500-6000 BP, well after estuarine conditions had developed in the valleys. This date is still subject to some debate (Allen 1987: 97) although most researchers seem willing to accept 5000 years as a reasonable maximum estimate (eg Schrire 1982: 239; White and O'Connell 1982: 119; Mulvaney 1987: 82). At about 3500 BP small tools labelled 'adzes/chisels' by Jones and Negerevitch (1985: 4) and 'scraper-adzes' by Schrire (1982: 179) appear in some archaeological deposits (Jones and Johnson 1985: 208). At other sites these adze/chisels appear to be followed by use-polished flakes (Schrire 1982: 249).

In the most recent (undated) levels of a few sites, points are replaced or supplemented by long pointed and unretouched blades (Jones and Bowler 1980: 13). At European contact such blades were an important item in the trade networks that extended throughout Arnhem Land (Thomson 1948-49). Quarries where these blades were manufactured have been recorded in Arnhem Land and neighbouring regions but their antiquity has yet to be established.

About 6-7000 years ago, as the sea approached its present level, mangrove and mudflat shellfish species colonised estuarine areas near the sandstone outliers of the plateau. The first appearance of estuarine shell middens in some of the nearby rock shelters occurred at that time (Schrire 1982: 136). Shell middens composed of estuarine and mangrove mudflat species first appeared on the newly developed plains about 4600 years ago but they became much more common after 3000 BP (Woodroffe *et al* 1986: 133).

About 700 to 1000 years ago there was a dramatic increase in occupation debris at Anbangbang shelter and in the accumulation of stone tools at sites along the wetland edges. Jones (1985: 293) has interpreted this as evidence of a major increase in population numbers linked to the development of the resource-rich freshwater wetlands in the region.

5:3 Faunal Remains

Virtually all faunal remains are found in the upper levels of the excavated sites. This is largely the result of depositional environments: the alkaline conditions associated with shells differ from the slightly acid sands found below the midden or where middens do not occur (Schrire 1982: 234). No megafaunal remains have been found. In fact, with the exception of a Tasmanian devil (*Sarcophilus harrisii*) mandible dated to 3120 +/- 100 BP, no remains of extinct species have been

recovered from the excavated sites. All other species recorded in excavations are present in Arnhem Land today (ibid: 235).

5:4 Mineral Analysis

Recent studies have revealed the existence of a variety of mineral coatings on the rock faces in Arnhem Land (Hughes and Watchman 1983; Watchman 1985, 1987). Most of these coatings are believed to have formed through processes associated with particular environmental conditions, and if these conditions can be accurately determined, it may prove possible to bracket different art styles and art periods.

For example, some of the oldest paintings are coated in a layer of silica. If it can be proven that these silica skins are the product of certain environmental conditions, it should be possible provide age estimations for them. This would provide a minimum age for paintings covered by the silica, and a maximum age for paintings which overlie the coating.⁸

Some of the skins contain oxalate minerals, believed to be derived from organic compounds. Several samples of multi-layered crusts containing oxalates minerals have been subjected to radio-carbon analysis (Watchman 1987). These provided dates of about 8000 years, but this represents the mean age of the combined layers. It also remains unclear whether paintings on the same rock face are completely beneath the crust, or embedded within it.

Other mineral skins analysed consist largely of polyhalite, a mineral usually derived from oceanic salt deposits. Watchman (1985: 288) suggests that the polyhalite was derived from a local 'basin of evaporation', blown into the escarpment as dust, and remobilised in solution during wetter periods to be eventually deposited as coatings on the rocks. A marine 'basin of evaporation' that may have produced the polyhalite was present from the time that the sea flooded the valleys of the current South and East Alligator Rivers, about 8000 BP, until the formation of the present freshwater plains about 4-5000 years ago. Watchman's research is still in progress. It offers one of the most important possibilities for establishing absolute dates for different art styles and periods.

6 CHALOUPKA'S DATING

In his model of dating, Chaloupka (1984) presents a case for the absolute age of three of his six pre-estuarine styles. The other pre-estuarine styles are dated indirectly by their relative position within the sequence. Throughout the three subsequent periods — estuarine, freshwater, and contact — only three styles are described. For the most part, Chaloupka attempts to date the art by linking the subject matter of different styles to specific periods within the environmental and cultural history of the region. The changes in environment from pre-estuarine to estuarine and freshwater are established fact but the correlations Chaloupka makes between the art and the environment are questionable.

In the following discussion I will first examine Chaloupka's specific arguments for the dating of his pre-estuarine styles, beginning with his oldest style. I will then examine the evidence he presents for, and his suggested dating of, his pre-estuarine/estuarine division.

6:1 Handprints, Grass Prints and Imprints of Thrown Objects

Chaloupka (1984: 17, 20) does not give any clear reason for associating these motifs as a single 'style'. Apparently he classes them together because they are executed in the same technique and because, he claims, they are usually placed at or above the limits of human reach. In an earlier paper Chaloupka (1983: 7) suggested that many of the hand and grass prints were applied from ledges which have since collapsed, apparently implying a great antiquity for the motifs. The reason given for claiming that this 'style' is not just 'old', but actually the earliest, is that he believes the hand prints are superimposed by all other styles.

In his chronological table (see 1:4) Chaloupka places this 'style' at 35,000 BP but in his written description he argues for a date of only 18,000 years. Chaloupka suggests that the grass prints were made when grass seeds were economically important. He believes that this was the case 18,000 years ago because mortars of this age were excavated in Arnhem Land by Kamminga and Allen (1973: 48), and may have been used to prepare cereals.

From my own observations, grass prints and hand prints are not always high out of reach; in several instances grass prints, interspersed among paintings in various styles, are located within two metres of ground level (eg Figure 30). Hand prints are even more frequently found within easy reach (eg Figures 9, 39; Plate 31). A few hand prints have the three middle fingers closed in the manner of the hand stencils associated with boomerang figures (eg Figure 8). This suggests that some prints are contemporary with stencils of that type. In addition, the existence of paintings in inaccessible positions may or may not indicate the former presence of ledges used by the artist. There are numerous instances of paintings, in various styles, located high up on smooth rock faces which have probably never had projecting ledges.

At Ubirr (Obiri Rock) two superimposed sorcery figures in polychrome technique are located near the edge of an overhang, at least 7 metres from the rear wall and 10 metres above ground level. A short distance away a large tree abuts the same overhang and indicates an alternative method for applying such paintings. Trees are likely to have a more limited lifespan than rock ledges, and paintings applied from tree branches would become inaccessible in a comparatively short time. The possibility that Aboriginal artists used a long pole or built a platform to reach high rock faces must also be considered. Such structures would be subject to an even shorter lifespan than trees. Even where it is obvious that ledges were used in the execution of paintings, nothing can be said about when these ledges collapsed or, by extension, the age of the paintings.

Chaloupka mentions the existence of several grass prints that might be identifiable as to species. But even if this proves possible and the species is known to produce edible seeds, this will not prove their importance in the past. Indeed, a subject does not have to be an important economic resource for it to be painted frequently. For example, paintings of the Rainbow snake are a much more common motif in 'old' red art than grass prints, but it is doubtful that Rainbow snakes were ever an important food resource.

An alternative explanation for grass prints concerns aspects of Aboriginal ritual activity. Mountford (1956: 214, see plate 62B) mentions the existence of a number of 'increase centres' in the Oenpelli area. He states that similar rituals are carried out at each site and describes one such ritual as follows:

When the Aborigines want to increase the supply of water-snakes in the lagoons they choose the correct season, and standing before the painting, beat it lightly with a bough to hunt out the spirits of the water-snake, directing them meanwhile to go to the various waterholes and there become large water-snakes.

Similar rituals involving the striking of a Dreaming site with small branches or a handfull of twigs, often while singing appropriate verses, have been recorded in many areas of Australia (pers. obs. Victoria River district; see Spencer and Gillen 1899: 172; Stanner 1965: 231; Berndt and Berndt 1970: 143). Such an activity may well be portrayed in Figure 36 (see Plate 15), a scene from the Boomerang Period (ie Chaloupka's 'dynamic figures' style). Whether these grass prints are the result of a similar activity in the past will never be known, but in my opinion it is a more convincing hypothesis than that they represent an important food resource.

The link between grass prints and the 18,000 year old mortars excavated by Kamminga and Allen is untenable on two grounds. First, of three grindstones excavated from levels dated to around 18,000 BP, one has a clear-cut circular, cup-shaped depression, about 10 centimetres in diameter (Kamminga and Allen 1973: 48-49) while the other two apparently have little more than very shallow surface abrasions. One of latter two has ochre stains indicating its use in the preparation of pigments. It is clear from archaeological reports (Kamminga and Allen 1973;

Schrire 1982; Jones 1985), and ethnographic observations (Peterson 1968), that mortars (or shelter floors) with circular depressions were in use in Arnhem Land from the recent past to at least 18,000 BP, if not considerably beyond. From this it is clear that the mortars cannot be correlated with any particular art style or period.

Second, when the type of grindstone in use 18,000 years ago, and in subsequent periods, is compared with the various grindstones observed in use in recent times, the preparation of grass seeds in mortars seems highly unlikely. By far the most common form of grindstone in west Arnhem Land is the mortar with its cup-shaped depression. These are used with a pestle for pounding materials. They are commonly seen on portable slabs, on immovable boulders in shelters, and in the bedrock of shelter floors (eg Plate 48). Portable slabs and shelter floors with elongated grinding hollows are present in Arnhem Land though rare (pers. obs.) and apparently have not yet been uncovered in archaeological deposits in west Arnhem Land.

Peterson (1968: 567-570) observed mortars, and grindstones with elongated grooves, in use in east Arnhem Land. A great variety of foods and other materials were prepared with these grinders, but in that region neither type was used for grass seed preparation, a practice apparently unknown in Arnhem Land in recent times (Golson 1971: 205). On this point, Peterson notes that 'in the desert where seeds are the staples ... grinding as opposed to pounding becomes more important and long mortars are more common than square' (1968: 568). Peterson's observations offer independent confirmation for the statements of west Arnhem Land Aborigines that the circular depressions were used to crush fruits (Kamminga and Allen 1973: 49; Brandl 1973: 3, and 199, documentation for figure 133).

There is no direct evidence of the use to which mortars were put in the distant past. However, if Peterson's (1968: 568) claim that 'the correlation between artefact and associated behaviour [is] strong throughout Australia' is correct, I suggest that in Arnhem Land throughout the past 18,000 years, and probably earlier, the preparation of foods and other materials that required pounding was common but the grinding of foods such as grass seeds was rare or absent.⁹

In sum, the connection which Chaloupka makes between grass prints and the 18,000 year old mortars is untenable. First, there is no proof that the grass used to make the prints had seeds used as a food resource. Second, the grass prints cannot be correlated with the 18,000 year old mortars because identical mortars occur throughout the occupation deposits, and were in use in recent times. Third, by ethnographic analogy, the mortars in question are not the type of grindstone used to grind seeds. In addition, Chaloupka assumes that the presence of grass prints indicates the former economic importance of grass seeds, without giving due consideration to alternative explanations. By ethnographic analogy the act of striking stones or other objects with pieces of vegetation makes reference to the object struck rather than to the material used for striking. Indeed, the distribution of this motif appears to be limited (Chaloupka 1984: 17) and this may indicate a

localised practice rather than a plateau-wide art period. Finally, figures in both the Boomerang Period and the 'Hooked Stick' Period are portrayed carrying branches (eg Figures 36 and 97) and I believe it likely that at least some 'grass prints' are contemporary with these periods (see Figure 30 for an instance where 'grass prints' are much better preserved than adjacent boomerang figures).

6:2 Large Naturalistic Animals and Human Beings

The earliest style described (tentatively) by Brandl (1973: 177) consists of large crudely drawn animals and humans. This undoubtedly equates with Chaloupka's second oldest style of 'large naturalistic animals and humans' (1984: 20-24; see table 3 in 1:4). Large naturalistic paintings of animals, in particular, are common in Arnhem Land rock art but I have seen none where there is any convincing reason to believe that they might pre-date 'early' Mimi figures as a whole.

In terms of relative dating, Chaloupka states that he has found 'dynamic' figures superimposed on 'large naturalistic animals' 32 times. The various problems involved with deducing overlay sequences from superimposed red ochre art have been outlined above (1:2), and there are additional problems in defining this style and placing it in a dated sequence.

Chaloupka's dating attempts appear to have been complicated by an inadequate definition of the style of 'large naturalistic animals and human beings'. It is not precise enough to say that paintings in this style are large and naturalistic. For example, Chaloupka's attempts at absolute dating were initially based on large naturalistic paintings he believed represented megafaunal species that may have become extinct 20,000 years ago (1981: 33; 1982: 4; 1983: 8). Later, in a paper co-authored with Murray (1984), the case was presented for identification of these paintings as extinct megafaunal species and they also argued that other large naturalistic paintings were representations of the dingo (*Canis familiaris dingo*). Murray and Chaloupka (1984: 115) acknowledge that if dingo paintings are present in this style, then the style could have persisted until 'mid to late Holocene' times. The logical outcome of their faunal identifications is that paintings in large naturalistic style were painted, apparently without obvious stylistic change, over a period of 15,000 years or more. It was later shown that the primary data they presented were flawed and the methodology they used to identify the species depicted was inverted (Lewis 1986). Consequently, Murray and Chaloupka's combined claims that megafaunal species and the dingo are depicted in large naturalistic style, and that this style may span a 15,000 year period, are not substantiated.

Even if their identifications did hold up to scrutiny, it would be extremely difficult to accept that one style persisted without recognisable change for up to or beyond 15,000 years. This is especially so when during the same time period styles of human figures changed dramatically, and at one stage large naturalistic paintings of animals were being produced with the particular stylistic features of the highly distinctive 'dynamic figures' style.

Another problem with the chronological position and dates Chaloupka ascribes to this style concerns the material culture items associated with some of his examples. Chaloupka (1984: 24) claims that stick-like human figures associated with this style do not possess boomerangs but use single-pronged and multi-pronged spears, and what he claims might be a fighting pick. In one of Chaloupka's published examples of this style (1977: 248 figure 2a, see also 254 figure 10a), a kangaroo associated with a human figure holding a 'hooked stick' is pierced by a spear that has two knobs on the shaft, a feature that indicates three-piece construction

I have already presented my argument that multi-pronged spears and 'hooked sticks' are first associated with a series of styles and motifs in the 'Hooked Stick'/Boomerang Period, and are found in all subsequent periods. I have also argued that spears with composite shafts are associated only with the two spearthrower periods. Concerning the latter point, a spear identical to that illustrated by Chaloupka is depicted by Mountford (1956: 121 figure 19k) and is shown in use with a spearthrower. In the case of Chaloupka's figure, I suggest that the 'hooked stick' represents a spearthrower and, as I will demonstrate below (7:3), the 'large naturalistic animal' is less than 6000 years old. Even in Chaloupka's own chronology the spearthrower does not appear until after 9000 and possibly less than 7000 years ago.

Apart from material culture items, the only conclusively identified motifs that indicate a possible age for this style are representations of the thylacine (*Thylacinus cynocephalus*; see Figures 55, 56, 63, 64, Plate 20) and the Tasmanian devil (*Sarcophilus harrisii*; see Figures 54, 62, Plate 21). At least one of these animals (*Sarcophilus*) was present in Arnhem Land until circa 3000 years ago (Calaby and White 1967).

I would suggest that, like the category of stick figures, unless large naturalistic paintings are directly associated with a particular distinguishing feature such as a certain material culture item (eg Figure 94), a well defined style of human figure (eg Figure 26), or internal anatomy (Figure 185), they cannot be attributed to a particular dated period with any certainty. Of the examples Chaloupka has published so far, only a few have features that fulfill any of these requirements. All of these are associated with material culture items that post-date Chaloupka's 'dynamic figures' style and at least one appears to be contemporary with the spearthrower which, in Chaloupka's scheme, is restricted to his estuarine period.

In sum, the style of 'large naturalistic animals and humans' is ill-defined and it may actually consist of a number of similar styles present throughout the entire sequence of Arnhem Land art. An alternative, and in my opinion, more likely probability is that most of the 'large naturalistic style paintings' of the type that Chaloupka has published post-date 'early' Mimi art and predate early X-ray art. That is, they are restricted to the 'Hooked Stick' Period and the early stages of the Broad Spearthrower Period.

6:3 Yam Figures

Chaloupka's 'large naturalistic animals and human beings' style is followed in chronological order by 'dynamic figures', 'post-dynamic figures' and 'simple figures with boomerangs'. He offers no direct evidence to date these styles; they are assigned an indeterminate position between 20,000 and 9000 BP.

Chaloupka (1984: 34, 41-42) links the appearance of 'yam figures' with the latter stages of the post-glacial marine transgression. He proposes several hypotheses for associating the 'yam figures style' with this event. According to one hypothesis, Aborigines who reoccupied the north Australian continental shelf during the glacial maxima may have come into contact with their 'New Guinea neighbours' for whom wild yams may already have had 'considerable importance'. The Aborigines may have adopted traditions associated with yams and when later forced to retreat by the post-glacial sea level rise they may have carried these traditions back to Arnhem Land. There, they painted yam figures which may 'be considered as the expressions of an earlier "yam civilisation"' (1984: 41-42).

Another hypothesis is that people forced off the 'grasslands' by the rising sea may have adopted yams as a replacement for carbohydrates which they formerly gained from grass seeds.

In Chaloupka's third hypothesis he notes that 'yam figures' are commonly associated with depictions of an animal-headed Rainbow snake. Because of its present-day association with rain and floods, Chaloupka links the appearance of the Rainbow snake, and by extension the yams, to social disturbances caused when the coastal plains were flooded by the post-glacial marine transgression.

In Chaloupka's fourth and final hypothesis, yams appeared or became much more plentiful in Arnhem Land when the marine transgression caused an increase in precipitation.

The first hypothesis is complete speculation and does not merit a response. The second hypothesis is also speculative but in this instance, I will note several relevant facts. First, it is not known if there were ever 'grasslands' in Arnhem Land. It is also unknown whether grass seeds were ever a carbohydrate source in the diet of Arnhem Land Aborigines, or whether seeds were replaced at some stage with yams.

Yams may be present in rock art for reasons other than their economic importance. Indeed, yams could be present in rock art when they are not an important economic resource at all. Like totemism, yams, or other motifs, may be 'good to think' rather than good to eat (Levi-Strauss 1963: 89). A case in point is the Kulama ritual on Bathurst and Melville Islands. The focus of this ritual concerns the only yam species on the islands that is highly toxic in its raw state. This yam (*Dioscorea bulbifera*; Mountford 1958: plate 44D) is, in fact, the predominant species depicted in the Rainbow snake complex of paintings. Normally it takes at

least one day to render this yam non-toxic (Levitt 1981: 136-37). In the context of the Kulama ritual it takes three days of elaborate preparation before the yam is safe to eat and it is only consumed during this ritual (Mountford 1958: 130-143; Goodale 1982: 205). Yams may have been important in the Rainbow snake complex of Arnhem Land paintings, not because they were a staple in the diet, but because, among other reasons, they provided food for large ceremonial gatherings. This latter point takes on greater significance when the probable function of the associated Rainbow snake motif is considered (see 7:2).

Chaloupka's third hypothesis linking the appearance of Rainbow Snakes in the art with sea level rise has some merit, but needs qualification. I believe that the inspirational factors suggested by Chaloupka — floods, storms, rain, etc. — are at best only indirect aspects to the development of this motif. The motif Chaloupka is talking about is the Rainbow snake **in animal-headed form**. Representations of what may reasonably be considered to be the precursor to the composite Rainbow snake are present in the Boomerang Period when, according to Chaloupka's scheme, floods were not of particular concern (eg Figure 37). In fact, at European contact, the concept of a Rainbow snake in **ordinary** snake form was virtually Australia-wide (Berndt and Berndt 1964: 209), a circumstance that may indicate considerable antiquity for this belief.

The idea of the Rainbow snake as an animal-headed or more complex being is found throughout the northern part of the Northern Territory, including the Victoria River district to the west, and extends into Queensland as far as Mornington Island (Memmott 1982), but a recent claim that a rock engraving in south-east Cape York represents an animal-headed Rainbow snake (Flood 1987: 115-16) will require the discovery of other examples in the area before acceptance. The elaboration of the Rainbow from ordinary snake form to composite snake **can** be linked by inference to the marine transgression, but not for the reasons suggested by Chaloupka. In a later chapter I present a detailed analysis of the appearance and probable function of the composite Rainbow snake.

Chaloupka's fourth and final hypothesis is the most compelling as it has a direct basis in scientific fact. There is sufficient detail in the art for the majority of yams in the Rainbow snake complex to be identified as the 'round yam' *Dioscorea bulbifera* (cf. Figures 142-145 with Figure 153). The 'long yam', *Dioscorea transversa*, may also be represented. During the arid glacial period these species may have been restricted to favourable localities. As Chaloupka states, they are only likely to have become widespread during the post-glacial period when annual rainfall increased above 120 cm. Unfortunately, Chaloupka does not provide a time scale for when rainfall may have reached this level, other than that it occurred during the period of sea level rise (ie between about 16,000 and 6000 years ago). As I will show, a more precise estimate is possible (see 7:2).

6:4 Estuarine Period

The period which Chaloupka (1984: 54) identifies as estuarine, is stated to have begun 6000-7000 years ago, although on his chronological table the dates he provides are 7000-9000 B.P. (ibid: 16). He contends that the beginning of this period is marked by the introduction of naturalistic paintings, apparently with simple X-ray features, although this is not made clear (ibid: 43, figures 20a, 20c; see also Chaloupka 1983: 28, figure 1.7).

This 'early X-ray convention' developed into the 'Descriptive X-ray' style in which the internal organs and bone structure are depicted in a realistic manner. This style in turn developed into 'decorative X-ray', though the 'descriptive' form continued to be produced. Other styles were painted during the estuarine period but these are not described in detail.

Chaloupka (1984: 42) contends that the estuarine period begins 'with the first appearance of paintings representing animal species introduced into the region as the sea rose to its present level'. He argues that some 'pre-estuarine' species were forced to move inland or became extinct at this time (ibid: 42, 54). The species Chaloupka identifies as 'estuarine fauna' include the barramundi (*Lates calcarifer*), mullet (*Liza diadema*), lesser salmon catfish (*Hexanematichthys leptaspis*), and the saltwater crocodile (*Crocodylus porosus*). He claims that they are depicted only in this style.

A second reason he gives for assuming this age for X-ray art is based on the appearance of stone points in Arnhem Land archaeological deposits 4000 years ago. Chaloupka claims that spears bearing these stone points are first depicted in the 'descriptive' X-ray style.

The claim that estuarine species were first depicted in the art when estuarine conditions developed in the region is based on two assumptions. One assumption is that cultural change is congruent with environmental change: a change in the environment will be reflected in a change in the rock art styles and/or motifs, and that dates for environmental change thereby provide dates for cultural change. This is an assumption which requires testing before acceptance. A similar assumption was made by Schrire in an early report on her excavations in west Arnhem Land. Initially, Schrire correlated the appearance of estuarine shell middens with the introduction of points and other types of small stone tools. In a recent reanalysis (1982: 239) she found her original conclusion to be wrong and states that 'there is no absolute correlation between the first appearance of the estuarine middens and this particular cultural assemblage'.

The other assumption is that Arnhem Land rock art is an all-inclusive record of Aboriginal experience and concerns. As an example that this is not the case, Brandl (1973: 172) pointed out that although boomerangs are used as ceremonial objects in Arnhem Land today they are not depicted in X-ray art and other recent styles. Other examples are not difficult to find. In this context it should be noted that with

the exception of the thylacine and the Tasmanian devil, both extinct throughout mainland Australia, every conclusively identified species in Chaloupka's 'pre-estuarine' period is available in Arnhem Land today. Chaloupka's argument seems to be that because estuarine species were not depicted in pre-X-ray styles, they were not present in the environment.

The use of the term 'estuarine' with regard to the species depicted in the 'estuarine period' is something of a misnomer. All of the 'estuarine' species Chaloupka mentions also live in fresh water for long periods; saltwater crocodiles, barramundi, and lesser salmon catfish (as well as sawfish) are commonly found over 150 kilometres above the tidal limit (pers. obs). Indeed, at least one of these species (ie the barramundi) spends a major part of its life-cycle in freshwater environments (Lake 1971: 31). Long before the advent of estuarine conditions in west Arnhem Land, Aboriginal people living there were likely to have had access to most of the 'estuarine' species mentioned above.

My second concern is Chaloupka's claim that stone points, spearthrowers and estuarine species are depicted only in X-ray art. First, it appears from Chaloupka's chronology of styles that he does not recognise an equivalent to Brandl's (1973) 'late' Mimi art (see 1:4). Brandl demonstrates conclusively that figures **with** boomerangs but without spearthrowers ('early' Mimi) are followed (with marginal overlap) by figures **without** boomerangs but possessing spearthrowers and a range of new spear types ('late' Mimi). According to Brandl, among the new spears is the apparently stone-tipped variety mentioned by Chaloupka. At the beginning of Brandl's 'late' Mimi period (phase 1), none of the human figures or animals have any type of X-ray feature and the species depicted are predominantly land animals. Incipient and simple X-ray features only appear late in this phase. With minor qualifications, my own observations confirm this part of Brandl's chronology. Second, 'estuarine' species are depicted in styles that pre-date X-ray art (pers. obs.; Tacon 1987: 46).

By comparison, Chaloupka's scheme has 'simple figures with boomerangs', followed by 'yam figures'. After 'yam figures' there is the sudden appearance of animals and humans with X-ray features and the changes in weaponry described above. There is no mention in his scheme of a period or style in which human figures have spearthrowers, and spears with leaf-shaped points, but do not have X-ray features. Likewise, there is no suggestion that X-ray features developed from incipient and very simple forms.

Lastly, Chaloupka's (1984) date of 4000 years for the appearance of stone points is at least 1000 years too young. Several studies cited above (5:2) have concluded that stone points first appeared around 5000 years ago. Neither Chaloupka nor these researchers had available the recent work of Jones and Johnson (1985: 206), in which they present evidence that stone points first appeared at least 5500 years ago, and possibly around 6000 BP.

On the basis of this evidence I would suggest that figures depicted carrying possible stone-headed spears precede the appearance of X-ray art. In contrast to

Chaloupka's dates of 6000 to 7000 BP, the evidence indicates that X-ray art must be considerably less than 5000 years old. There are other lines of evidence in support of this contention which I will present below (7:3 and 7:4).

6:5 Freshwater and Contact Periods

According to Chaloupka (1984: 49) the dominant style in the estuarine period, the freshwater period, and the contact period is X-ray art. The only difference between these 'periods' is in the introduction of representations of freshwater species and, later, of Macassan and European subject matter. No-one can deny the link between depictions of contact items, and available historic and archaeological documentation.

With regard to Chaloupka's claim that there are separate estuarine and freshwater periods, I have already discussed the fact that his 'estuarine' species may also be regarded as freshwater species. I believe that the pre-estuarine/estuarine division in the rock art is an incorrect interpretation of the evidence and that the changes in the art actually reflect the development of the present-day wetlands. In other words, **there is no estuarine period documented in the rock art**. Further evidence in support of this argument is presented in the following chapter.

7 POST-GLACIAL SOCIAL STRATEGIES and ECOLOGICAL CHANGE

Rock art in Arnhem Land demonstrates both continuity and change through time. Rich ethnographies, comprehensive archaeological and environmental studies, and information from Aboriginal people on aspects of traditional life are now available to help analyse and date the most recent period of art, but this is not the case for older periods of rock paintings. Here, analysis and dating of changes in the art depend largely on inferences concerning social strategies developed in response to variations in sea level, and the resulting changes in environment and landforms. Dated cultural and faunal remains provide some information, but the older the period, the more basic is the archaeological and environmental data. As a consequence, hypotheses concerning the analysis and dating of earlier periods of art are less testable at this time.

The analysis I present here emerges from the same set of theoretical concerns as analyses of European Palaeolithic art such as those presented by Conkey (1978), Gamble (1982; 1983), and others. That is, I see art as part of an integrated information system, other aspects of which have either not survived or are difficult to recognise archaeologically. Information systems, in this theoretical model, are both determined by, and constitutive of, social strategies of adaptation to particular ecological systems; style can be interpreted as a marker of social identity.¹⁰

For several reasons the analysis of Arnhem Land rock art cannot be identical to the analysis of European Palaeolithic art. Gamble's (1982) excellent analysis of portable art objects cannot be applied uncritically to Arnhem Land because the surviving art in this region is non-portable; it cannot serve as a mobile identity marker. In addition, Gamble contends that the appearance of the Venus figurines among the earliest known artworks may indicate the emergence of specific social forms of alliance. His contention is tenable given the 30,000 BP dates he is working with, but, as I will show, the oldest surviving rock paintings in Arnhem Land are likely to be far younger. Therefore, in hypothesising that Arnhem Land art carries information about systems of social strategies, it is important to bear in mind that the systems under consideration would have developed long before the existing rock art was created. A further point is that in analysing Arnhem Land art there is a good case for the use of ethnographic analogy. This is so in large part because Australian prehistory is marked by continuities of traditions.

At the most general level, theoretical models developed with reference to European Paleolithic art are likely to have world wide application, in spite of the differences in the type of art, the time frame, and the strength of continuities. Indeed, the analysis presented here suggests ways in which European models may be refined.

It has been claimed that some paintings may predate those that I have defined as constituting the Boomerang Period (Brandl 1973: 177; Chaloupka 1984: 17). This may eventually be proven correct, but at this time the styles in question remain ill-defined (see 6:2). A few published examples have features that indicate a relatively recent time period but generally speaking, their position in the chronology of Arnhem Land art is unclear. Therefore, I will begin my analysis with the earliest well-defined styles of paintings: those in the Boomerang Period.

7:1 The Boomerang Period

There is no subject matter unique to the art of the Boomerang Period that can be correlated with other data of known age. Representations of *Sarcophilus harrisii*, extinct on the Australian mainland, are present in the art of the Boomerang Period (eg Figures 54, 62) but *Sarcophilus* is also depicted in the art of two subsequent periods, and fossil remains of this species have been found in Arnhem Land in 3000 year old deposits (Calaby and White 1967). Thus, there can be no direct correlation between the date of the fossil and depictions of this animal in the art of the Boomerang Period. The same situation applies to another animal extinct on the Australian mainland, the Tasmanian tiger or thylacine (*Thylacinus cynocephalus*), with the exception that fossil remains of this species have not been found in Arnhem Land.¹¹

In Arnhem Land rock art, depictions of the boomerang only occur in early styles; it is absent in recent styles and was not made or used as a weapon in Arnhem Land at European contact. Although the boomerang is known to have an antiquity in southern Australia of 9-10,000 years (Luebbers 1975: 39) neither the antiquity of the Boomerang Period of rock art nor the timing of the boomerang's disappearance from Arnhem Land art can be deduced from the subject matter of the period. The only feature of the Boomerang Period that provides circumstantial evidence for its age is the distribution pattern of the dominant style of boomerang figures.

The main style of boomerang figures appears to be found throughout the Arnhem Land plateau (pers. obs.; Chaloupka 1984: 24-25). The only area where their presence is in doubt is in the south-eastern corner of the region, an area for which no reports are available. Wherever they occur, the dominant type of boomerang figure exhibits a great similarity in style, themes, painting techniques, and material culture. There are hints of a difference between some of the figures in the west (Alligator Rivers) and figures in the east (Cadell River) but the eastern sample is too small for meaningful statements to be made at this time. Even if there should prove to be a difference, boomerang figures stand in marked contrast to human figures from subsequent art periods which usually exhibit regional variation, particularly in form and painting technique (see 7:3 and 7:4).

Brandl (1973: 176) suggested that the uniformity of style and widespread distribution of the main type of boomerang figures may reflect 'a long period of established tradition'. To this one could add: a period of relative social and cultural

stability. Relative social stability may have been achieved subsequent to sea level rise, but evidence from other art periods indicates that boomerang figures substantially predate sea level stabilisation (see below). It seems certain that the progressive loss of land caused by the post-glacial marine transgression created unprecedented stress among coastal and near-coastal societies. If this was the case, then a period of relative social and cultural stability that might have produced boomerang figures is only likely to have occurred before the full effects of post-glacial sea level rise began to be felt among the societies then living in the Arnhem Land plateau area.

There are at least two inter-related hypotheses in support of this contention. One hypothesis concerns the relationship between the size of the territory inhabited by a socio-linguistic group and prevailing ecological conditions. The other concerns the regional socio-economic strategy appropriate to particular ecological circumstances.

With regard to the first hypothesis, the suggestion here is that during the Boomerang Period there were fewer socio-linguistic groups in Arnhem Land and that each group occupied a much larger territory than the societies of subsequent art periods. This hypothesis is based on the correlation between territory size and rainfall, demonstrated by Birdsell (1953).

In Arnhem Land during the glacial maxima, climate and vegetation are believed to have approximated that now existing in the semi-arid country between Daly Waters and Tennant Creek, 400-600 kilometres south. If so, water supplies and food resources are likely to have been much more limited and less reliable than in most of the Holocene. It is generally accepted that in Australia the size of a hunter-gatherer territory is a function of resource availability and reliability (Birdsell 1953, 1968; Tindale 1974). This hypothesis works on the principle that there is an optimal size for hunter-gather socio-linguistic groups, and that environmental changes are adapted to by altering the size of the territory rather than altering the size of the group. Stated succinctly, the hypothesis is that if technology and level of socio-cultural integration are held constant, increased carrying capacity of the land will result in smaller group territories while decreased carrying capacity will result in larger territories (Birdsell 1968: 233; Steward 1973: 156, 170-171). In ethno-historical times in Australia this optimal group size appears to have been in the order of 450-500 people (Tindale 1974: 31). This number is not 'fixed', but rather is a 'central tendency'; significant variations may occur in particular circumstances (Birdsell 1968: 246). On this basis it is reasonable to hypothesise that during the glacial period the territories of socio-linguistic groups in Arnhem Land were much larger than those of recent times, and probably approximated those of the Tennant Creek-Daly Waters area at the time of European contact.

By comparing a modern socio-linguistic area from the Tennant Creek-Daly Waters region with one from Arnhem Land, an idea of the possible order of magnitude difference can be gained. For example, according to Tindale (1974: 236) the lands of the Tjingili, between Daly Waters and Tennant Creek, cover 15,300 square

kilometres while those of the Kakadu, near Oenpelli, encompass 6000 square kilometres (ibid: 228; see map 5).

From this comparison it is apparent that the area within which boomerang figures are found could be encompassed by one large inland territory, or it could overlap a number of territorial boundaries. This latter possibility is discussed below, in relation to the second hypothesis.

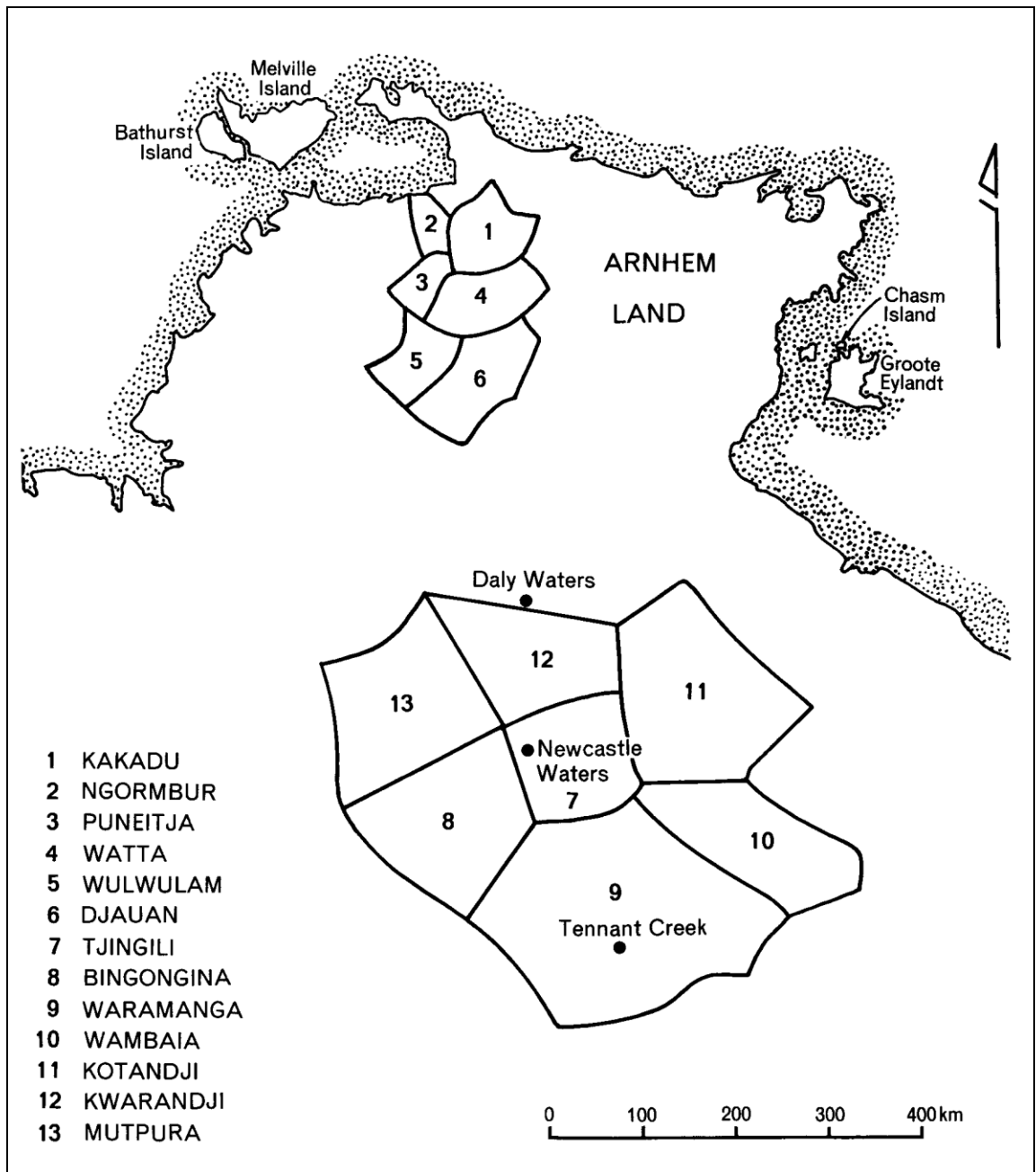
The second hypothesis concerns the socio-economic strategy developed by Aborigines to enable them to survive in arid and unreliable environments. In the words of Yengoyan (1976: 127):

Populations in harsh environments, which are characterised by spatial and temporal variations in resources, require mechanisms by which all local groups are reciprocally linked to promote interaction and mobility over vast areas of highly limited resources.

Such a strategy was a necessary precondition for social reproduction and survival in the harsh and unpredictable environmental conditions in arid Australia (Yengoyan 1976: 125; Gould 1980: 106; Myers 1986: 95-101). One way to achieve this aim was to emphasise similarity rather than difference. In contrast, in regions where water and food supplies were reliable and abundant, alliance strategies were still formed, but the range of social links was more circumscribed and greater emphasis was placed on the identity of the local socio-linguistic unit (Yengoyan 1976: 127; Gould 1980: 105-107).

Given the demonstrable cultural continuities in Australian prehistory (Jones 1973: 280-81; 1975: 28; Mulvaney 1975; Hallam 1987: 55-73), it is reasonable to hypothesise that during the glacial period similar socio-economic strategies prevailed in Arnhem Land and other arid regions. It can thus be envisaged that 16,000 to 20,000 years ago, people in Arnhem Land are likely to have emphasised regional integration rather than differentiation. One way to do this would be to adopt similar visual markers, in this case, similar styles of painted figures in rock art.

This hypothesis may well explain the striking parallels between Arnhem Land boomerang figures and the classic form of Bradshaw figures found in the Kimberley region, over 600 kilometres away (see Crawford 1968: illustrations 65-68, 71 and 73; 1977: 360, figure 6). While by no means identical, both sets of figures are characterised by the presence of large headdress, 'dancing skirts' and other ceremonial paraphernalia, the use of hand thrown spears and boomerangs, fine line control, the sole use of red pigment, and the arrangement of many figures into complex, composed scenes that express similar themes (see Brandl 1973: 185-86 for a formal comparison of these two art styles). Both styles exhibit great uniformity throughout their known ranges (Brandl 1973; Crawford 1977: 359).



Map 5. Tribal boundaries from Tindale (1974), showing relative size of territories between Daly Waters/Tennant Creek region and western Arnhem Land region.

In suggesting that the similarity of art style and content in both regions may be the result of an information network that extended between both regions, it does not necessarily follow that an individual or group in one region had direct interaction with an individual or group in the other, although this could have been the case. The extended information network of each group overlaps with the information network of others in such a way as to form the equivalent of a biological cline. Just as neighbouring populations of species may vary subtly and more widely separated populations may vary substantially, an art style expressing social

identity within an extended information network could be expected to vary over long distance.

During recent field work in the Victoria River valley which lies between Arnhem Land and the Kimberley, motifs were found that bear an affinity with certain figures in Arnhem Land Mimi art (Lewis 1984). These motifs were located on strata of silicified sandstone similar to the rock type found in the Mimi art and Bradshaw art areas. The comparative rarity of this rock-type between Arnhem Land and the Kimberley is a primary reason why Bradshaw/Mimi figures have not previously been reported from this area. The motifs recorded do not provide a conclusive link between Bradshaw figures and 'early' Mimi figures. However, it seems likely that with further field work human figures that constitute a stylistic 'missing link' will be found and the hypothesis of an extended information network between Arnhem Land and the Kimberley strengthened.

Two other points are relevant. First, Peterson (1976) suggests that, generally speaking, drainage basins largely determine regional culture areas. Second, Tindale (1974: 81) and Mulvaney (1976: 84) point out that in drier areas, lines of communication followed water courses and river junctions were the standard meeting places. During the height of the arid glacial period, rivers flowing out of the eastern Kimberley (Bradshaw art area) and out of the south-west corner of the Arnhem Land plateau (Mimi art area) joined a common ancestral stream (Fairbridge 1953; Van Andell *et al* 1967: 743, figure 5). This river system would have provided an easy and relatively direct link between the two regions (see map 4).

With regard to the possible extent of information networks during the glacial maximum it should be noted that the styles in question actually overlap into neighbouring drainage basins (see maps 3 and 4). This indicates that information networks may have extended far beyond the Arnhem Land/Kimberley region.

Both of the hypotheses outlined above point to the glacial period, but I am not suggesting that paintings of boomerang figures now seen on the rock faces of Arnhem Land necessarily date from the height of the glacial period, 16,000 to 18,000 years ago. Although the paintings appear to reflect a social organisation developed during the arid conditions of the glacial period, it does not necessarily follow that the paintings that survive on the rocks are that old.

Glacial aridity is believed to have prevailed until after 10,000 BP, so that the particular social structure that the distribution of boomerang figures reflects may have persisted into the early Holocene. Therefore, some of the paintings that survive on the rocks are likely to be as recent as 9000 or 10,000 years. Undoubtedly, differences occur in the preservation of paintings from one shelter to another. Possibly some boomerang figures are some thousands of years older than others, but if circa 9000 years is accepted as a minimum date, then to suggest that some boomerang figures may be up to 18,000 years old leads to two conclusions. First, some boomerang figures must be up to twice as old as other boomerang

figures and second, figures in this style were produced without obvious change for up to 9000 years.

The fact is that at this time, neither of these conclusions can be proven or disproven. Ongoing work on a variety of mineral coatings (Watchman pers. comm.; see Hughes and Watchman 1983: 63-77; Watchman 1985: 281-89; Watchman 1987) may eventually provide a means for dating this period (see 5:4), but at this time any claim that some boomerang figures have survived on the rocks for 18,000 years, or that one style persisted for up to 9000 years, is speculation.

In sum, the Boomerang Period is dominated by a style of human figures that Brandl termed 'early' Mimi and which Chaloupka termed 'dynamic figures'. Stencils are another important component of this period. Boomerang figures appear to be the artistic end-product of a social organisation that had its origins in the arid conditions of glacial times. The upper age limit of the boomerang figures now seen on the rocks cannot yet be defined, but it should be noted that the only extinct species depicted during this period are the Tasmanian devil and the thylacine. Both of these animals are believed to have died out in late Holocene times. Because rainfall increased significantly after 10,000 BP, the lower age limit of the Boomerang Period is likely to be in the vicinity of 9000 years BP. Analysis of the subsequent 'Hooked Stick'/Boomerang Period, presented below, lends support to this contention and also shows that age estimations are more complex than a simple one to one correlation of style change with increased rainfall.

7:2 The 'Hooked Stick'/Boomerang Period

The 'Hooked Stick'/Boomerang Period encompasses two inter-related but distinct stylistic units: an array of regionally distinct styles of human figures, and a relatively homogeneous set of paintings comprising the Rainbow snake complex. Both have been described above (chapter 3).

The regional differentiation of human figure styles in the 'Hooked Stick'/Boomerang Period appears to indicate an increased social concern with local territories and a lessened interest in extended information networks. Other aspects of the 'Hooked Stick'/ Boomerang Period appear to indicate inter-group stress and the development of social mechanisms for stress control.

Inter-group stress is implied, to some degree, by the very existence of regionally differentiated art styles, but it is also apparent in aspects of the 'hooked stick' figures themselves. For example, as described in 2:8, some 'hooked stick' figures are placed face to face with their weapons opposed. Others appear to be holding their 'hooked sticks' in a non-threatening manner. Both features are present in a group of over 35, all the members of which wield a boomerang, a 'hooked stick', or both (Figures 78, 79 and 80; Plate 27).

The significance of depicting weapons being held in what seems to be a non-threatening position may be to indicate dispute avoidance. In Central Australia, for

example, there are rituals to facilitate the coming together of groups of strangers. The groups approach each other fully armed, but they hold their spears with the points facing away from the oncoming group and other weapons are held in a non-threatening (ie non-functional) manner (pers. comm. Dick Kimber).

The appearance of regional differentiation in the art is, of course, directly connected with the hypothesis outlined in the analysis of the Boomerang Period. The extended information networks implied by the distribution of boomerang figures are likely to have persisted until some time after 10,000 BP, when rainfall increased significantly and environmental conditions improved. As conditions improved, local populations would have increased until the existing system of social organisation, designed for a population thinly spread over a large area, could no longer function efficiently. At this point the societies reorganised and divided, perhaps along existing social divisions (e.g. clans), and formed viable social groups focused on smaller land areas with an increased emphasis on local identity. In analytic terms, this may be seen as a change from a regional polity with diffuse principles of recruitment to localised polities with limited principles of recruitment.

The combination of ecological improvement and population growth may alone have been sufficient reason for social and hence artistic differentiation. But stylistic differentiation is only apparent among human figures. Depictions of composite Rainbow snakes which, on the evidence of associated material culture items are part of the 'Hooked Stick' Period, are not regionally differentiated. In this instance, a different function seems to have been involved. There is reason to believe that events late in the 'Hooked Stick' Period led to an elaboration of a pre-existing myth complex into the concept of the composite Rainbow snake. These events, occurring as a direct consequence of the post-glacial marine transgression, are outlined below.

I have already described the environmental conditions that are believed to have existed in Arnhem Land during the glacial period, and suggested some of the social strategies that may have been adopted at that time: arid conditions necessitated large group territories and an emphasis on regional integration rather than regional differentiation.

At the level of the local territorial unit modern ethnographies suggest that in arid environments different land use strategies were adopted according to local factors. In certain favourable riverine areas, people remained more or less permanently based on waterholes along the rivers, only exploiting hinterland resources after rains (eg Tindale 1974: 60). Such riverine conditions are relatively uncommon in arid Australia. During wet periods in non-riverine areas people might initially congregate for social reasons, but as local food resources were consumed they usually dispersed to take advantage of abundance in other areas. As the less reliable waters dried up people were forced to congregate at key waters (eg Strehlow 1965: 124; Gould 1968: 104-105; Yengoyan 1970: 83; Tindale 1974: 65). The bottom line of both riverine and non-riverine land-use strategies was that people were forced to congregate at key waters during periods of maximum

dryness and could only disperse if rains had replenished less reliable water sources in the hinterland of their territories. The practical constraints of aridity virtually enforce such a land-use strategy and it is highly likely that a similar pattern of land-use existed in Arnhem Land during the glacial period.

From about 16,000 BP the glacial icecaps began to melt and sea level to rise. A common and simplistic view is that the rise in sea level forced coastal peoples inland because their lands and resources were being visibly submerged (Blainey 1975: 89-91; Mulvaney 1975: 136). This view has been challenged by Bowdler (1977) who suggests that the rise may have created more shoreline, and hence more food resources, but she does acknowledge that areas with 'a wide shallow offshore profile' may have been more adversely affected than other areas (ibid: 212).

There can be little doubt that in areas such as northern Australia, where the continental shelf is very broad and has an extremely gentle slope, the effects of sea level rise were highly complex. It was not a simple case of uniform coastline retreat. While vertical rise of sea level may have been fairly uniform, lateral movement would have varied significantly according to the configuration of the landscape being submerged.

At a broad level, areas such as Arnhem Land and the Kimberley were cleaved apart as the sea flooded what is now Bonaparte Gulf (see map 4). As the sea rose, Arnhem Land in particular suffered land loss from three directions which must have severely compounded the stresses experienced by human populations in that region.

At a more detailed level, lateral advance of the sea may have been slowed because of rises in topography; at other times sea water may have advanced very quickly across flat areas. Undersea mapping in the Arafura and Timor Seas shows major rises that must have formed large peninsulas and islands as the sea rose (Fairbridge 1953: 4-7; Van Andell *et al* 1967: 741-45, 752-54, figure 9). It is not known whether human populations became stranded on some of these islands, only to perish as the land was engulfed, or if there were at times large and sudden population shifts inland as the inevitable fate of the land became obvious. It seems likely that both possibilities eventuated.

Without denying the impact that loss of land and shifts of population are likely to have had, I suggest that the loss of long stretches of river valleys was particularly stressful for coastal and near-coastal peoples. The relatively low gradient of the Arnhem Land rivers ensured that as the sea rose, long stretches of the valleys were flooded very quickly and tidal influence was likely to have extended a considerable distance inland. At the present time, for example, the tidal limit on the South Alligator River is over 100 kilometres from the coast.

Recently documented cases of salt water ingress to freshwater environments in west Arnhem Land (Stocker 1971; Jones 1985: 114-115, 123, 125) indicate that the influx of salt water into the South Alligator and other Arnhem Land rivers would

have had immediate and drastic effects on the riverine environment. Freshwater vegetation, including food species found in the water and on the river banks and flats, would no longer have been available. Much of the freshwater fauna would have died out, eventually to be replaced by estuarine species, but populations of many of the land animals would have diminished once their habitats and supplies of freshwater disappeared.

Riverine populations, possibly up to 100 kilometres from the coast, would have experienced major stress because of the influx of salt water into the river valleys well ahead of the general coastal encroachment. Such groups, formerly living more or less in equilibrium with their resource base, lost not only major food resource areas but also their major river-based freshwater sources. As increasingly higher tides brought saltwater into freshwater reaches, the initial result was probably only slightly brackish water. However, towards the end of any prolonged dry period, falling water levels in the river waterholes would significantly increase salinity levels, eventually beyond human tolerance. People who might customarily have relied on the river waters during such dry periods would eventually have found they could no longer do so.

As the sea encroached upon the territory of each consecutive group, there was likely to have been at least seasonal movement upriver to gain access to adequate freshwater and food supplies. This in turn would have created stresses between the inland 'freshwater' groups and the newly created 'saltwater' people, even if there were pre-existing social ties to which the 'refugees' could appeal. It is not difficult to imagine the problems that would be created if, at the height of the dry season when food and water resources are scarcest, an entire local group was forced to congregate in a highly restricted portion of its original river frontage or to move into the territory of another group further upstream. Eventually, of course, as sea level continued to rise, water sources would have become undrinkable throughout the year and the ability of a given section of river valley to sustain a human population would have been severely reduced.

In essence, the salt water invasion would have paralleled the effects of drought. Enforced movements of people into neighbouring territory because of drought have been documented by Tindale (1974). Where people were forced into the territory of others with whom they were already related through marriage he states that 'the cross-tribal kinship links established thereby often prevented large-scale quarrels' (ibid: 34). However, in one instance of people being forced into the territory of strangers, Tindale observed that:

men had to buy temporary respite for themselves by giving women in marriage. Not all managed to be so fortunate — some lost their lives as well as their wives to the more securely situated people. (ibid: 71).

If the hypothesis of enforced movement up the riverine corridors is correct, it would have begun to occur virtually from the moment that the sea began to rise, circa 16,000 BP, until it approached its greatest intrusion inland. Whether it occurred continuously or in episodes would depend upon how uniform the sea

level rise was, and on the configuration of the river valley floor. Steep sections would slow the advance for a time, and flat-lying sections would be flooded very quickly.

There is no way of knowing how far inland from the coastline and with what intensity such stresses may have been felt at any given time. However, according to Willensky (pers. comm.), the prior valley in the modern reaches of the South Alligator River appears to have had a very flat bed so that the flooding of this section, about 8000 years ago, is likely to have been quite rapid. Consequently, estuarine conditions must have appeared and concomitant social stresses must have been felt in the Arnhem Land plateau country by about 8000 BP, well before sea level actually stabilised at around 5800 BP.

The social effects of the post-glacial marine transgression may be summarised as causing more or less continuous stress on coastal and riverine populations through loss of land, loss of at least some resources, and loss of key waters. This in turn is likely to have necessitated seasonal and later permanent movement inland, inevitably into the territory of neighbouring groups. Such movement may well have followed existing social networks but is, nevertheless, likely to have caused inter-group as well as intra-group tensions.

It cannot be known with certainty how people would have managed the effects of sea level rise. Various scenarios have been suggested, ranging from mass migration (Chaloupka 1984: 41) to warfare (Blainey 1975: 91). Mulvaney (1975: 136) suggests that the stresses this event imposed upon Aboriginal societies probably necessitated 'adaptive efforts' and a 'consolatory philosophy', although 'conciliatory' is probably a more appropriate term.

I believe that the appearance of depictions of the composite Rainbow snake, that is, a 'snake' that incorporates parts of a number of animal species, reflects such a conciliatory philosophy. My contention is based on Taylor's (1987b) analysis of the cultural context of depictions of composite Rainbow snakes in west Arnhem Land bark paintings.

Taylor (1987b) analysed modern representations of the Rainbow snake that incorporate parts of different animal species. He found the composite Rainbow snake to be of central importance in the cosmology of Arnhem Land Aborigines, and to be the focus of the most important rituals performed in the region. His analysis of the particular form in which the Rainbow snake is depicted suggests that the various animal parts represent totemic affiliations of different clan groups throughout the area (1987: 10). In this form the Rainbow snake symbolises the possibilities of alliance among clan groups; it is a means of inclusion, a counter-balance against tensions that tend to fragment larger social groups.

Arnhem Land rock art documents the concept of the Rainbow snake as a composite being, from the 'Hooked Stick'/Boomerang Period to the ethnographic present. Rock paintings that Arnhem Land Aborigines identify as the Rainbow snake occur in the earlier Boomerang Period (eg Figure 37; see Brandl 1973: 181), but these

are not composite representations. The most recently recorded rock painting of a composite Rainbow snake was produced in about 1965 (Brandl 1973: 124, plate 14). Although rare in recent styles of rock art, the motif is still commonly produced on bark paintings (see Brandl 1973: figure 151 and relevant documentation; Aboriginal Arts Board 1979: 62-67) and on that medium it appears to have undergone an increased elaboration in very recent times (Taylor 1987a: 274).^{12, 13}

Given the demonstrated continuity of composite Rainbow snakes in the art, I believe it is reasonable to hypothesise that the early rock paintings of this being document rituals that fulfilled a similar function to the rituals of the present time. That is, they document the existence during the 'Hooked Stick'/Boomerang Period, of rituals which promoted alliance among local groups (alliance rituals). The importance of yams (*Dioscorea bulbifera*) within the Rainbow snake complex may be related to the need for large quantities of food to facilitate such rituals, and may also have been valued for symbolic reasons.

The existence of 'alliance' rituals during the 'Hooked Stick' Period would offer an explanation for the plateau-wide stylistic uniformity of motifs in the Rainbow snake complex when compared to the 'hooked stick' figures. Whereas social difference is symbolised by regional differentiation of styles of 'hooked stick'/boomerang figures, the Rainbow snake complex of paintings symbolises the counter-balance to social differentiation: social alliance. This would also explain why regionally differentiated styles of human figures have not been found directly associated with the Rainbow snake complex. A visual representation of alliance would be an inappropriate context in which to draw attention to social differences.

I have already suggested a loose estimate of about 9000 BP for the change from boomerang figures to 'hooked stick' figures, and suggested that environmental improvement and consequent increase in population may have provided the impetus for change. The differentiation in art styles may also indicate resistance to population pressure from the north, caused by rising sea level. Whether or not this was a contributing factor at this time remains unknown, but there can be no doubt that the rapid flooding of the modern reaches of the Alligator Rivers about 8000 BP would have had profound effects on the inhabitants of both plain and plateau. This was almost certainly the period of greatest stress experienced by the local Aboriginal societies and, among other changes, probably created the strongest move toward social differentiation among the different groups as each sought to defend its right to local resources. I suggest that if the concept of the composite Rainbow snake had not already developed, it was developed at or shortly after this time. In other words, the appearance of composite Rainbow snakes in Arnhem Land art probably occurred between 7000 and 8000 BP.

A time difference between the appearance of 'hooked stick' figures and the appearance of composite Rainbow snake depictions may explain apparent differences in the material culture associations of each category of motif (see 3:6). The majority of 'hooked stick' figures carry a boomerang and a 'hooked stick' that has a knob at the end of the handle, or no knob at all. In contrast, only six sites have been found where motifs from the Rainbow complex are depicted with material

culture items. Of eight examples with 'hooked sticks', six have a knob set back from the end of the handle of that weapon, and none are associated with a boomerang. This situation is paralleled among some human figure paintings that otherwise resemble 'hooked stick'/boomerang figures. For example, none of the individuals in Figure 76 carry a boomerang but three of them carry a 'hooked stick' with a knob set back from the end of the handle.

Because of the extremely limited occurrence of material culture items in the Rainbow complex, the apparent differences between the two motif categories may be due to chance. However, it is equally possible that the Rainbow snake complex came into being at about the same time that the boomerang disappeared from Arnhem Land, but before the arrival of broad spearthrowers. The different positioning of the knob on the handle of the 'hooked stick' may be nothing more than alteration of a grip, but it may also document experimentation with mass distribution on the prototype spearthrower. On this last point, the extremely large knob set back a short distance on the handle of the 'hooked stick' in Figure 82 may be a deliberate exaggeration of this feature to emphasise its importance as an innovation or modification. The existence of some 'hooked stick' figures that do not carry boomerangs or unambiguous spearthrowers (eg Figures 76, 93, possibly 94) may also indicate that the boomerang disappeared **before** the 'Hooked Stick' Period ended and more specialised spearthrowers were developed or introduced.

The change from a plateau-wide style to regional styles, and the appearance of a motif complex that suggests rituals of alliance, appears to be paralleled in the Kimberley region. Crawford (1977: 357) has investigated the 'possibility of an evolutionary relationship from Bradshaw to Wandjina style'. He was unable to find conclusive proof, but the existence of, for example, very weathered Wandjina-like motifs in red ochre led Crawford to suggest that 'an evolutionary sequence may eventually be confirmed'.

Among Crawford's (1968, 1977) illustrations of 'Bradshaw' art are several groups of figures that carry boomerangs and single-piece spears, but which in style, are quite different from the classic form of Bradshaw figures (eg cf his 1977 figures 4, 5, and plate 6 with his figure 6). These appear to document trends similar to the trends between boomerang figures and 'hooked stick' figures. For example, figure 72 in Crawford's 1968 publication is of a figure that has boomerangs, a uniserially barbed spear, and an object that may represent a 'hooked stick'. In figures 4 and 5, and plate 1 in his 1977 study, the ritual paraphernalia found among 'classic' Bradshaw figures is either of diminished significance or absent, and 'fighting' may be evident. The figures in plate 1 of that paper also have gaps in their bodies, indicating the original use of colours other than red that have since weathered away. Concerning this panel Crawford (1977: 361-2) also notes that stylistically the figures have no counterpart elsewhere. This may indicate the appearance of regional differentiation in Kimberley rock art.

In Arnhem Land the composite Rainbow snake is concerned with alliance between groups. Conceptually, it is linked with water, rain, and the regeneration of life that rain brings. In the Kimberley the Wandjinas fulfill similar functions; they link

groups together and are associated with rain and fertility (Blundell 1982: 14; Layton 1985: 443).

The reason for the disappearance of the boomerang from the hunting and fighting equipment of Arnhem Land has not previously been addressed and remains one of the great enigmas of Arnhem Land prehistory. In the following Broad Spearthrower Period figures are occasionally depicted carrying spear, spearthrower, and 'crossed sticks' that probably represent throwing sticks and/or throwing clubs, adopted as a replacement for the boomerang (eg Figures 162-165, 167, 169, 171 and Plate 33).¹⁴ Because throwing sticks and clubs fulfill essentially the same function as boomerangs, it does not seem likely that environmental change rendered the use of boomerangs impractical. This argument is supported by the fact that, at European contact, boomerangs were an important artefact, not only in desert regions and tropical savanna country, but also in the heavily wooded south-east of Australia. Similarly, there is no reason to believe that the appearance of the spearthrower caused the abandonment of the boomerang because the weapons fulfill very different functions and both weapons were used together throughout much of the continent, including the region immediately south of Arnhem Land.

I have already pointed out that the material culture depicted in the early art styles of both Arnhem Land and the Kimberley is virtually identical. It is significant that this early 'Arnhem Land/Kimberley' toolkit appears to undergo identical changes. While the presence of 'hooked sticks' in Kimberley art remains to be confirmed, it is an established fact that boomerangs disappear from the art sequences of both Arnhem Land and the Kimberley.

The fact that the relatively uniform early material culture suites of the two regions should experience a directly equivalent change, apparently after similar stylistic changes had occurred, suggests that a similar cause was responsible. It should be remembered that in Arnhem Land, the disappearance of the boomerang closely coincides with the appearance of the Rainbow snake complex of paintings, which itself is probably a response to a period of extreme stress. In keeping with the hypothesis outlined above, I suggest that during the Boomerang Period and until the end (or close to the end) of the 'Hooked Stick' Period, boomerangs were part of an extensive and formalised trade network which included Arnhem Land and the Kimberleys, and that the social adjustments required by the rising sea and changing climatic regime led to alterations of this trade.

In this context it is important to note that south of Arnhem Land, in the Newcastle Waters region (see map 5), large quantities of boomerangs are still produced and passed into the **Winan** trade system (pers. obs.). One major branch of this trade system extends to the southern regions of the Kimberleys (Kaberry 1939: 166) and another reaches the lower Daly River (Stanner 1933: 162). I suggest that during the Boomerang Period and the 'Hooked Stick' Period, a similar though more extensive network of trade routes existed and that the boomerangs used by the Aborigines in Arnhem Land and the Kimberleys were part of this system.

By suggesting that trade networks altered, I do not mean to imply that contact between Arnhem Land, the Kimberleys, and neighbouring regions ceased entirely. In fact, Arnhem Land art provides some evidence that trade continued to occur at a much lower level of frequency. Among the paintings from the spearthrower periods of Arnhem Land art, there are extremely rare depictions of shields (Figures 172 and 226) and boomerangs (Figure 158). Neither artefact was made in Arnhem Land at European contact and their presence in the art is probably due to low level trade or chance acquisition from inland areas.

In sum, based on broad principles and ethnographic analogy, it is reasonable to suggest that the appearance of both the 'hooked stick' figures in distinct regional styles, and the Rainbow snake/yam/ flying fox complex of motifs throughout the plateau, reflect adaptive responses to changing ecological conditions ultimately created by the changing global climate. The disappearance of the boomerang may have been caused by alterations in a formerly extensive trade network.

It should be noted that the social change documented in the rock art is not reflected in the archaeological record. The stone industry used during the 'Hooked Stick' Period appears to be the same as that used in the earlier Boomerang Period and there is no detectable change in the local economy that can be linked to the appearance of 'hooked stick' figures. Indeed, as I will argue below, the first instance of congruence between a change in the stone industry and a change in the art appears to occur at the transition between the 'Hooked Stick'/Boomerang Period and the Broad Spearthrower Period.

Depictions of the composite Rainbow snake and associated motifs may have appeared somewhat later than the first 'hooked stick' figures, but probably not much later than the arrival of estuarine conditions near the base of the Arnhem Land plateau circa 8000 BP. The lower age limit — the change from the 'Hooked Stick' Period to the Broad Spearthrower Period — is dealt with below.

7:3 Broad Spearthrower Period

The Broad Spearthrower Period is the first in which unambiguous spearthrowers are depicted. These consist of both the broad spearthrowers, for which the period is named, and cylindrical spearthrowers. The styles of figures in this art period are highly varied, and in contrast with the preceding periods, colours other than red commonly survive on the rocks. I have not yet detected a pattern of regional styles equivalent to that seen among the previous 'hooked stick'/boomerang figures but this is as likely to be the result of insufficient field work as it is to be an accurate reflection of the true situation.

The apparent absence of regionalisation, combined with the obvious diversity of styles and colours used, creates a subjective impression of rapid change, even of turmoil, and brings to mind the marked increase in stone tool discard rates that occurred in some sites at about 3500 BP. This is not to suggest that the Broad

Spearthrower Period began at this time. A general trend throughout the sequence of Arnhem Land art seems to be one of increasing change. As I will show, there is reason to suspect that the change in stone tool discard rate occurred some time after the first appearance of the broad spearthrower in the art.

One clue to the dating of the transition from 'hooked stick' figures to broad spearthrower figures concerns the types of spearheads depicted in each period. In the 'Hooked Stick' Period and in the Boomerang Period, almost all of the spears depicted are unhafted and multi-barbed (see Figures 1 and 65). These are almost certainly made from a single length of wood with barbs carved in the solid. In contrast, the spears depicted in use with broad spearthrowers, or with figures that on other grounds can be associated with them, have spearheads that are highly varied in shape and often clearly hafted (eg Figures 156, 157). Some of these spearheads have a lanceolate shape that could represent either a stone point or a flat blade of wood (eg Figures 163, 168; see Brandl 1973: figure 78L). Unfortunately, these representations are small and are silhouettes rather than outlines. Consequently the detail included is limited to shape and does not facilitate a precise identification. However, in the earlier art periods no spear bears a head that even remotely resembles a stone point.

Stone points suitable for use as spearheads first appear in archaeological deposits which, according to Jones and Johnson (1985: 206), are at least 5500 years old, but which Allen (1987: 97) suggests are more likely to have appeared about 4000 years ago. In either case, if stone points are being portrayed, the Broad Spearthrower Period may have an equivalent antiquity.¹⁵ As a matter of interest with regard to these points, especially in view of the apparent absence of regional styles of broad spearthrower figures, Jones and Bowler (1980: 13) remark that:

These point industries showed more regional differentiation than was the case previously, suggesting greater localisation of technology which may have been a factor of increasing self-definition of local groups in terms of the design details of their tools.

A maximum date of about 6000 years for any type of spearthrower is also suggested by their absence on Bathurst and Melville Islands (Spencer 1914: 362; Basedow 1913: 302).¹⁶ These islands were separated from the mainland, and apparently isolated from cultural changes that took place there, shortly before the sea attained its present level about 6000 years ago. It is, however, possible that spearthrowers were present in the Bathurst and Melville islands region before the area was separated from the mainland. These may later have disappeared from the islands in a manner similar to the disappearance of various material culture items from Tasmania after that region was isolated (Jones 1977). In the context of this possibility it should be noted that stone points were not part of Bathurst and Melville island culture at European contact, and there are no reports of them there as archaeological specimens (Davidson 1934: 153; Mountford 1958: 17).

The Broad Spearthrower Period encompasses most of what Brandl called 'late' Mimi art. According to Brandl, phase 1 of 'late' Mimi art has stylistic features in common with 'early' Mimi art, but in phase 2, incipient and simple X-ray features

begin to predominate (eg see Figures 64, 258-261, and Plate 31). By the time that fully developed X-ray art appears, the broad spearthrower has been replaced by the long spearthrower. When the conjunction of the change in spearthrower types with fully developed X-ray art is considered in relation to certain motifs in the art, it is possible to suggest a minimum date for the Broad Spearthrower Period.

The particular motifs that can be related to the broad spearthrower and fully developed X-ray art are depictions of two animals now extinct on the Australian mainland. One of these is the Tasmanian devil (*Sarcophilus harrisii*), fossil remains of which have been recovered from a site near Oenpelli and radio-carbon dated to circa 3000 BP (Schrire 1982: 53, also page 14).

It would appear that *Sarcophilus* was rarely depicted in any art period. At present only about six representations of this animal are known (see Figures 54, 62; Calaby and Lewis 1977: 150-151, figures 1 and 2; Brandl 1980: 10, figure 4). All of these have surface features indicated in the manner typical of Mimi art except for one reported by Tacon (1987: 46) which has simple X-ray features.

The present sample is too small for firm conclusions, but if *Sarcophilus* is restricted to pre-X-ray and simple X-ray styles, that is, to the broad spearthrower and earlier periods, then it must have become extinct in the region before fully developed X-ray art became the dominant style. In other words, the broad spearthrower was in use 3000 years ago when *Sarcophilus* was still present in Arnhem Land. There is other evidence in support of this contention.

The other extinct animal depicted in the art is the thylacine or Tasmanian tiger (*Thylacinus cynocephalus*). Brandl (1973: 172) noted that 'paintings of the Tasmanian tiger ... are associated with Mimi art ... while dogs and dingos occur in X-ray art and other recent styles.' My observations confirm Brandl's claim. Upwards of forty paintings of the thylacine have been recorded (see Figures 55, 56, 63, 64 and Plate 20; Brandl 1972, and Lewis 1977 for a selection of these). With one marginal exception, all may be broadly classified as Mimi art. The exception is a painting (Figure 64) which, according to Brandl's definition of the term (1973: 168), has an incipient X-ray feature and may therefore be considered as transitional between Mimi art and X-ray art. In this instance, the incipient X-ray feature is the representation of an unpainted space inside the body (cf Figure 64 with Plate 31). On stylistic/chronological grounds, this is the most recent thylacine painting before the animal disappears from the rock art and paintings of dingos appear (see Figure 263 for one of the few known Arnhem Land rock paintings of a dingo or dog).

At the present time nothing conclusive can be said about the extinction date of the thylacine in Arnhem Land, nor can a date be given for the first appearance there of the dingo. Evidence from other regions of mainland Australia suggests that the dingo was established by 3500 BP while the thylacine became extinct not long after, around 3000 years ago (Gollan 1980: 94). The two events are believed to be directly related. Like *Sarcophilus*, the thylacine may have survived longer in Arnhem Land than elsewhere but if, for the moment, we assume that these dates

are applicable in Arnhem Land, it follows that the transition from 'late' Mimi art to simple X-ray art must be later than 3000 BP. Taken together, the date of the *Sarcophilus* mandible and the implied date of *Thylacinus* extinction suggest that simple X-ray art became common less than 3000 years ago.

Among the animal representations associated with the broad spearthrower are some that have only surface features indicated and others that exhibit simple or 'early' X-ray features. Because X-ray features of any kind are extremely rare in depictions of either the thylacine or the Tasmanian devil, it is clear that the broad spearthrower remained in use well after the disappearance of these animals from the art. Of course, both the Tasmanian devil and the thylacine may have survived for a considerable time after 3000 BP, in which case the change from simple X-ray to more complex forms, and the accompanying change from broad spearthrower to long spearthrower, may also be much more recent. As will be shown, there is some reason to believe that this might be the case.

7:4 Long Spearthrower Period

The Long Spearthrower Period approximates the period when 'standard' X-ray art and associated styles were being produced. This form of X-ray art is distinguished from incipient and simple X-ray art by, among other things, the accurate and detailed portrayal of internal features and the general use of polychrome techniques (eg Figures 262, 267, 268, 270, 271, and Plates 39, 40, 44, 45, 47). The broad spearthrower does not appear to be depicted in what Brandl (1973: 168) termed 'standard' X-ray art and it seems safe to conclude that by the time X-ray art developed fully, the broad spearthrower was no longer used in Arnhem Land.

There can be no doubt that fully developed X-ray art and associated styles constitute the most recent period of Arnhem Land rock art. The material culture depicted in this art period is the same as that documented ethnographically. Arnhem Land Aborigines recognise fully developed X-ray art as a product of their own society (Brandl 1973: 165) and they still produce X-ray style paintings on the medium of bark. Material culture items that appear to be largely or totally restricted to this period and which are recorded in regional ethnographies include the didgeridoo, string 'chest harness', 'goose' spears and their specialised spearthrower, and the goosewing fan (see Spencer 1914; Berndt 1951; Warner 1958; Vanderwal 1982). There are also depictions of canoes and rafts which may be a freshwater wetlands adaptation (Figures 265, 266; Plate 42). Some of the human figures associated with watercraft are executed in a nondescript, stick figure style and thus may be contemporary with, or predate, the Long Spearthrower Period. Animals such as lesser salmon catfish (*Hexanematichthys leptaspis*), barramundi (*Lates calcarifer*; Plate 44), saltwater crocodile (*Crocodylus porosus*; Figure 268), magpie goose (*Anseranus semipalmata*), ibis (*Threskiornithidae*), and turtle species (*Cheidae*), which became dominant subjects in the Long Spearthrower Period, still form an important component in Arnhem Land Aboriginal cultures and economies.

There are several lines of evidence that point towards particular temporal limits for the long spearthrower and fully developed X-ray art. One of these concerns the fact that fully developed X-ray art reflects a wetland environment and economy. According to Woodroffe *et al* (1986) the mid-Holocene 'big swamp' was replaced by freshwater floodplains no later than 4000 BP but this date cannot automatically be taken as the time that fully developed X-ray art first appeared in Arnhem Land. Several factors indicate that caution is advisable in assigning a 4000 BP date to depictions of fresh water animals and plants.

Recent research at Anbangbang shelter and wetland edge sites in Kakadu National Park (Jones 1985) has revealed a dramatic increase in archaeological remains between 1200 and 500 years ago. Concurrent geomorphological research in the area indicates that the freshwater wetlands developed in the region from about 1400 BP. The congruence in the dating led Jones to link the two events and to suggest that the huge increase in food resources available in freshwater habitats led to a major increase in human population (*ibid*: 293).

The date of 1400 BP that Jones quotes for the formation of the wetlands clearly conflicts with the estimate of 4-5000 years provided by Woodroffe *et al* (1986). However, it is possible to reconcile this problem and show that Jones's deduction is essentially correct. Although the modern floodplains were in place by about 4000 BP, at that time they were drained by a sinuous river and the numerous billabongs and lagoons now seen on the plains did not exist. No doubt the monsoonal rains created extensive backwater swamps, but, like their modern counterparts, these would have been predominantly shallow and therefore largely ephemeral in nature. Woodroffe *et al* demonstrate that the permanent freshwater lagoons now seen on the plains did not appear until the large meanders of the sinuous river were cut off and isolated through a process of shoaling, erosion and deposition (*ibid*: 119-122). This process may have begun as early as 2000 BP but accelerated after about 1000 BP (*ibid*: 140). Once isolated, the paleochannels were transformed from brackish water to freshwater by seasonal flooding.

It seems clear that the dramatic increase Jones observed in archaeological remains is linked to the appearance of numerous freshwater lagoons on the floodplains, rather than to the development of the floodplains themselves. These freshwater lagoons, combined with the largely ephemeral floodplain swamplands, contained extraordinarily rich food resources and probably provided large and reliable late dry season water supplies.

Jones's evidence for dramatic increase in population, linked to the development of this food-rich environment, supports the hypothesis I put forward in 1983 to explain the intriguing distribution pattern of fully developed X-ray art. At that time I suggested that there was a major population increase on the coastal plains due to the dramatic increase in food resources in that area, and that this population increase resulted in changes in the rock art. The greatest number and most extensive galleries of X-ray art are located along the north-western fringes of the plateau and along the valleys cutting into it. Less accessible areas of the plateau have very few paintings in this style. This dichotomy was first noted by Brandl

(1973: 2) and my own observations confirm his claim. Brandl believed that the interior of the plateau was abandoned before the X-ray style developed and that only sporadic visits occurred thereafter. His deduction finds some support in a recent assessment of historical evidence for traditional population distribution and land-use patterns in west Arnhem Land.

Schrire (1982: 25) examined the available ethnographic literature and found strong indications that population was concentrated on the coastal plains. She found no evidence to suggest a seasonal movement between plain and plateau as she had previously postulated (White and Peterson 1969). The only European source for information on plateau populations derives from Leichhardt's crossing of the plateau in November, 1845. As Leichhardt moved into the plateau from the south, he saw few Aborigines and few signs of their presence. For the last eight days before descending onto the coastal plains, he crossed rugged sandstone country, typical of much of the Arnhem Land plateau (see Plates 6-9). In this area there were no signs of Aborigines at all (Leichhardt 1847: 476-484). In the light of Leichhardt's testimony Schrire (1982: 25) comments, 'if negative evidence is any guide, the plateau was virtually uninhabited compared to the plain'. Thus it appears either that the more rugged areas of the Arnhem Land plateau were largely abandoned before the appearance of X-ray art (Brandl's contention), or that the plateau always had a relatively low population and, consequently, a low level of art production.

Another line of evidence for dating this period concerns a style of non-X-ray human figure which, on stylistic and material culture grounds, is clearly contemporary with fully developed X-ray art. This is the distinctive type of human figure found in the Oenpelli-East Alligator River crossing area (see 4:7). The heads of some of the spears carried by these figures have carefully painted lanceolate outlines with a dividing line along the long axis (eg Figures 242, 243). This dividing line probably represents the spine of a stone blade and when the relative size and shape of these blades is taken into account, it is virtually certain that these spearheads represent the large (20-30 cm.) unretouched or minimally retouched quartzite 'leilira' blades recorded in use as spearheads and knives at European contact (Thomson 1948-49: part 3-55). Similar blades are probably depicted on the spears carried by figures in fully developed X-ray style but in this technique the artists did not include the dividing line that enables stone blades to be differentiated from similarly shaped iron or wooden forms.

Dating the first appearance of this type of blade will provide a minimum date for the appearance of the long spearthrower. Such blades are sometimes found in the uppermost layers of Arnhem Land archaeological sites which suggests that they may be a very recent development, perhaps only during the last few centuries. However, recent research on identical blades in the area immediately south of Arnhem Land raises the possibility that blades of this type were deliberately broken and reworked into different stone tools (pers. comm. Robert Paton). A number of very large quarries where these blades were produced have been recorded in Arnhem Land. Establishing the age of these quarries may represent the

most reliable way to date the appearance of both the blades and the long spearthrowers.

A third line of evidence concerns the techniques applied to X-ray art itself. It is clear that fully developed X-ray art is a recent elaboration of the earlier, simple X-ray style. The concept of showing more of a subject than is normally visible, that is, 'X-ray' features, has a long tradition in Arnhem Land art. Rare examples of paintings with what may be simple X-ray features occur among the earliest styles (eg Figure 74; Plate 13) but they only become common, and unambiguous, in the latter part of the Broad Spearthrower Period (ie Brandl's 'late' Mimi art, phase 2). The reason for the rise of the X-ray concept is the subject of ongoing doctoral research by Paul Tacon (see Tacon 1987; also, see Taylor 1987a) and will not be addressed here. My concern is with the elaboration that X-ray art and other related styles underwent in the most recent period of rock art production. This elaboration constitutes a major change from an ancient tradition of generally small, line and silhouette paintings, including those in early X-ray style, to the production of generally larger, bichrome and polychrome designs, often containing intricately cross-hatched sections.

The cause or causes of this elaboration in Arnhem Land rock art remains an open question. McCarthy (1965: 89) believed the change to be abrupt and suggested that it was stimulated by Aboriginal contact with 'a foreign people', but he also noted that 'a clear-cut Macassan [ie Indonesian] influence cannot be claimed for the change in the cave art of Western Arnhem Land'. In contrast, Brandl (1973: 178) argued, correctly, that the change from Mimi art to X-ray was gradual, and marked by cultural continuity. He agreed with McCarthy that a Macassan influence was not obvious and suggested that the transition may have been caused by an 'almost exclusively European influence'. My own contention is that two factors were involved in this major reorientation of style. These were ecological change and foreign [pre-European] contact.

Jones (1985: 293-94) suggests that the development of resource-rich freshwater wetlands on the coastal plains of Arnhem Land facilitated a dramatic increase in population density which almost certainly stimulated social change. Population increase and resultant social change may be the decisive factor in the dramatic elaboration of X-ray art, but the possibility that Macassan or other foreign contact may have played a role cannot be dismissed.

The dating of both population increase and foreign contact is by no means firm. Jones's date for the apparent increase in population is '1200-500 BP' (1985: 292). Macknight (1976) excavated a number of Macassan sites on the northern Territory coast and the oldest of these were radio-carbon dated to about 800 BP (ibid: 98). In spite of the fact that 'the three oldest dates show a surprising consistency between widely separated sites', Macknight dismissed the dates in favour of evidence from historic documents which suggests that Aboriginal-Macassan contact began less than 300 years ago. His main argument is based on historic records which indicate that trepang (sea cucumber or beche-de-mer) collecting for the Chinese market was the major industry in Australian waters and that this market did not exist

before the 1600s. Historic sources indicate that while the Macassans were collecting trepang in Australian waters, they also gathered a wide variety of other products (ibid: 42-45). Whether Macassans or others were visiting Australia to gather these resources before the trepang trade arose remains unknown.

It should be noted that in an east Arnhem Land shelter in a layer possibly 1000 years old, Schrire (1972: 664-66) excavated shell fishhooks that resemble the bronze hooks used by Macassan fishermen. It should also be noted that Aboriginal traditions recorded by Berndt and Berndt (1954: 32-39) appear to document the visits of an earlier, non-Macassan people. The question of when Macassans (or others) first made reasonably frequent contact with Aborigines requires further study.

At this stage there can be no doubt that about 300 years ago regular contact existed between Macassan sailors and Aborigines. By that time the Aboriginal population in Arnhem Land had already increased and undoubtedly social adjustments had been made. However, it remains quite possible that Macassan or other foreign visits began much earlier, as is indicated by the archaeological evidence. The two events — population increase and foreign contact — may have been largely concurrent.

The profound effect of Macassan contact on Arnhem Land Aboriginal cultures is well documented (Thomson 1948-49: part 3, 58-61 and 1949: 82-94; Berndt and Berndt 1954: 63, 188; Urry and Walsh 1981). As well as introducing new elements to ceremonial life, mythology, and language, trade networks were stimulated and reinforced as demand for exotic goods increased among interior groups. It has been suggested that the stone blades discussed above could be copies of iron 'shovel-nosed' spearheads, introduced by Macassan sailors (Mulvaney 1975: 219). If correct, this would suggest that demand for Macassan goods outstripped the supply. Among the Macassan goods that moved rapidly inland along these trade routes were iron axes and cloth (Thomson 1948-49 and 1949; Urry and Walsh 1981: 99, 101). These particular items may have influenced both the content and style of recent rock art production.

With regard to iron axes, a statement made by one of Donald Thomson's east Arnhem Land informants is intriguing. Thomson was told that cylindrical spearthrowers preceded the appearance of long (notched lath) spearthrowers (Thomson n.d., cited in Cundy 1980: 171). He was informed that long spearthrowers were not made until the introduction of iron axes, presumably by the early Macassan sailors. In this context it should be remembered that to achieve optimum efficiency with long spearthrowers the projectiles must be lightweight and rigid. In Arnhem Land the favoured material for the larger spears used with notched lath spearthrowers is bamboo (*Bambusa arnhemica*), found only on the Daly River, South Alligator River and the intervening streams. This limited distribution could indicate that this species of bamboo is a recent (pre-European) introduction but this is by no means certain.

The notched lath spearthrower is either restricted to, or was developed shortly before the appearance of, fully developed X-ray art. If the statement by Thomson's informant is correct, it raises questions regarding the age of recent X-ray art and associated styles of paintings, as well as the antiquity of alien contact in Arnhem Land.

There may also be a possible influence of cloth on rock art styles. The intricate cross-hatching characteristic of fully developed X-ray art (eg Plates 40, 44), as well as in the bark paintings of eastern Arnhem Land, may be derived from the appearance of woven coloured fibres, and the application of motifs to a prepared white background may also reflect designs on cloth. The latter technique is also a recent development used by the Wandjina artists in the Kimberley (see Crawford 1968: 24, also plates 14, 16, 19 and others).

In sum, the art of the Long Spearthrower Period, that is, fully developed X-ray art, may be seen as the culmination of a tradition that has its roots in the Pleistocene. X-ray art is the most recent and visually the most dramatic change within the continuum of Arnhem Land rock art. The driving force behind this change was the development of the resource-rich coastal wetlands during the past 1-2000 years, but the final result of this change may owe a great deal to the influence of the Macassan sailors in recent centuries.

CHRONOLOGY AND DATING OF ARNHEM LAND ROCK ART

Periods	Identifying characteristics	Years BP (approx.)
Boomerang	Figures in monochrome red with ornate headdress, carrying boomerangs and/or spears only. Naturalistic perspective usually with allusion to movement. Stencils of hands and material culture items are common. Distribution: pan-plateau.	Maximum unknown, but no megafauna present Minimum: 9,000
'Hooked Stick'	Figures with 'hooked sticks' as well as boomerangs and spears, usually with simplified headdress. Regional variation in perspective and style. Rainbow snake complex appears throughout the plateau late in period and continues, with changes, until the present time.	Maximum: 9,000 Minimum: 6,000
Broad Spearthrower	Figures with short, broad spearthrowers, and cylindrical spearthrowers, and a great variety of spear types. Varied perspective, style and colour. In north-west of plateau, long-necked spearthrowers appear to be transitional between broad and long spearthrowers.	Maximum 6000 Minimum: 1-2000
Long Spearthrower.	Figures with long, narrow spearthrower varied perspectives, painting techniques, and styles. Includes fully developed X-ray art. Limited variety of spear types.	Maximum: 2000 (probably less than 1000) Minimum: Ethnographic present.

Table 4: Chronology and dating of Arnhem Land art Periods.

8 CONCLUSIONS

The Arnhem Land plateau is probably the richest and most complex body of rock art in Australia; it may well prove to be the greatest rock art complex in the world. The illustrations in this monograph provide only a glimpse of the staggering profusion of artworks in the region, the greater part of which has not been recorded. With so much work yet to be done, the work presented here must be considered only another step towards unlocking the vast storehouse of information encoded on the stone bastions of Arnhem Land.

I began this monograph with an assessment of the methodologies and resulting chronologies of the two major researchers of Arnhem Land rock art – Chaloupka and Brandl. Chaloupka's method was to identify different styles and to place them in consecutive order on the basis of apparent superimpositioning. He claimed three major divisions in his sequence, the first two based on changes in subject matter that he believed reflected changes in the environment, and the third based on the appearance of contact motifs. I have shown that the earlier of these, his pre-estuarine/estuarine division, does not exist and should be conflated with his later estuarine/freshwater division.

Brandl's warnings on the shortcomings of the method Chaloupka used have been shown to be correct. Brandl established his chronology primarily on the basis of changes in the perspective of individual figures and the composition of groups of figures. In one instance, he divided his chronology on the basis of a change in style that was also marked by a change in material culture ('early' Mimi to 'late' Mimi). Other stylistic divisions were less clear-cut because, in his system, the changes in question were part of a continuum, with styles grading one into the other (eg 'late' Mimi phase 1 to 'late' Mimi phase 2 to X-ray art).

Of the two, Brandl's (1973) methodology and chronology are the more reliable, and I have used his chronology as the baseline for the work presented here. However, in establishing divisions in the sequence of Arnhem Land art styles, this monograph takes a radically different approach to those used by Brandl and by Chaloupka. In place of their criteria, I have focused on changes in material culture items depicted in the art. Through this approach it has been possible to establish another period within Brandl's sequence. It has also been possible to determine more reliably the position in the sequence of the Rainbow snake/yam/flying fox complex of paintings.

As well as providing a detailed history of technological change, including the exciting possibility of a complete record of the development of spearthrower technology from the earliest prototype, I believe that the study of the distribution patterns and changes in material culture items depicted in the art provides the key to ordering the greater portion of Arnhem Land paintings. My analysis gives some indication of the potential of this approach. As fieldwork progresses it should be possible to delineate finer divisions and to identify more regional styles within the sequence. Eventually it will be possible to map the boundaries of regional styles

and particular material culture traits or associations. Such maps will provide data on past social groupings unobtainable from other types of archaeological research.

When Arnhem Land art styles are clustered on the basis of common material culture inventories, and these inventories are placed in sequence according to relative age, the changes in distribution patterns, themes expressed, and subject matter portrayed can then be interpreted and dated in terms of cultural and ecological changes documented through archaeological excavations, geomorphological research and other data.

From the analysis presented in chapter 7, there can be little doubt that Arnhem Land art documents modes of social and cultural organisations that have been responsive to the environmental changes caused by the post-glacial rise in sea level. The sequence of Arnhem Land rock paintings thus spans the entire Holocene period and almost certainly extends some millenia into the Pleistocene.

Features of the earliest paintings (boomerang figures) provide evidence for larger socio-linguistic territories than is the case in Arnhem Land today, as well as the existence of an information network extending beyond each group. Subsequent changes in the art document an increasing emphasis on smaller social units, on inter-group tensions ('hooked stick' figures and spearthrower figures), and the development of rituals to counteract an apparent tendency toward social fragmentation. The loss of the boomerang at (or near) the end of the 'Hooked Stick' Period may indicate the disruption or partial disruption of the extended information network established in the Pleistocene. These changes may best be explained as the result of sea level rise causing dramatic changes in ecological conditions, with consequent changes in social organisation. The final phase of the sequence documents the appearance of the resource-rich modern wetlands and the influence of alien cultures. Here we see an increasing diversity in art styles, techniques, motifs, and in material culture, as well as an increased emphasis on species associated with freshwater.

The suggestion that the distribution pattern of boomerang figures reflects larger territories and an emphasis on regional identity is strengthened by the existence of a strikingly similar early art style and material culture inventory throughout the Kimberleys. The hypothesis that sea level rise was the driving force behind the changes in Arnhem Land art also finds support in the Kimberleys. As in Arnhem Land, the early pan-Kimberley art style appears to have been replaced by regionally distinct styles and the early material culture inventory seems to have been subjected to parallel changes, including the loss of the boomerang.

From about the time that the boomerang disappeared, Kimberley art and Arnhem Land art began to diverge. Whereas in Arnhem Land composite Rainbow snakes appear in the art, in the Kimberleys the major new motif is the Wandjina. Although quite different in outward form and mythological basis, the composite Rainbow and the Wandjinas fulfill similar social functions. Both work to sustain and regulate inter-group relations. Both arose from the need to counteract tensions caused by the effects of rising sea level. There is reason to believe that these inter-group

tensions had already at least partially disrupted the inter-regional exchange networks, as evidenced by the disappearance of boomerangs from Arnhem Land and the Kimberleys. Rituals based on the composite Rainbow snake and the Wandjina ancestral beings were developed in an attempt to defuse or control these tensions, and to curtail the tendency toward social fragmentation.

Throughout this monograph I have noted areas where further research will be fruitful. However, there are areas beyond Arnhem Land where research may be of equal or even greater importance. First, the Tiwi people on Bathurst and Melville Islands were separated from the mainland at least 6000 years ago and available evidence suggests that they have remained virtually isolated since that time (Osbourne 1974: 1-3; Kirk 1987). Because of their isolation they were in some respects the tropical equivalent of the Tasmanians. Aspects of Tiwi culture appear to reflect the culture of 'Greater Arnhem Land' as it existed over 6000 years BP. For instance, the basic type of Tiwi spear is of one-piece construction, with ten to thirty barbs cut in the solid, usually on only one side of the blade (Basedow 1913: 302 and plate 9-5). These are hand thrown and are identical to those depicted in the Boomerang Period and in the 'Hooked Stick' Period of Arnhem Land art. Similarly, at roughly the same time that these islands were isolated from the mainland, Arnhem Land art documents a significant emphasis on yams. The Tiwi still maintain a cultural elaboration of yams, both as the focal point to initiation and as a 'key symbol' of life (Goodale 1982). This parallel between rock art on the mainland and ritual/symbolic activity on Bathurst and Melville islands indicates the possibility of testing hypotheses through further research. To date, no archaeological or ethno-archaeological research has been undertaken on these islands. Such research should be initiated, preferably in conjunction with similar research on the adjacent mainland.

Second, there are indications that the rock art of Groote Eylandt and Chasm Island may have considerable antiquity. Rose (1942 and 1968: 137-38) identified two phases in Groote Eylandt art. The earlier paintings are in red and reflect a land-based economy. They include paintings of emus which are not found on the island, and group scenes which his informants interpreted as mainland ritual. There are also stencils of boomerangs that McCarthy (1967b: 51) relegates to the earlier phase. Paintings of animals from this period often have surface features indicated and resemble early west Arnhem Land styles (pers. obs.; eg McCarthy 1967b: 51, figure 31). Some are in fully exposed positions and clearly have bonded to the rock face (pers. obs.).

The later paintings are often polychrome and emphasise a marine-based economy. Rose (1968: 138) argued that the change from land to marine resources occurred when the Macassans introduced the dugout canoe and that the earlier paintings were made by people on occasional visits from the mainland. Implicit in Rose's suggestion is that the earlier paintings post-date the separation of Groote Eylandt from the mainland. This may be correct, but it is equally possible that the land-based economy reflected in the art points to the period before Groote Eylandt and the mainland were separated by the rising sea, circa 6000 years ago. An antiquity

of 6000 years or more would provide important comparative material in relation to Arnhem Land rock art, and more detailed research is warranted.

Third, establishing a detailed chronology of Kimberley art styles is essential. Of particular interest is the period from about 6000-7000 BP when the differences between Arnhem Land and Kimberley culture began to become more distinctive than the similarities. In Arnhem Land this was a time of increasing cultural innovation and ecological change. It seems likely that similar processes were at work in the Kimberley and that broadly similar responses were made, but the nature and timing of the changes that occurred remain virtually unknown. In Arnhem Land sufficient archaeological, geomorphological, botanical and other research has been done to enable the sequence of art styles to be viewed against a framework of dated cultural and ecological changes. There is a great need for similar research work to be carried out in the Kimberley. Such work will not only provide a detailed understanding of Kimberley prehistory, but will enable comparisons to be made between the two regions that should vastly increase our understanding of the relationships between culture, ecological change, and rock art. It will also enable testing of the hypotheses put forward in this monograph to explain and date various changes manifest in Arnhem Land rock art.

The research projects mentioned above will serve to expand and refine the work presented here, but even at this stage of analysis it is clear that the study of Arnhem Land rock art has implications for the study of prehistory in regions far beyond Arnhem Land. For instance, the evidence for a Pleistocene information network between Arnhem Land and the Kimberleys poses the question of whether similar networks existed in other areas. It is possible to go some way toward answering these questions by considering several points.

First, it should be remembered that the boomerang figures in Arnhem Land and the classic Bradshaw figures in the Kimberleys each extend into the headwaters of drainage basins other than the Bonaparte basin (see maps 3 and 4). This suggests that the culture complex that produced boomerang art and Bradshaw art extended well beyond the area where these figures are now found. If the hypothesis that drainage basins facilitate the flow of cultural information is applied to the Pleistocene, then the Pleistocene Arnhem Land/Kimberley information network could easily have encompassed most of northern 'Greater Australia' (see map 4).

Second, the glacial period was a time of greatly increased aridity throughout virtually the entire continent. Nevertheless, it is known that every major ecological zone, including the extremely arid centre of the continent (Smith 1987), was occupied at this time. Given the necessity for highly ramified information networks to enable survival in arid and unreliable environments, it is a reasonable assumption that such networks were *in situ* during the glacial period. Obviously, for information networks to exist and function efficiently there had to be stable local organisation as well.

Third, if information networks were *in situ* throughout Australia during the late Pleistocene, this would largely explain the underlying unity of Australian cultures

as documented through archaeological and ethnographic research. It might also explain the absence of some of the items that are 'missing' from Tasmania. If boomerangs were part of a trade network encompassing Arnhem Land and the Kimberleys during the terminal Pleistocene, a similar situation may have existed elsewhere on the continent, including Victoria and Tasmania. In Tasmania, of course, any social disruptions that might have been caused by the rising sea level were accompanied by the total isolation of that island.

At least one feature in the art suggests that the Pleistocene Arnhem Land/Kimberley information network was linked to other networks which, in maximum extent, reached as far as the south-east corner of the continent. Among the stenciled objects from the Boomerang Period of Arnhem Land art are rare examples of a variety of boomerang-like throwing sticks (Figures 45 to 49). The fact that painted or stenciled images of these artefacts are rare suggests that they may have been trade items, possibly acquired through highly extended exchange networks. The closest ethnographic analogies for these artefacts are found in the south-east of the continent, from eastern and southern Queensland, through New South Wales and across Victoria (cf Figure 48 with Figure 95: c and 96: b; Figures 46 and 47 with Figure 95: c; Figure 45 with Etheridge 1897 plate 3: 22). The stencils and the south-eastern artefacts are not identical, but if a relationship is accepted, then they provide further evidence of the continuity of Aboriginal culture traits, and evidence for the flow of ideas from one side of the continent to the other.

Continuity is also evident in the division between the predominantly figurative art of the Arnhem Land/Kimberley region and the predominantly non-figurative art (engravings and paintings) of the arid inland to the south. From the analysis presented here and in view of the mounting evidence that the inland tradition of non-figurative art has Pleistocene antecedents (Rosenfeld 1981a: 30; Dragovitch 1986), it seems that, like the information networks in existence when Europeans first arrived in Australia, this figurative/non-figurative division may also have a Pleistocene origin.

In 1975 Jones expressed the opinion that by 30,000 years ago, 'the distinctive Australian economy was already in train and that the major adaptations to the continent had been made' (1975: 28). Evidence presented in this monograph suggests that social systems for information exchange were also established at a very early stage in Australia's prehistory.

ENDNOTES

1: Throughout this monograph I have used 'Plate' or 'Plates' when referring to my own photographs, and 'plate' or 'plates' when referring to the photographs of others.

2: As with the photographs, I use 'Figure' or 'Figures' when referring to my own line drawings and 'figure' or 'figures' when referring to the line drawings in other sources.

3: Mountford (1956: 202, 204) describes and illustrates 'hooked sticks', or more accurately 'hooking sticks', used by mythological beings. For examples, on page 204 he reproduces a rock painting of a spirit being called Matjiba, with two sticks that have hooks at each end (1956: 204 plate 57-c). A Matjiba being is also the subject of a bark painting (201, plate 56-a). In this instance, two sticks with hooks at only one end are portrayed. The Matjiba is said to use his hooked sticks to catch human victims

4: Chaloupka has discovered what he identifies as 'dynamic figures' and other 'pre-estuarine' paintings (1983: 16; 1984: 25) executed in colours other than red, or with other colours added to the red (eg. white on red). He uncritically takes these as evidence that some pre-estuarine paintings were painted in more than the surviving red pigment. This may have been the case, but it is equally possible that the other colours were added at a later time or that the figures painted only in white or yellow could be later copies of earlier styles. The only way of knowing with certainty that colours other than red were used in early Arnhem Land art is if there are gaps in the red pigment where another colour is still visible or where it is obvious that another colour has weathered away. In this context it should be mentioned that no 'early' Mimi figures have been recorded that have gaps in the red pigment where other colours once existed. Paintings that have separate red and yellow sections, and figures with gaps in the red pigment, make their appearance in subsequent styles. Figures in white, painted directly onto the rock face, almost always exhibit stylistic or other features that place them in or close to the most recent period of Arnhem Land rock art.

5: The Djauan Valley is named after the local Aboriginal people who speak Jawoyn language. I have retained the local spelling in this context.

6: As a matter of interest, a wooden-headed trident spear with a short lanceolate central point and smaller lanceolate outer blades was used in the southern highlands of New Guinea. It is regarded as a 'killing' spear and, in shape, closely resembles some of the tri-pointed spears depicted in the art (pers. comm., Ingreth McFarlane).

7: During the late Pleistocene the South Alligator River, East Alligator River, and Cooper Creek appear to have been tributaries of a 'Greater Arnhem Land River'.

8: Chaloupka (1984: 52-54) believes that the silica layers on Arnhem Land rock paintings formed during a period when hot, dry conditions prevailed and that such conditions last occurred during the glacial maximum, circa 18,000 years ago. He argues that, once formed, these layers protected the art from subsequent weathering. While it may be true that the formation of silica skins acts to preserve paintings for a considerable time, the fact is that the formation of such layers is not necessarily restricted to an arid environment. For example, silica skins have been recorded in the humid south-east of Australia (Lambert 1979), in one instance over European graffiti (see Rosenfeld 1985: 25, 68 plate 27). Even if it is eventually proven that the Arnhem Land silica skins formed during hot dry conditions, such conditions are a feature of every Arnhem Land dry season. It should therefore be expected that silica skins would be forming during part of every year. Work by Hughes and Watchman (1983: 58) indicates that this may well be the case. They found that the silica skin on a rock sample from the Mount Brockman massif 'consists of at least two layers and that possibly a third layer is in the process of being formed.'

9: I would also suggest that, contrary to the comments of a number of researchers (eg Thomson 1983: 86-7; Schrire 1982: 241; White and O'Connell 1982: 71), Arnhem Land mortars were not often used to prepare pigments. One of Brandl's informants stated explicitly that ochre was not

pulverised or mixed in this type of grindstone (1973: 3). Pigments, he said, were prepared by rubbing ochre pieces on flat stones. The use of flat stones is the preferred method of preparing ochre in parts of northern Australia today (pers. obs.). Available evidence suggests that in the past, mortars and flat stones were used for much the same purposes as recorded in ethnographies. Of the many hundreds of circular grinding hollows in Arnhem Land rock shelters, including those uncovered in archaeological excavations, few, if any, have clear-cut pigment staining. The 18,000 year old ochre-impregnated grindstone excavated by Kamminga and Allen (1973: 48-9) and the 6-13,000 year old slab with traces of ochre excavated by Jones and Johnson (1985: 218) are both, in essence, flat stones. It should also be noted that many of the ochre pieces recovered from Arnhem Land excavations bear relatively flat ground facets which suggests that they were rubbed against a flat stone.

10: In this monograph 'information network' refers to an integrated network of communication between self-defining groups, involving the movement of goods, ideas, and people.

11: Although no fossil remains of *Thylacinus* have been found in Arnhem Land, remains of this species have been found in the tropical regions of the Kimberleys (Archer 1973) and New Guinea (Van Deusen 1964). There is no reason to doubt that it was formerly present in Arnhem Land.

12: As well as undergoing an increased elaboration in recent times, other aspects of the Rainbow snake complex have changed. For instance, the Rainbow snake is now depicted with freshwater lilies rather than with yams (eg see Aboriginal Arts Board 1979: 66). Similarly, flying foxes are now rarely depicted with Rainbow snakes although they are still associated in mythology.

13: Rock paintings of composite Rainbow snakes are almost totally restricted to 'old' red ochre art. The rarity of examples with any kind of X-ray feature suggests that most pre-date that style. Composite Rainbow snakes are also quite rare in recent polychrome rock art, yet this motif is now commonly produced in bark paintings. It thus seems that there have been two main phases of production of Rainbow snake motifs; an early phase when the motif first appeared in the art and a second phase that has occurred within the last decade or so, on the medium of bark.

14: At European contact, throwing clubs were in use among the Tiwi people of Bathurst and Melville Islands (Basedow 1913: 300-01), and among the Larrakia people on the adjacent mainland (Basedow 1925: 170).

15: This date corresponds well with Luebbers' (1978) estimate for the appearance of the spearthrower in southern Australia.

16: Graebner (1913: 7) illustrates a toy spearthrower from Melville Island. This is of the female type where the spear butt is fitted into a hole on the thrower. Throughout the mainland, spearthrowers are all of the male type where a peg fixed to the spearthrower fits into a hollow in the butt of the spear.

PLATES 1 - 48



PLATE 1. Sandstone monoliths and outliers on a floodplain near the edge of the escarpment at Ubirr.

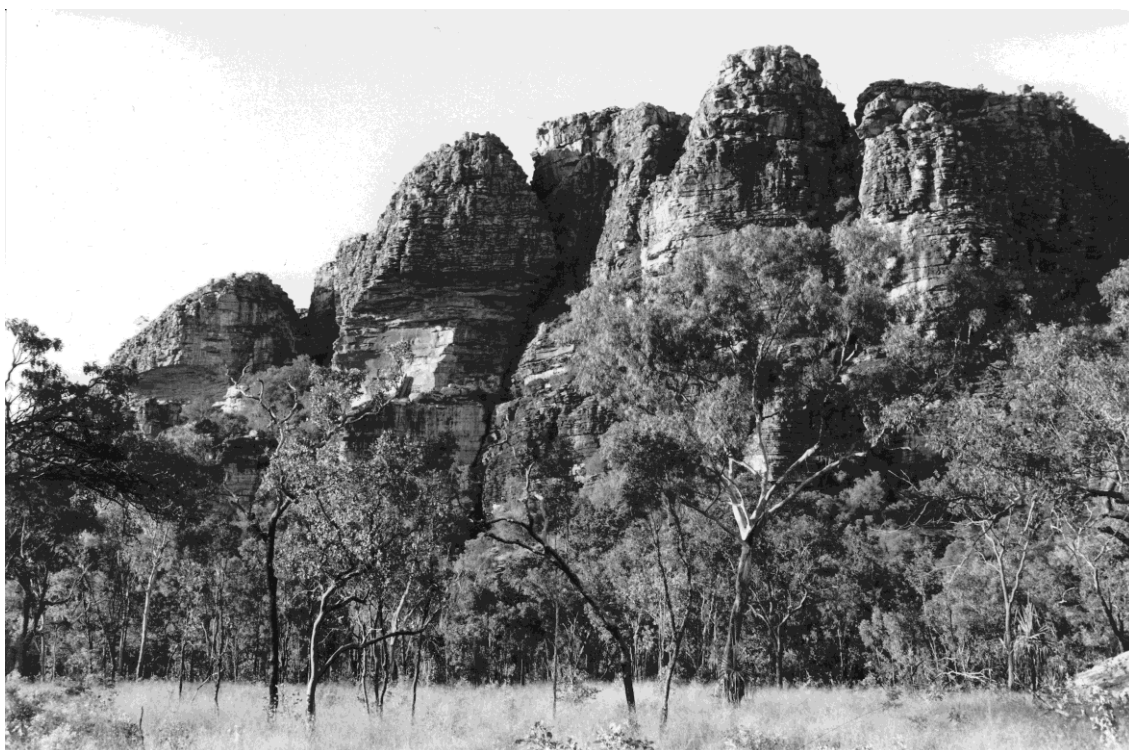


PLATE 2. Sandstone cliffs on the Djawumbu-Madjawarnja massif. These are typical of the western and northern borders of the Arnhem Land plateau. Shelters with rock art are common.



PLATE 3. Shelters at the base of a cliff on the Djawumbu-Madjawarnja massif.



PLATE 4. The upper East Alligator River, bordered with cliffs and broken stone country that abounds with rock shelters.



PLATE 5. A small valley to the east of the Djawumbu-Madjawarnja massif. Hundreds of similar valleys slash the edges of the plateau.



PLATE 6. Another view of the plateau-edge country east of the Djawumbu-Madjawarnja massif. Paintings are commonly found on faces such as those on the right side of this photograph.

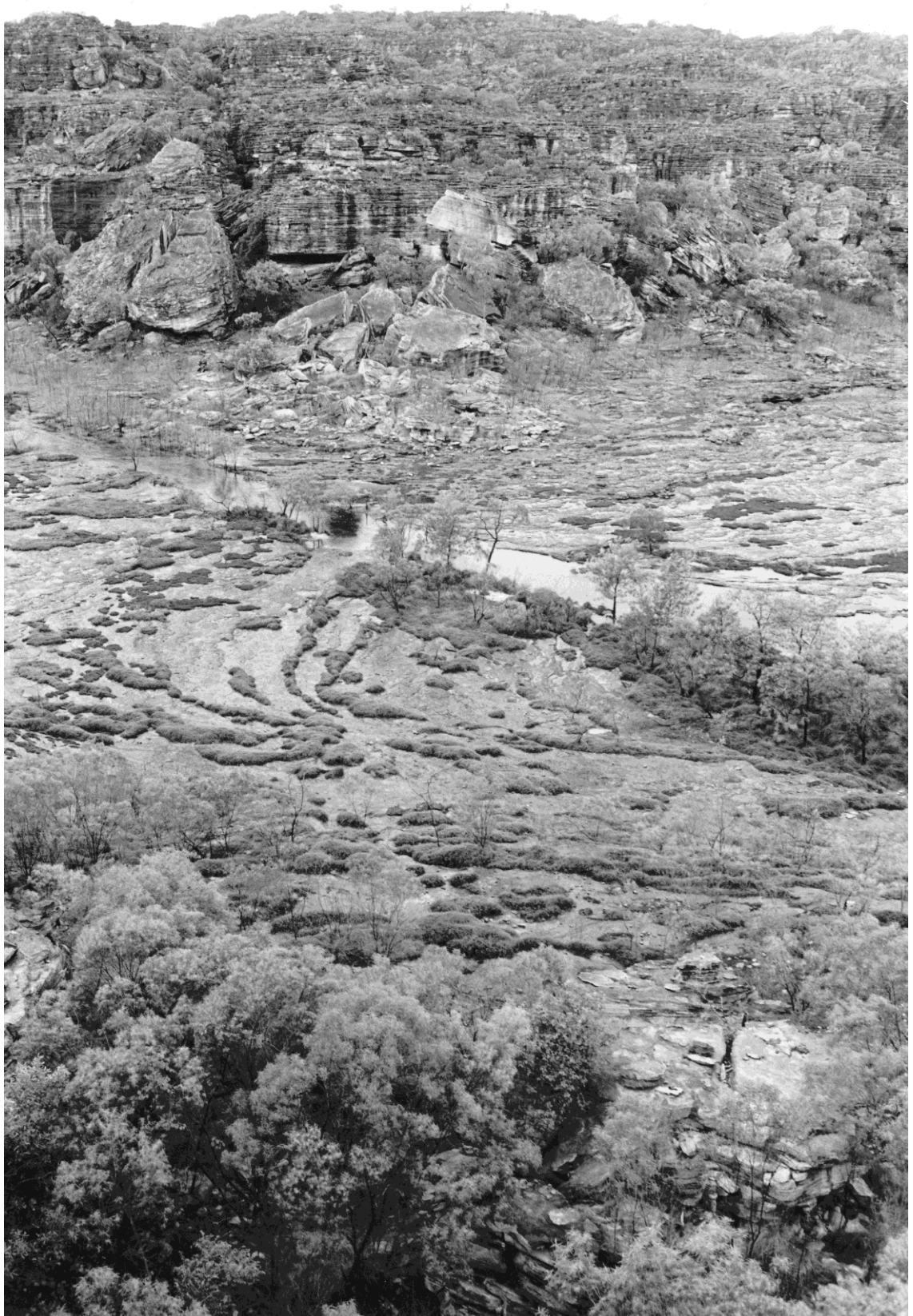


PLATE 7. A typical plateau-top valley. The landscape is predominantly of stone. Note the large shelters visible beneath the boulders in the background. Mount Brockman massif.

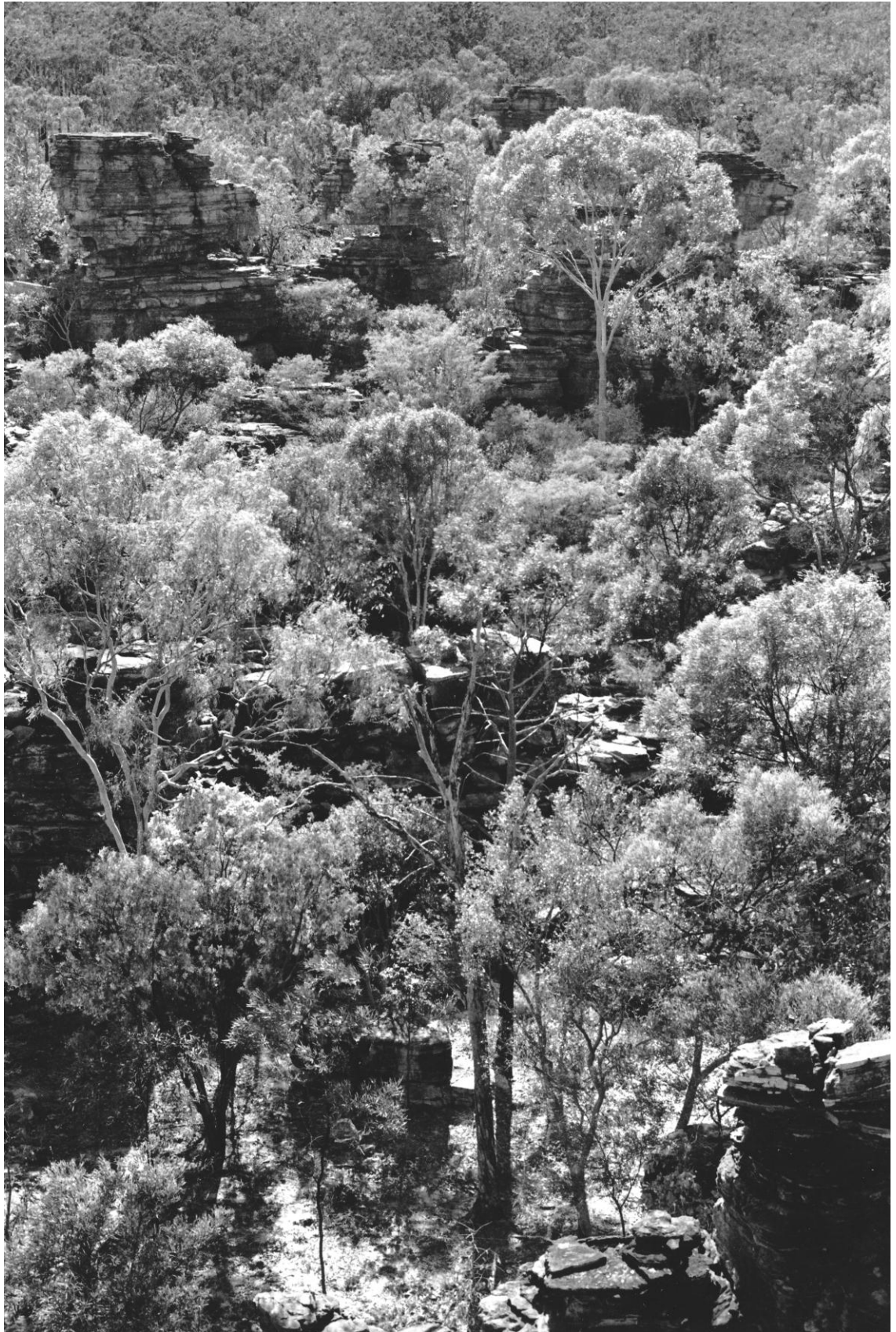


PLATE 8. Scattered outcrops and boulders typical of much of the plateau-top country away from the valleys. Upper Jim Jim Creek.



PLATE 9. An area of massive tumbled boulders on the Mount Brockman massif. Elevations on the plateau are often heavily dissected in this manner.

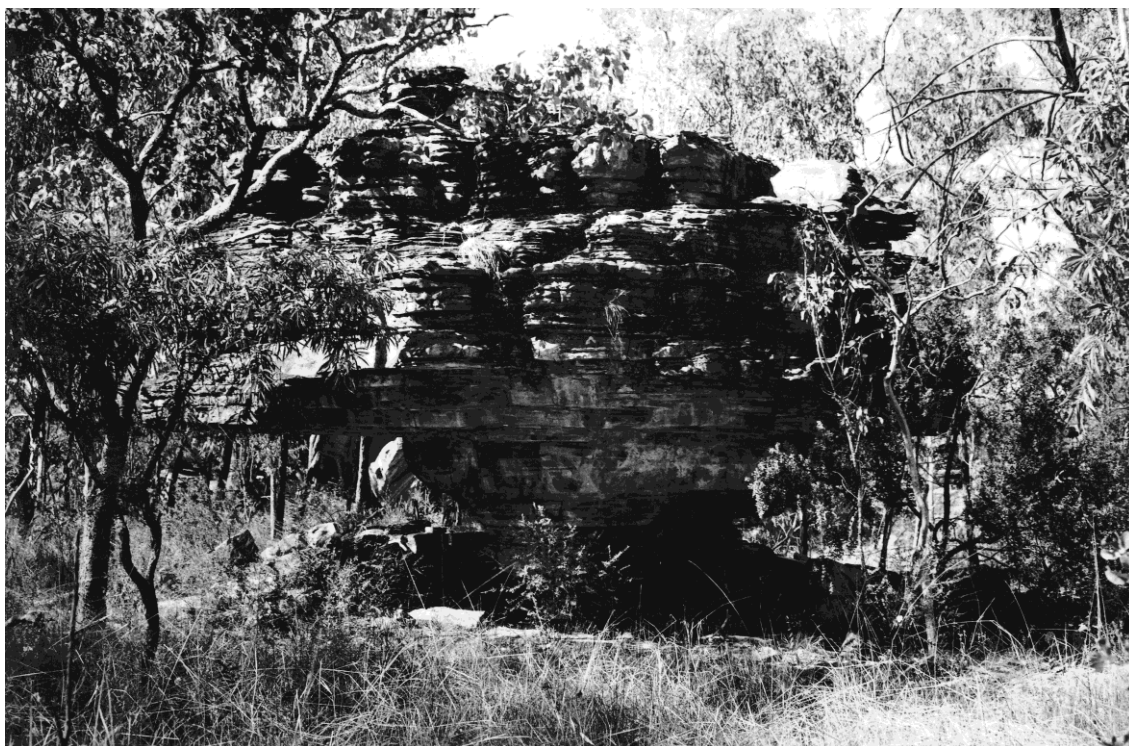


PLATE 10. Boulders are frequently found weathered into mushroom shapes. These form excellent shelters and often contain art. Plates 21 and 28 come from this site, located on Jim Jim Creek.

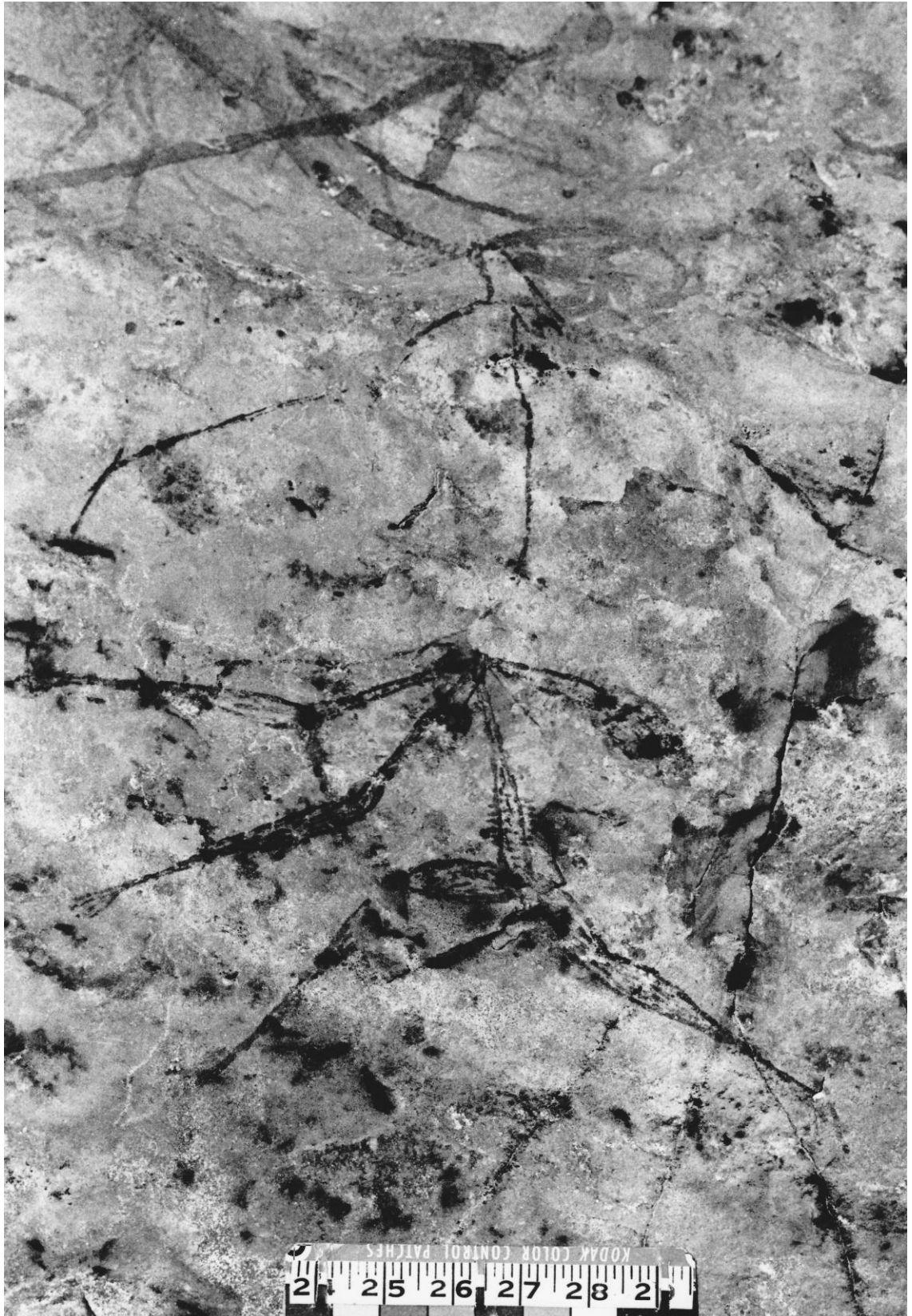


PLATE 11. A human figure from the Boomerang Period, holding an animal-headed bag-like object (see Figure 23). Dark red. Jim Jim Creek. Scale in inches.

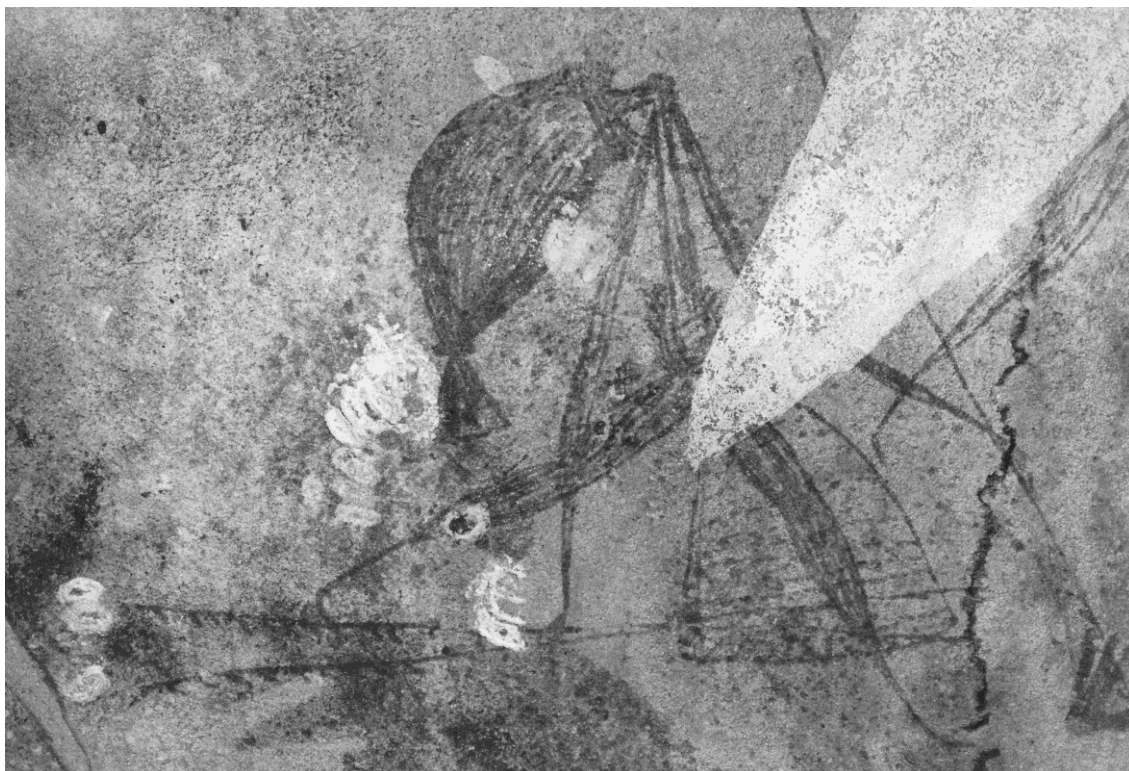


PLATE 12. Hand stencils and a boomerang figure from the head-waters of Waterfall Creek (see Figure 6). Red pigment.

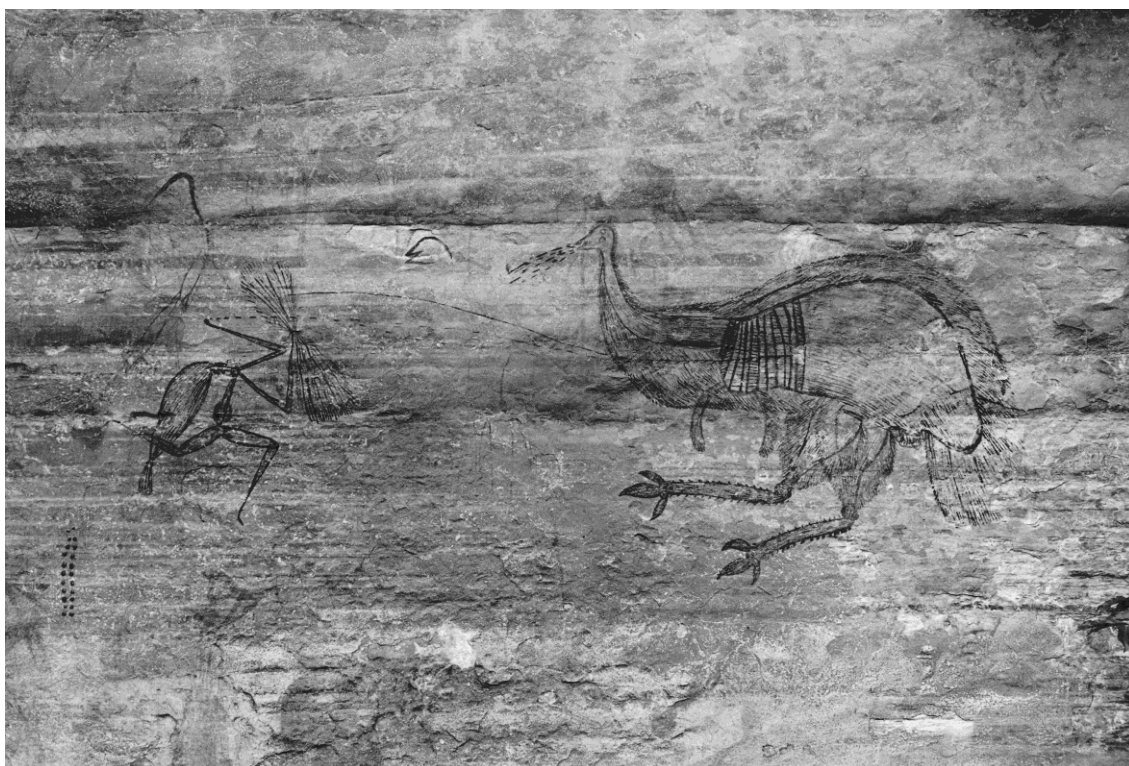


PLATE 13. An emu speared by a boomerang figure holding camouflage bushes. The pattern on the chest of the emu could represent an anatomical feature or a ritual design. The parallel dots at lower left are beeswax pellets. Mt. Brockman massif. Rump of emu to left foot of hunter: 256 cm.



PLATE 14. A hand stencil and a pair of boomerang figures from the Djawumbu-Madjawarnja massif (see Figure 7). Red pigment.



PLATE 15. A composed scene of boomerang figures, animal tracks, and animal-like objects (see Figure 36 for group at lower left). Nourlangie Rock area.



PLATE 16. Stencils of hands with the three middle fingers closed, and of two hooked boomerangs. Red pigment. Djawumbu-Madjawarnja massif. Boomerang at right: 105 cm. end to end.



PLATE 17. Palm prints, roughly painted concentric circles, and a stencil of a length of string, possibly with a round object at one end. Mount Brockman massif. Red pigment. Scale in inches.



PLATE 18. Stencil of an unidentified flat object. Red pigment. Mount Brockman massif. Scale in inches.

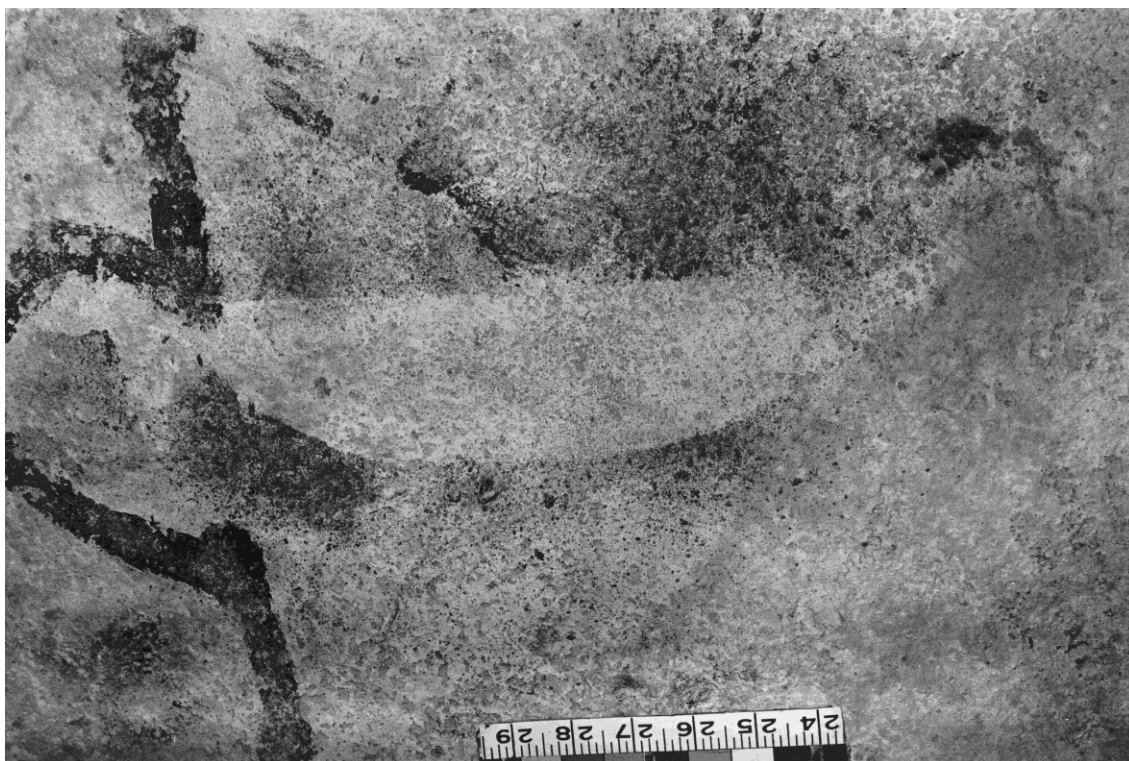


PLATE 19. A thickly painted line at left, and a stencil of an unidentified object similar to those in Figure 50. Mount Brockman massif. Red pigment. Scale in inches.

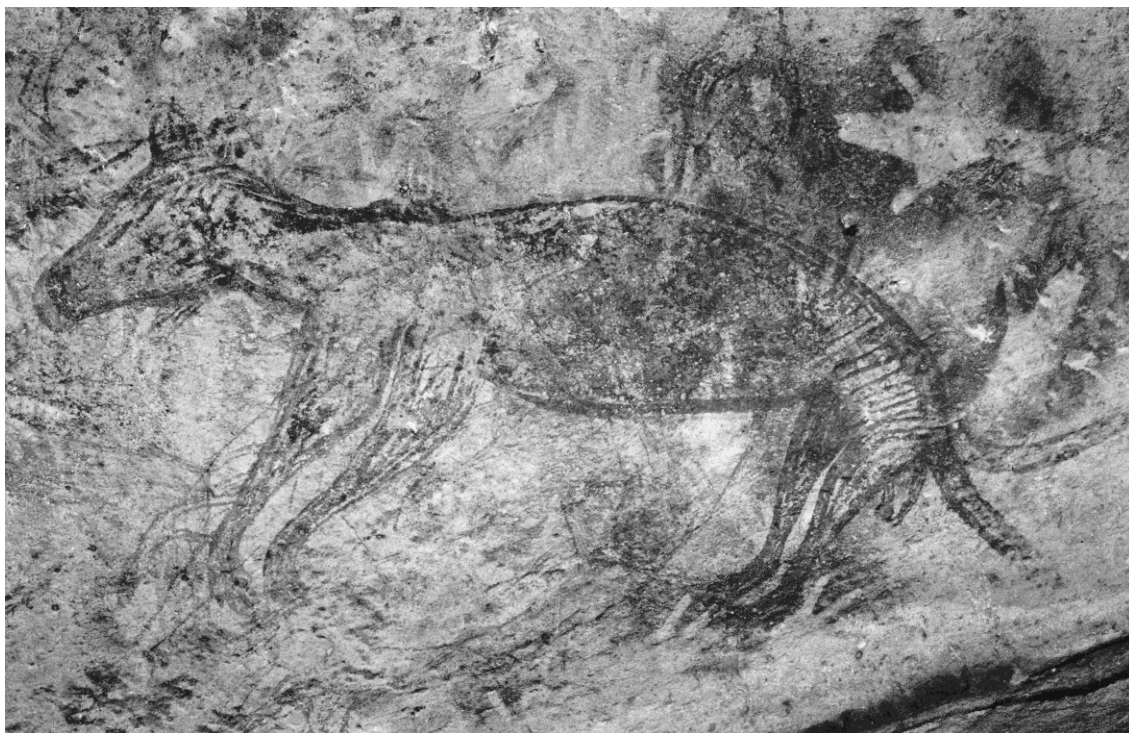


PLATE 20. Hand stencils with the three middle fingers closed, and a male thylacine (*Thylacinus cynocephalus*). Red pigment. Stag Creek. Length of thylacine: 120 cm.



PLATE 21. A Tasmanian devil (*Sarcophilus harrisii*). Red pigment. Upper Jim Jim Creek (see Figure 62).

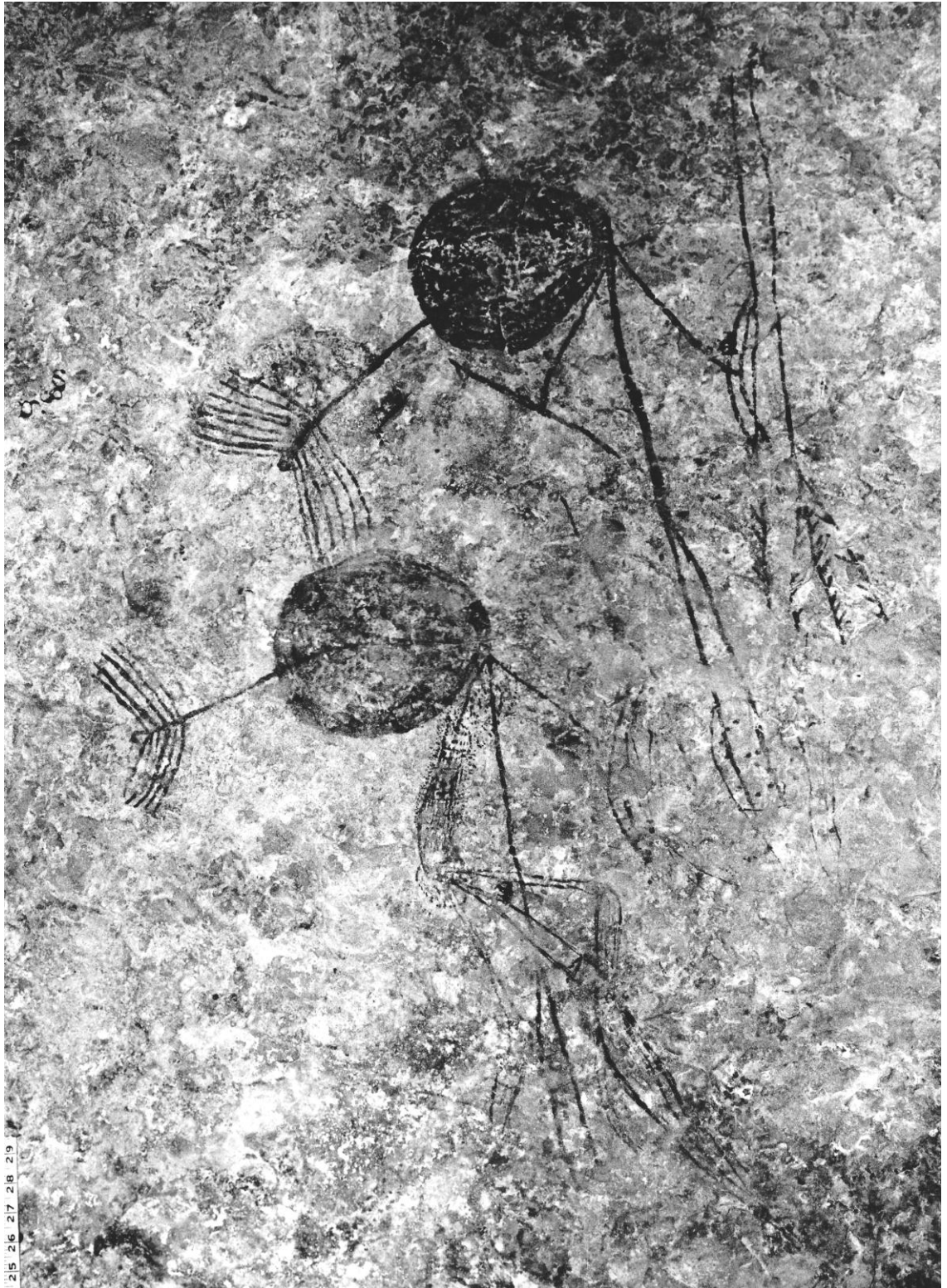


PLATE 22. Two 'hooked stick' figures with large headdress, in superimposition with a boomerang figure (see Figure 75). Mount Brockman massif. Scale in inches.



PLATE 23. 'Hooked stick' figures from the Djawumbu-Madjawarnja massif (see Figure 69). Note the large genitalia on several figures, and the multi-pronged, multi-barbed spear.



PLATE 24. An Oenpelli 'hooked stick' figure in superimposition with two birds. Note that where the lines of the three figures cross in different places, the apparent order of superimpositioning changes. Ubirr. Red pigment. Length of bird at left: 20 cm.



PLATE 25. Twin Falls 'hooked stick' figures (see Figure 97). Note branch-like objects. Red pigment.

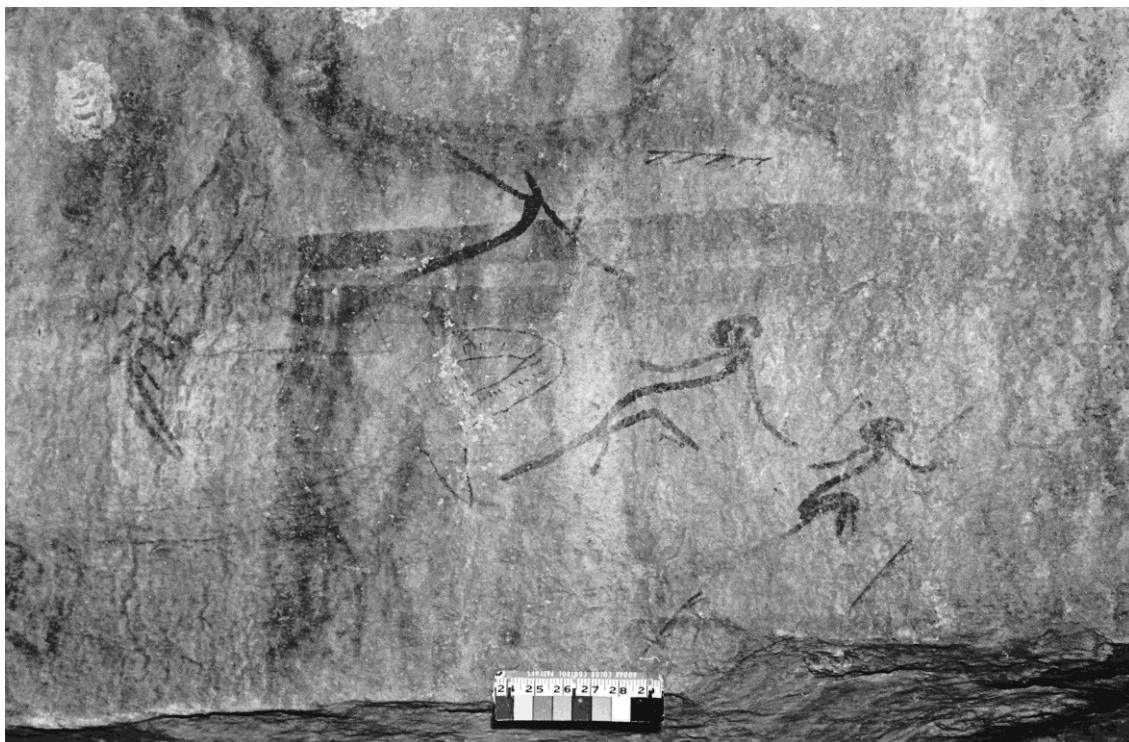


PLATE 26. Three Oenpelli 'hooked stick' figures and other faded motifs. Of a spear formerly held by the top figure only the barbs (in red) now remain. The objects around the other two figures are also probably the surviving red portions of depictions of material culture items. Ubirr. Red pigment. Scale in inches.

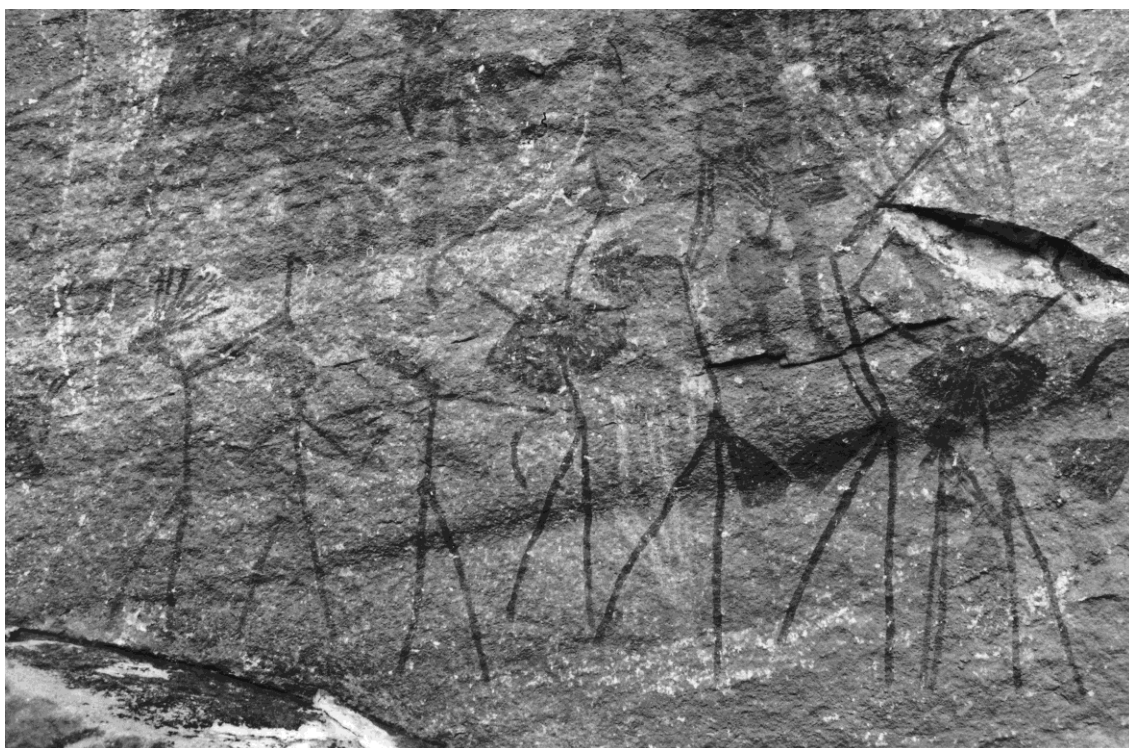


PLATE 27. Part of a group of over 35 'hooked stick' figures from the Mount Brockman massif (see Figure 80). Red pigment.



PLATE 28. Stylised yams and an anthropomorphic figure from the Rainbow snake complex of motifs (see Figure 152). Red pigment. Upper Jim Jim Creek.



PLATE 29. A composite Rainbow snake and an anthropomorphic yam figure from Twin Falls Creek (see Figure 128). Red pigment.

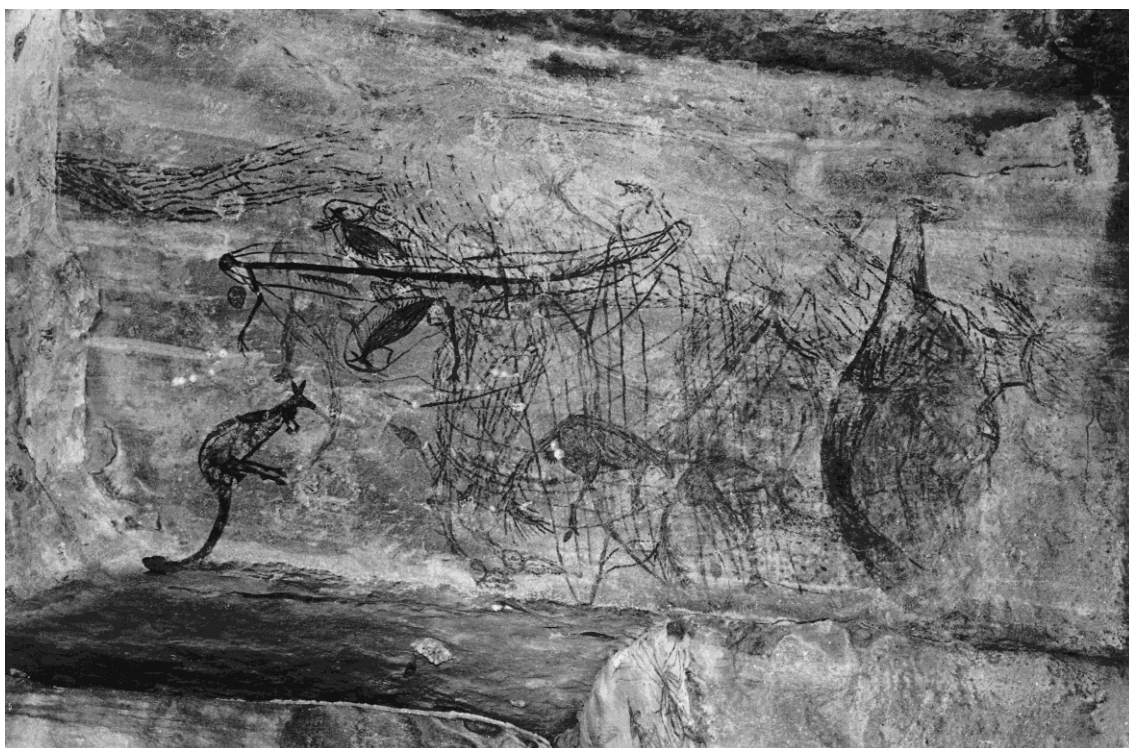


PLATE 30. Heavily superimposed red ochre art from Ubirr. Motifs include a large and small macropods, a bird, and several spirit beings that possess stylistic affinities with the Rainbow snake complex of paintings. Length of entire panel: 220 cm.



PLATE 31. Hand prints, human figures, and marsupials with incipient X-ray features. Broad spearthrower period. Red pigment. Mount Brockman massif. Scale is in inches.

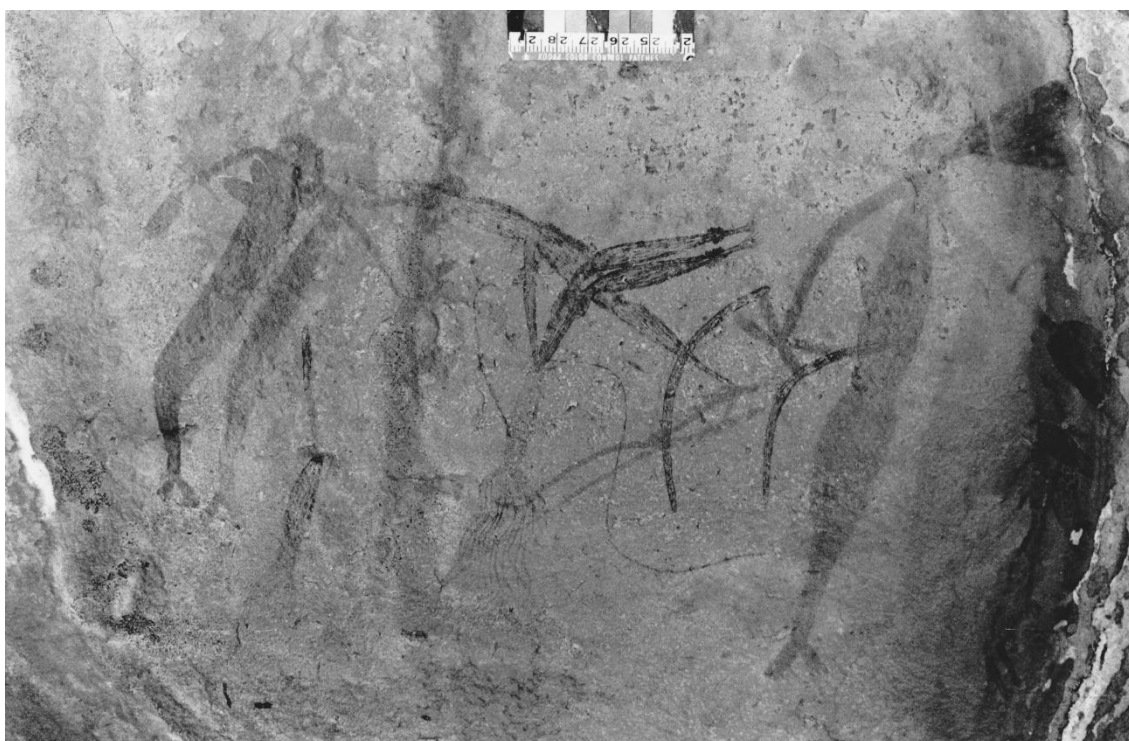


PLATE 32. Superimposed human figures in red pigment. Silhouette figures at left and right are from the Broad Spearthrower Period. Note the 'crossed sticks' held by the figure at the right. The inverted central figure is from the Boomerang Period. Upper Jim Jim Creek. Scale is in inches.



PLATE 33. Two human figures from the Broad Spearthrower Period (see Figure 163). Note the 'crossed sticks' held by each figure. Red pigment. Upper East Alligator River.



PLATE 34. Human figure with long-necked spearthrower and a large fan, from the Djawumbu-Madjawarnja massif (see Figure 202). Red.



PLATE 35. Male and female figures from the Djawumbu-Madjawarnja massif. Probably Long Spearthrower Period. Note the boomerang-like object at right. Red silhouettes with white interior decoration.



PLATE 36. Human figure with dillybag, shield, and weapons, from the Long Spearthrower Period (see Figure 226). Note hand stencils and other earlier red ochre paintings.



PLATE 37. Red ochre paintings of three mounted horsemen, and a human figure from the Long Spearthrower Period (see Figure 269). East of the Djawumbu-Madjawarnja massif.



PLATE 38. Superimposed red ochre art from the Long Speargrower Period (see Figure 243). The figure with speargrower is in a style restricted to the Oenpelli-East Alligator River crossing area. East of the Djawumbu-Madjawarnja massif.



PLATE 39. An X-ray style fish and other motifs from the Long Speargrower Period. Note the tiny fish in the stomach area of the larger fish. Upper East Alligator River.



PLATE 40. A woman in X-ray style, superimposed on a white flying fox and a white kangaroo with a spear in its back. All of these figures are superimposed on a series of early red ochre paintings of animals (see Edwards 1979 back cover for colour reproduction of these paintings). Stag Creek. Length of woman: 112 cm.



PLATE 41. Paintings of two human figures, fish and macropods from the Long Spearthrower Period. Compare the style and material culture of the larger figure with Figures 241 and 246. Upper East Alligator River. Length of spear: about 180 cm.

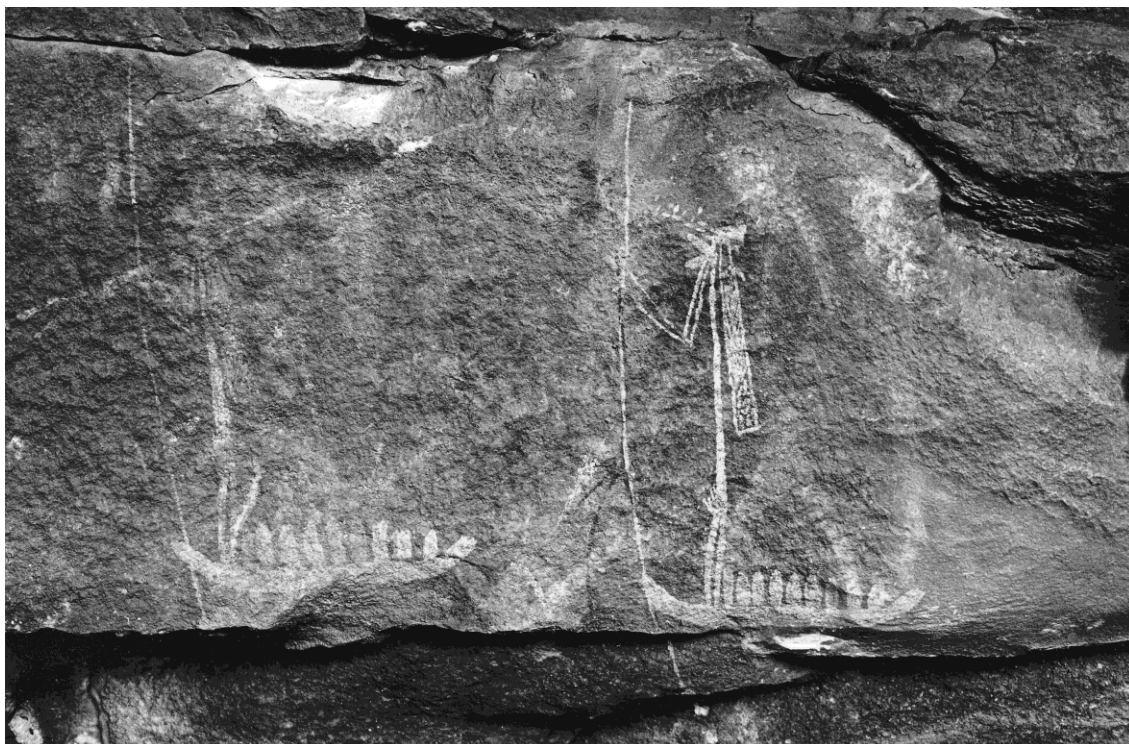


PLATE 42. Two women poling watercraft with loads of waterfowl eggs (see Figure 266). Note the dots in front of the mouth of the figure at right. White pigment. Djawumbu-Madjawarnja massif.



PLATE 43. Freshwater swampland on the Magela Creek floodplain, adjacent to the Djawumbu-Madjawarnja massif.

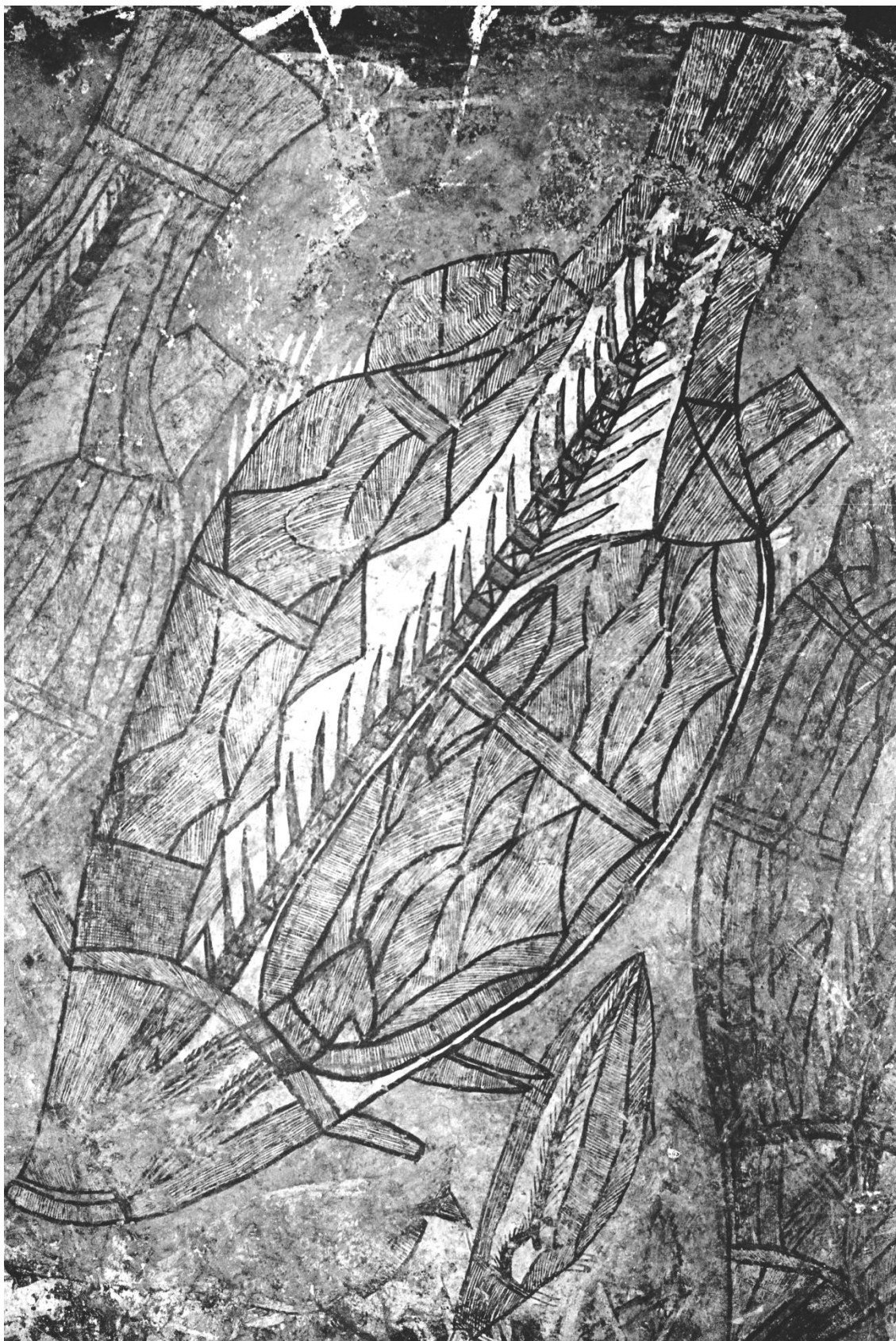


PLATE 44. X-ray style fish. The backbone and internal organs of the larger fish are clearly depicted. Note the fine cross-hatching and parallel lines used to infill various body parts. Ubirr. Red lines on a white base.



PLATE 45. X-ray kangaroos superimposed on other recent and early style paintings (see Edwards 1979 front cover for a colour reproduction of these paintings). Stag Creek. Length of complete kangaroo: about 170 cm.



PLATE 46. An image of a European sail boat, made from beeswax. East of the Djawumbu-Madjawarnja massif. Length: 31 cm.



PLATE 47. Painting of a buffalo hunter and a Martini-Henry rifle with cartridge in the breech (see Figure 271). This type of rifle was commonly used for buffalo shooting from the late 1800's until early this century. These motifs are superimposed on a goanna and other paintings in recent style. The object to the left of the rifle barrel may be a skinning knife in its sheath. Purplish-red lines on a white base. Upper East Alligator River.



PLATE 48. Typical mortar depressions in the bedrock of an Arnhem Land shelter. Similar circular depressions may also be found on portable slabs and have been excavated in archaeological deposits well over 20,000 years old. Average diameter of these examples: about 10-12 cm.

FIGURES 1-271

Notes on the Illustrations

Unless stated otherwise, the line drawings in the following pages were reproduced by tracing images projected from colour transparencies. In organising the illustrations, I have not followed the usual convention of numbering the illustrations as they are referred to in the text. Instead, I have grouped them into periods, from earliest to latest, to enable easier recognition of the main styles in each material culture period, to facilitate comparisons between the different periods, and to demonstrate how the unity of different styles and unique motifs is apparent through common material culture associations.

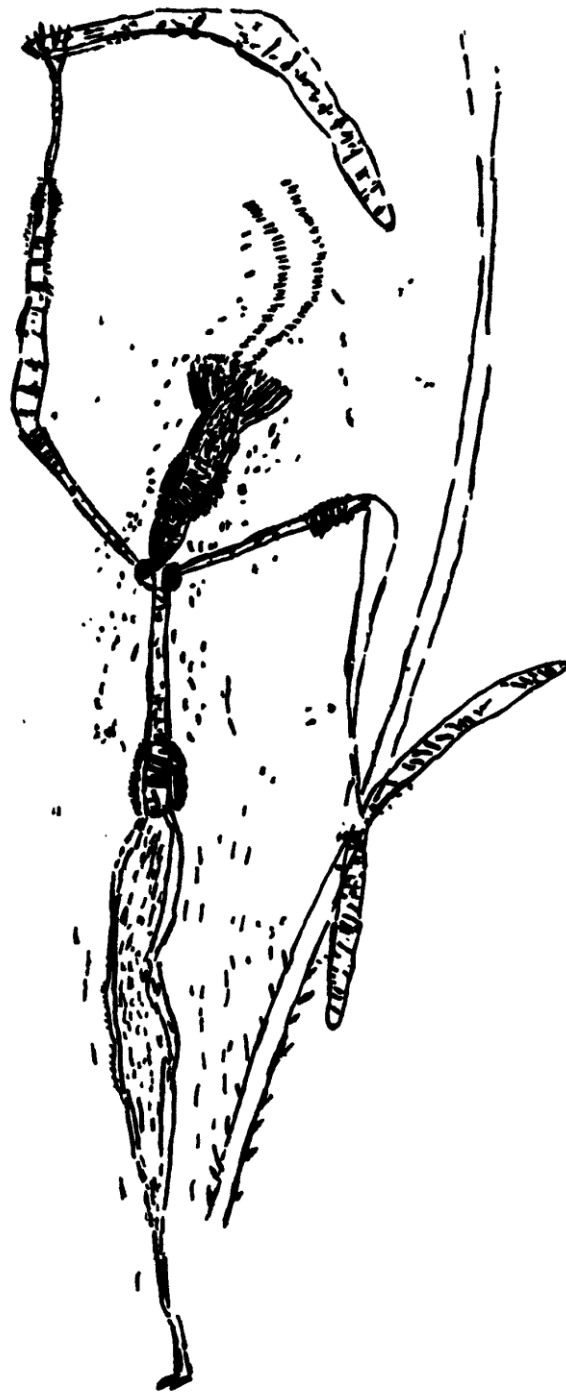


FIGURE 1.

Boomerang Period.

Deaf Adder Creek.

Male with boomerangs, spears and headdress. The dots around the body are intentional and are said by Aborigines to represent the breath and body warmth of living beings (Brandl 1973. 181), a feature sometimes seen in other Arnhem Land art periods (eg Figures 189, 266).

Red.

Length: about 120 cm. overall.

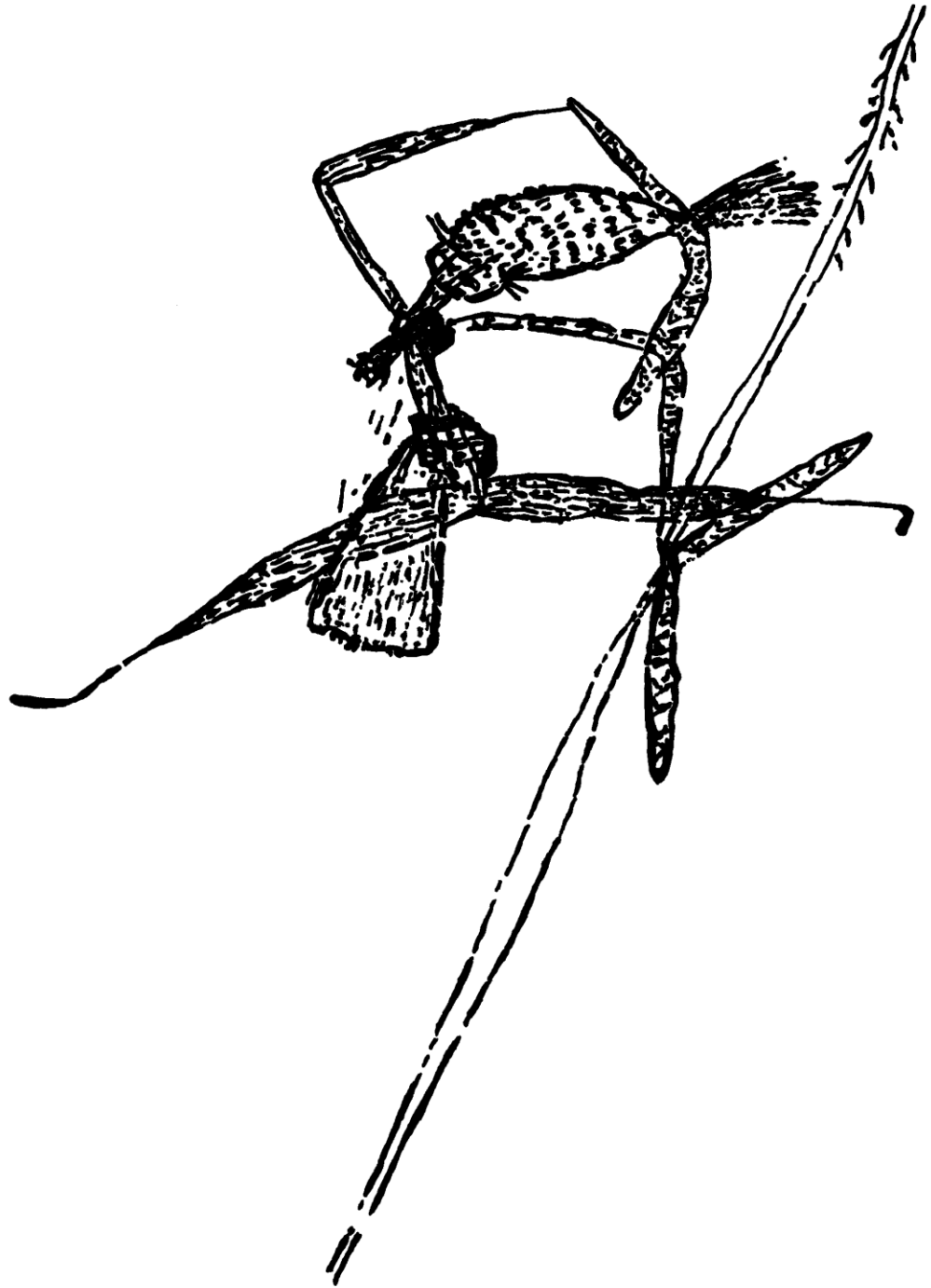


FIGURE 2.

Boomerang Period.

Cannon Hill.

From a group of four similar figures, a human being with boomerangs, spears, headdress and 'dancing skirt'.

Dark red.

About 62 cm. foot to foot.



FIGURE 3.

Boomerang Period.

Stag Creek.

A hand stencil and human being with spear, headdress, large boomerangs and a 'dancing skirt' hung from a hair belt.

Highly weathered red.

Foot to foot: 40 cm.

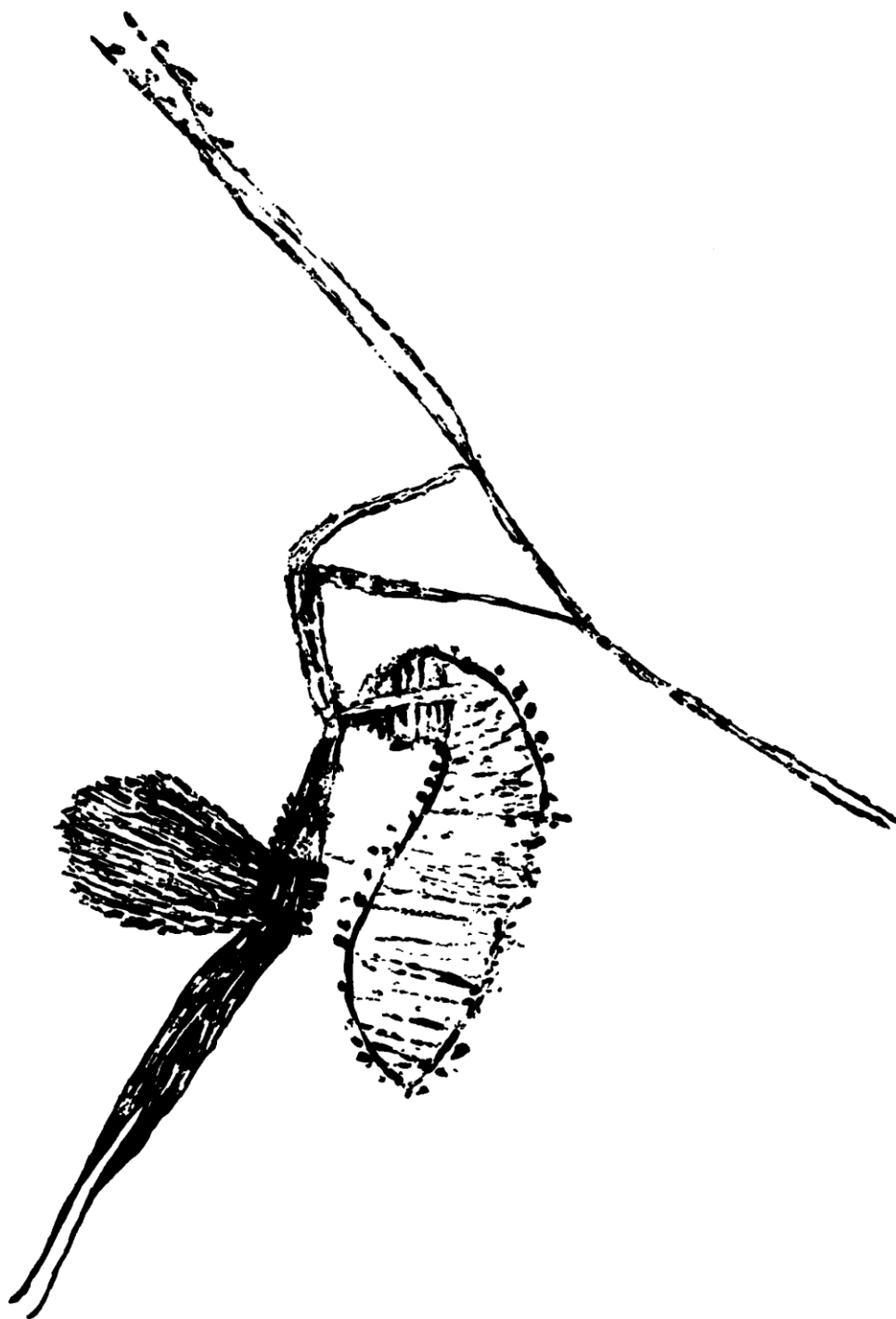


Figure 4.
Boomerang Period.
Deaf Adder Creek.
A human being with two spears held aloft, a large headdress and a 'dancing skirt'.
Dark red.
Height of figure: 35 cm.

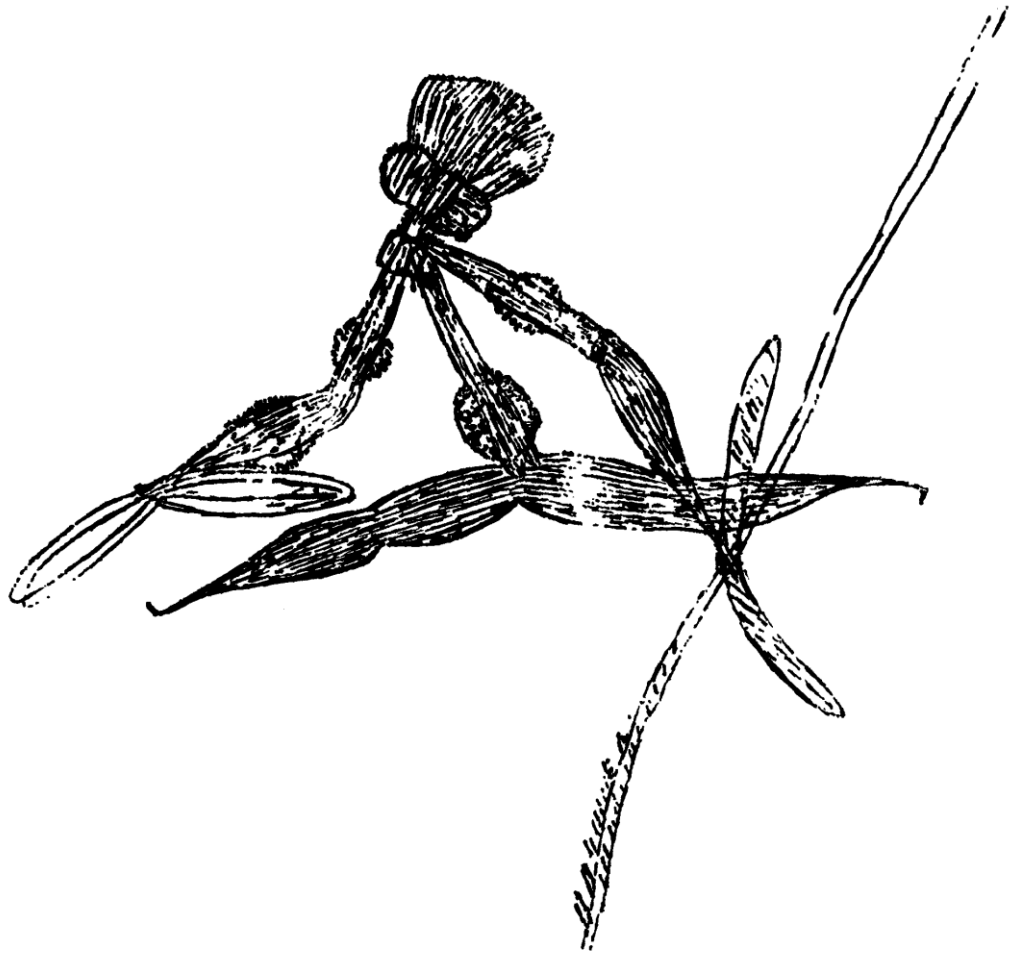


Figure 5.
Boomerang Period.
Deaf Adder Valley.
A human being with weapons, headdress, hair belt and an arm decoration.
Red.

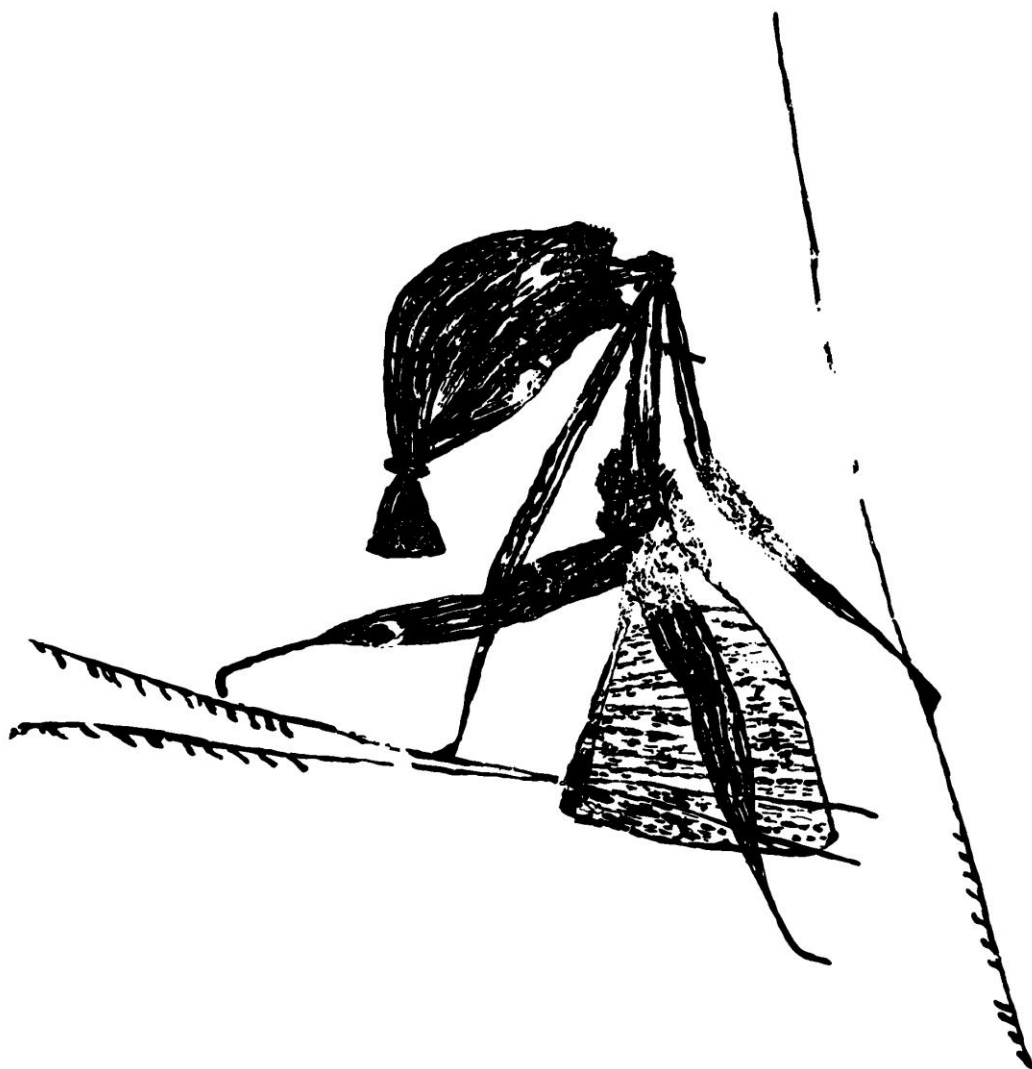


FIGURE 6.
Boomerang Period.
Headwaters of Waterfall creek.
A human being with a headdress, 'dancing skirt' and spears (see Plate 12).
Red.
Height of figure: 38.5 cm.



FIGURE 7.

Boomerang Period.

Djawumbu-Madjawarnja Massif.

Two figures with headdress and boomerangs (see Plate 14). Note the boomerangs held in the waist belts.

Dark red.

Maximum dimension: 55 cm.



FIGURE 8.

Boomerang Period.

Deaf Adder Creek.

A hand stencil and a male figure with headdress, large 'dancing skirt', decoration on the right arm, and a 'necklet'.

Red.

Foot to foot: 43 cm.

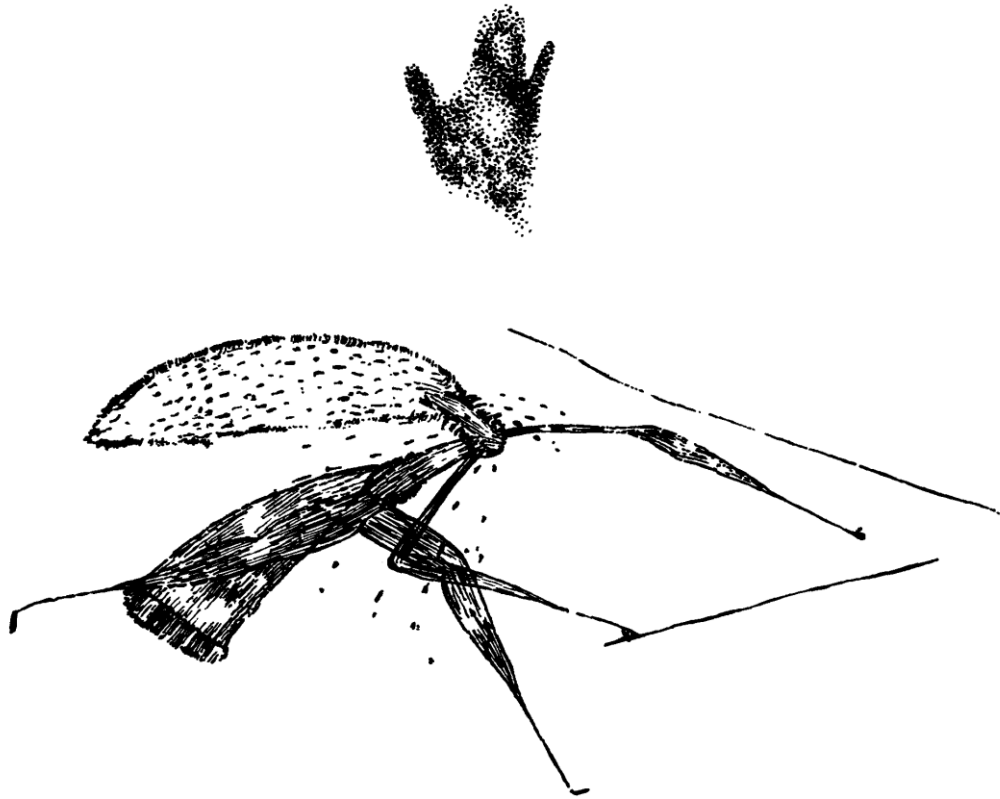


FIGURE 9.

Boomerang Period.

Deaf Adder Creek.

A hand print and a male figure with headdress and fringed 'dancing skirt'. The figure is holding a spear or stick and appears to have just thrown another. Note that the hand print has the three middle fingers closed, similar to many of the hand stencils associated with figures from the Boomerang Period.

Dark red.

Maximum length: 66 cm.



FIGURE 10.

Boomerang Period.

Deaf Adder Creek.

A human being with boomerangs, headdress and a 'dancing skirt' hung from a hair belt. Note the tassel suspended from the front of neck.

Red.

Foot to foot: approximately 65 cm. (from memory).

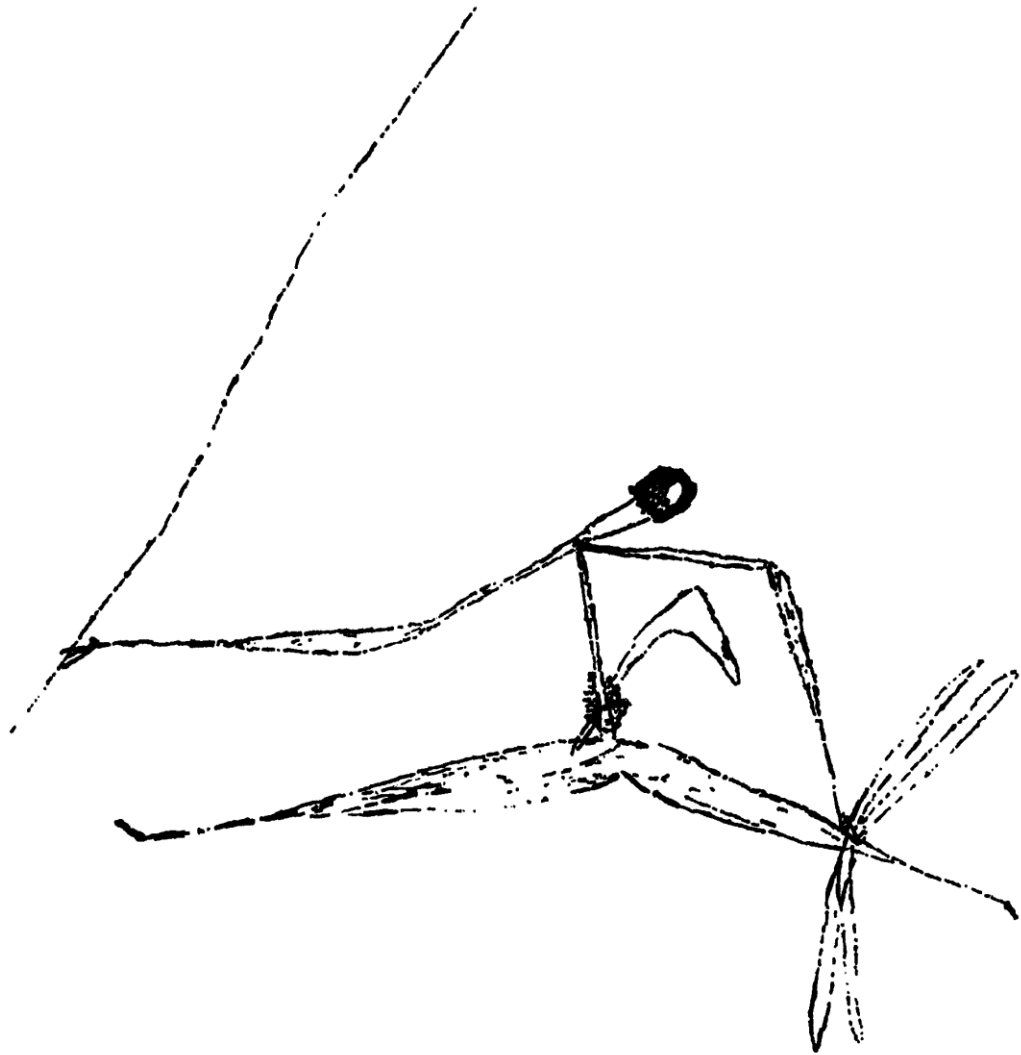


FIGURE 11.

Boomerang Period.

Deaf Adder Creek.

A 'running' human figure with a spear, boomerangs, and an unusual boomerang-like or club-like artefact in the waist belt. Similar artefacts are seen among Arnhem Land stencils (eg Figure 48, 49 and Plate 16).

Red.

Maximum dimension: about 35 cm.

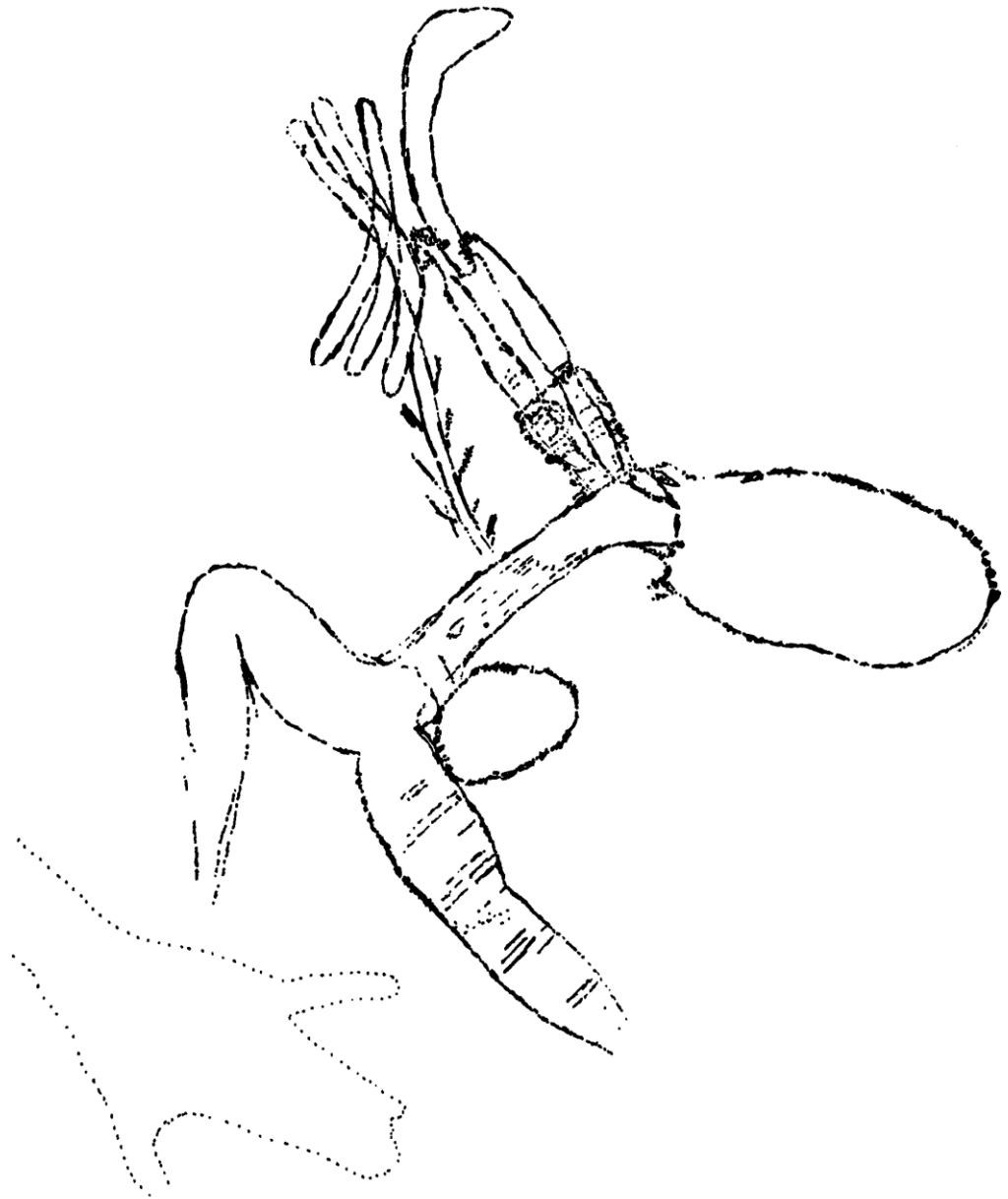


FIGURE 12.

Boomerang Period.

Baroalba Creek.

A hand stencil and a dancing (?) human figure with a headdress and waist ornament.

The figure holds three conventional boomerangs and an unusual boomerang-like or club-like artefact of a type no longer known in Arnhem Land (cf. with Figures 45-48).

Faded red.

Maximum dimension of figure: 59 cm.

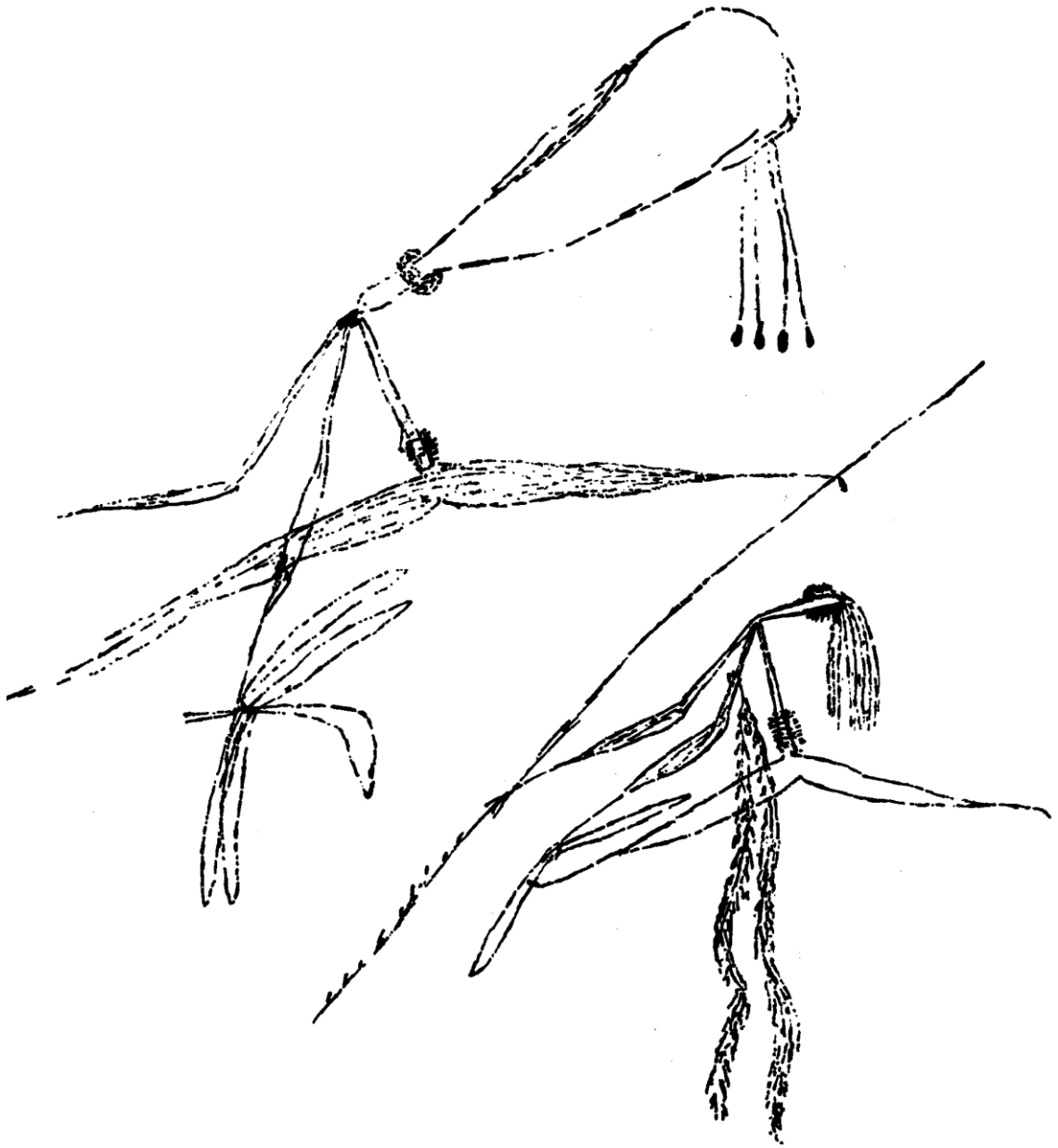


FIGURE 13.

Boomerang Period.

Deaf Adder Creek.

Two human beings with headdress and weapons, one with a long ornaments hung from the bicep. Note the unusual artefact held by the figure on the left.

Red.

Upper figure: about 50 cm. foot to foot.

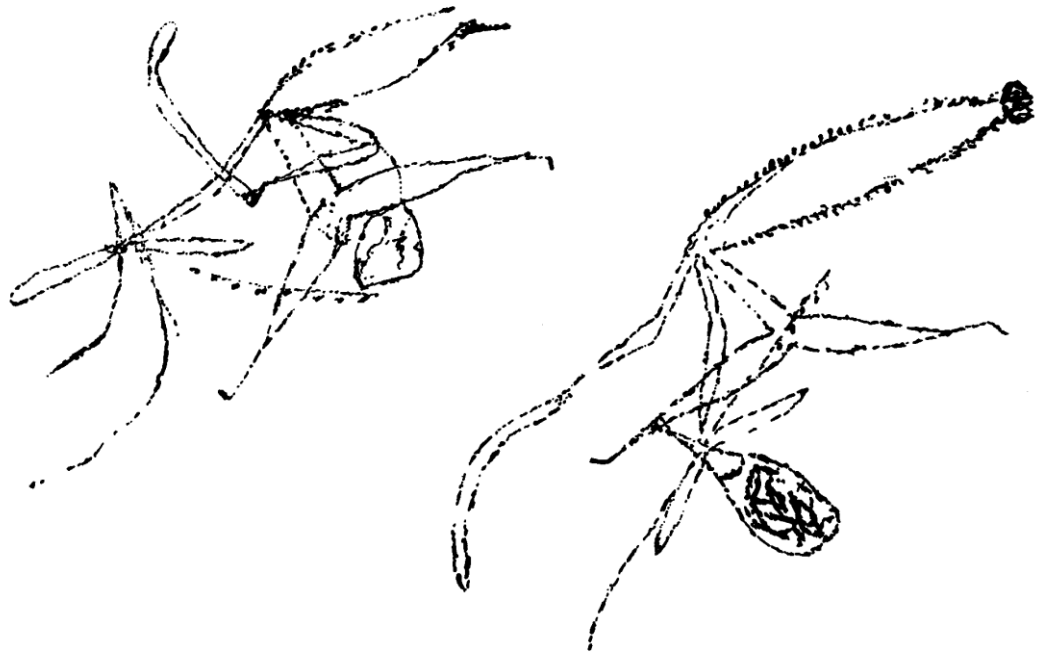


FIGURE 14.

Boomerang Period.

Deaf Adder Creek.

Two running males with headdress, weapons and dilly bags. Note the unusual shape of the boomerang held by the figure on the left (cf. Figure 45).

Dark red.

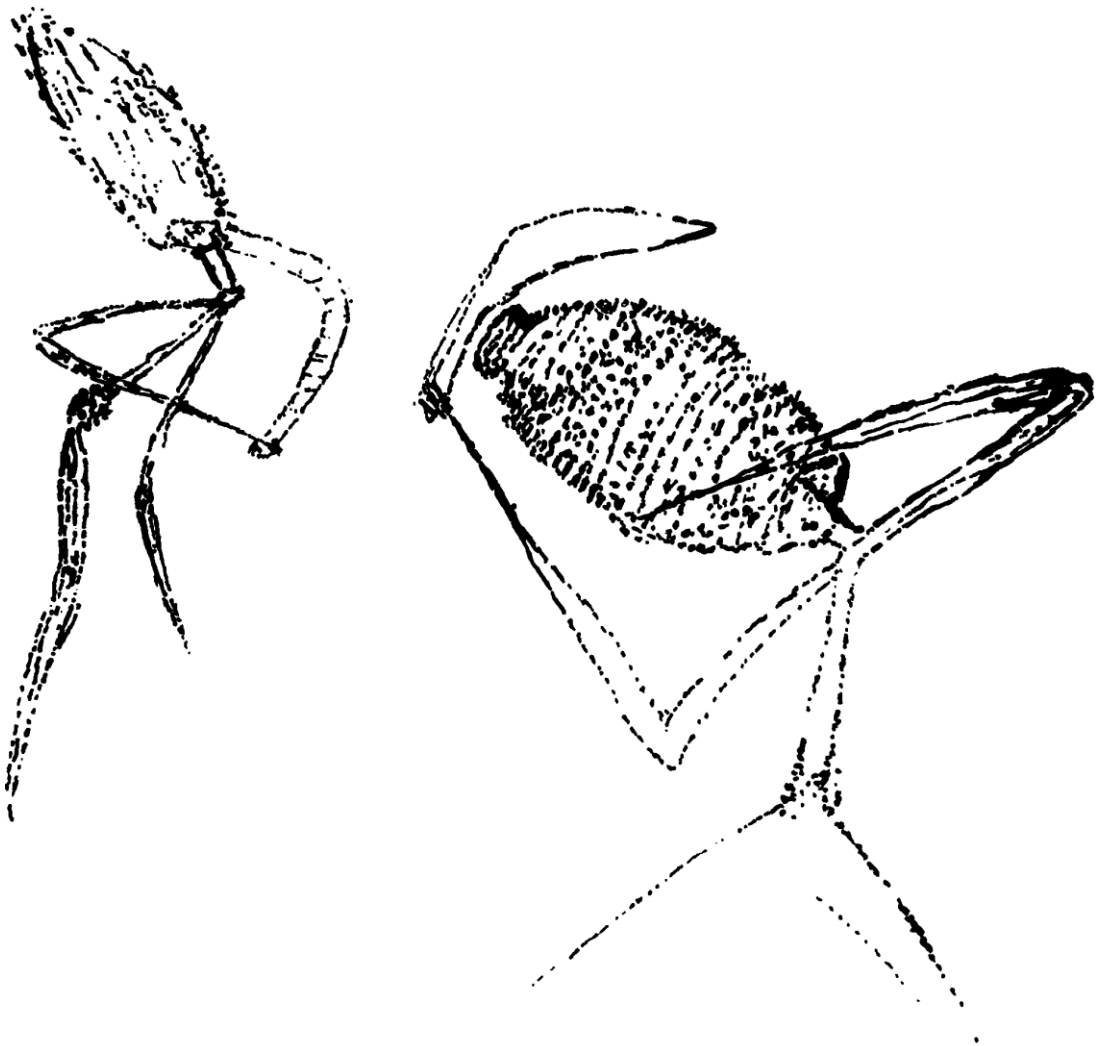


FIGURE 15.

Boomerang Period.

Deaf Adder Creek.

Two human beings with headdress. Note the unusual form of boomerang carried by the figure on the right.

Faded red.

Left hand figure: 25 cm. tall.

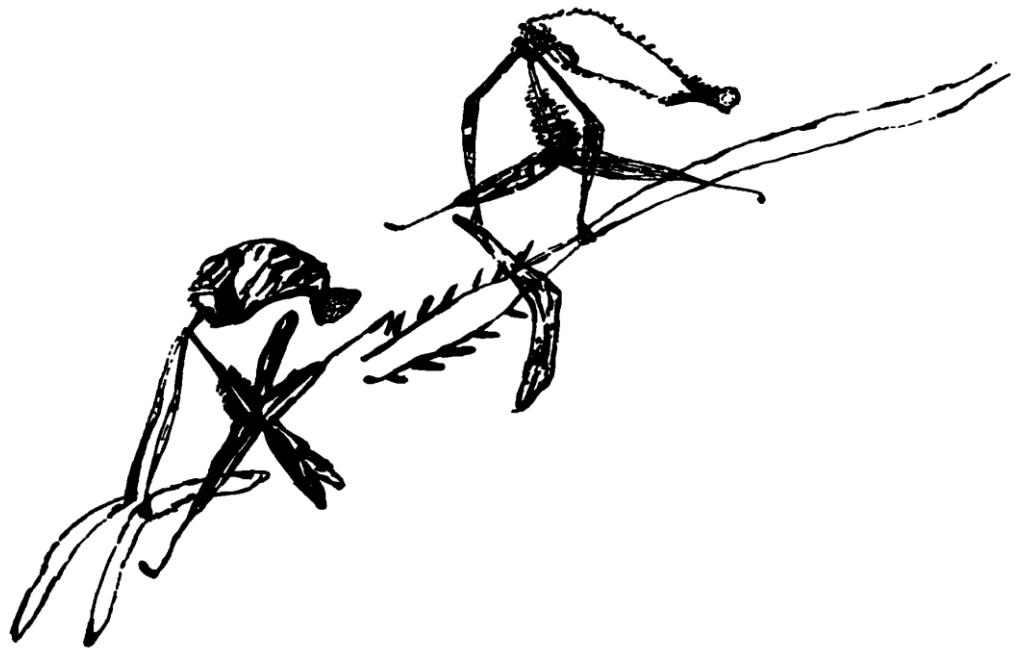


FIGURE 16.

Boomerang Period.

Baroalba Creek

Two human beings with headdress. Note the unusual boomerang carried by the figure on the right and the boomerangs carried in the waist belt by the figure on the left.

Red.

Maximum dimension: about 70 cm.

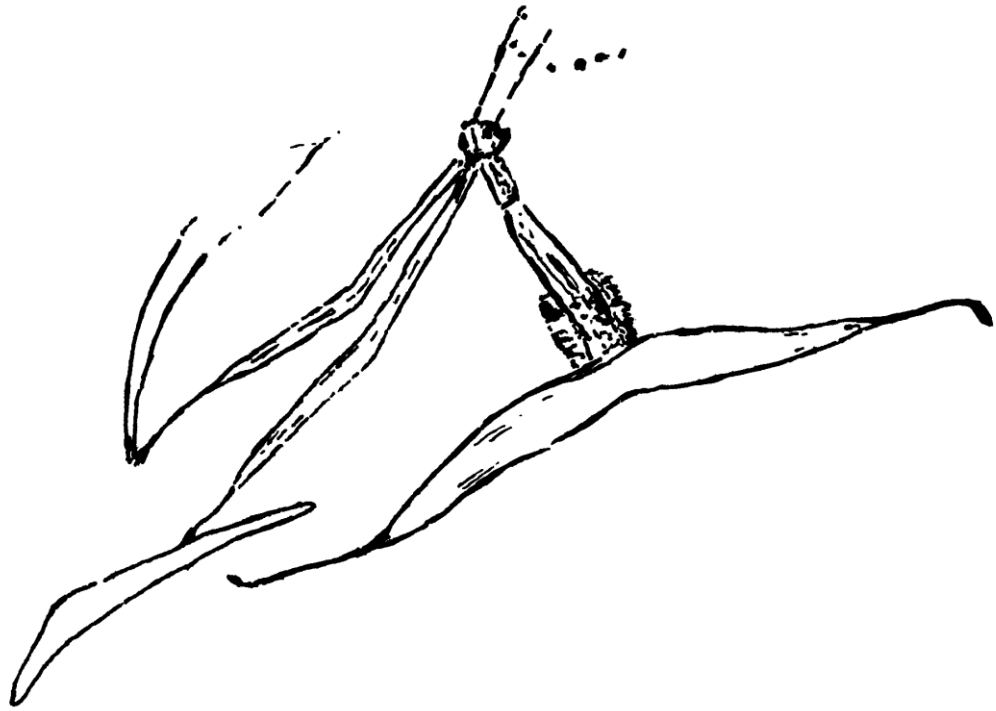


FIGURE 17.

Boomerang Period.

Deaf Adder Creek.

A 'running' figure with boomerangs. Note the unusual shape of the lower boomerang.

Red.

Maximum dimension: about 20 cm.

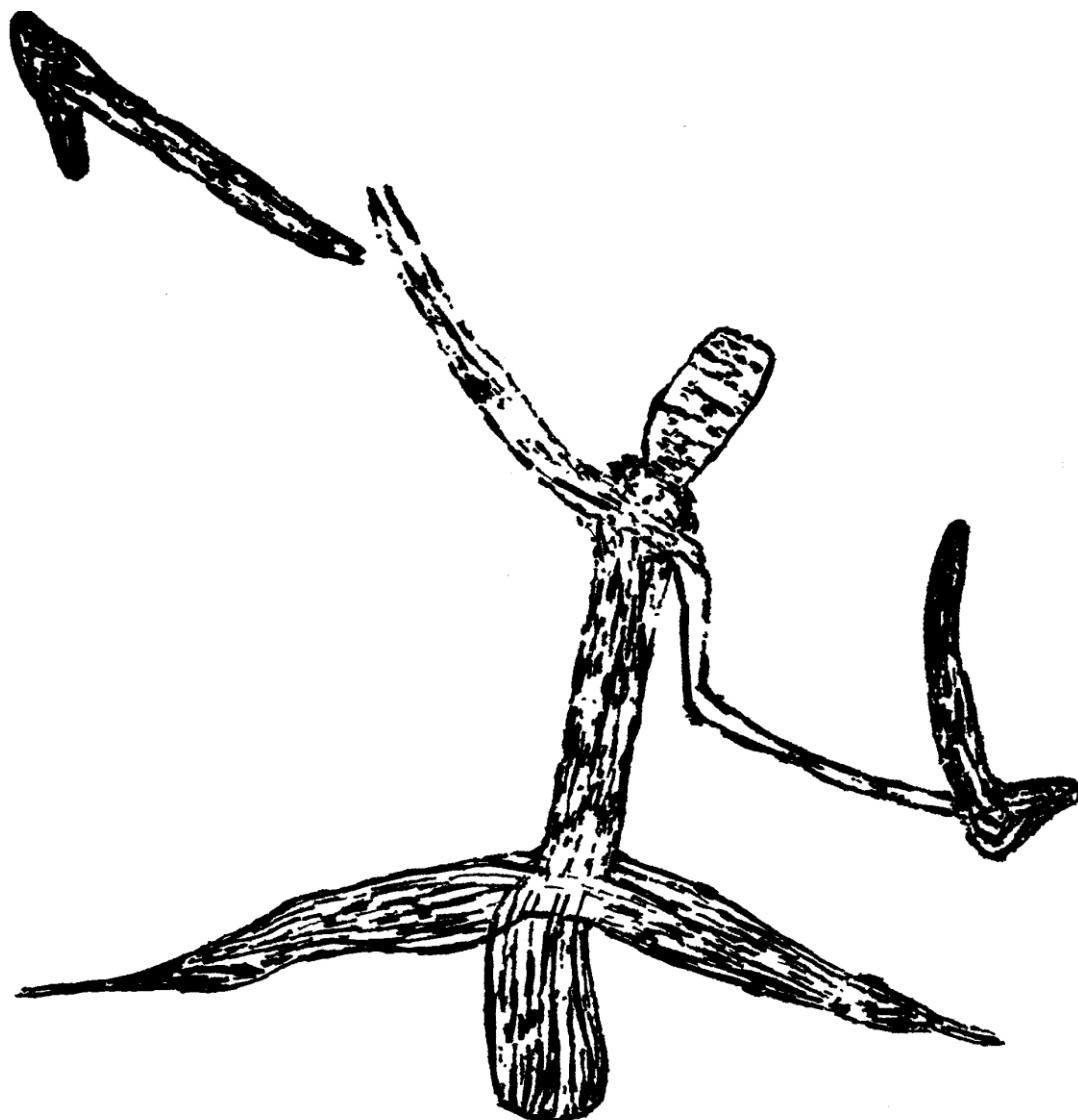


FIGURE 18.
Boomerang Period (tentative).
Baroalba Creek.
A weathered human figure with a 'dancing skirt' and weapons.
Red.
Leg span: 28 cm.

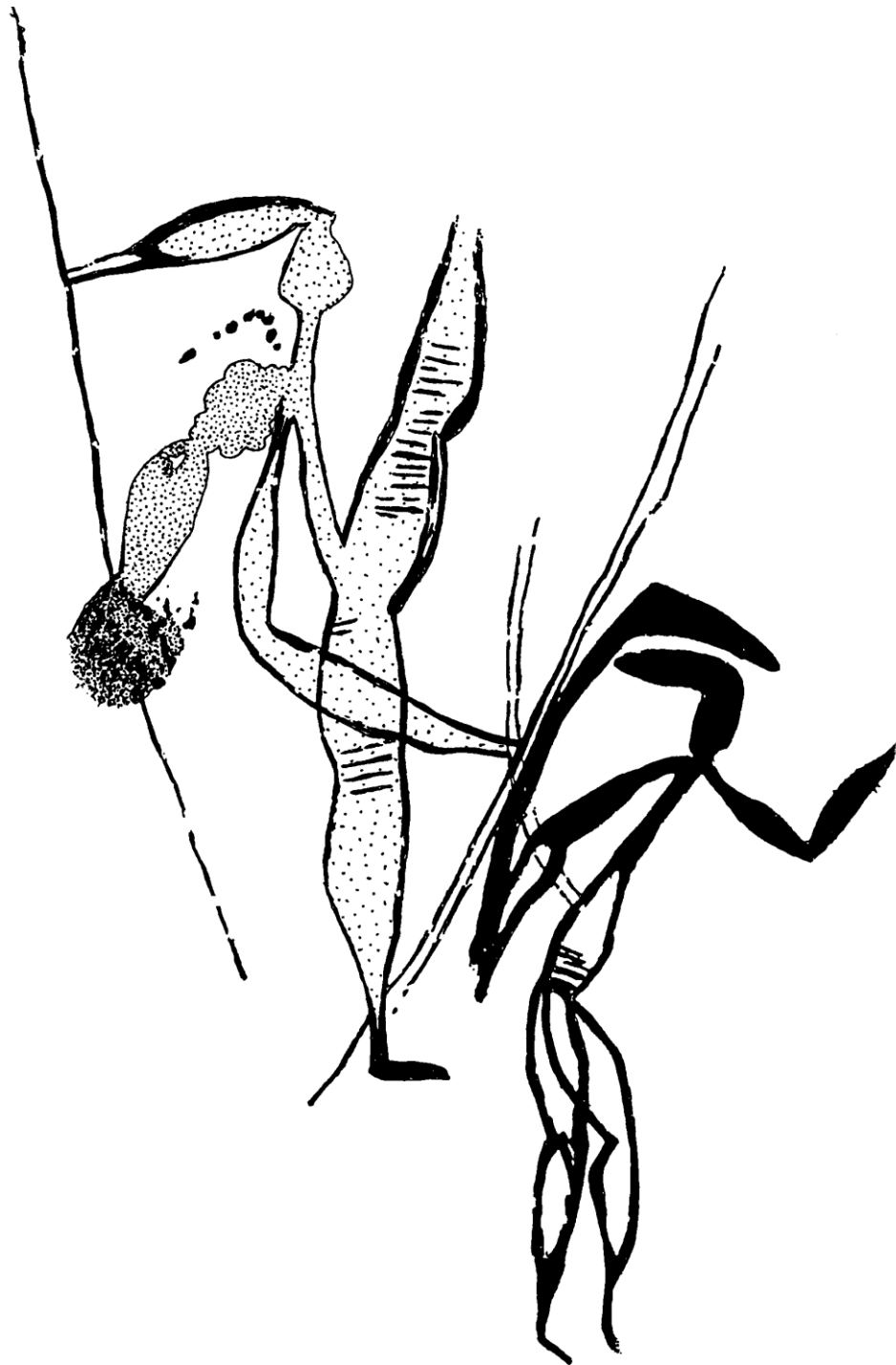


FIGURE 19.

Boomerang Period.

Stag Creek.

Two human beings with weapons, from a highly weathered group scene. Because of weathering the detail on the upper figure is not sharp. Note the unusual artefact between the two figures.

Weathered dark red.

Right hand figure: 36 cm.

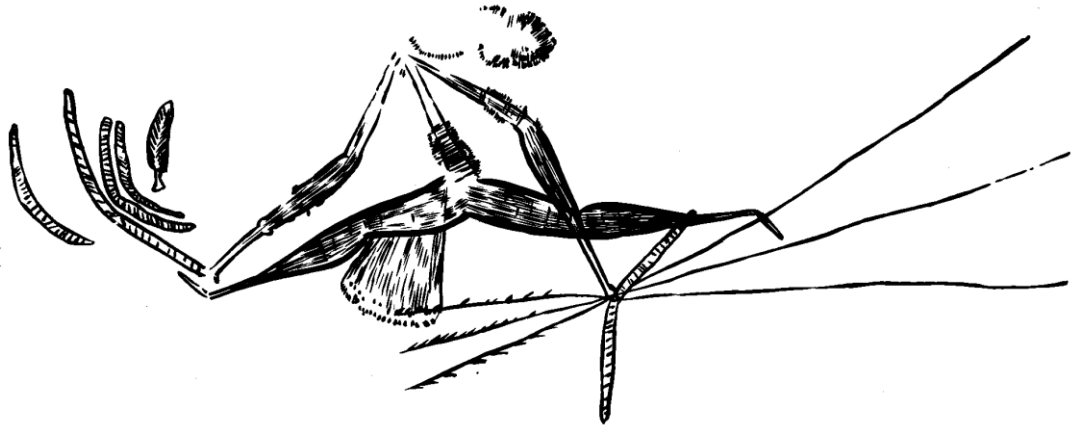


FIGURE 20.

Boomerang Period.

Deaf Adder Creek.

A human being with headdress, 'dancing skirt' and weapons. Alongside the boomerangs is an unusual fish-shaped object. Stencils of this artefact have been found at several locations, providing precise dimensions (eg see Figure 50). The edges of these stencils are sharp which suggests that the artefact was fairly flat. In this painted version, there are infill lines that might represent two flat planes on one side, forming a lateral ridge on the object. If so then the artefact may have had a flat triangular or diamond-shaped cross-section. The association of this artefact with boomerangs may indicate its use as a weapon, possibly a type of throwing club. Artefacts of this shape and size are not known among the weapons that were used anywhere in Australia at European contact. The closest analogy, at least in shape, seems to be the Muraian sacred object recorded by Spencer (1914, plate 3). However, the function of the object depicted here remains unknown.

Red.

Size unknown.

From the Brandl collection, Australian Institute of Aboriginal Studies, courtesy of M. Brandl.

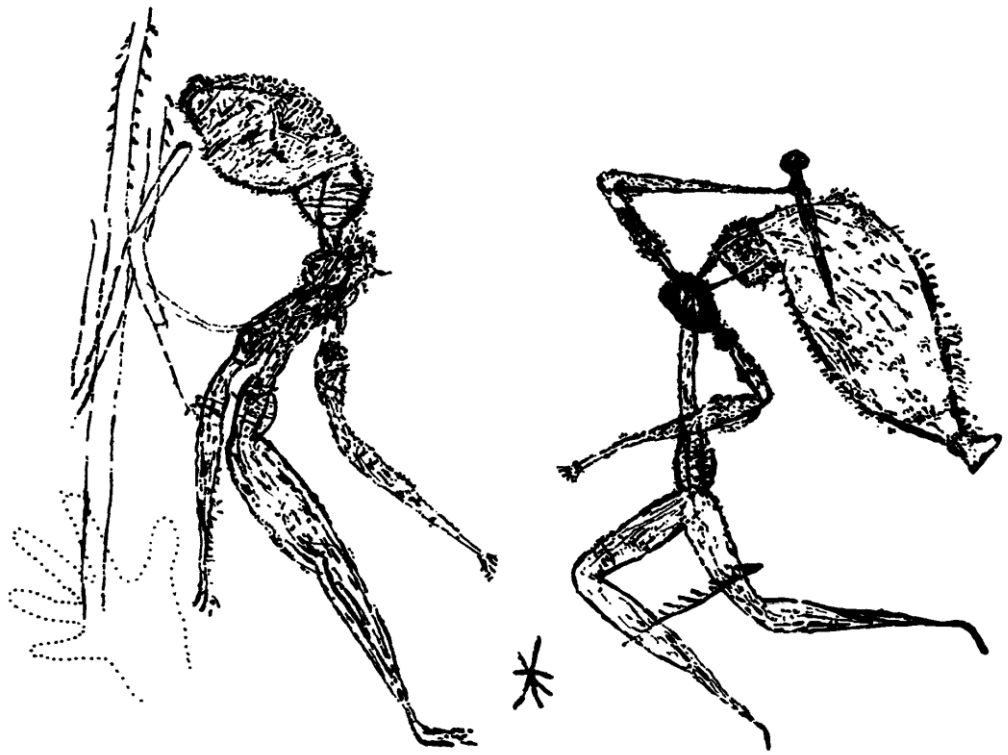


FIGURE 21.

Boomerang Period.

Mount Brockman Massif.

A hand stencil and two human beings with headdress and weapons. The figure on the right holds a knobbed club. An asterisk-like design that may represent fire is located between the feet of the two figures (see Figure 32). Designs of this type are almost totally restricted to this art period. Both paintings were originally red. The figure on the left appears to have been repainted in yellow at a later time.

Right hand figure, foot to elbow: 39 cm.



FIGURE 22.

Boomerang Period.

Ngarradj Warde Djobkeng.

A human being with headdress, 'dancing skirt', spear and boomerang, shown following kangaroo tracks. Note the boomerangs in waist belt.

Dark red.

Kangaroo tracks: 10 cm.



FIGURE 23.

Boomerang Period.

Jim Jim Creek.

A human being with headdress and carrying a sack-like object that has an animal head (see Plate 11).

Dark red.

Maximum dimension: 37.5 cm.

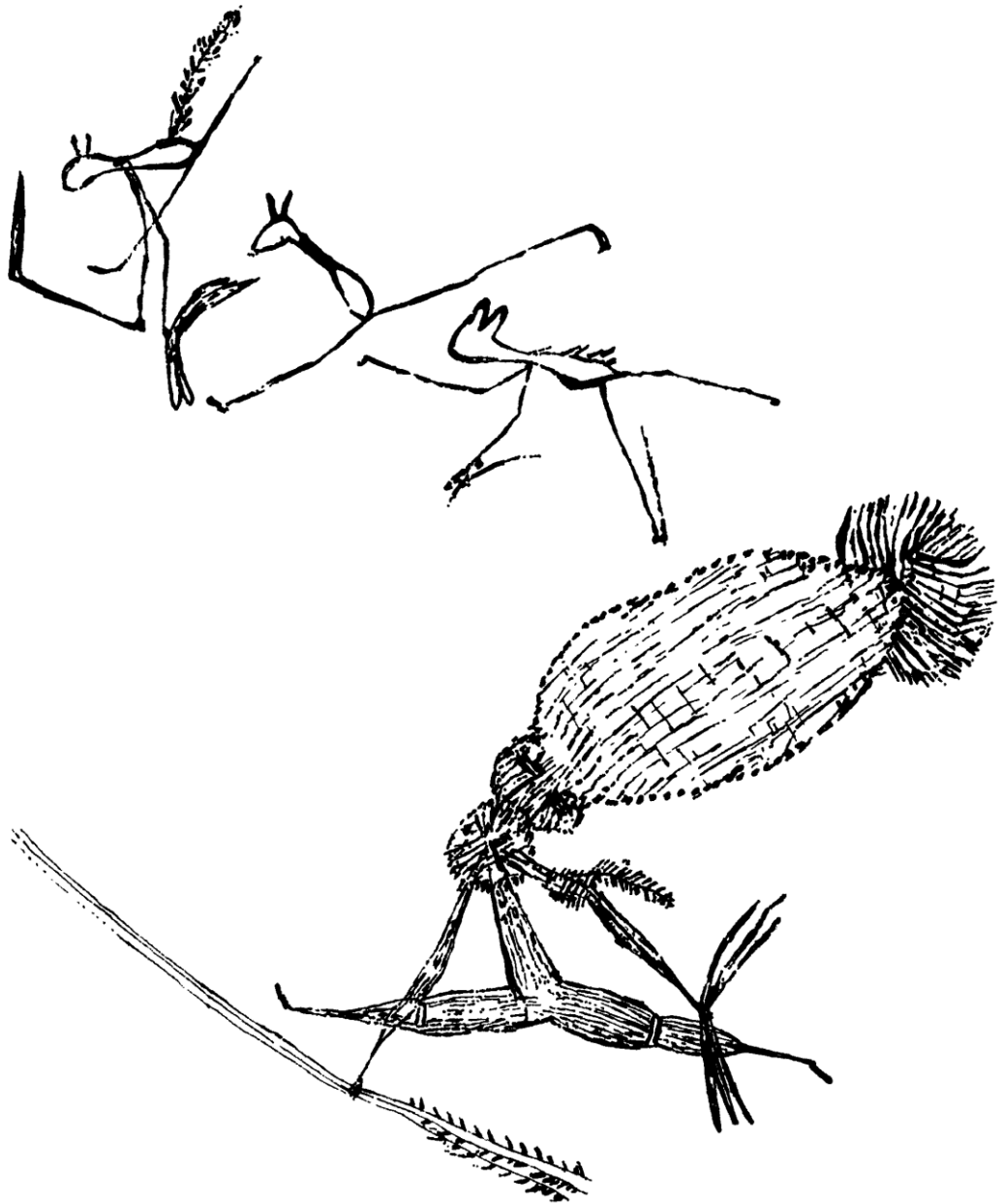


FIGURE 24.

Boomerang Period.

Baroalba Creek.

Three animal-headed beings, and a human being with large headdress, spears, boomerangs and an arm ornament. Note the angled object (boomerang?) held by the being at the left.

Red.

Spears: about 50 cm.

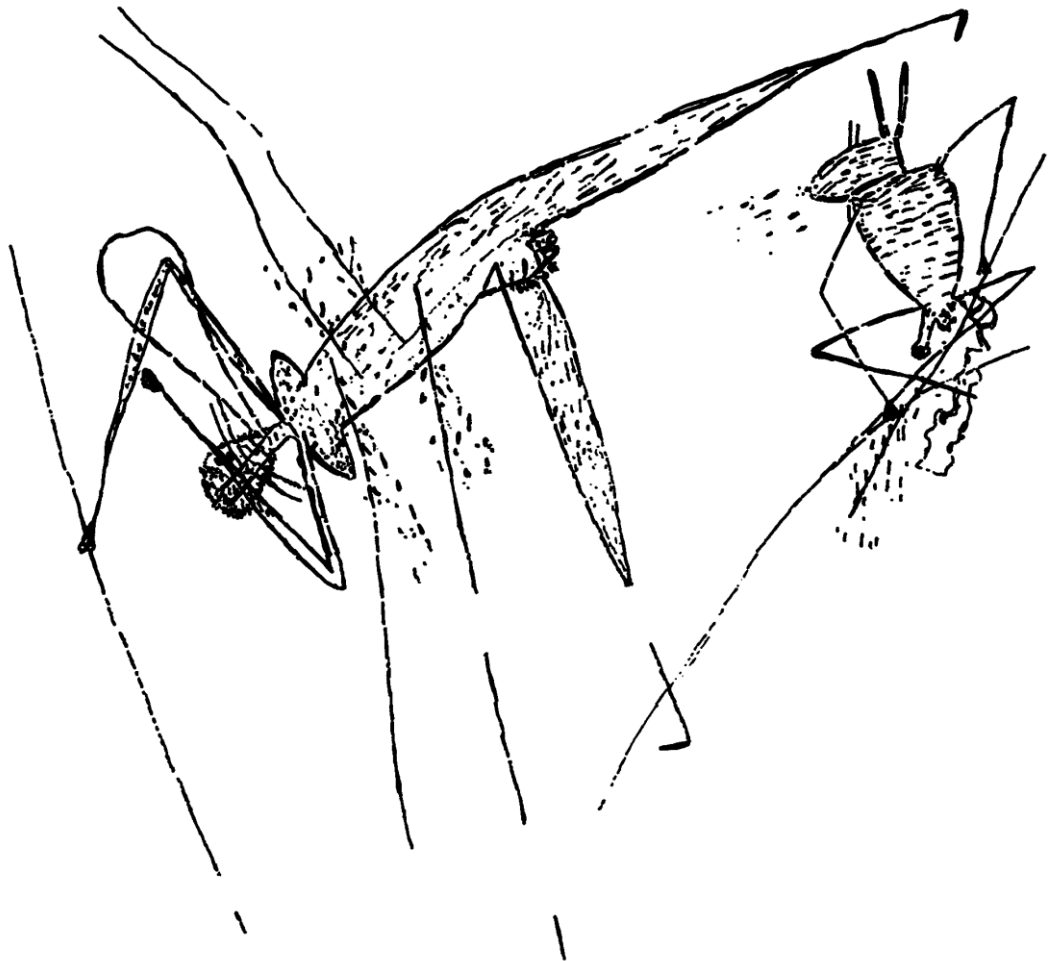


FIGURE 25.

Boomerang Period.

Deaf Adder Creek.

A woman with dillybag, face ornament and stick (?), and an animal-headed being with spears. Four spears protrude from the woman's body. Dots alongside each spear may represent blood or 'breath' escaping from the wounds. Judging from the body shape the animal-headed being probably represents a 'flying fox-man'.

Red.

Maximum dimension: approximately 60 cm.



FIGURE 26.

Boomerang Period.

Baroalba Creek.

A hand stencil, an outline of kangaroo, and a human being with a 'dancing skirt', boomerangs and spear. The kangaroo and the boomerang figure appear to be the same colour and were probably painted at the same time. Note that this kangaroo does not exhibit the 'crossed legs' perspective common to animals from the Boomerang Period (eg Figures 54-60).

Red.

Spear: 52 cm.

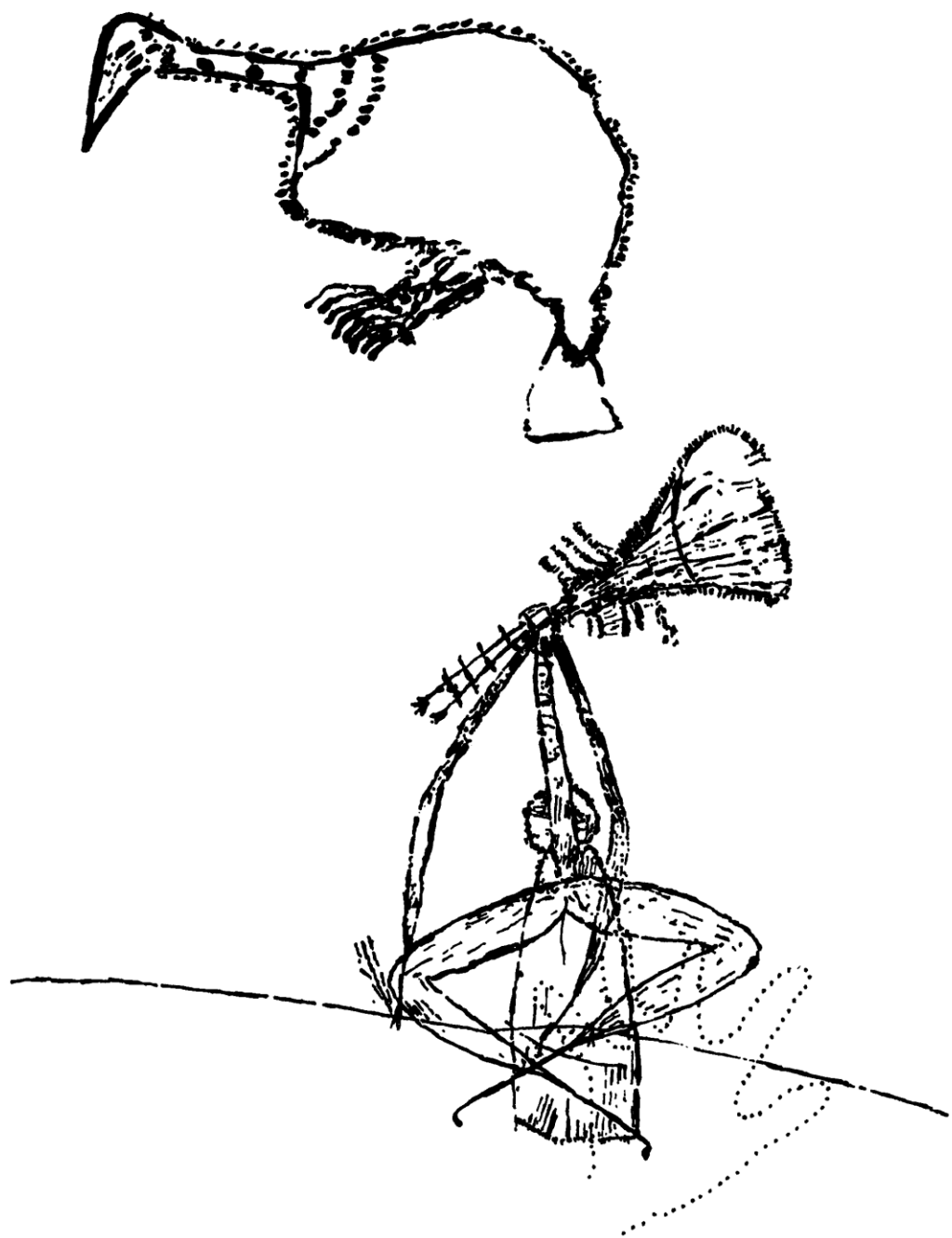


FIGURE 27.

Boomerang Period.

Deaf Adder Creek.

A hand stencil and contemporary paintings of a bird and a human being with headdress, 'dancing skirt', hair belt, and pendants suspended from the neck.

Red.

Length of bird: 31 cm. beak tip to tail tip.

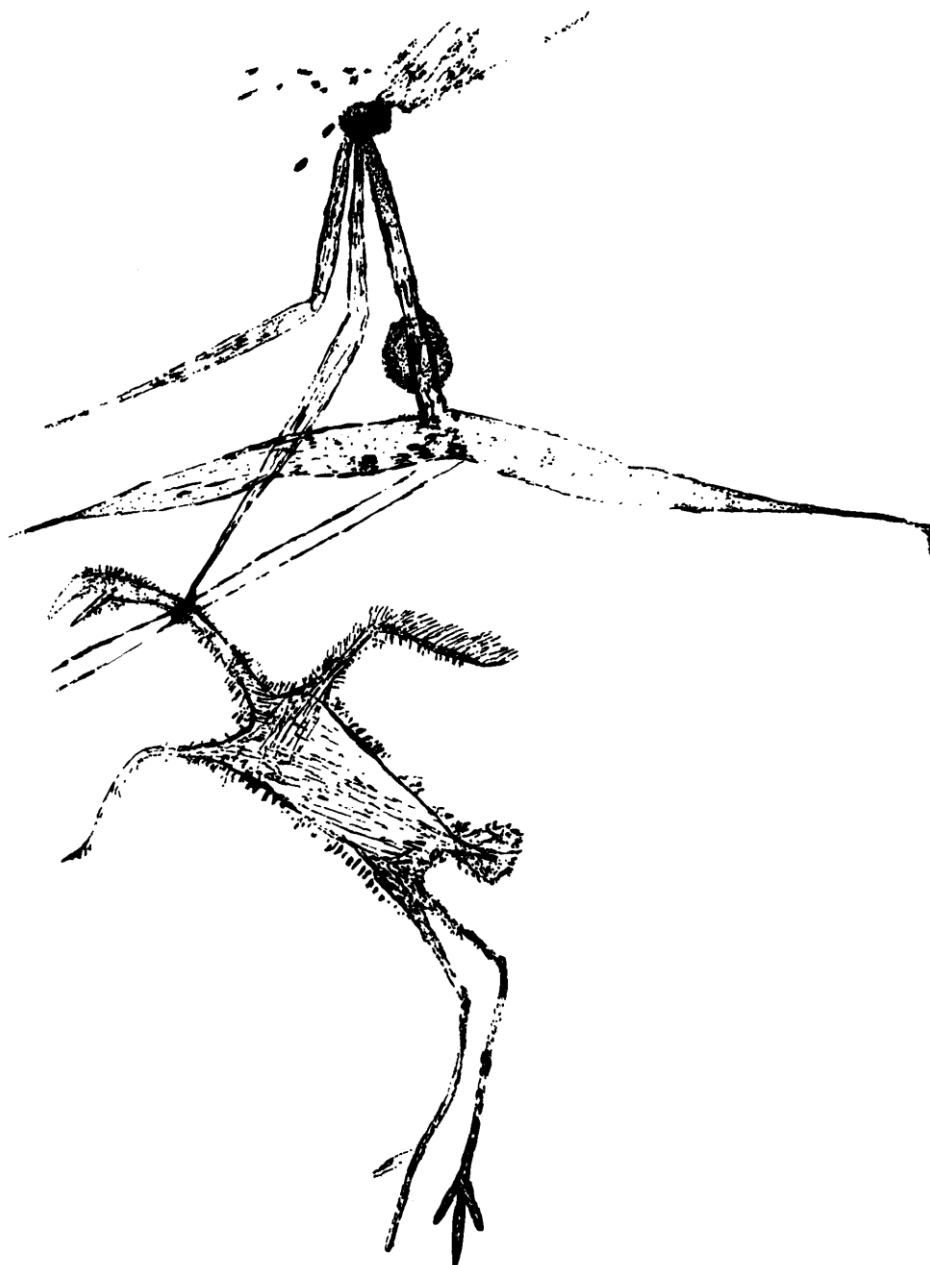


FIGURE 28.

Boomerang Period.

Djawumbu-Madjawarnja Massif.

A human being with headdress and hair belt, carrying spears and a plucked bird, possibly a brolga.

Red.

Bird: 34 cm. long.



FIGURE 29.

Boomerang Period.

Mt. Brockman Massif.

A composed 'scene'. A human figure with a huge headdress and surrounded by fish is shown grasping the tail of a kangaroo.

Dark red.

Maximum dimension: 71 cm.



FIGURE 30.

Boomerang Period.

Nourlangie Rock area.

An echidna (spiny anteater, *Tachyglossus aculeatus*) feeding on a termite mound, 'grass' prints, and two extremely weathered superimposed boomerang figures shown here as dotted outlines. The smaller of the boomerang figures is a very pale brown colour. The larger appears to have undergone a chemical colour change from the original red and is now a pale whitish-yellow, so faded that it can easily be overlooked. The two figures contrast with the echidna and the 'grass' prints, both of which are dark red and quite clear on the rock face. If such disparate preservation is taken as a guide, then the 'grass' prints are much younger than the boomerang figures, the reverse of the sequence to which Chaloupka (1984: 16) assigns them.

Length of echidna: 35 cm.



FIGURE 31.

Boomerang Period.

East of the Djawumbu-Madjawarnja Massif.

Three human beings with headdress, hair belts, boomerangs and spears. Note that each headdress has a distinctive shape. The figure at the left has an atypical bird-like head or headdress.

Weathered dark red.

Top right figure: 60 cm. tall.

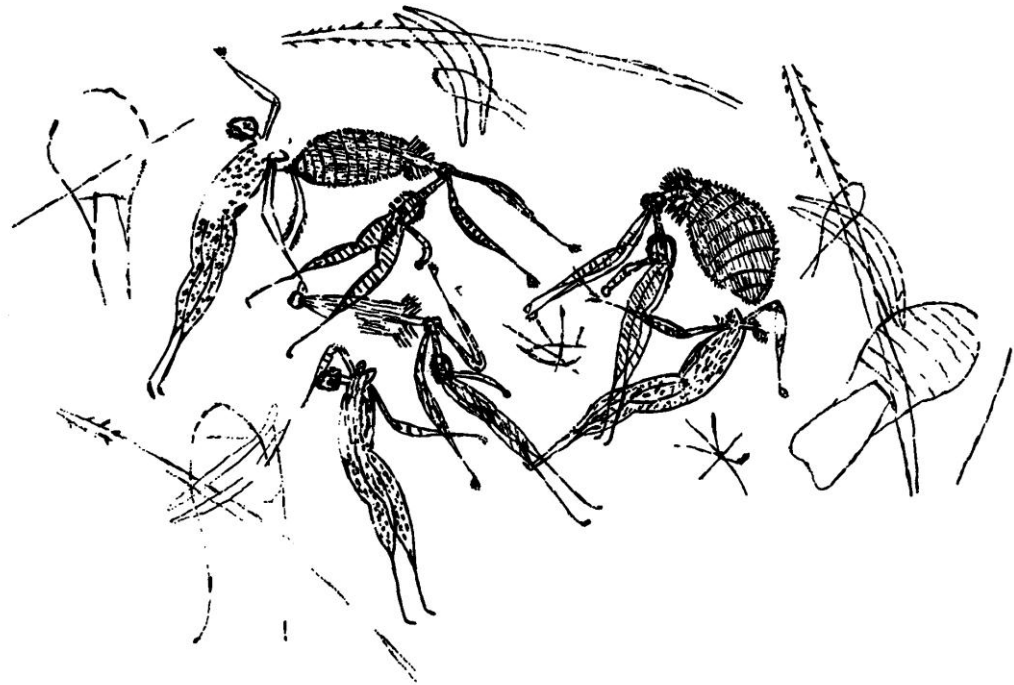


FIGURE 32.

Boomerang Period.
Deaf Adder Creek.

A composed scene depicting three men with headdress, and three women. The dillybags and digging sticks of the women, and the spears and boomerangs of the men, are placed on the outer edge of the scene. An asterisk-like design occurs in the centre of the group while another is placed to the right of the right hand couple. One possible interpretation of this composition is that it represents a camp scene: three couples lie beside a central campfire, their personal possessions on the opposite side within convenient reach. Two of the women rest their head on their forearm. The couple at the right is flanked by another fire. A common way that Aborigines kept warm at night was to sleep between two small fires. Note the large penes of the males. Among paintings of humans in this style male genitalia are rarely depicted, usually only when the males are depicted with women.

Red.

Maximum dimension: 115 cm.



FIGURE 33.
Boomerang Period.
Headwaters of Twin Falls Creek.
Three human beings with headdress, spears and boomerangs.
Dark red.
Maximum dimension: 56 cm.

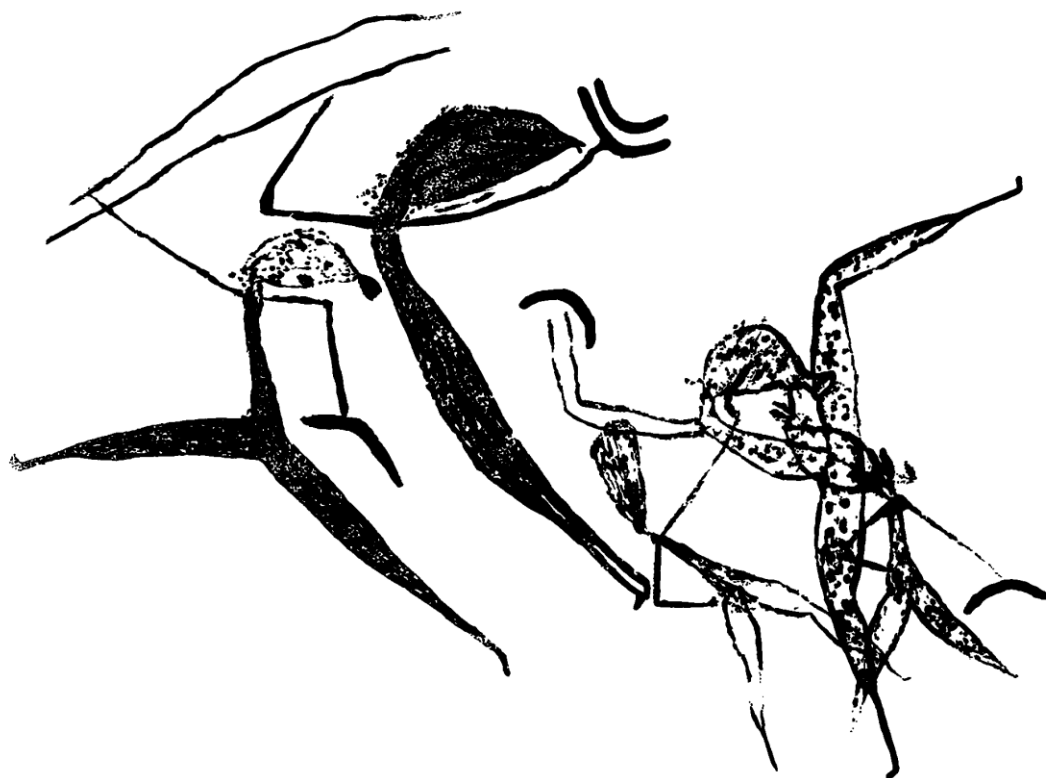


FIGURE 34.

Boomerang Period.

Ubirr (Obiri Rock).

Group scene. Five human beings with headdress, some carrying boomerangs and spears.

Weathered red.

Maximum dimension: about 60 cm. (from memory).



FIGURE 35.

Boomerang Period.

Baroalba Creek.

Four human beings in ceremonial attire and one unidentified figure, possibly an anthropomorphic being. The group is partly encircled by a sinuous line, the meaning of which is unknown. Note the tassels suspended from the arms of the larger figure and the dillybag suspended from the neck of the second largest figure.

Faded red.

Tallest figure: 61 cm.



FIGURE 36.

Boomerang Period.
Mt. Brockman Massif.

A group scene. An animal-headed object is the focus of attention for five human beings with headaddress. At least one of the figures (top right) holds a branch-like object. The scene is reminiscent of ethnographically recorded rituals to increase animal species by striking rocks at Dreaming sites with small branches. Other figure in this panel, not shown here, include several other human figures, kangaroo tracks, and another kangaroo or kangaroo-like being (see Plate 15).

Dark red.

Width of group: 46 cm.



FIGURE 37.

Boomerang Period.

Deaf Adder Creek.

Ten human beings involved in a ritual scene involving a large snake. Most of the participants wear ceremonial attire. Two figures at the right wear nose pegs, another carries a fan-like artefact. The snake itself wears a ceremonial necklet. Brandl's informants interpreted this as how the 'old people' must have portrayed the Rainbow snake. The Rainbow snake is still the focus of major ceremonial complexes throughout large areas of northern Australia. This scene thus provides evidence of the remarkable continuity of the ritual association of snakes and humans in Aboriginal cosmology.

Red.

Snake: 51 cm.

From the Brandl collection, Australian Institute of Aboriginal Studies, courtesy M. Brandl.

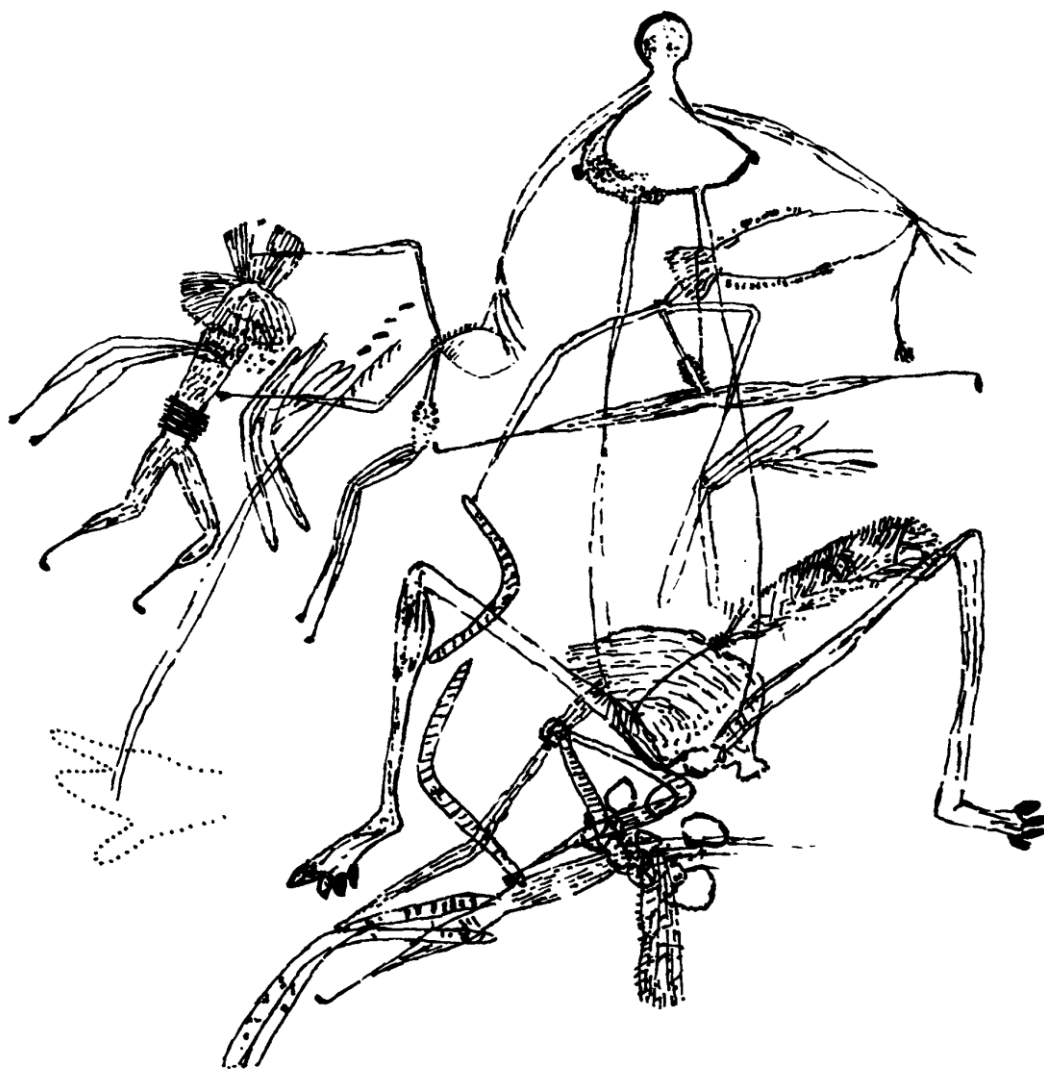


FIGURE 38.

Boomerang Period.

Deaf Adder Creek.

A hand stencil with the three middle fingers closed, a large squatting woman, and four males with headdress and weapons. The lowest male figure has its headdress in position with the abdomen of the woman. Note the large feather-like object above the woman's right knee and the circular objects below her buttocks. Originally the 'feather' was probably attached to the right arm of the lowermost figure, but the connecting line appears to have weathered away.

Red.

Height of woman: 94 cm.

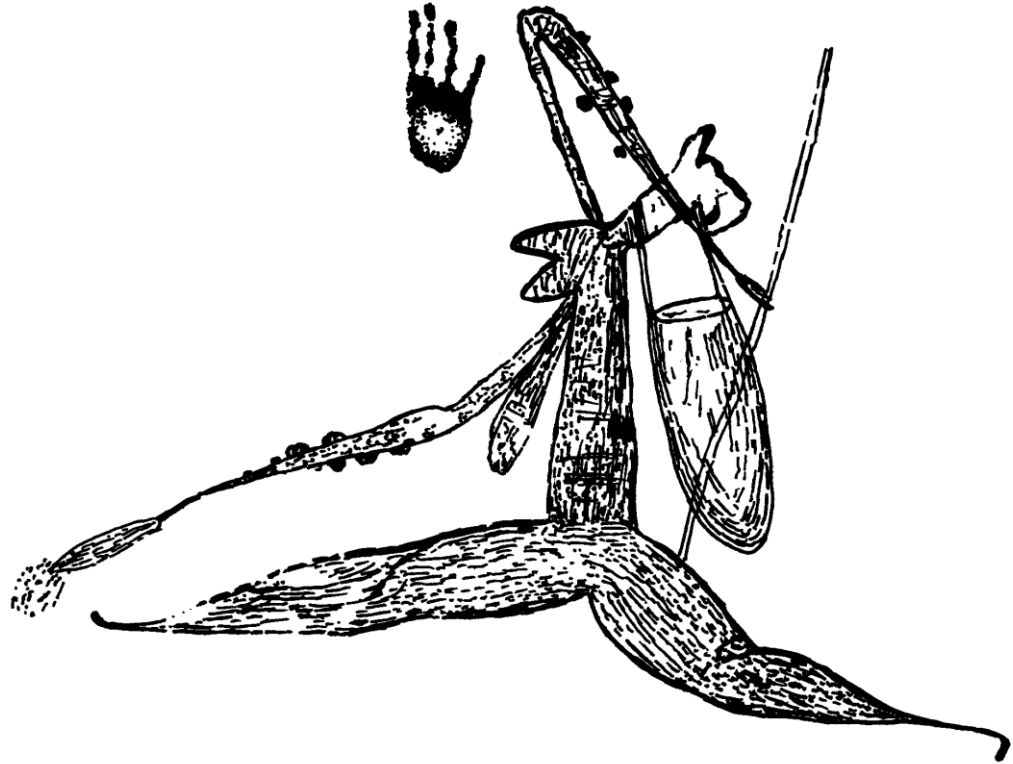


FIGURE 39.

Boomerang Period.

Deaf Adder Creek.

A red hand print and a woman with dillybags, digging stick, arm decoration, and firestick in the left hand. The woman is typical of women in this style in that the body and legs are proportionately thicker than the male figures. It is also typical in that women are almost always depicted totally naked and are never depicted wearing headdress.

Dark red.

Maximum dimension: about 110 cm.

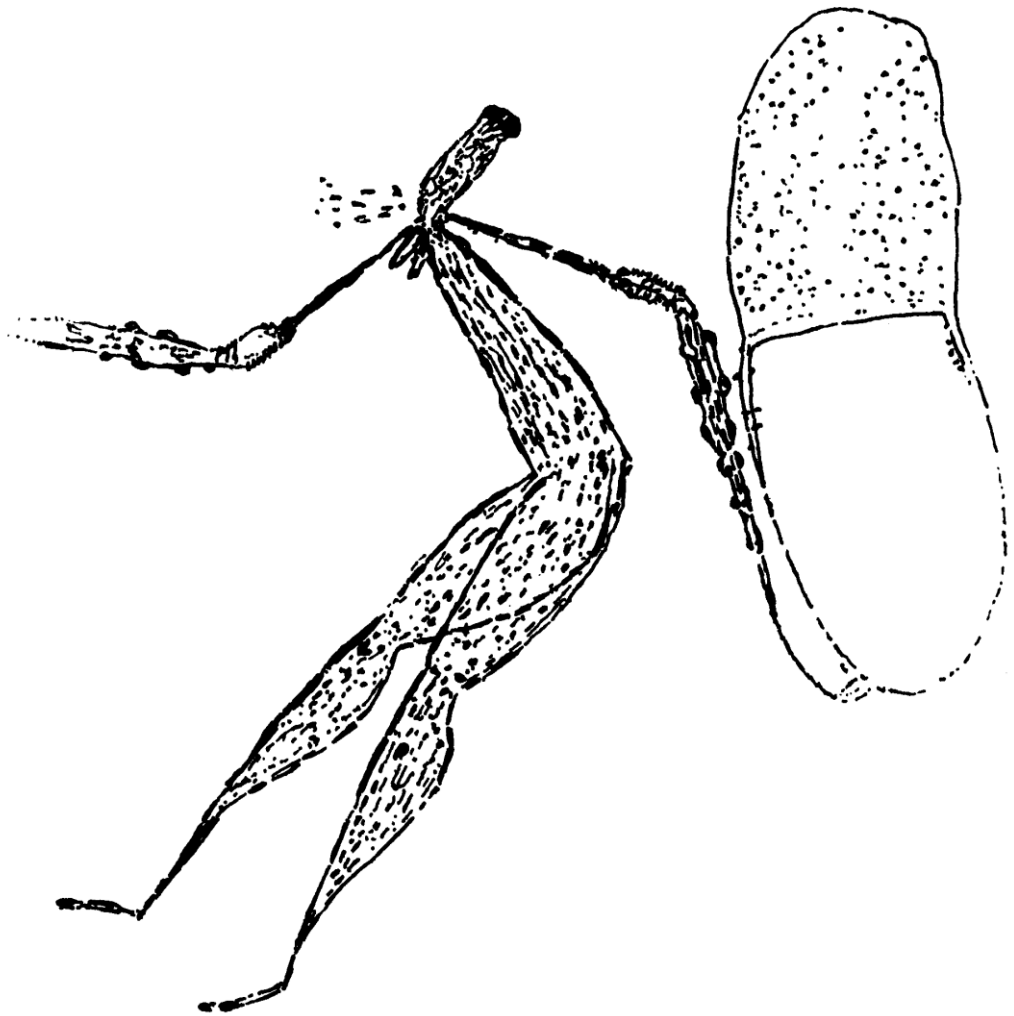


FIGURE 40.

Boomerang Period.

Baroalba Creek.

A female human being with large dillybag and arm decoration. Her 'breath' is indicated by the dots in front of her face. Note the perspective of showing the outline of both legs crossing at the thighs, as though they are transparent. This is a stylistic trait unique to the Boomerang Period.

Dark red.

Head to foot: 44 cm.

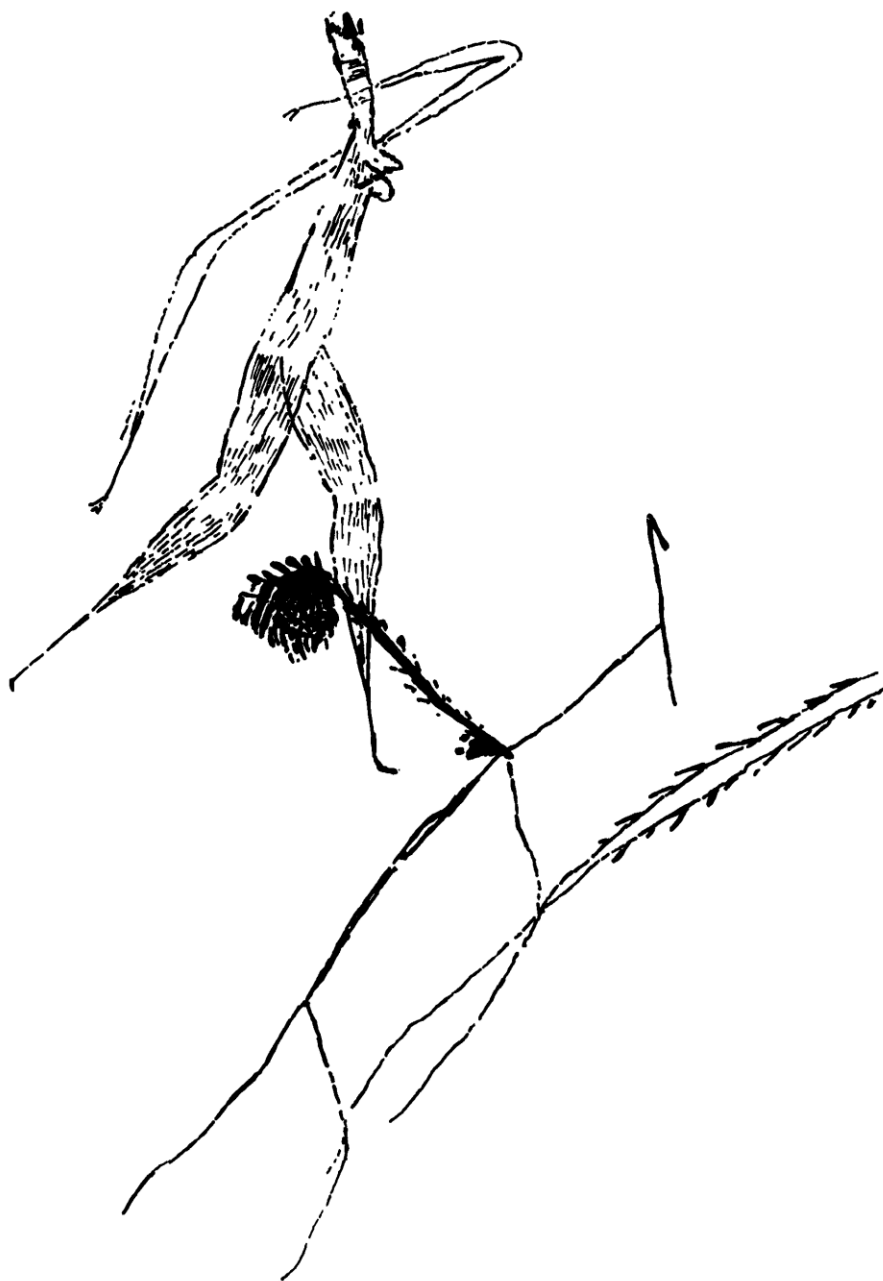


FIGURE 41.

Boomerang Period.

Mt. Brockman Massif.

A female boomerang figure and a stick-like hooked stick' figure. Where the two figures cross, the pigment of the 'hooked stick' figure is darker and gives the subjective impression of being on top of the pigment of the other painting.

Upper figure: faded red.

Lower figure: dark red.

Height of lower figure: 55 cm.



FIGURE 42.

Boomerang Period.

Baroalba Creek.

A group of at least sixteen human beings in headdress as well as a number of 'crosses'. None of the figures is associated with a weapon. These figures appear to be a variant of the more typical boomerang figures though whether they are earlier, later, or contemporary with them remains unknown (cf Brandl 1973: frontpiece). An interesting feature of this panel is that the high points of the surface they are painted on are devoid of pigment. It appears that the painting has been rubbed or pounded with a stone, perhaps for a ritual purpose.

Very dark red.

Longest figure: 82 cm.

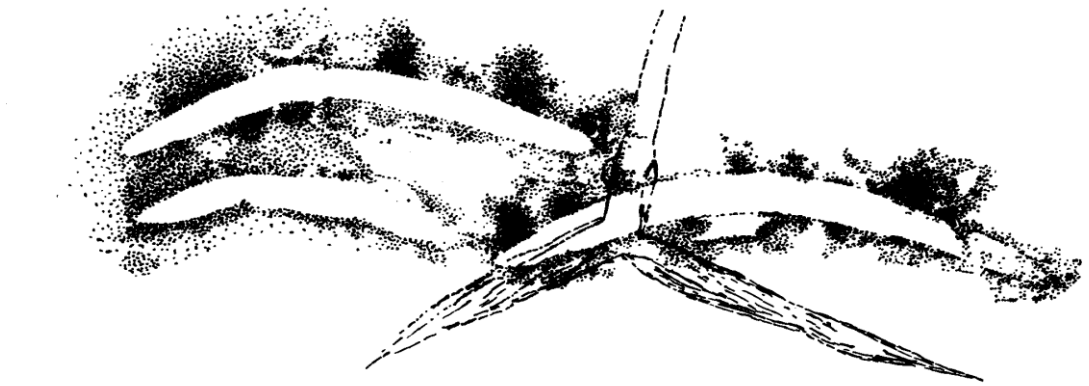


FIGURE 43.

Boomerang Period.

Mt. Brockman Massif.

Three stencils of conventional boomerangs, and the painted torso and legs of a human being (the arms and headdress have weathered away).

Red.

Top left boomerang: 61 cm.



FIGURE 44.

Boomerang Period.

Baroalba Creek.

Two stencils of asymetrically curved boomerangs.

Red.

Length: about 70 cm.



FIGURE 45.

Boomerang Period.

Ubirr (Obiri Rock).

Stencil of an unusual boomerang or boomerang-like artefact. Compare this stencil to the weapon held by the man on the left in Figure 14.

Weathered red.

Length: about 60 cm.



FIGURE 46.

Boomerang Period.
Nabarlek area.

Two concentric circles and a branch-like design as well as stencils of hands, a 'Y'-shaped artefact and two unidentified 'L'-shaped artefacts. The 'Y'-shaped objects have not been found in painted form among the boomerang figures and their function cannot be determined. As a matter of interest, a 'Y'-shaped or forked artefact used in the Maraian ceremony is illustrated by Brandl (1973: 15, figure 18a), and a forked message stick from the Mt. Isa district is illustrated by Roth (1905: plate 1:3). Variants of the weapon stencils reproduced here have been recorded at a number of sites throughout the Arnhem Land plateau (eg Figures 47 and 48). In shape they resemble, but are not identical with, several types of artefact apparently restricted to the east and south-east of the continent at European contact. One of these artefacts was a form of club called a **Marpangye** (after Etheridge 1897; eg Figure 95: d). Another is a form of boomerang illustrated in Figure 95: c (see also Rosenfeld 1981: 91, figure 6, for stencils of a similar artefacts from south-east Cape York). A third category is those artefacts called **Lil-Lils** (eg Figure 96: a; see Etheridge 1897: plate 3: 4 and 5). Two features of these stencils suggest that the artefact stenciled was more boomerang-like than club-like. First, the edges of the stencils are usually sharp which suggests that the edge of the object stenciled was very close to the surface of the rock, that is, the object was flat. Second, the stencils are quite broad across the handle end. This conforms with boomerangs and boomerang-like artefacts but not with clubs. Clubs usually have a narrow, round cross-section handle to provide the user with a secure and comfortable grip when striking an object. None of the stencils recorded are curved in the manner of a typical Lil-Lil although some of the artefacts held by boomerang figures are curved along the long axis (Figures 12, 18 and 19). In sum, the stencils seem to document the former use in Arnhem Land of flat, boomerang-like weapons related to the Lil-Lils and other boomerang-like throwing sticks of eastern and south-eastern Australia.

Faded red.

Maximum dimension: 155 cm.



FIGURE 47.

Boomerang Period.

Stag Creek

A pair of boomerang-like artefacts. The lower stencil has been partly outlined by hand (see Figure 46 for discussion of this type of artefact).

Red.

Length: about 75 cm.



FIGURE 48.

Boomerang Period.

Mt. Brockman Massif.

Stencils of artefacts. Two of these appear to be variants of those in Figures 46 and 47. The other resembles a hooked boomerang, but does not have the hook set at the angle usually seen on that type of weapon (eg cf this figure with Figure 95e and with Plate 16).

Red.

Longest stencil: 93 cm.



FIGURE 49.

Boomerang Period.

Baroalba Creek.

Stencil of a boomerang-like artefact similar to that seen in Figure 48. On the same rock face are hand stencils with the three middle fingers closed, hand prints, and a turtle.

Red.

Length: 61 cm.



FIGURE 50.

Boomerang Period.

Twin Falls Creek area.

Two stencils of an unidentified artefact. Stencils of what seem to be a similar object have been found in Deaf Adder Valley and on the Mount Brockman Massif (see Plate 19). A painted version of the object has also been recorded as part of the weapon inventory of a boomerang figure from Deaf Adder Valley (see Figure 20). Note that the edge of the notched end is not as sharp as the broad end. This suggests that the notched end was round and the broad end flat.

Faded red.

Length of right hand stencil: 27 cm.



FIGURE 51.

Boomerang Period.

Stag Creek headwaters.

Stencil of an unidentified ring-shaped artefact and part of the hand that was holding the object against the rock face. Possible identifications include a waist belt or a necklet. Several other similar ring-shaped objects have been recorded.

Red.

Length: about 28 cm.



FIGURE 52.

Boomerang Period.

Waterfall Creek headwaters. Stencils of a small mammal, what could be a gliding possum with head and feet removed, and an animal leg. These are not shown in correct relative position on the shelter wall, but are correct relative scale. In the same shelter there are several other animal stencils. One is of a rat-like mammal, slightly larger and with a longer tail than the stencil reproduced here. The other appears to be a small bird. These are the only animal stencils yet located in Arnhem Land although emu feet and mammal paws have been found elsewhere. All of the animal stencils at this site are within one and a half metres of floor level, low enough that children could have made them. Red.

Length of clawed leg: 18 cm.

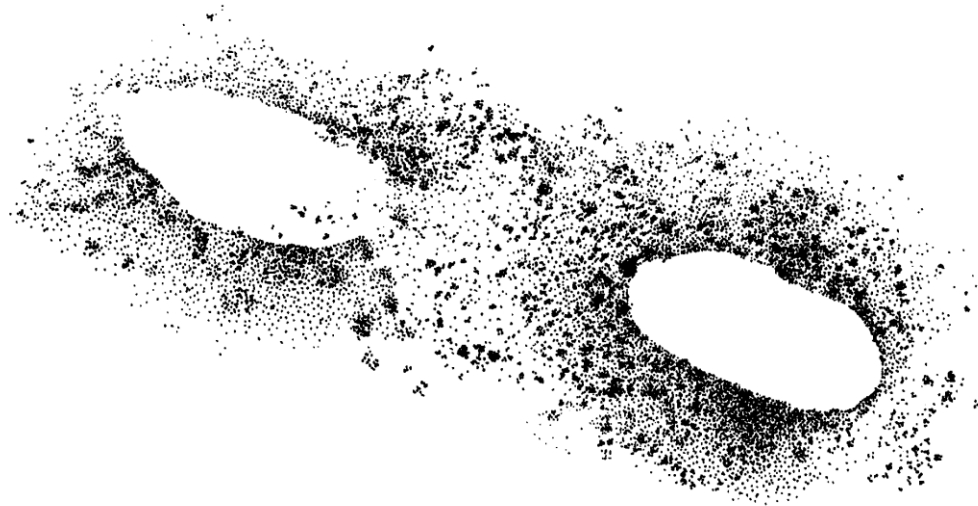


FIGURE 53.

Boomerang Period.

Magela Creek.

Two stenciled oval objects. From their size and shape one is immediately reminded of the baler shell pendants from the north Queensland coast (and to a lesser degree the pearl shells from the Kimberley coast) that were being traded across the continent at the time of European contact (eg see Mulvaney 1975: 111 and 114, plate 40). Most of these shells had a hole near the edge so that they could be suspended from the waist or neck. Stencils of baler shell pendants have been recorded in central Queensland rock art (Beaton and Walsh 1977). The object used to make the stencil reproduced here bears no evidence of such a hole or of a cord, so that conclusive identification is not possible. Should another example be found with pigment staining indicating the presence of such a hole or cord, it would strongly suggest that shell pendants were being manufactured and traded in late Pleistocene/early Holocene times.

Red.

Length: about 18 cm. (from memory).

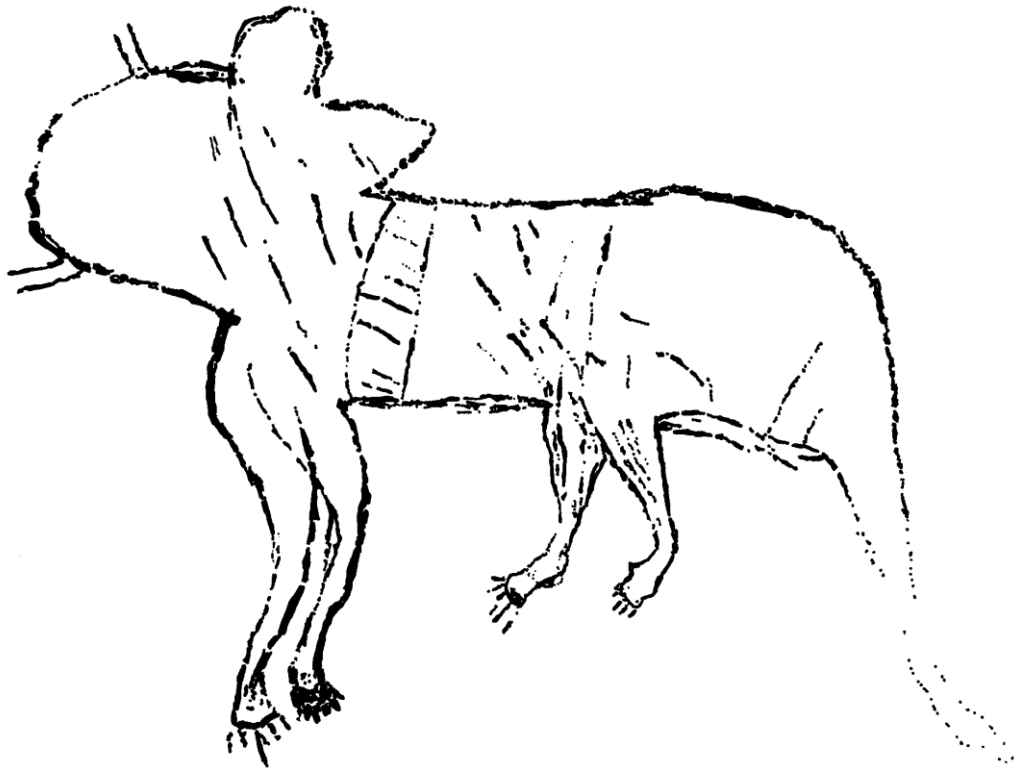


FIGURE 54.

Boomerang Period.

Upper East Alligator River.

Probable representation of a Tasmanian devil (*Sarcophilus harrisii*). Note the massive head and dog-like paws characteristic of that animal. The painting also has the 'crossed legs' perspective of the Boomerang Period. The significance of the banded strip across the chest of the animal is unknown.

Dark dull brown, probably red originally.

Maximum length: about 80 cm.



FIGURE 55.

Boomerang Period.

Nabarlek area.

Painting of a thylacine (*Thylacinus cynocephalus*) with pouch and four striped young (photographic reduction of 1:1 tracing).

Weathered red to dark brown.

Length: 170 cm.

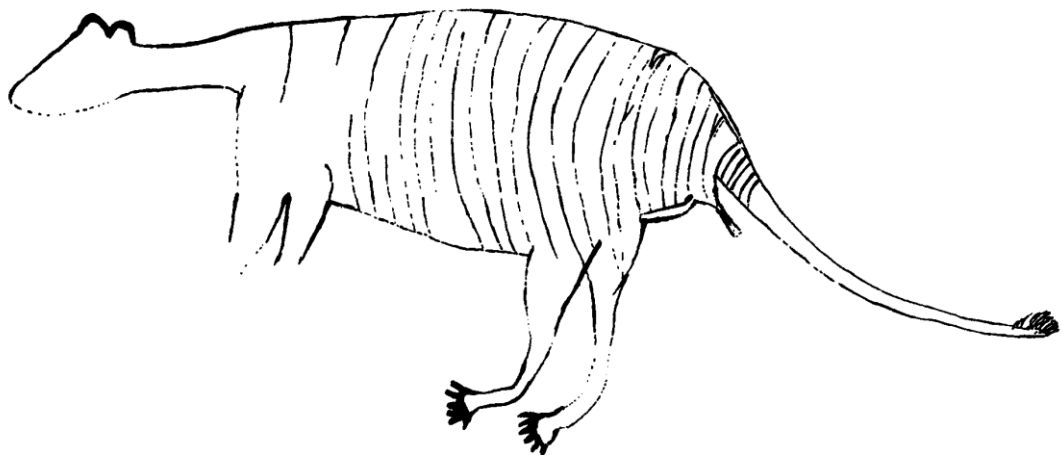


FIGURE 56.

Boomerang Period.

Mt. Brockman Massif.

Painting of a thylacine. The rear-opening pouch is indicated by a line behind the hind legs.

The stripes and the tufted tail-tip are characteristic of this species.

Faded red, particularly towards the front of the animal.

Length: 116 cm.

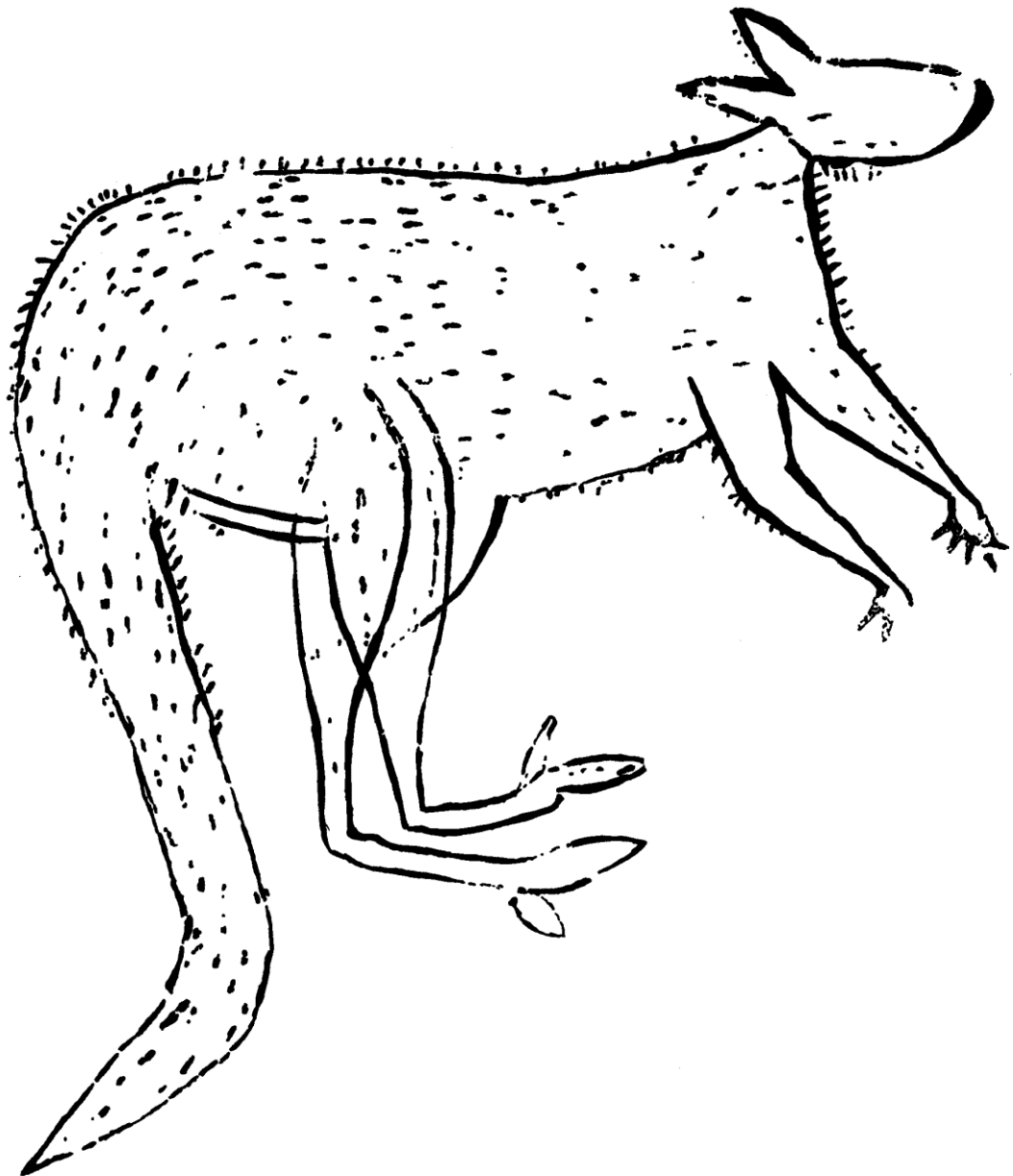


FIGURE 57.

Boomerang Period.

Nourlangie rock area.

Painting of a kangaroo. Note the pouch-line indicated, similar to Figure 56, and the 'crossed legs' perspective commonly used in paintings of the Boomerang Period.

Faded red.

Nose to tail tip: 65.5 cm.

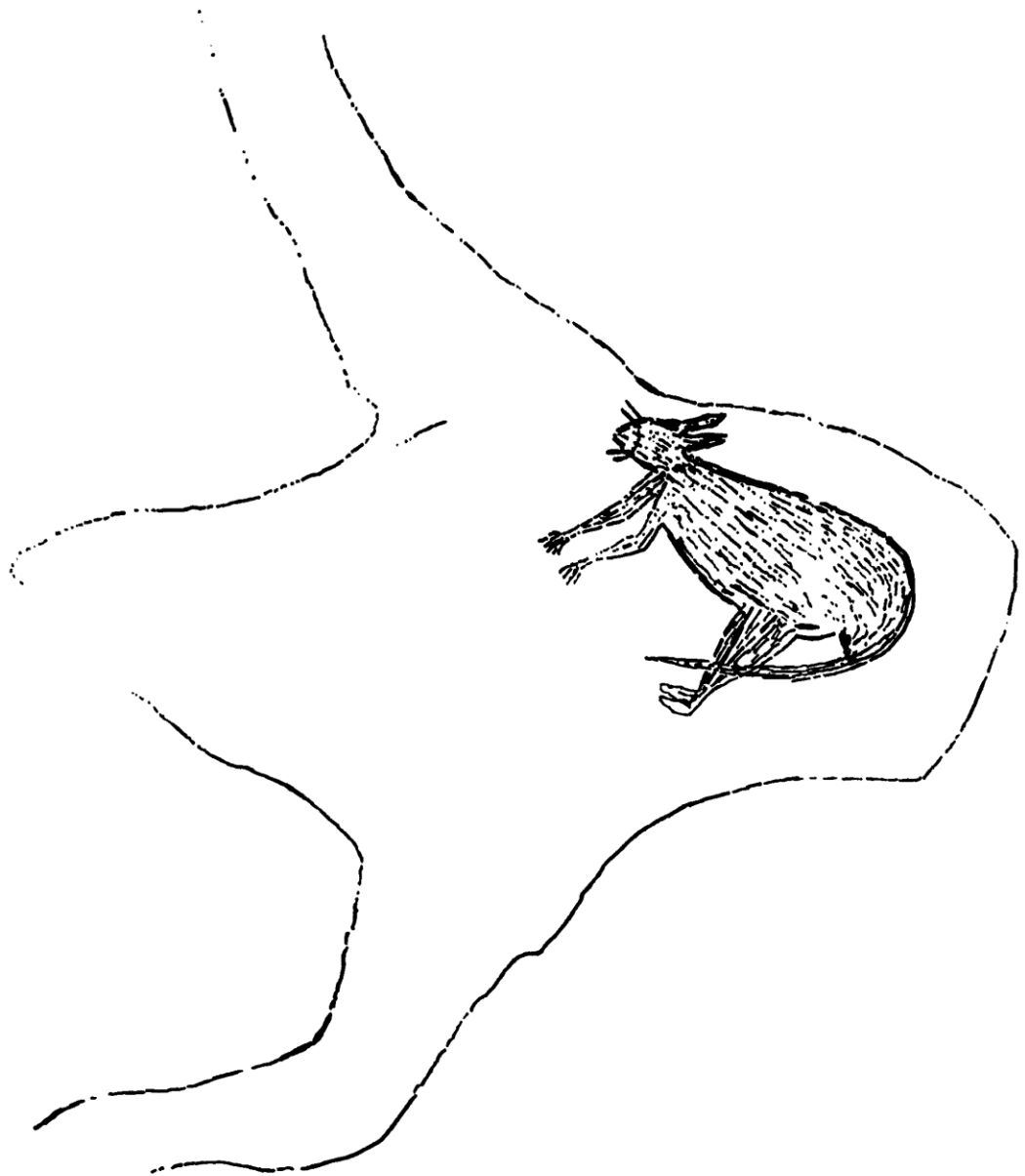


FIGURE 58.

Boomerang Period.

Baroalba Creek.

A macropod enclosed in lines that possibly represent a cave or crevice in the sandstone country. A number of kangaroo and wallaby species that inhabit the Arnhem Land plateau stone country seek shelter from the daytime heat in such places.

Dark red.

Nose to rump: 21 cm.

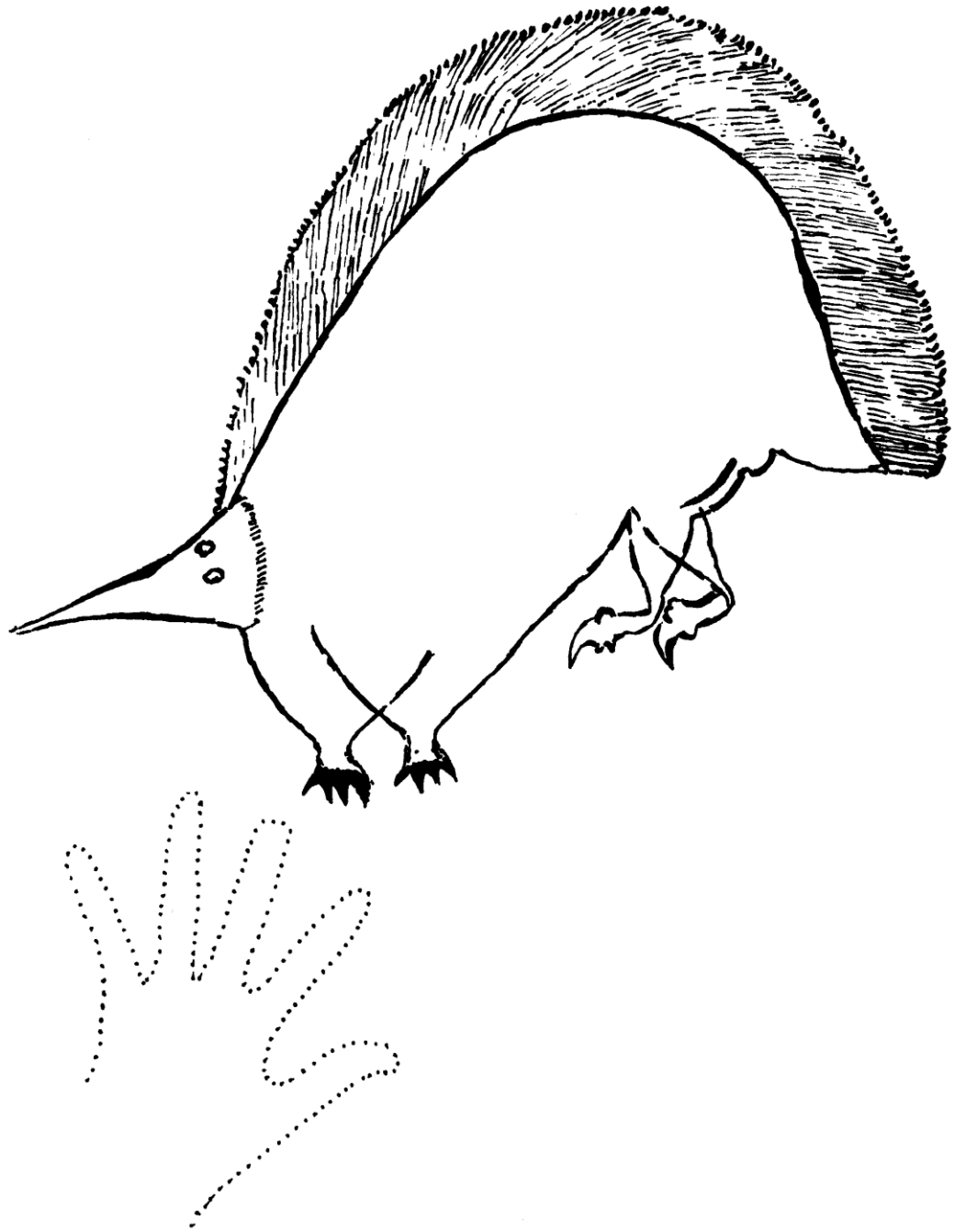


FIGURE 59.

Boomerang Period.

Deaf Adder Creek.

A hand stencil and a painting of an echidna (*Tachyglossus aculeatus*). While the echidna has some unusual stylistic features, it nevertheless has the 'crossed legs' perspective believed to be unique to paintings of the Boomerang Period.

Red.

Maximum dimension: 50 cm.

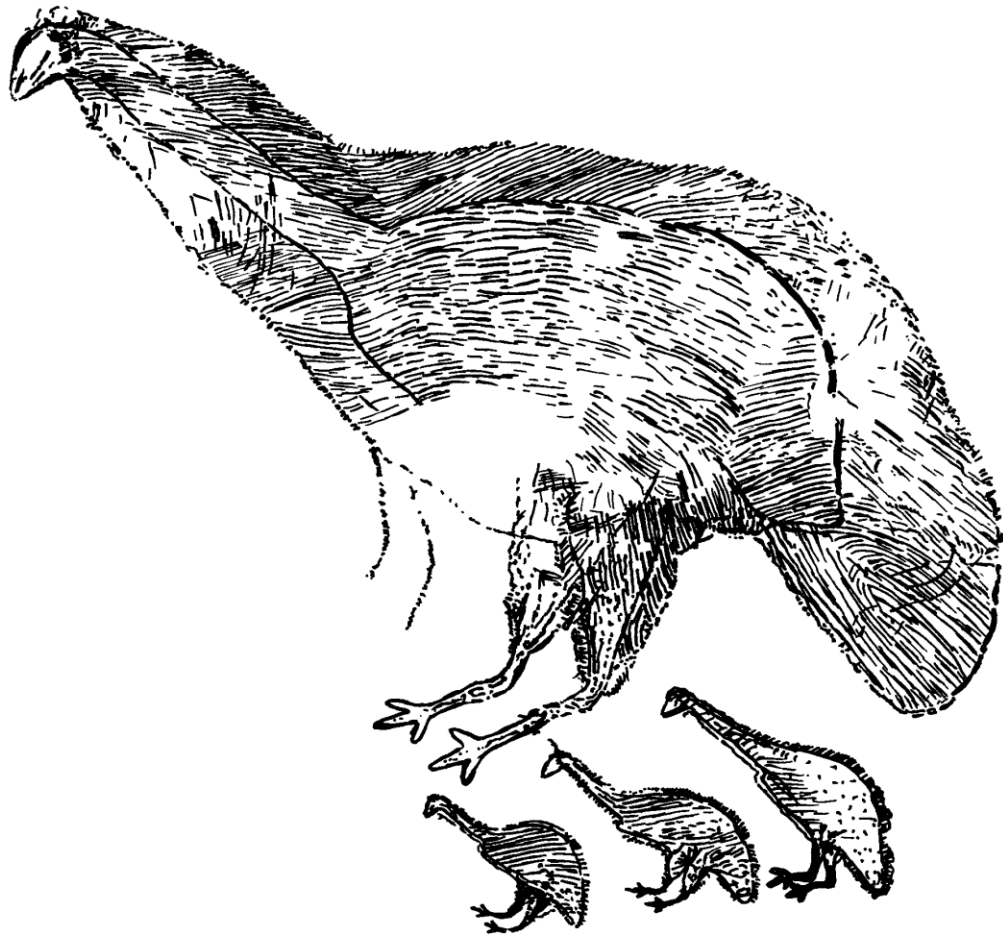


FIGURE 60.

Boomerang Period.

Twin Falls Creek area.

An emu (*Dromaius novahollandiae*) with three chicks. The parent bird has its feathers depicted as strokes of paint superimposed on the body outline. Its vestigial wings hang from its chest and the legs are shown crossed at the thighs.

Faded dark brownish-red pigment.

Length of large emu: 159 cm.



FIGURE 61.

Tentative Boomerang Period.

Upper Gimbat Creek. A unique rear view of a sitting kangaroo. Although at any given time there were basic principles of style that Aboriginal artists worked within, there was room for experimentation or individualistic approaches (Brandl 1973: 166). The painting reproduced here is an outstanding example of such variation. I have placed the painting in the Boomerang Period because of its colour and condition, adjudged from colour transparencies, and because experiments with perspective is a tendency most apparent in the Boomerang Period.

Dark red.

Size unknown.

Photograph from the Brandl collection, Australian Institute of Aboriginal Studies, courtesy M. Brandl.

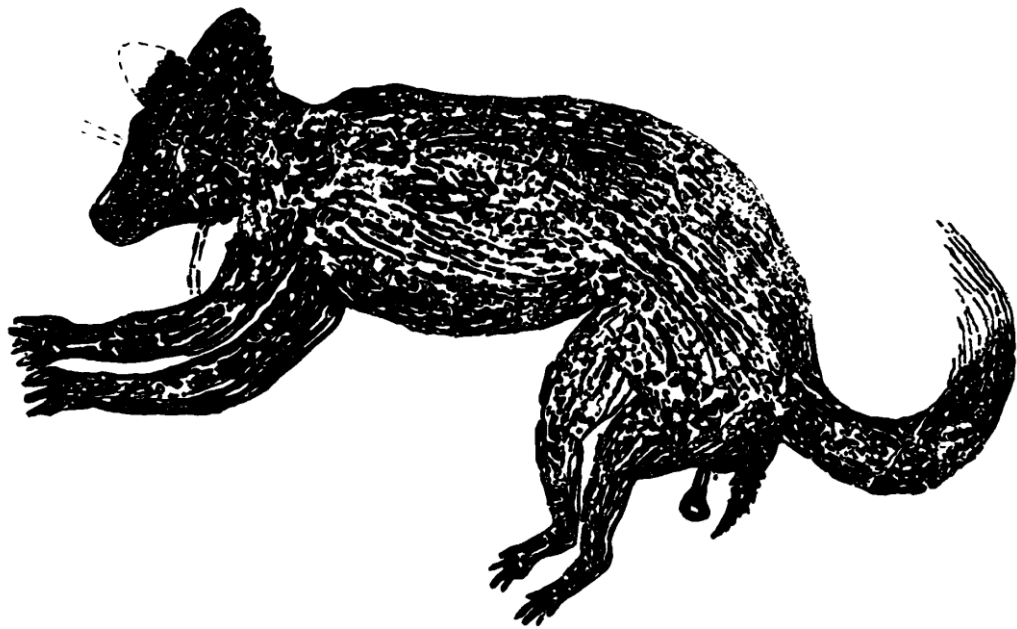


FIGURE 62.

Tentative 'Hooked Stick' Period.

Jim Jim Creek.

A Tasmanian devil (*Sarcophilus harrisii*; see plate 21). The painting is not associated with any material culture item. In the same shelter there are paintings of yams, Rainbow snakes, and a poorly preserved kangaroo. There are no boomerang figures or paintings with X-ray features. The distinctive stylistic features of this painting are the indication of surface features as dots or strokes of paint, and the placing of each pair of legs side by side, creating an impression of stiffness. Such features are found among animal paintings that, on material culture grounds, clearly belong in the 'Hooked Stick' Period (eg Figures 88, 89, and possibly Figure 94). The convention of placing the legs side by side occurred in the Boomerang Period though usually only on the front legs (eg Figures 55-58). It remained the convention through subsequent periods, but in the Broad Spearthrower Period the majority of animals seem to have their surface indicated in solid colour or to exhibit incipient or simple X-ray features (eg Figures 185, 193; see Brandl 1973: 49 figure 93). On these grounds it would seem likely that the painting reproduced here belongs to the 'Hooked Stick' Period.

Red.

Length: 83 cm.

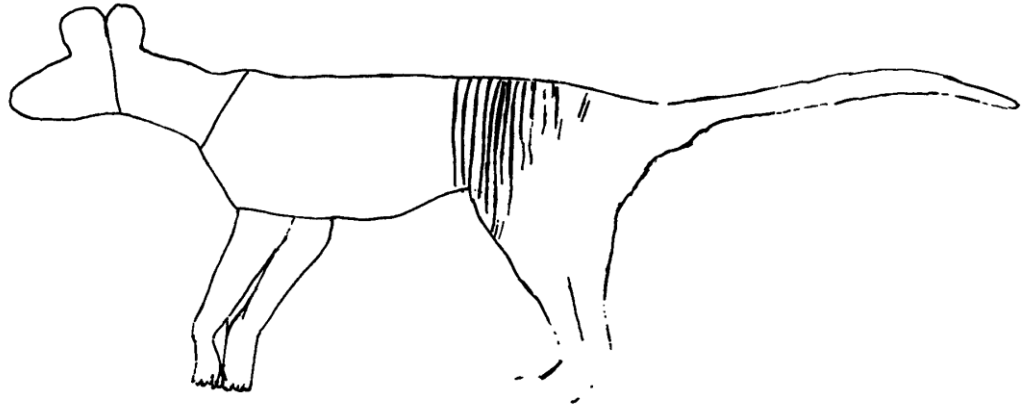


FIGURE 63.

Tentative 'Hooked Stick' Period.

Mt. Brockman Massif.

A thylacine (*Thylacinus cynocephalus*). Like the Tasmanian devil in Figure 62, this painting is not associated with any material culture item that can be related to a particular art period. Apart from stripes on the hindquarters, it does not have surface features indicated. Thylacine paintings that have their hind legs crossed at the thighs and which clearly belong to the Boomerang Period, often have only stripes indicated on the body. However, in this painting all four legs are shown side by side. On this basis, I suggest that the painting probably belongs to the 'Hooked Stick' Period.

Dark red.

Length: 200 cm.



FIGURE 64.

Broad Spearthrower Period.

Upper East Alligator River.

A thylacine (*Thylacinus cynocephalus*) this painting was first recorded by Brandl (1972: 24, figure 2 and plate 1a). Brandl argued that the unpainted space within the body is an incipient X-ray feature (see Plate 31).

Dark red.



FIGURE 65.

'Hooked Stick' Period.

Nabarlek area.

A human being with headdress, 'hooked stick', boomerang and spears.

Red.

About 20 cm. tall (from memory).



FIGURE 66.

'Hooked Stick' Period.
Baroalba Creek.

A unique figure with unusual headdress, waist and upper arm decorations, a 'hooked stick', large boomerangs, and spears. The figure is large and competently executed. Note that the hook on the 'hooked stick' is blunt rather than pointed like a fighting pick. The object across the chest and arm appears to be part of the original painting but has not been identified. Orange-yellow, but probably red originally.
Maximum height: 91.5 cm



FIGURE 67.

'Hooked Stick' Period.

Baroalba Creek.

A human being with headdress, arm and leg decorations, boomerang, spears, and 'hooked stick'.

Red.

Between the feet: 45 cm.



FIGURE 68.
'Hooked Stick' Period.
Upper East Alligator River.
Two human figures with headdress and weapons.
Dark red.
Figure at left: about 60 cm.



FIGURE 69.

'Hooked Stick' Period.

Djawumbu-Madjawarnja Massif.

A group of three males and one female, all with genitals of exaggerated size (see plate 23). Two of the men wear headdress; all three have weapons. The woman has a dillybag suspended from her head and carries a digging stick.

Red.

The second figure from the left is 78 cm. tall.



FIGURE 70.

'Hooked Stick' Period.

Nourlangie Rock area.

A human being with large headdress, two 'dancing skirts', boomerangs, and 'hooked stick'.

Dark red.

Height: 15 cm.

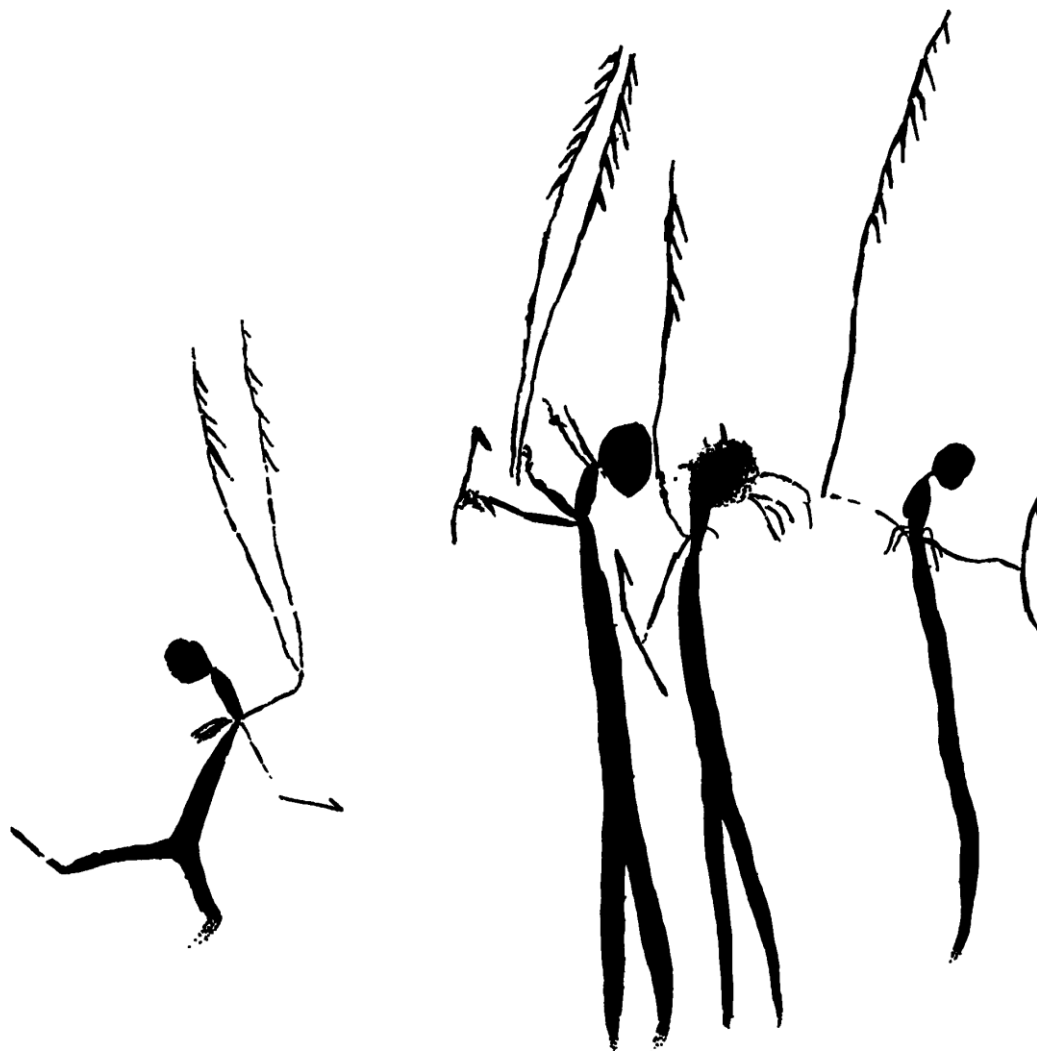


FIGURE 71.

'Hooked Stick' Period.

South of the East Alligator River crossing.

Four human beings with headdress and weapons, from a group of at least twelve figures.

Faded dark red.

Maximum length of figure at left: 32 cm.

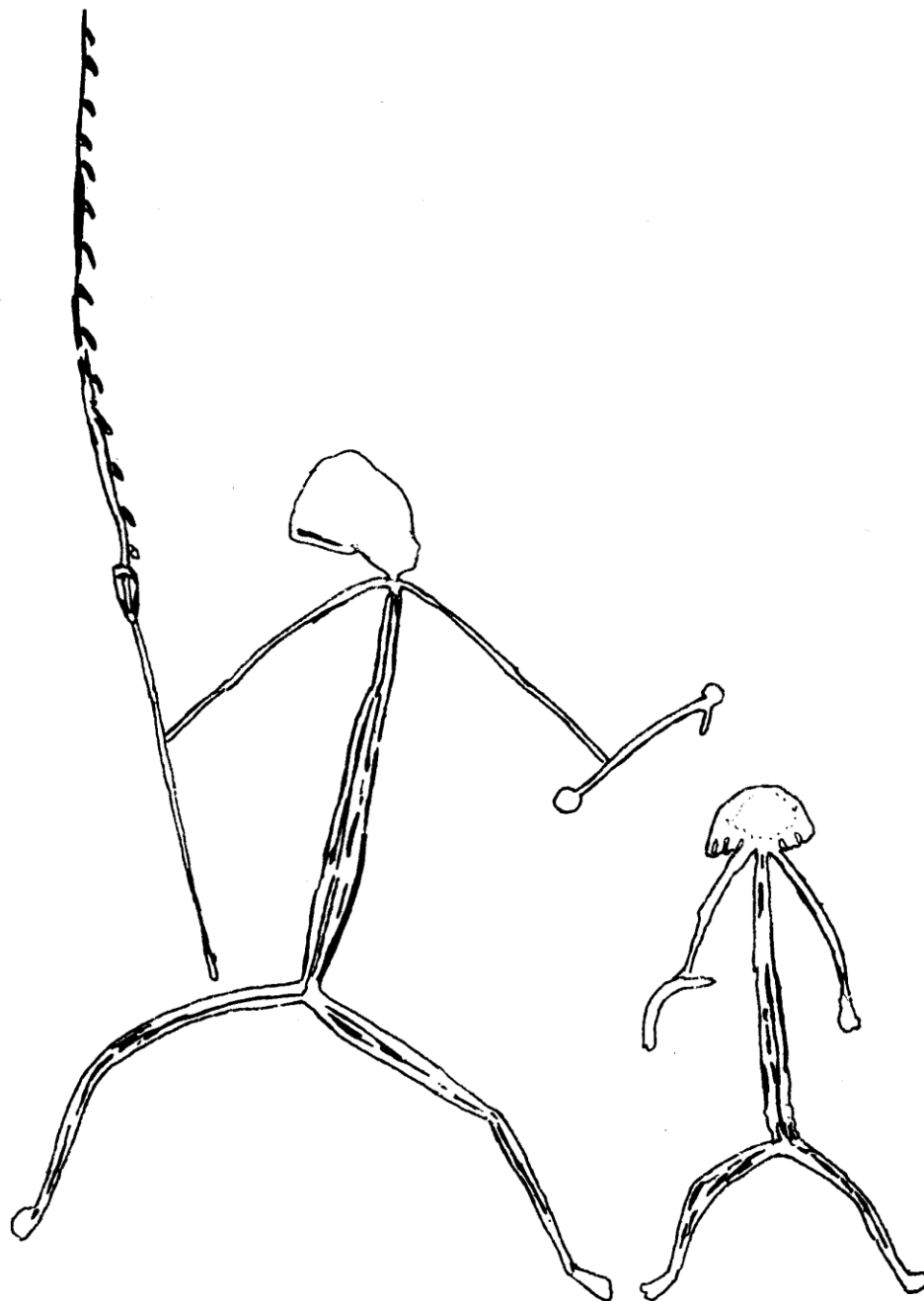


FIGURE 72.

'Hooked Stick' Period.

Nourlangie Rock area.

Two figures from a group of twelve. The panel is unique in several respects. For example, the figure on the left has one of the few single-pronged composite spears yet found among 'hooked stick' figures. It also has a 'hooked stick' with a knob at the junction of the hook and the shaft. All of the figures appear to be yellow silhouettes with red outlines and irregular interior stripes. It is possible that these figures have been repainted some time after they were first executed and that the features on the weapons are later additions.

Spear: 42 cm.



FIGURE 73.

'Hooked Stick' Period.

Magela Creek.

Two figures with headdress, boomerangs, 'hooked sticks', and spears.

Faded red.

Height: about 100 cm. (estimate).

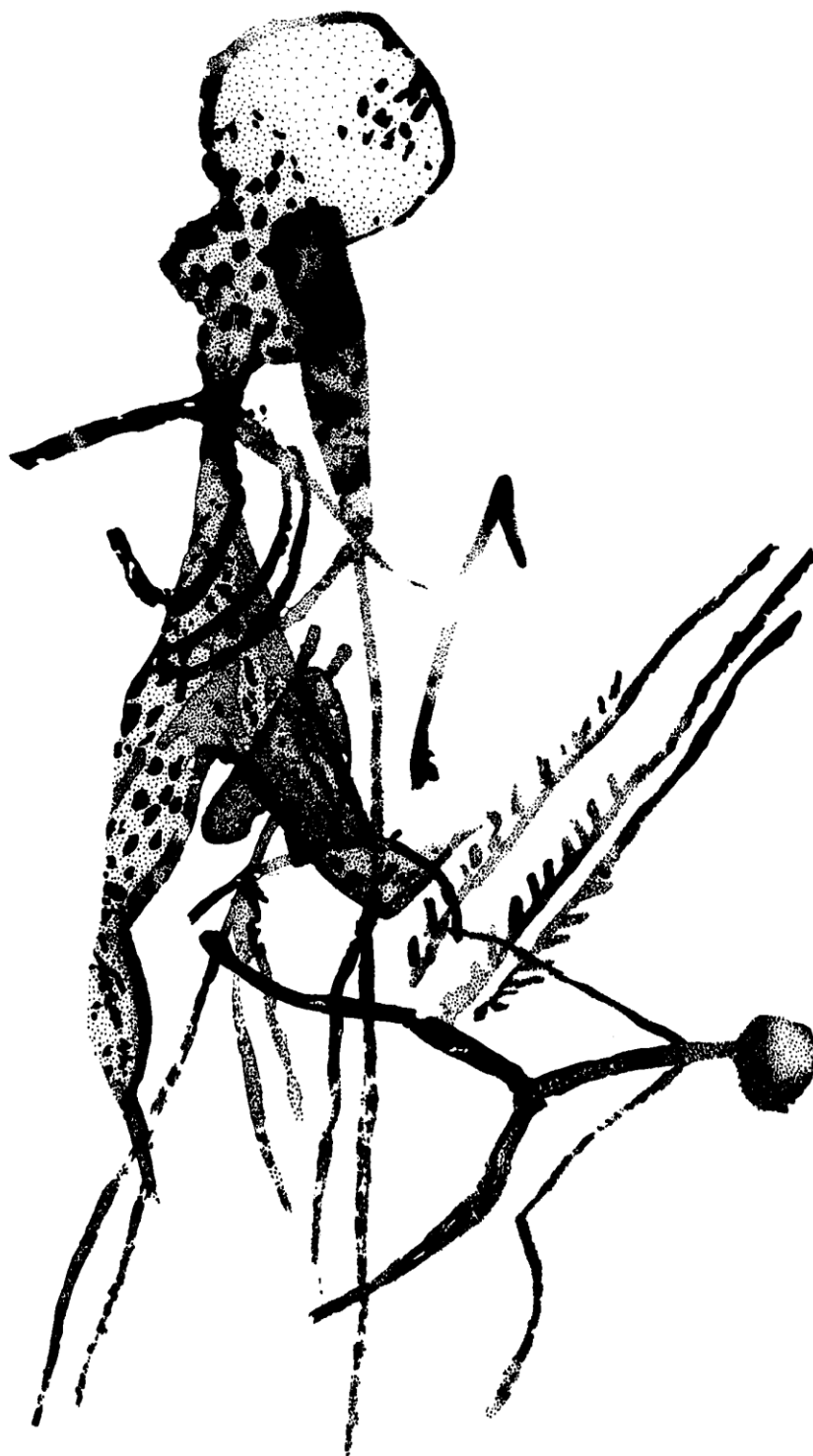


FIGURE 74.

'Hooked Stick' Period.

Koolpin Creek.

Four superimposed human figures from the Boomerang Period and the 'Hooked Stick' Period. The figure at the right has dots along its body that could represent either the backbone or body decoration.

Dark red.

Maximum height: about 54 cm.

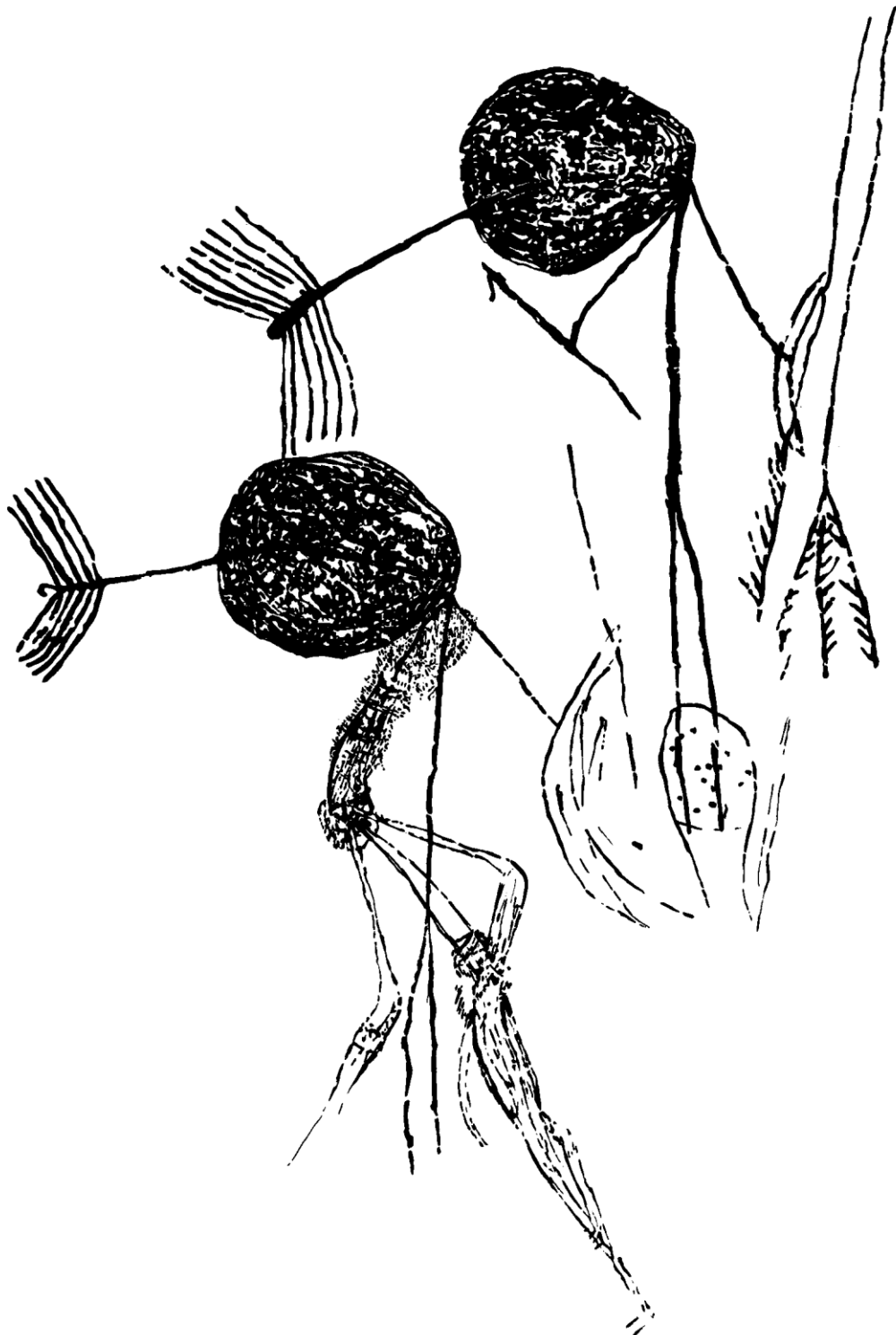


FIGURE 75.

'Hooked Stick' Period.

Mt. Brockman Massif.

Two well preserved 'hooked stick' figures in position with a faded boomerang figure (see Plate 22). Note the multi-pronged, multi-barbed spear beside the figure on the right.

'Hooked stick' figures: dark red.

Figure at right: 65 cm. tall.

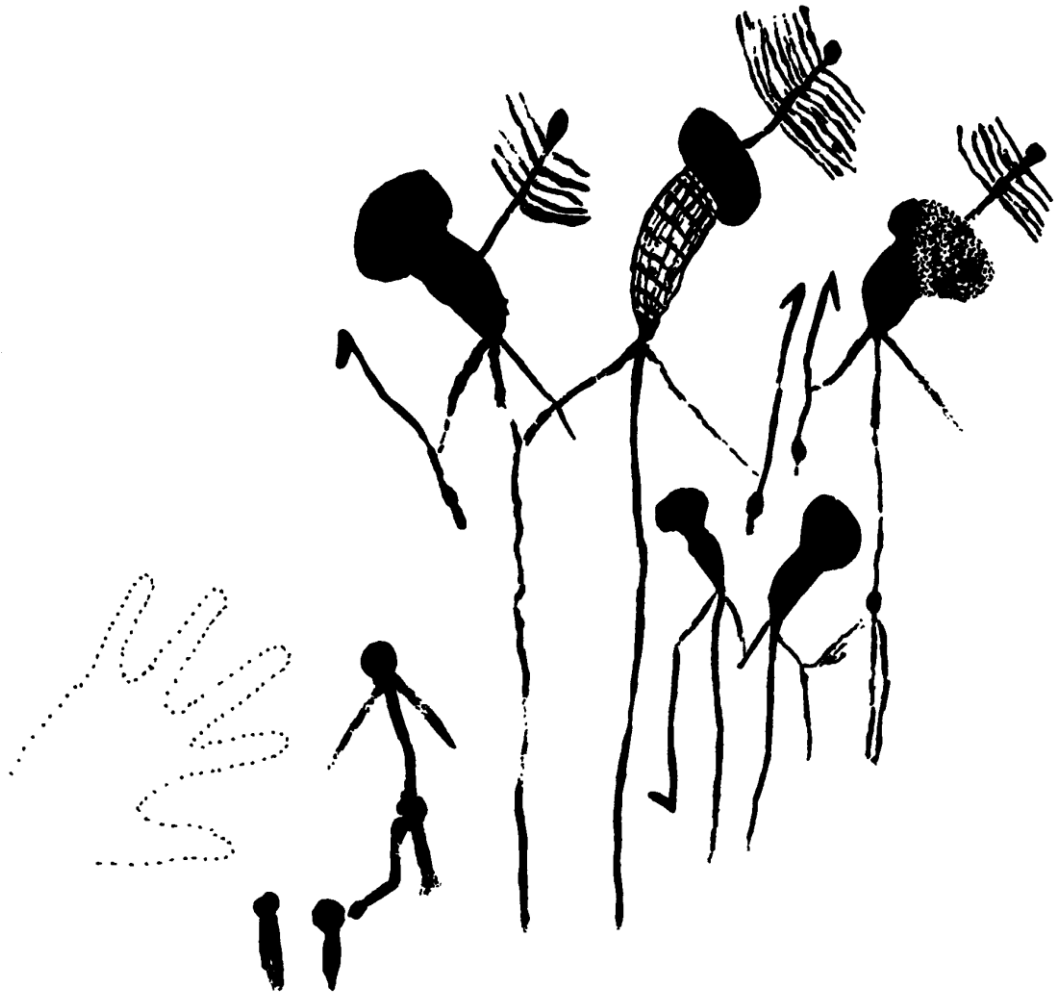


FIGURE 76.

'Hooked Stick' Period.

Deaf Adder Creek.

A hand stencil, and a group of human beings, most of which wear headdress and carry 'hooked sticks'. The objects at the lower left may represent kangaroo tracks.

Weathered dark red.

Largest figure: 58 cm.

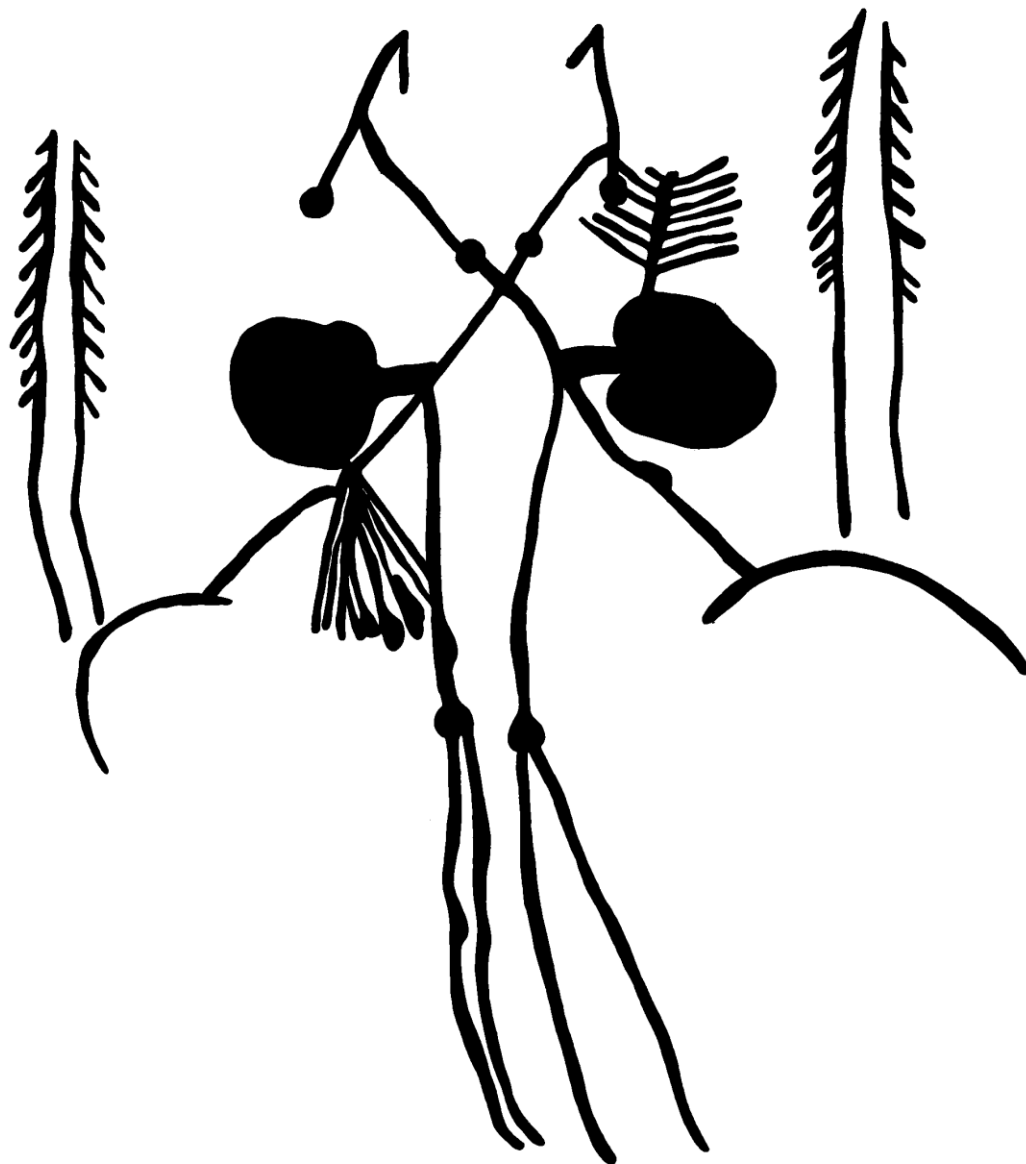


FIGURE 77.

'Hooked Stick' Period.

Mt. Brockman Massif.

Two opposed human figures with headdress and weapons. They have their 'hooked sticks' raised above each others head.

Faded red.

Figure at left: 21 cm.

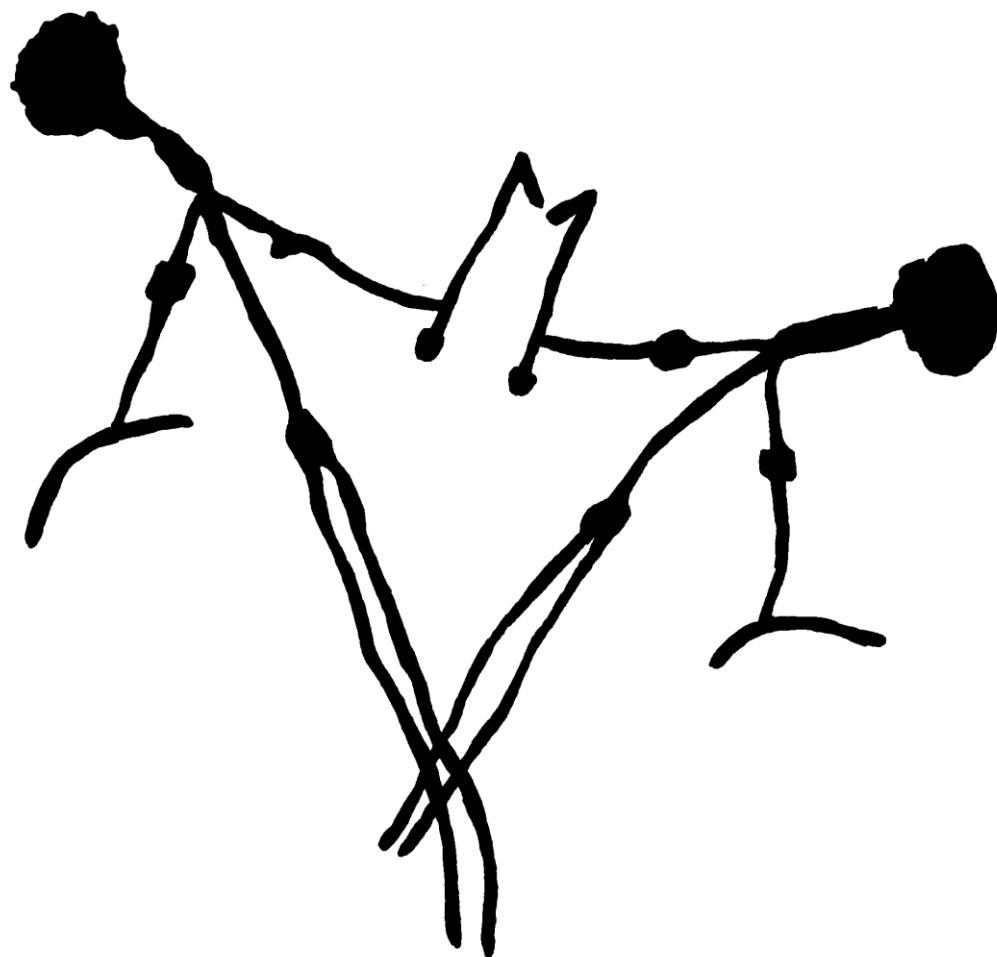


FIGURE 78.

'Hooked Stick' Period.

Mt. Brockman Massif.

Two opposed human figures with headdress, boomerangs, and 'hooked sticks'. They are part of a group of over thirty five similar figures (see Figures 79, 80, and Plate 27). In the arrangement shown here the 'hooked sticks' are being held as though they are fighting picks. However, another figure from this panel (Figure 79) has the hook of its 'hooked stick' poised over the butt of a semi-vertical spear, as though to indicate a functional relationship between the two artefacts.

Dark red.

Figure at left: 43.5 cm.



FIGURE 79.

'Hooked Stick' Period.

Mt. Brockman Massif.

Six human figures with headdress and weapons. Two of the figures wear 'dancing skirts'. One of these also has its 'hooked stick' in its waist belt. At the lower left is what appears to be a painting of a bird track. Of particular interest is the top left figure which has the hook of its 'hooked stick' poised over the butt end of a semi-vertical spear. This positioning suggests that the 'hooked stick' is in fact a spearthrower, in contradiction of other evidence from the same panel, shown in Figure 78.

Dark red.

Maximum width of panel: 74 cm.

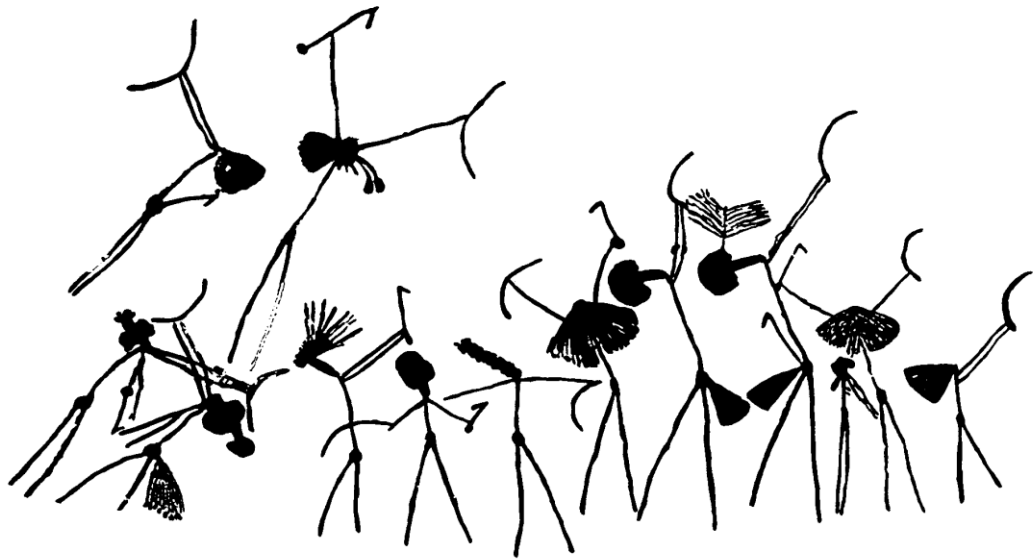


FIGURE 80.

'Hooked Stick' Period.

Mt. Brockman Massif.

Another part of the group that includes Figures 78 and 79. This section includes thirteen male figures that wear headdress, and carry boomerangs and 'hooked sticks', and one female (third from right). Eight of these figures are shown in Plate 27. Some of the figures illustrated here wear a 'dancing skirt' and a few carry their 'hooked stick' in their waist belt in the same way that boomerang figures are often shown carrying boomerangs (eg Figures 7, 11). In several instances, these figures are depicted as opposed pairs (see figures at the left side of this group, and Figure 78).

Dark red.

Maximum dimension: 100 cm.



FIGURE 81.

'Hooked Stick' Period.

Mt. Brockman Massif.

Three human figures, two of which possess a 'hooked stick' and a boomerang. These figures are on the same rock face as the emu hunter scene, shown in Plate 13, and in the same valley within 2 kilometres of the paintings shown in Figures 77-80. Close to these figures, and elsewhere in the gallery, there are numbers of 'grass' prints.

Dark red.

Spear: 48 cm.

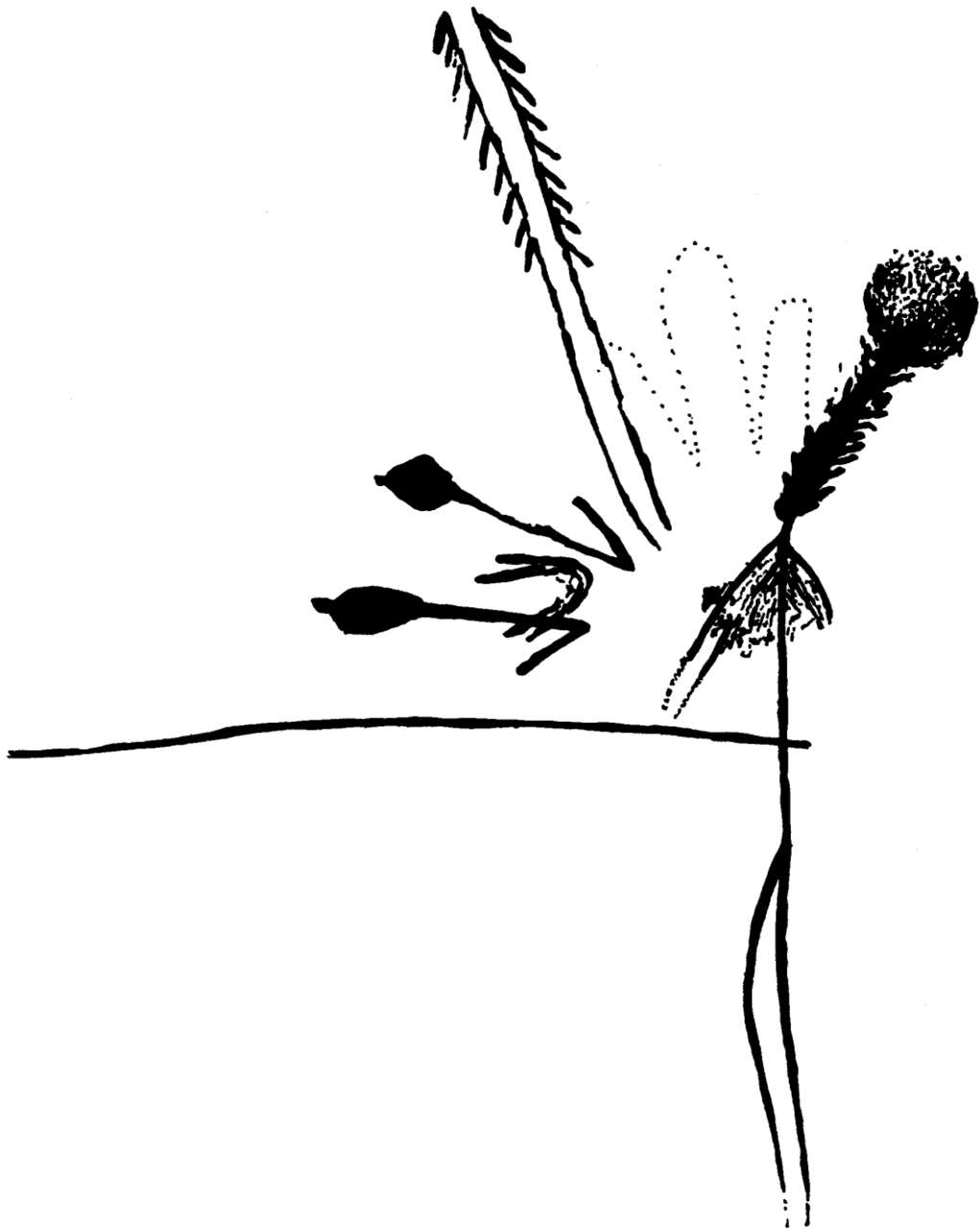


FIGURE 82.

'Hooked Stick' Period.

Upper East Alligator River.

A hand stencil and a human figure with headdress, boomerangs, spears, and 'hooked sticks'. The 'hooked sticks' are atypical in that they both have very long hooks and also knobs of exaggerated size a short distance above the base of handle. The deep curvature of the boomerangs is also unusual.

Red.

Top of headdress to foot: about 65 cm.



FIGURE 83.

'Hooked Stick' Period.

Koolpin Creek.

A group of six human figures. At the right a male with two waist tassels and weapons is flanked by two women with dillybags and digging sticks. A large kangaroo track is painted alongside the figure at the left. Note the similarity of the headdress with those seen on 'hooked stick' figures elsewhere in the Arnhem Land plateau (eg Figures 67, 79, 82).

Dark red.

Figure at the left: about 50 cm.



FIGURE 84.

'Hooked Stick' Period.

Koolpin Creek.

A stick-like human figure with boomerang and 'hooked stick'.

Faded dark brownish-red.

About 31 cm. long.



FIGURE 85.

'Hooked Stick' Period.

Koolpin Creek.

A weathered stick-like human figure with boomerang and 'hooked stick'.

Very faded brown.

About 45 cm.



FIGURE 86.

'Hooked Stick' Period.

Jim Jim Creek headwaters.

A stick-like human figure with boomerang, 'hooked stick', and a massive headdress.

Faded red.

Length: 37.5 cm.



FIGURE 87.

'Hooked Stick' Period.

Mt. Brockman Massif.

Three human figures with weapons. The central figure is depicted with its 'hooked stick' apparently sunk into the back of the figure on the right. This positioning suggests that the 'hooked stick' is a fighting pick.

Red.

Maximum dimension of panel: 88 cm.



FIGURE 88.

'Hooked Stick' Period.

Nourlangie Rock area.

Three human figures, and a marsupial with a spear in its back. All of the paintings appear to be painted with the same pigment. If the paintings are contemporary, the marsupial probably exhibits the stylistic conventions applied to animal paintings during the 'Hooked Stick' Period.

Dark red.

Length of marsupial: 41.5 cm.



FIGURE 89.

'Hooked Stick' Period.

Magela Creek.

A hand stencil, two human figures, and an echidna. One of the human figures carries a boomerang and a 'hooked stick'. It appears to be painted in the same colour as the echidna, although this is not certain. If the two paintings are contemporary, then the echidna is another example of the style (or styles) in which animals were portrayed during the 'Hooked Stick' Period.

Weathered red.

Echidna: about 65 cm.



FIGURE 90.

'Hooked Stick' Period.

Mt. Brockman Massif.

Hand stencils with the three middle fingers closed, an echidna, and a human figure with boomerang, 'hooked stick', and spear. In this instance the human figure and the echidna are clearly contemporary. Unfortunately, the echidna is badly weathered and little more can be said about its stylistic attributes other than that it is a silhouette with no X-ray features.

Dark red.

Spear: 26 cm.



FIGURE 91.

'Hooked Stick' Period.

Baroalba Creek.

Four stick-like human figures with weapons. Three of the figures have large rayed headdress and each carries a 'hooked stick'. One of the four also has a boomerang and another has a spear.

Red.

Tallest figure: 56 cm.

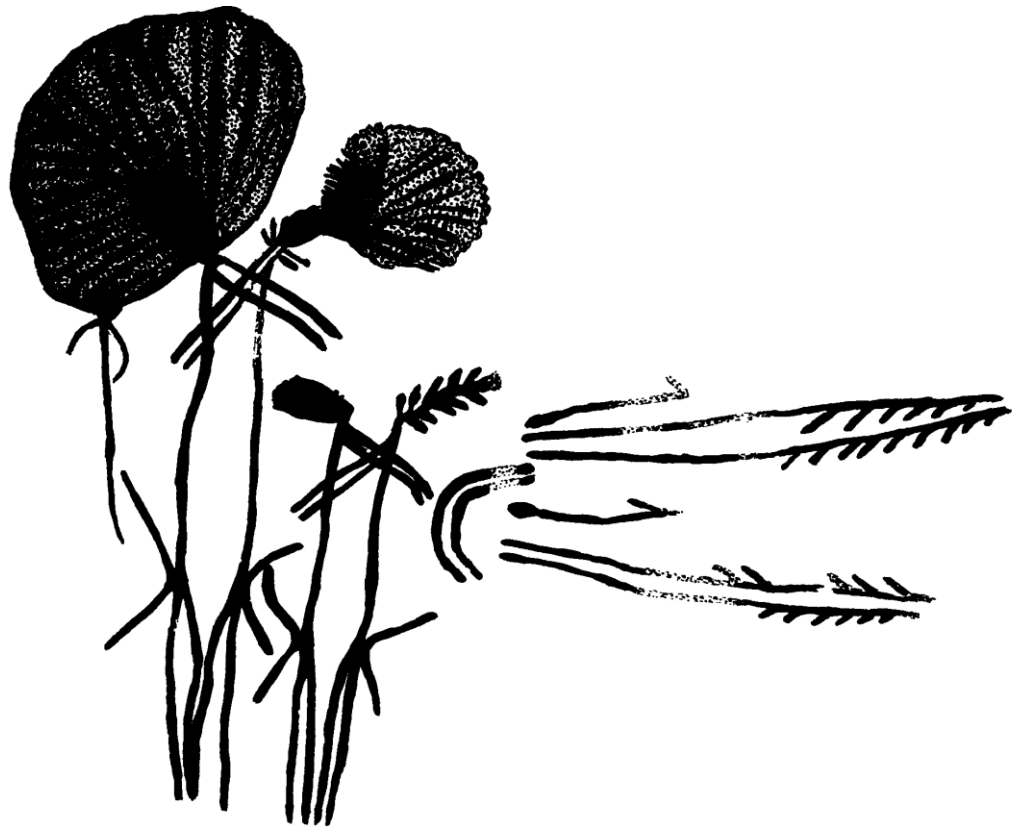


FIGURE 92.

'Hooked Stick' Period.

Deaf Adder Creek.

Two sets of paired figures with headdress, and boomerangs in their waist belts, and a fifth figure beneath the headdress of the left hand figure. Boomerangs, 'hooked sticks', and spears are arranged to the right of the paired figures.

Faded, dull dark brown.



FIGURE 93.

'Hooked Stick' Period.

Deaf Adder Creek.

Six human figures with massive headdress. The horizontal figure at the right has its body painted in full silhouette. It is in position with a boomerang figure. In this illustration part of the boomerang figure appears to be obscured by the horizontal figure, but in reality the entirety of the boomerang figure is visible. Although none of the figures have a boomerang, stylistic similarities with definite 'hooked stick' figures indicates that these are also 'hooked stick' figures.

Red.

About 80 cm. tall (estimate).



FIGURE 94.

Tentative 'Hooked Stick' Period.

Baroalba Creek.

Two hand stencils, a stick-like human figure, and a kangaroo with a multi-pronged, multi-barbed spear in its back. In this instance, the human figure is not associated with a boomerang so it could belong to either the 'Hooked Stick' Period or the Broad Spearthrower Period. However, the majority of animals from the Broad Spearthrower Period are either full silhouettes or have some form of X-ray feature. In view of this, and when other features such as the material culture items depicted and the condition of the painting in comparison with other motifs in the gallery are taken into account, it seems a reasonable assumption that these paintings belong to the 'Hooked Stick' Period.

Red.

The head and ears of the kangaroo have turned dark brown to black, apparently due to chemical reaction between the pigment and the rock.

Length of kangaroo: 180 cm.

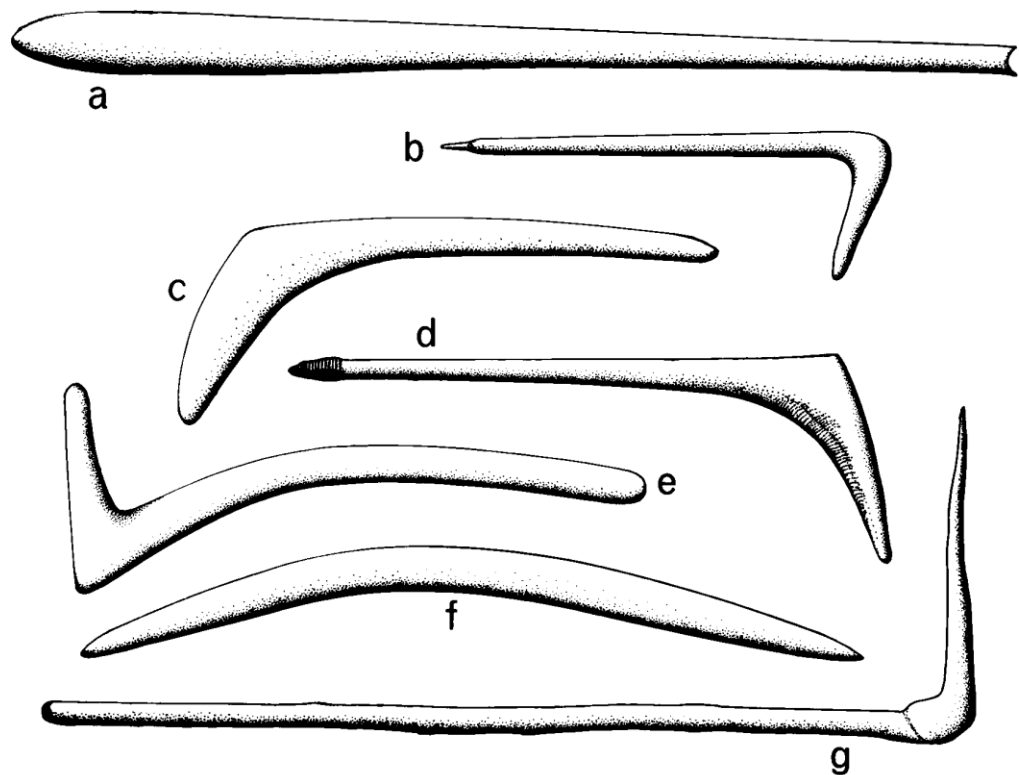


FIGURE 95.

a: Fighting club (**Periperiu**). West Arnhem Land (after Spencer 1914: 366-67, plate 16-4).

b: Hooked club. Victoria.

c: Non-conventional boomerang. Central Queensland coast.

d: Fighting club (**Marpangye**). South-eastern Australia.

e: Hooked boomerang. Central Australia.

f: Conventional boomerang. Queensland.

g: Fighting pick. East Arnhem Land.*

(*Length of Figure g: 117 cm. All figures correct relative scale).

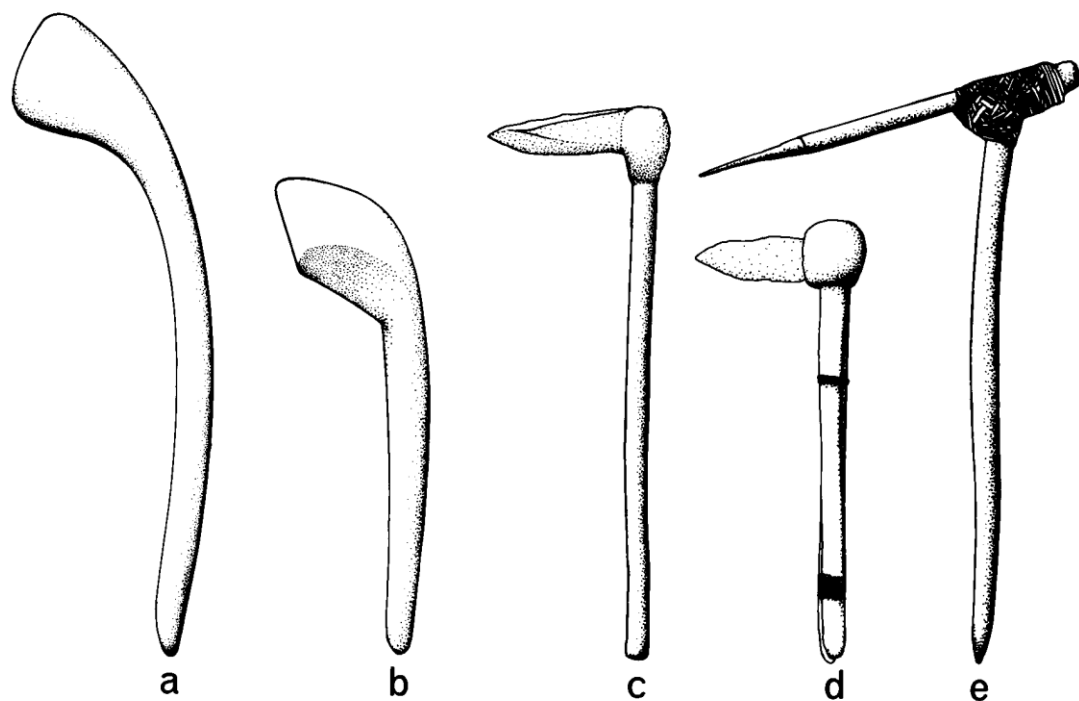


FIGURE 96.

a: Lil-Lil , a boomerang-like throwing stick. South-eastern Australia.

b: Throwing club. South-eastern Australia.

c: Stone-bladed fighting pick with split stick handle. Central Australia.

d: Stone-bladed fighting pick with bent withy handle. Central Australia.*

e: Fighting pick. New Guinea highlands.

(*Length of figure d: 45 cm. All figures correct relative scale).



FIGURE 97.

'Hooked Stick' Period.

Twin Falls Creek.

Three Twin Falls 'hooked stick' figures (see Plate 25). Note the 'branches' carried by the figures on the left and right.

Dark red.

Width of panel: 40 cm.



FIGURE 98.

'Hooked Stick' Period.
Twin Falls Creek.

Human being with headdress, boomerangs, 'hooked stick' and spear. Note how the hook on the 'hooked stick' is poised over the end of the spear, as though to indicate a functional articulation between the two artefacts.

Dark red.

Maximum dimension: about 45 cm.

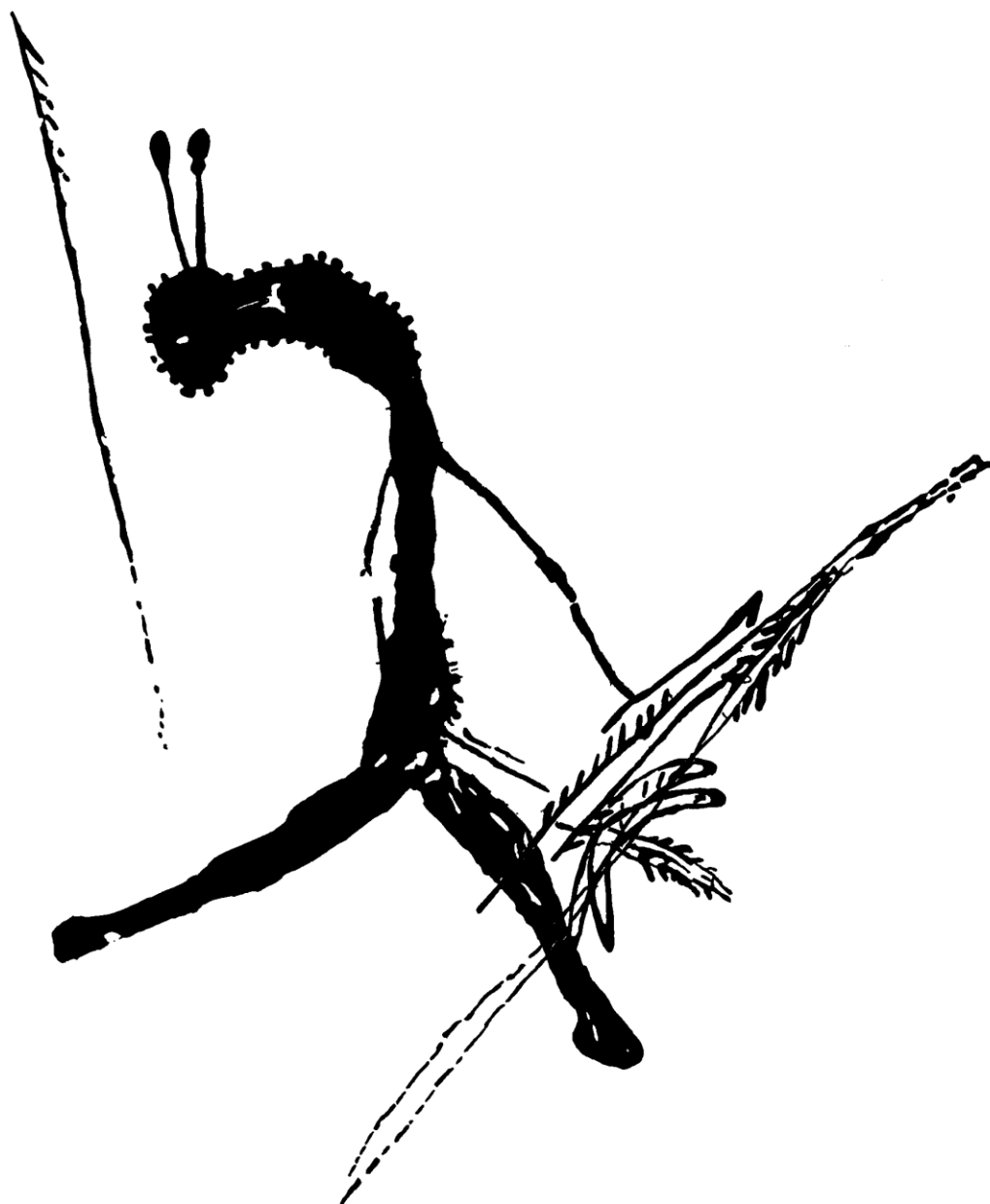


FIGURE 99.

'Hooked Stick' Period.

Twin Falls Creek.

Profile of a human being with headdress and weapons. Note the branch-like object extending to the right from the boomerangs.

Dark red.

Maximum dimensions: about 45 cm.



FIGURE 100.
'Hooked Stick' Period.
Twin Falls Creek.
'Rotund' human being with headdress, waist decoration and weapons.
Dark red.
Maximum dimension: about 40 cm.



FIGURE 101.

'Hooked Stick' Period.

Twin Falls Creek.

A human being riddled with spears. The dots scattered among the spear shafts possibly represent blood from the spear wounds.

Dark red.

Height: about 45 cm.



FIGURE 102.

'Hooked Stick' Period.

Barramundi Creek.

Stencil of a hand held side-on to the rock, and a human figure with headdress, waist decoration, and weapons.

Dark red.

The figure is about 80 cm. tall (not including spears).



FIGURE 103.

'Hooked Stick' Period.

Twin Falls Creek.

Two female human beings with dillybags, digging sticks, and lines from the head that could indicate either hair or decorations in the hair. As in the Boomerang Period, women are rarely depicted in the 'Hooked Stick' Period.

Dark red.

Woman on the left: 29 cm. (maximum length).



FIGURE 104.

'Hooked Stick' Period.

Djauan Valley.

A human figure with boomerang. The gaps between the head and body, in the lower legs, and the absence of arms on this and other Djauan Valley 'hooked stick' figures indicates an artistic convention where these parts of the figures were painted in a less stable colour, probably white.

Dark red.

Length: 35.5 cm.

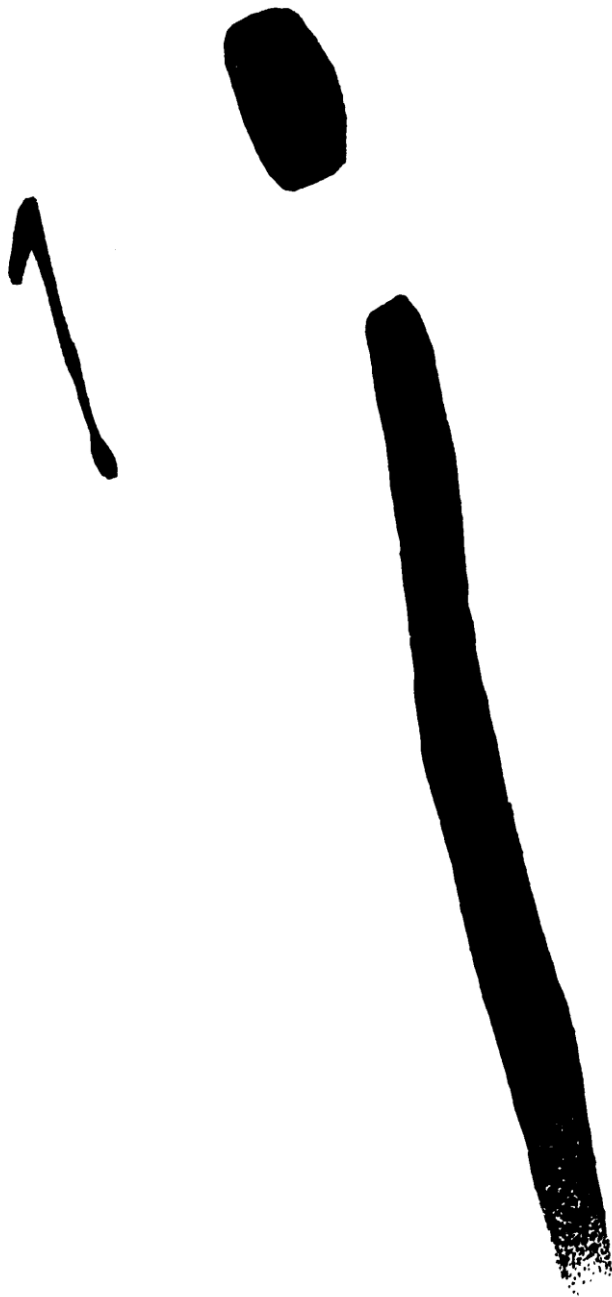


FIGURE 105.
'Hooked Stick' Period.
Djauan Valley.
A human figure with a 'hooked stick'.
Dark red.
Maximum length: 28 cm.



FIGURE 106.

'Hooked Stick' Period.

Djauan Valley.

A pair of human figures with boomerangs and 'hooked stick'.

Dark red.

Length of boomerangs: 11 cm. overall.



FIGURE 107.

'Hooked Stick' Period.
Djauan Valley.

Three human figures. The gaps between the head and body of each figure and the absence of arms appears to be due to the original use of a less stable pigment, probably white. In this instance, and in Figure 108, weapons may also have been painted in a colour now gone. Dark red.

Figure on the right: 36 cm.

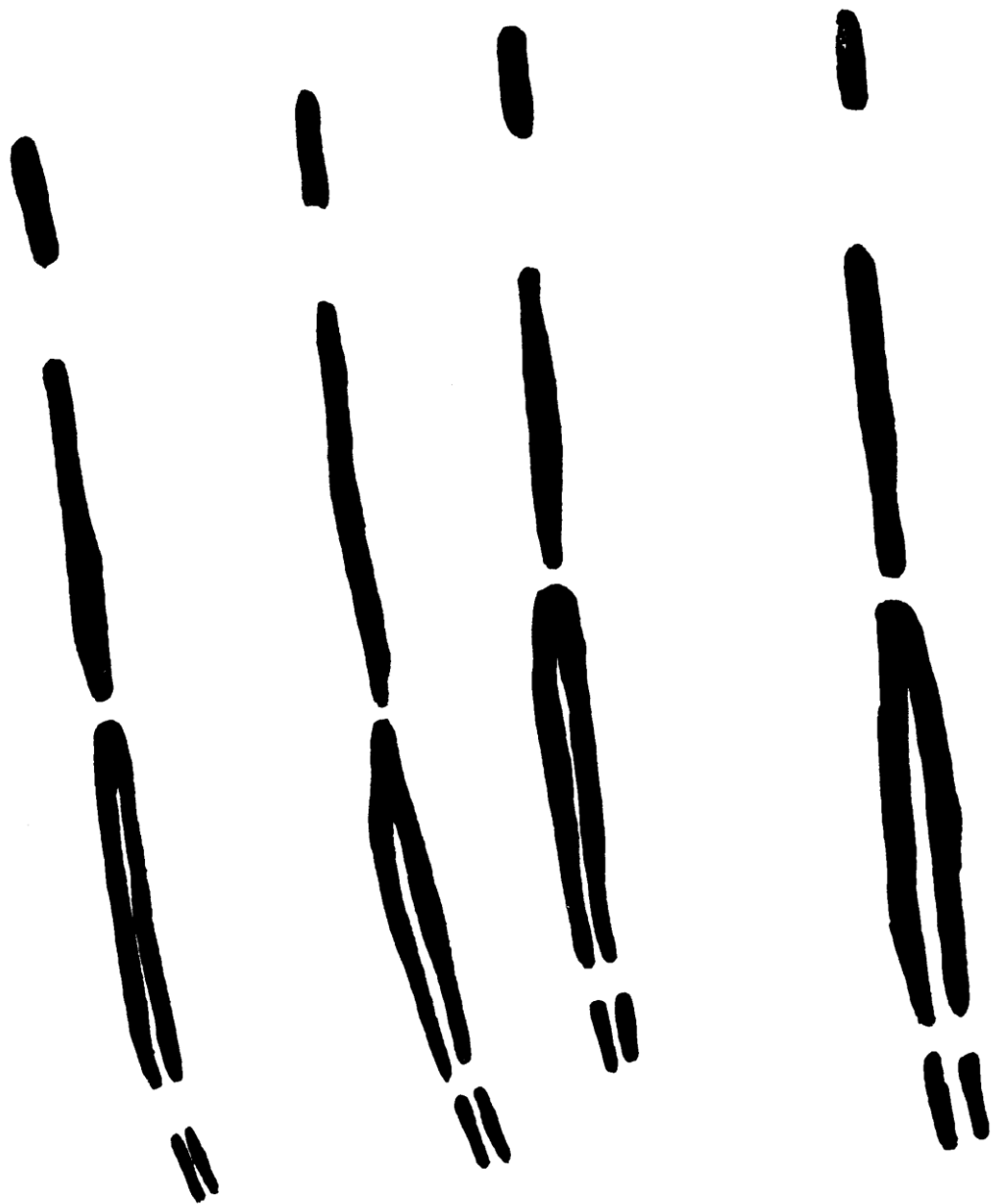


FIGURE 108.
'Hooked Stick' Period.
Djauan Valley.
Four human figures.
Dark red.
Figure on the left: 41 cm.

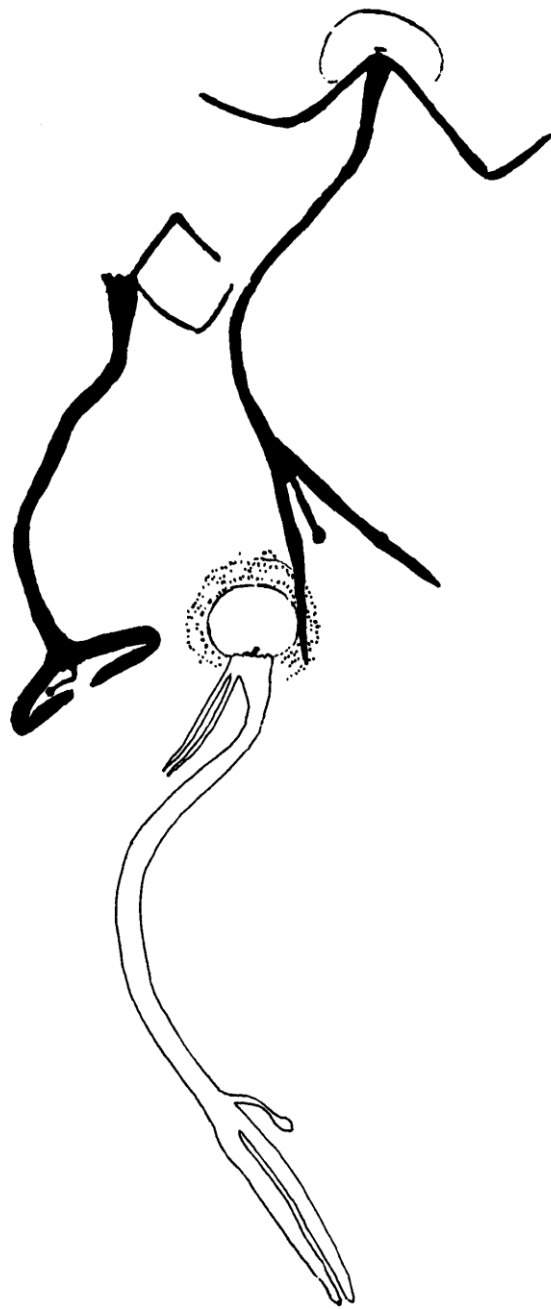


FIGURE 109.

'Hooked Stick' Period.

Cannon Hill.

Three human figures in the classic Oenpelli regional style. The lower figure is a faded yellow silhouette except for the head. The head has no internal pigment, but is outlined by a thin dark red line and outer band of dark red dots. The other two figures are dark red. One of these appears to have had its head depicted in a different shade of pigment that has since weathered away.



FIGURE 110.

'Hooked Stick' Period.

Ngarradj Warde Djobkeng

A human figure with a hand held spear or stick. The bulge at the end of the 'spear' may represent hafting material for the blade that was painted in a pigment that did not bond with the rock face. The figure has a faded grey-brown body with body outline and interior of head a faded purple.

Length: About 35 cm.

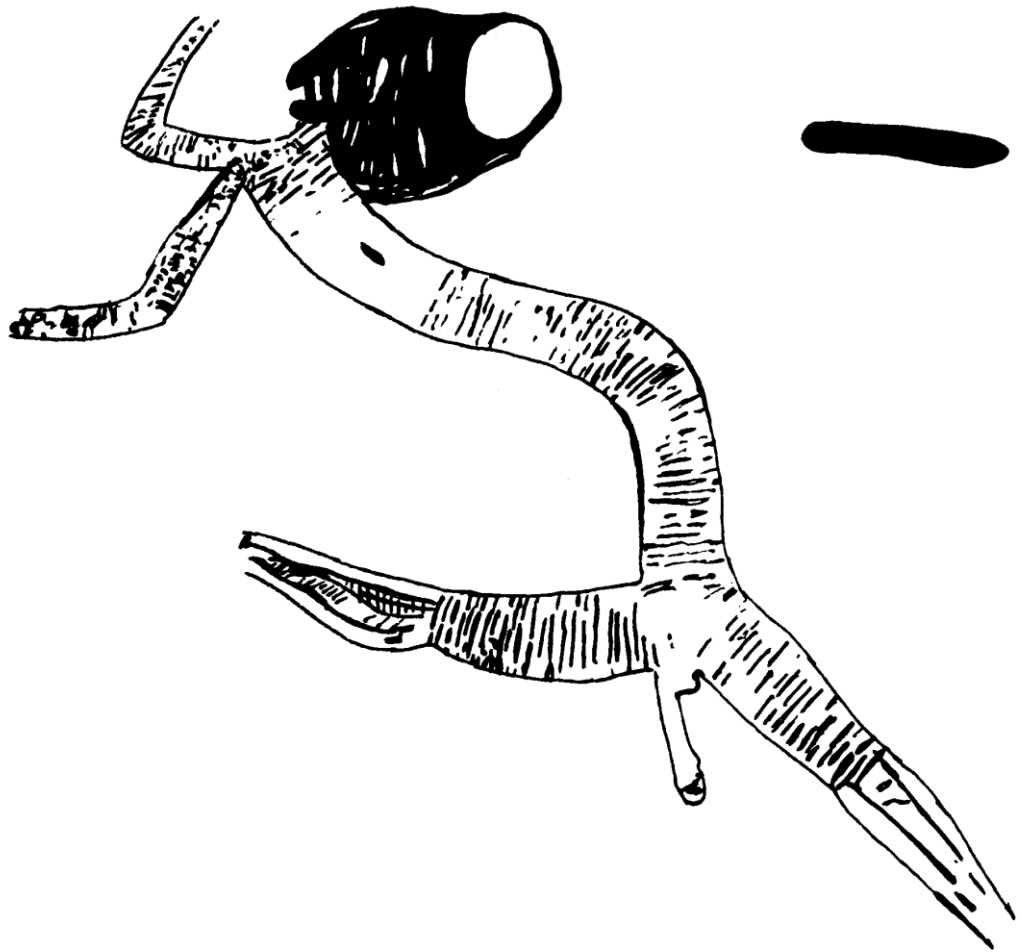


FIGURE 111.

'Hooked Stick' Period.

Ngarradj Warde Djobkeng

A human figure in the Oenpelli regional style. The figure has a pale orange-red silhouette with dark red to black outline, headdress, and body markings. The 'bar' to the right of the head is in the same colour as the headdress and may have once been joined to it by a shade of pigment that has not survived. Note the arm upraised as though holding a weapon. About 50 cm. long.

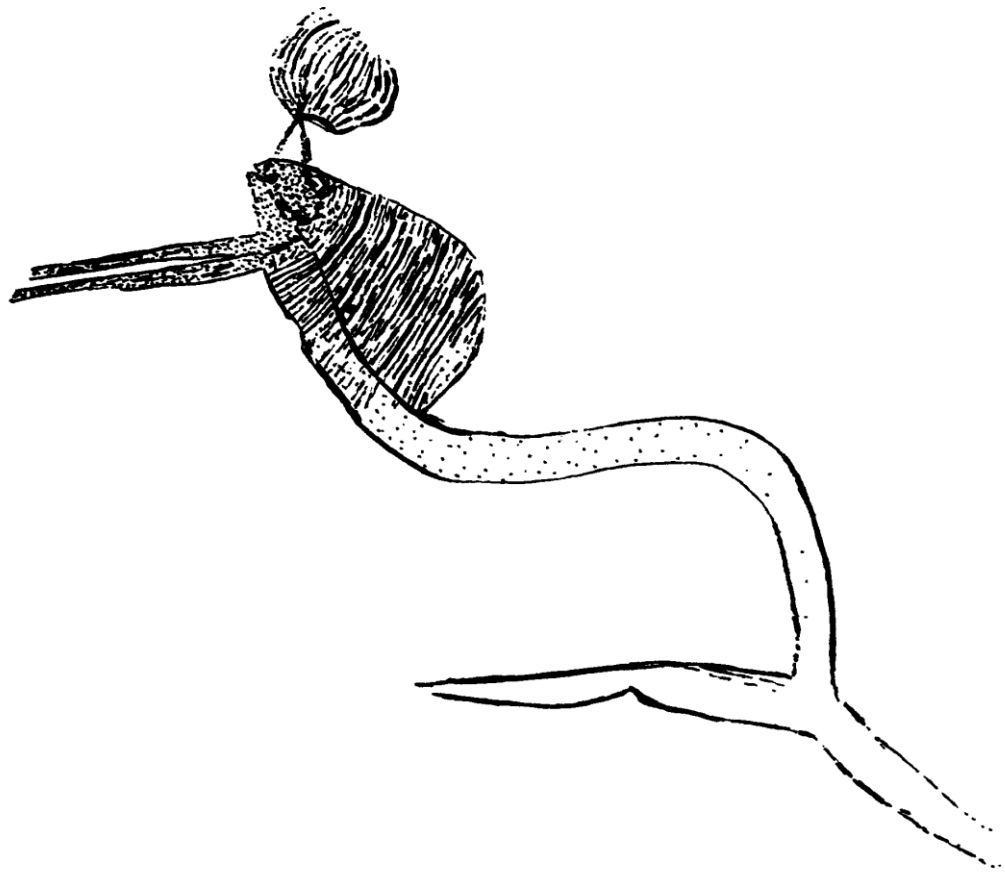


FIGURE 112.

'Hooked Stick' Period.

Ubirr (Obiri Rock).

An outline of a human being with headdress, painted in the classic Oenpelli regional variant of 'hooked stick' figures.

Painted in faded purplish-red lines.

Maximum length: about 35 cm.

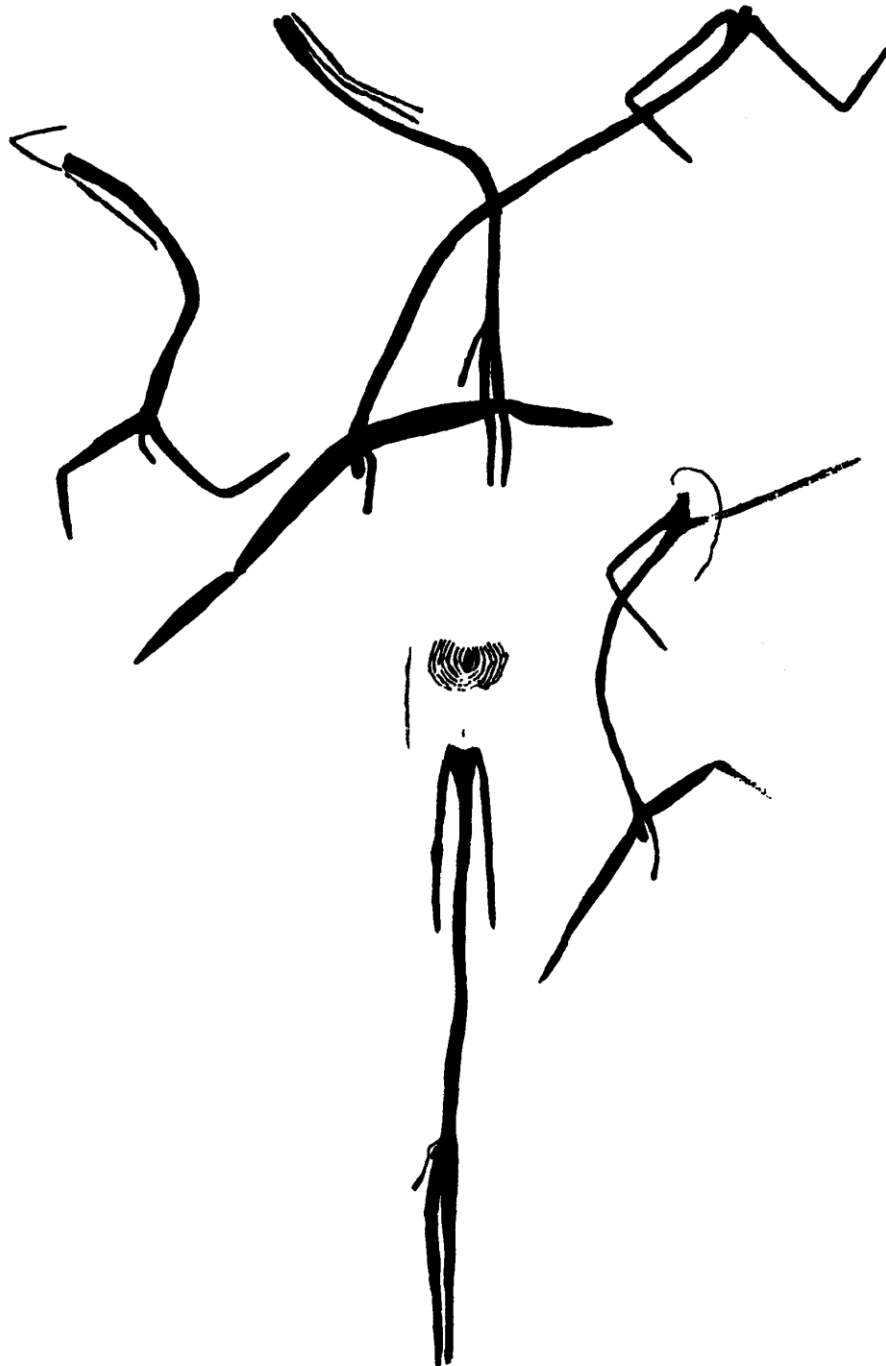


FIGURE 113.

'Hooked Stick' Period.

Cannon Hill.

A group of human beings in the classic Oenpelli regional style. Note that neither figure has a head indicated.

Dark red.

Lowest figure: about 55 cm.



FIGURE 114.

'Hooked Stick' Period.
Cannon Hill.

Human beings in the classic Oenpelli regional style of 'hooked stick' figures. Their heads are missing; only the fringing portions of their heads or headdress are now visible. Note the typical absence of material culture items.

Weathered red.

About 70 cm. tall (from memory).



FIGURE 115.
'Hooked Stick' Period.
East Alligator River Crossing area.
An Oenpelli 'hooked stick' figure with forearm decoration. Note the absence of the head.
Faded dark red.
About 30 cm. tall (from memory).



FIGURE 116.

'Hooked Stick' Period.

Ngarradj Warde Djobkeng.

A seated human figure in the Oenpelli regional style of 'hooked stick' figures.

Dark yellow body and limbs; red headdress.

Length: 35 cm.



FIGURE 117.
'Hooked Stick' Period.
Cannon Hill.
A human figure in the classic Oenpelli regional style of 'hooked stick' figures.
Red.
Height: about 30 cm. (from memory).

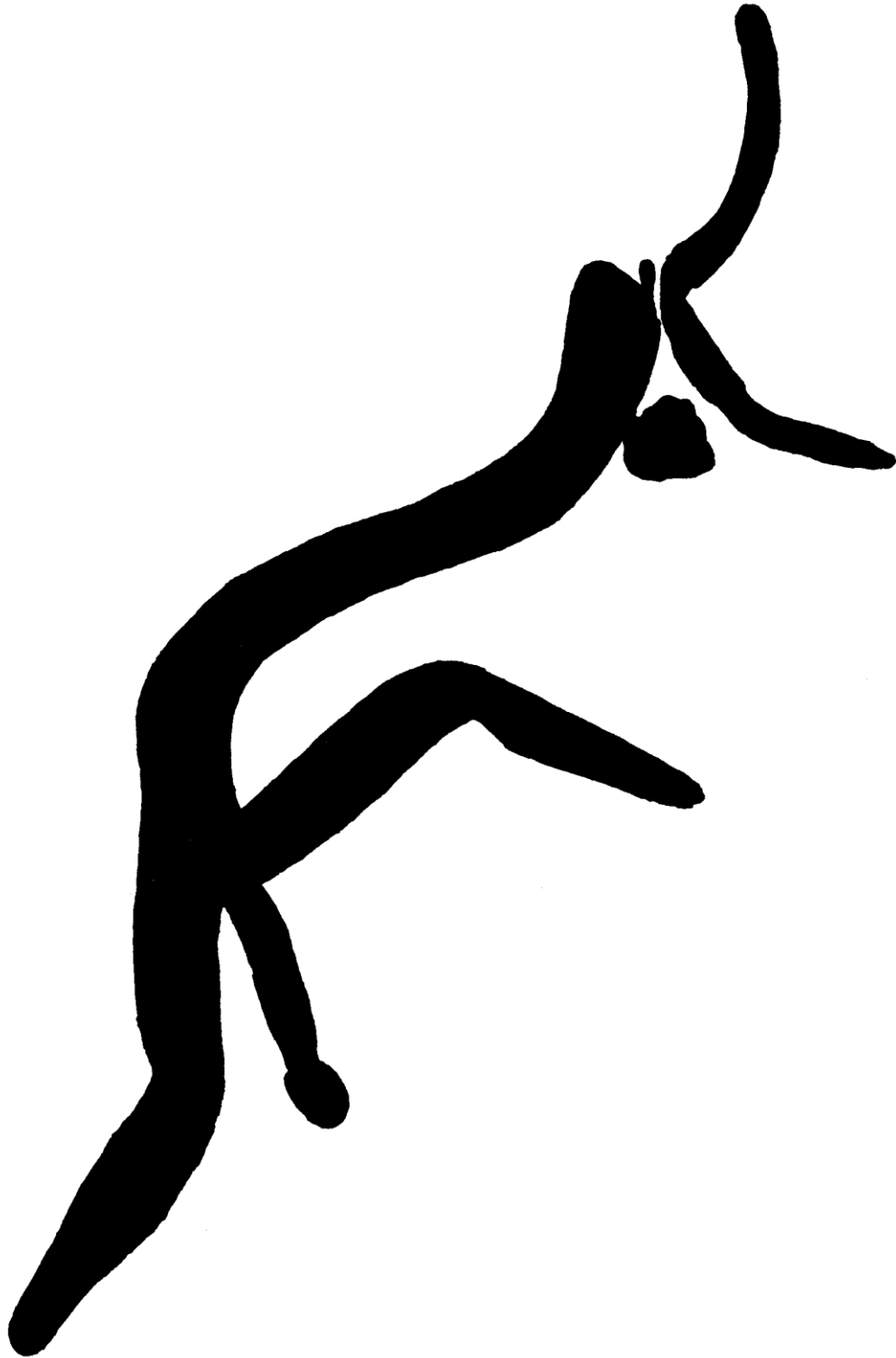


FIGURE 118.

'Hooked Stick' Period.

East Alligator River crossing area.

A headless human figure in the classic Oenpelli regional style of 'hooked stick' figures.

One arm is upraised as though holding a weapon.

Faded red.



FIGURE 119.

'Hooked Stick' Period.

East Alligator River Crossing area.

A group of human figures in the classic Oenpelli regional style of 'hooked stick' figures. Two of these figures have what may be a dillybag hanging on their backs. Four have an ornament fixed to the wrist of one upraised arm. Presumably, the objects scattered among the figures are portions of material culture items originally painted in a combination of red and another colour that has since weathered away. Similarly, the barbed spear blades among the figures presumably also once had shafts in a colour that has not survived on the rock face.

Dark red.

Average height: about 30 cm. (estimate).



FIGURE 120.

'Hooked Stick' Period.

Magela Creek.

A classic composition of motifs from the Rainbow snake complex. Included in the panel are a composite Rainbow snake, flying foxes, yams, and other motifs.

Red.

Maximum dimension: 235 cm.

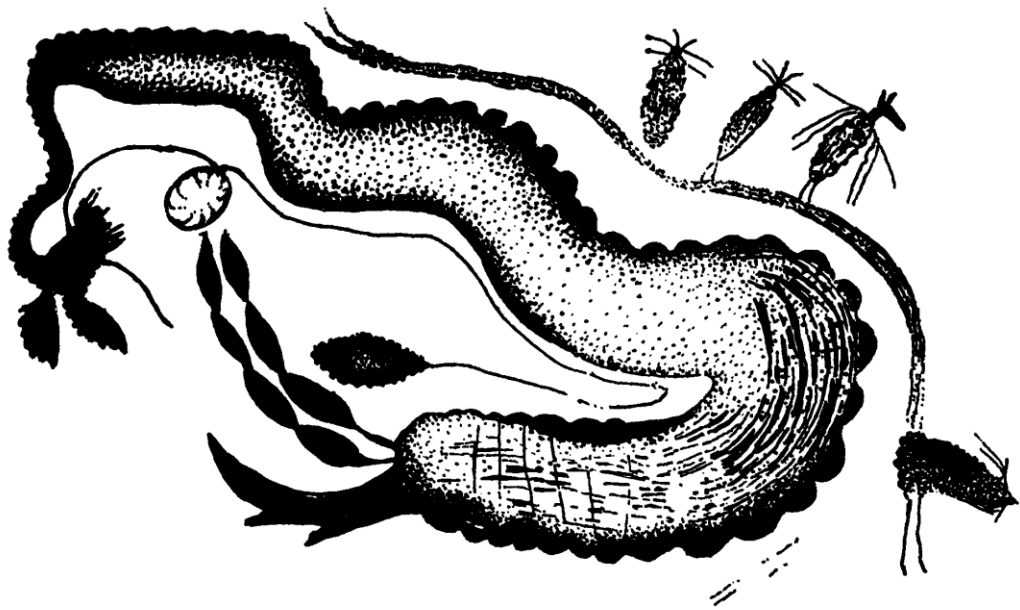


FIGURE 121.

'Hooked Stick' Period.

Jim Jim Creek.

A Rainbow snake with animal head, crocodile tail and lumps along its body which Aborigines say represent both the nodules on yams and feather decoration. A Yam and a yam leaf are attached to the face of the Rainbow snake by a line that represents a yam tendril. The conjoined objects that extend from near the tail of the Rainbow snake are probably yam tubers. To the right of the snake there is a bird with yam features (its head has weathered away). Extending from this bird, around the top side of the snake, is a band with a forked end. Lines with forked ends, and often with dots along their sides, are a common feature in the Rainbow snake complex of paintings. They probably represent the male inflorescence of the yam vine (cf this feature with the inflorescence in Figure 154). Attached to this band are yams and a flying fox with lines from the shoulders that probably represent yam roots (top right).

Dark Red.

Length of flying fox: 13 cm.



FIGURE 122.
 'Hooked Stick' Period.
 Deaf Adder Creek headwaters.
 Two composite Rainbow snakes and three turtles.
 Dark red.
 Length: 87 cm.



FIGURE 123.
 'Hooked Stick' Period.
 Stag Creek.
 Stencils of a hafted stone axe and a hand with the three middle fingers closed, and two
 animal-headed Rainbow snakes with crocodile tails.
 Dark red.
 Longest Rainbow snake: about 115 cm.



FIGURE 124.

'Hooked Stick' Period.

Deaf Adder Creek.

A composite Rainbow snake with a yam attached to its 'arm'. The segmented circle is commonly found among motifs from the Rainbow snake complex and appears to be restricted to the period when the complex first appeared. The other two objects have not been identified.

Red.



FIGURE 125.

'Hooked Stick' Period.

Barramundi Creek.

Two composite Rainbow snakes and an anthropomorphic yam being. One of the Rainbow snakes has a crocodile tail while the other has a fish tail. The maze of lines may represent roots and tendrils of the yam plant.

Dark red.

About 120 cm. overall.



FIGURE 126.

'Hooked Stick' Period.

Deaf Adder Creek.

A composite Rainbow snake associated with yams, flying foxes, an echidna, and other motifs.

Red.



FIGURE 127.

'Hooked Stick' Period.

Stag Creek.

A composite Rainbow snake with objects (yams ?) and an unidentified double-ended trident motif.

Red.

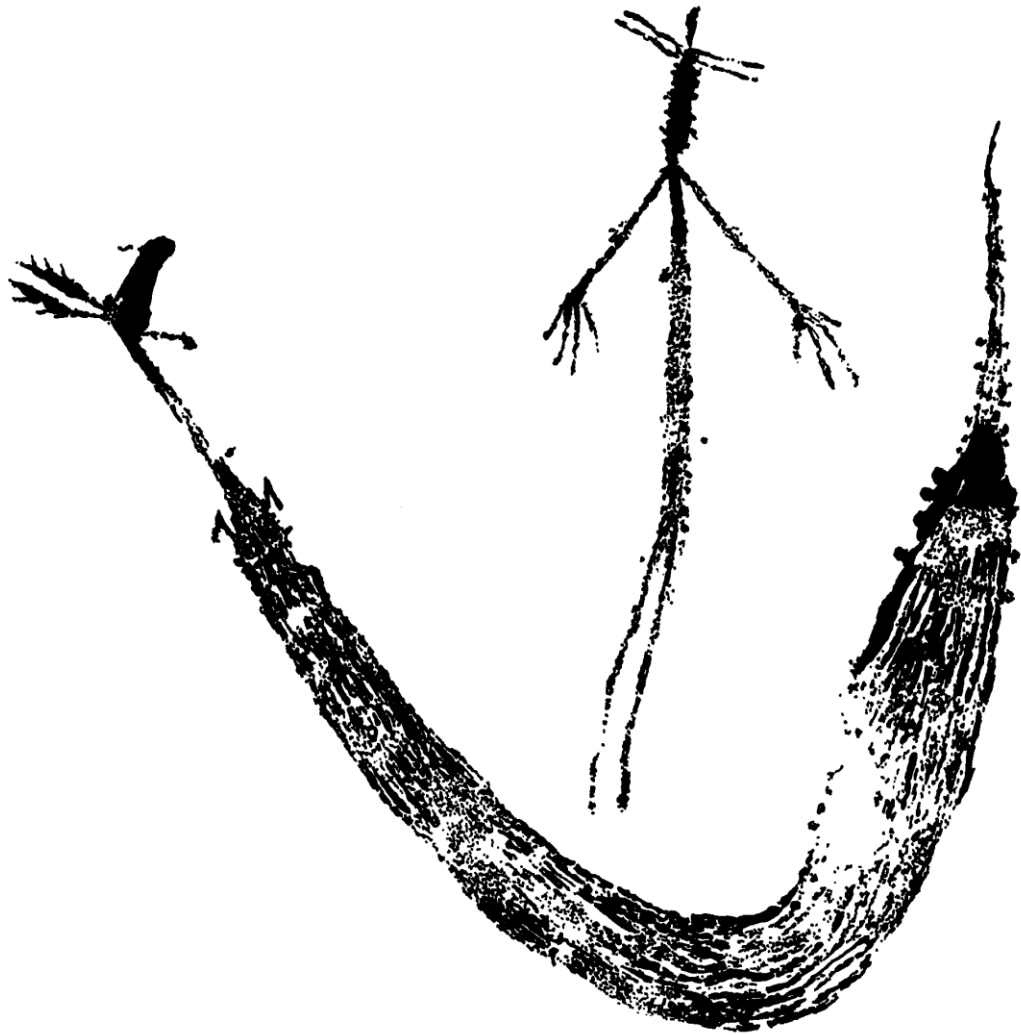


FIGURE 128.
'Hooked Stick' Period.
Twin Falls Creek.
A composite Rainbow snake and an anthropomorphic yam-being (see Plate 29).
Red.
Anthropomorph: 53.5 cm.

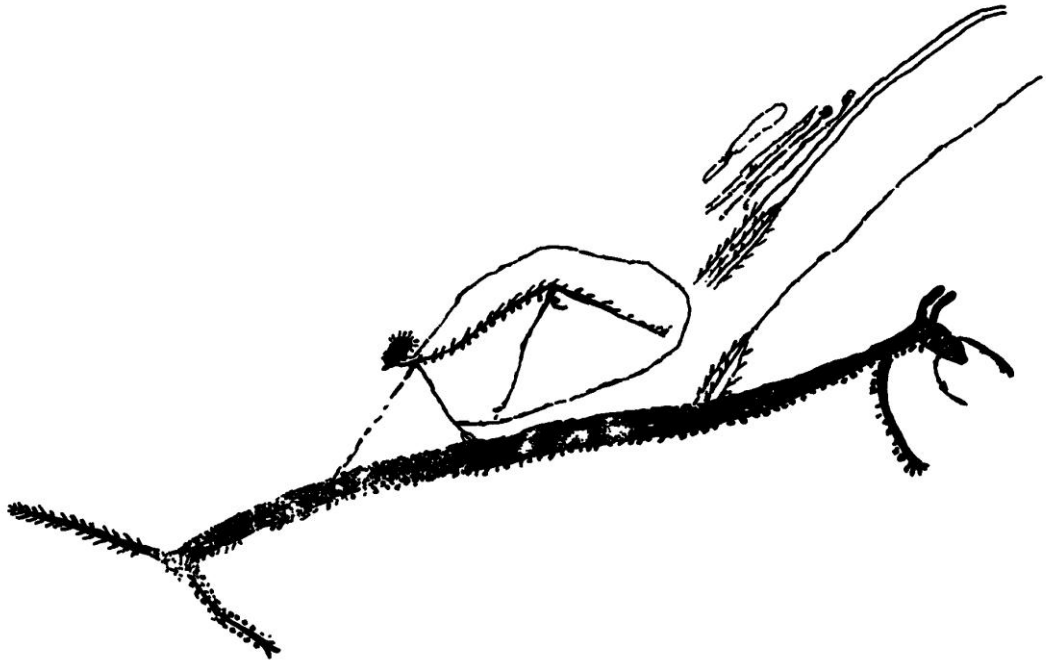


FIGURE 129.

'Hooked Stick' Period.

Narradj Warde Djobkeng

An anthropomorphic being touching the back of a composite Rainbow snake. To the right of the anthropomorph there is a multi-pronged spear, a dillybag, and several other unidentified artefacts. Another multi-pronged spear is shown piercing the back of the Rainbow snake. This Rainbow snake is unusual, but not unique, in that it has an arm and a leg indicated (see Brandl 1973: figures 160 and 161). The row of 'barbs' along both sides of the tail of the Rainbow snake is also unusual. The significance of the line around the anthropomorph is unknown.

Dark red.

Maximum length of Rainbow snake: 102 cm.



FIGURE 130.

'Hooked Stick' Period.

East Alligator River Crossing area.

A yam-headed being with yams attached to it by lines is shown holding the neck of a composite Rainbow snake that has a head like an ordinary snake. Arranged around the Rainbow snake are a centipede, an animal like a flying fox, a lizard-like animal, a human figure (at right), several yams, and a number of unidentified objects.

Faded dark red.

Length of snake: about 80 cm.

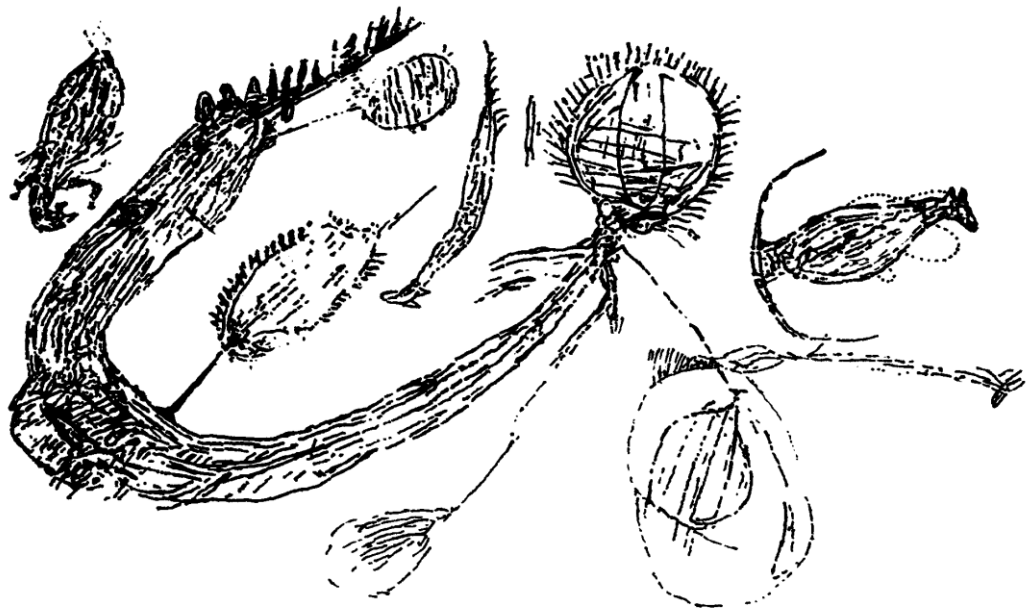


FIGURE 131.

'Hooked Stick' Period.

Waterfall Creek.

A composition from the Rainbow snake complex. The largest motif is a yam-headed being.

This being has a snake body and crocodile tail, and is probably a representation of a Rainbow

snake. Connected by lines to this yam-headed being are four round yams. Other motifs in the

panel include a flying fox (at right), a small inverted Rainbow snake (centre), and an unidentifiable

animal (left). Note the short lines representing rootlets around the head of the yam-headed being

and around several of the yams.

Red.

Length of inverted Rainbow snake: 35 cm.



FIGURE 132.

'Hooked Stick' Period.

Stag Creek.

A hand stencil, and yam-headed beings with yams attached to them by lines that represent roots.

Weathered red.

Largest yam-headed being: about 112 cm.

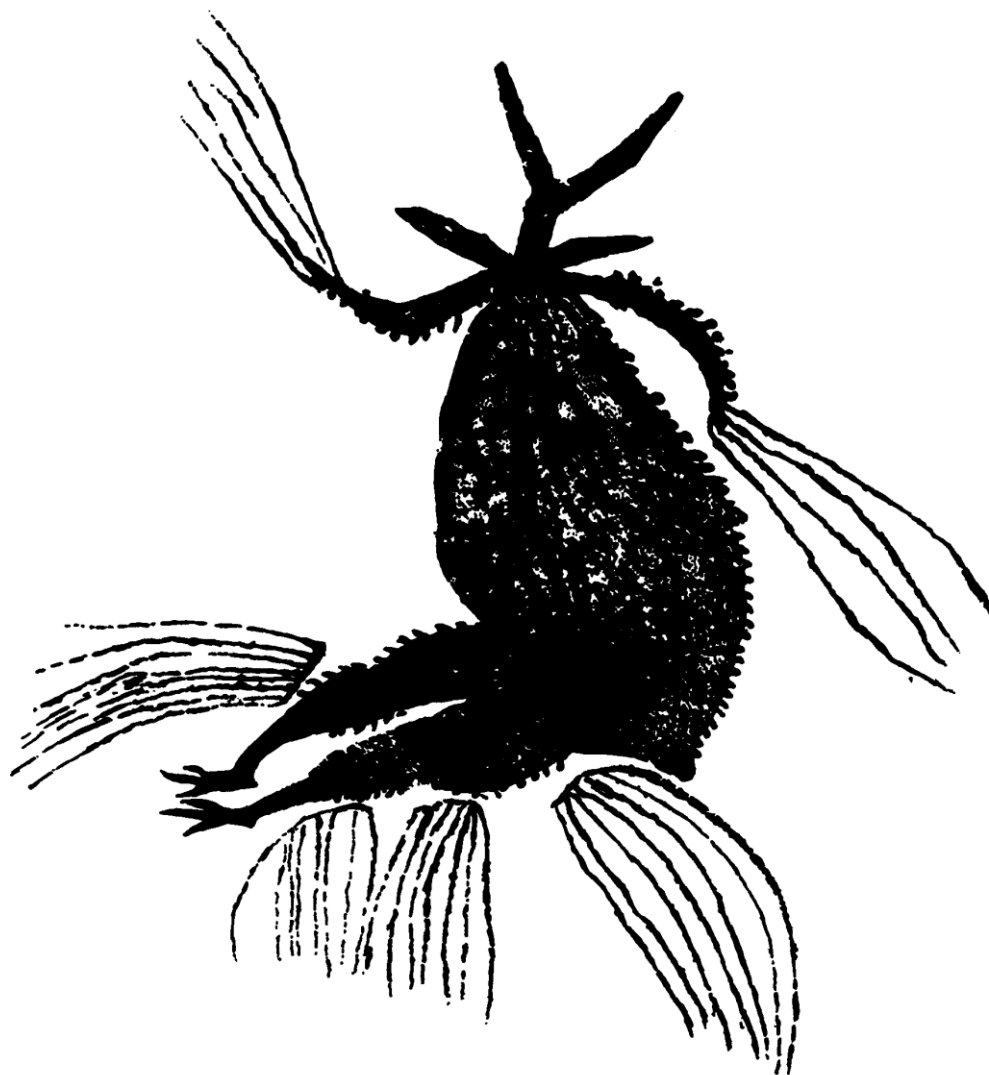


FIGURE 133.

'Hooked Stick' Period.

Deaf Adder Creek.

A large yam-being with a body like that of a plucked bird.

Dark red.

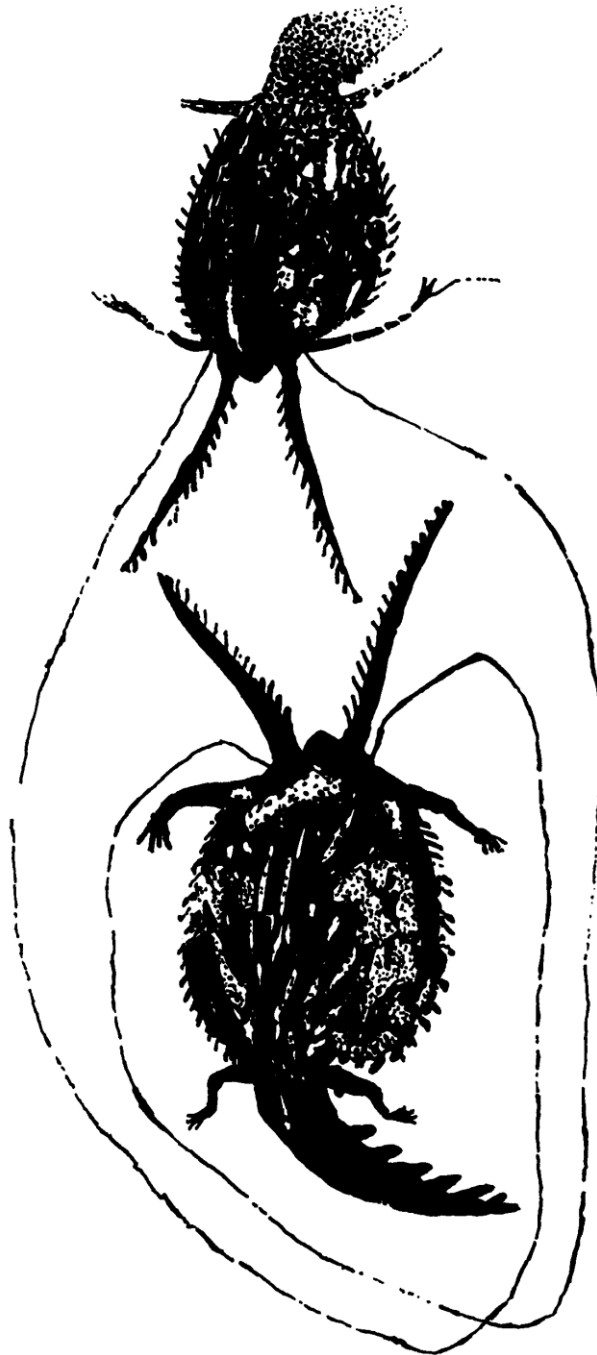


FIGURE 134.

'Hooked Stick' Period.

Deaf Adder Creek.

A pair of crocodile-like animals with yam features. Note the dots and short strokes around the bodies of the animals, and the lines that interconnect them both. The 'jaws' of both animals resemble the 'head' of Figure 133.

Red.

Maximum length: 94 cm.

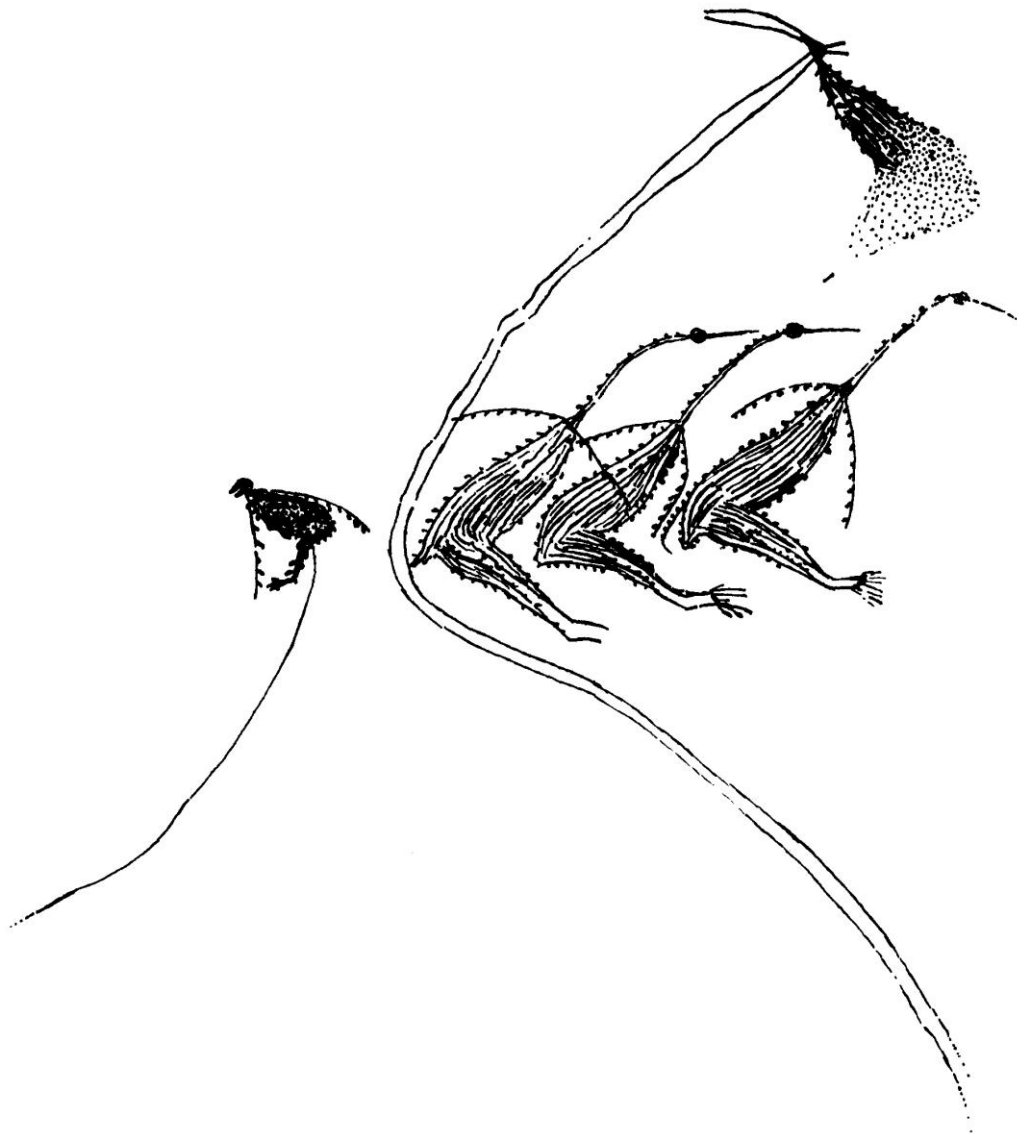


FIGURE 135.

'Hooked Stick' Period.

Mt. Brockman Massif.

Five birds, typical of those associated with the Rainbow snake complex. The birds are always depicted without feathers, with dots around their margins, and often with lines extending from their bodies. In some examples the bird species portrayed can be identified as ibis (eg the bird at the top right).

Red.

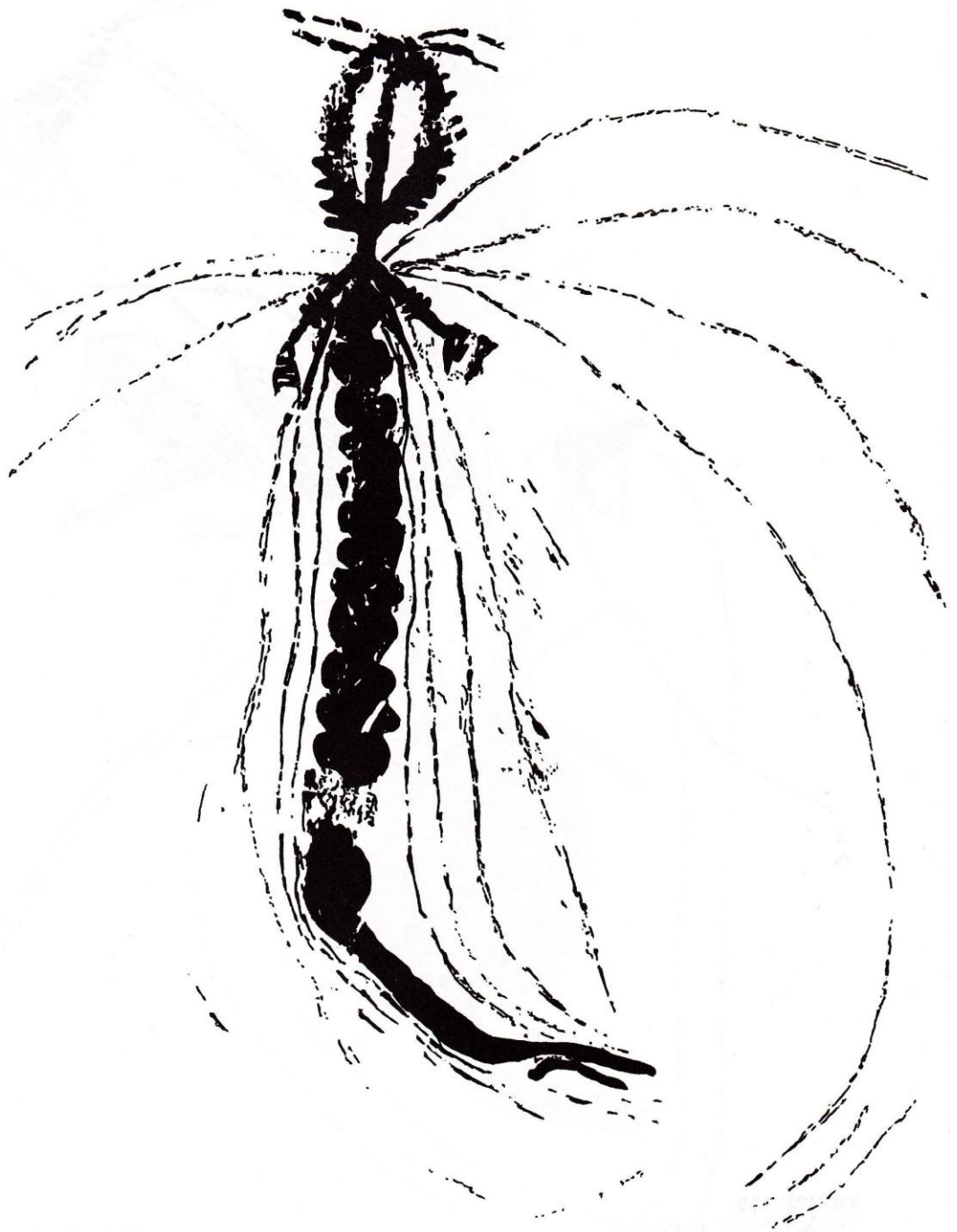


FIGURE 136.

'Hooked Stick' Period.

Stag Creek.

A yam-headed being with a snake body, two short arms, and lines extending from the neck and armpits.

Dark red.

Length of being: 72 cm.

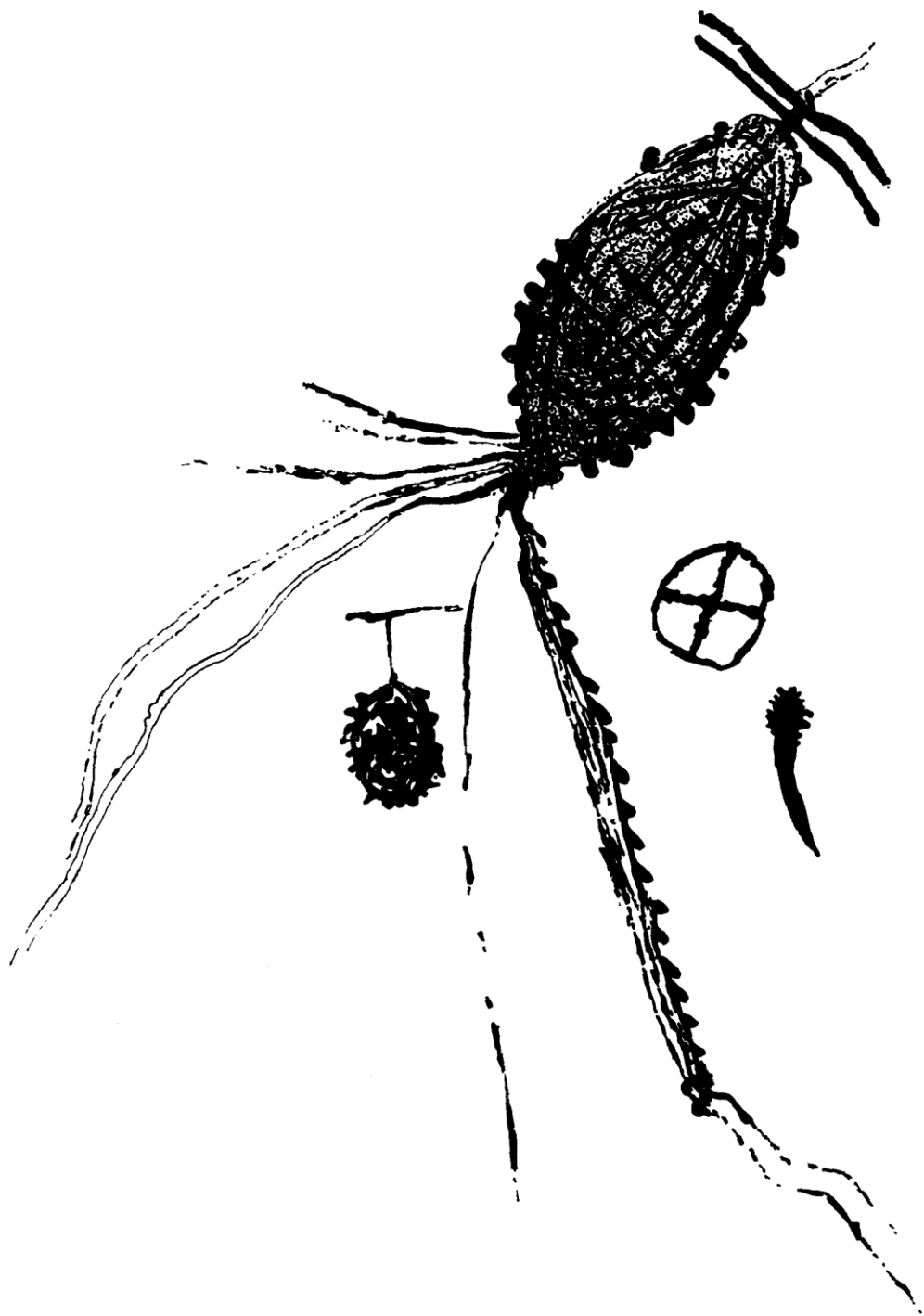


FIGURE 137.

'Hooked Stick' Period.

Deaf Adder Creek.

A yam-being associated with an ordinary yam, a segmented circle, and an unidentified object.
Dark red.

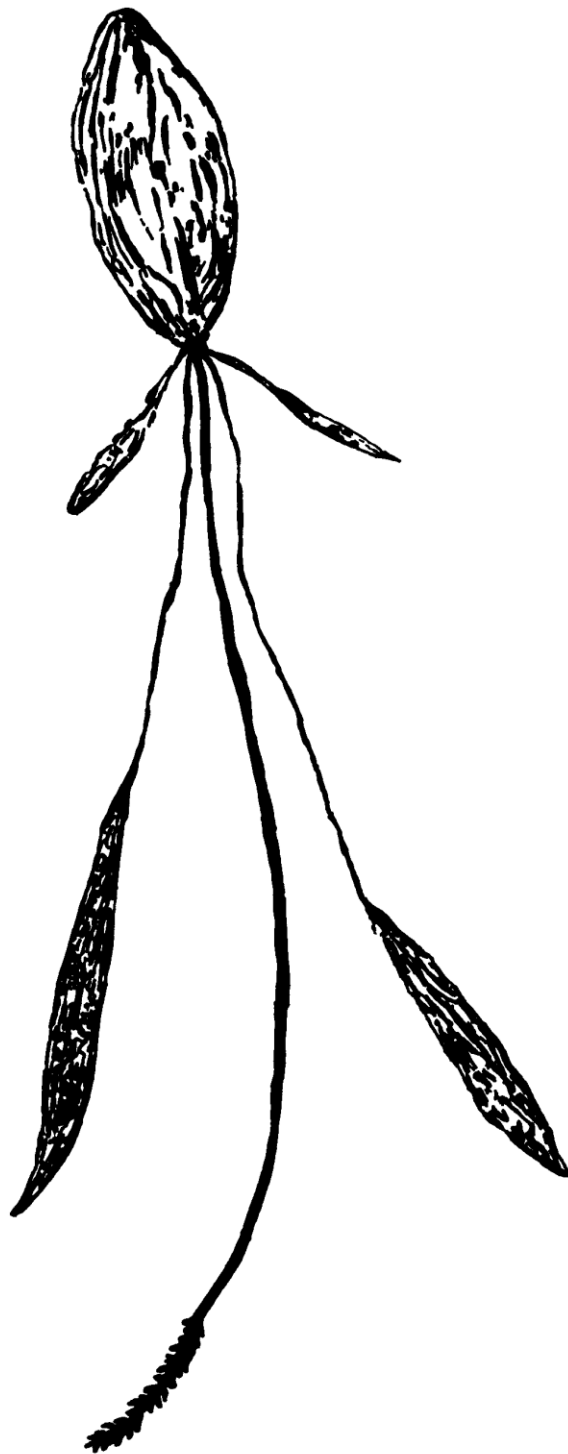


FIGURE 138.

'Hooked Stick' Period.
Deaf Adder Creek.

A yam with leaves (or other tubers ?) attached. Compare the lower end of this painting with the tail of the Rainbow in Figure 129.

Red.



FIGURE 139.
'Hooked Stick' Period.
Twin Falls Creek.
A yam plant.
Faded dark red.
Length: 41 cm.



FIGURE 140.

'Hooked Stick' Period.

Nabarlek.

Anthropomorphised yams, with limbs and heads composed of yam tubers. A termite tunnel crosses the figure on the right.

Dark red.

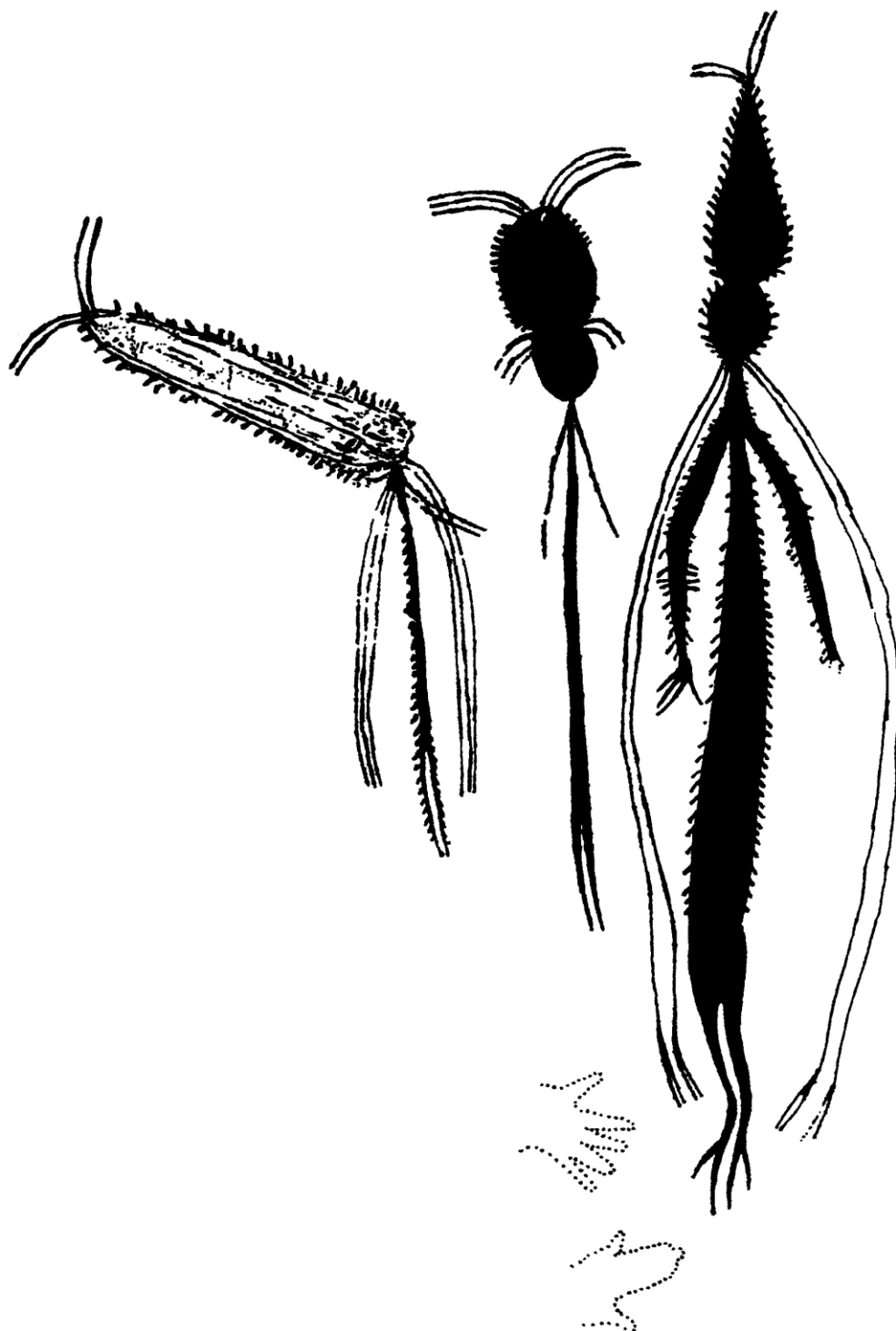


FIGURE 141.

'Hooked Stick' Period.

Deaf Adder Creek.

Hand stencils and three 'yam people'. The short strokes protruding from these figures represent the root hairs and the long lines represent the roots or tendrils of yams

Red.

Longest figure: 152 cm.



FIGURE 142.

'Hooked Stick' Period.

Deaf Adder Creek.

Two hand stencils and figures from the Rainbow snake complex, including four yam figures, an anthropomorphic figure (top right), and two female inflorescences (left), the top example of which has a yam leaf attached.

Red.

Maximum dimension: 200 cm.

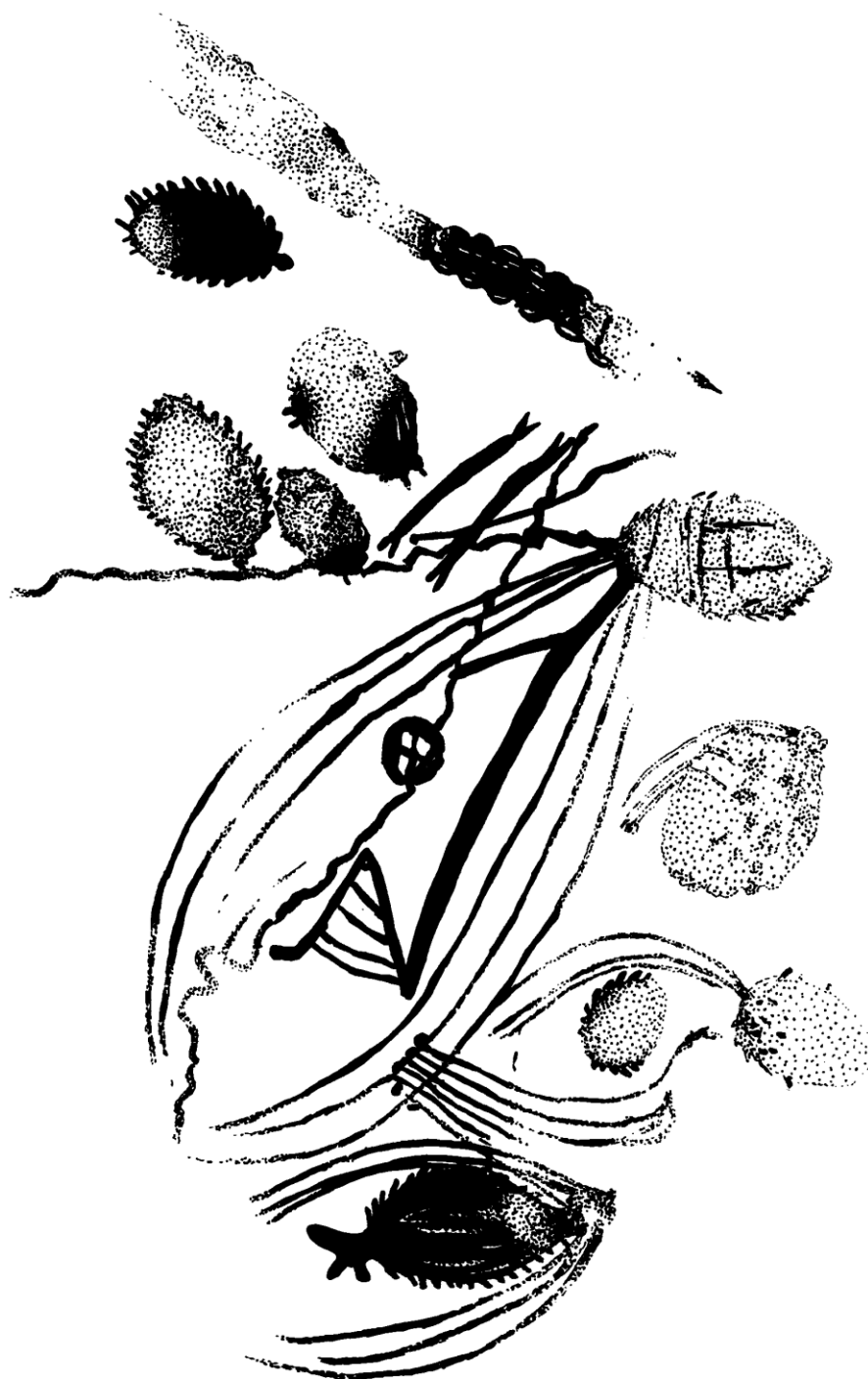


FIGURE 143.

'Hooked Stick' Period.

Baroalba Creek.

A panel of figures from the Rainbow snake complex.

The central figure is a yam-headed being with an arm and a leg, and with encircling lines attached to the neck. Around this figure is a flying fox with yam features, a number of yams, and a segmented circle.

Dark red.

Diameter of segmented circle: 4 cm

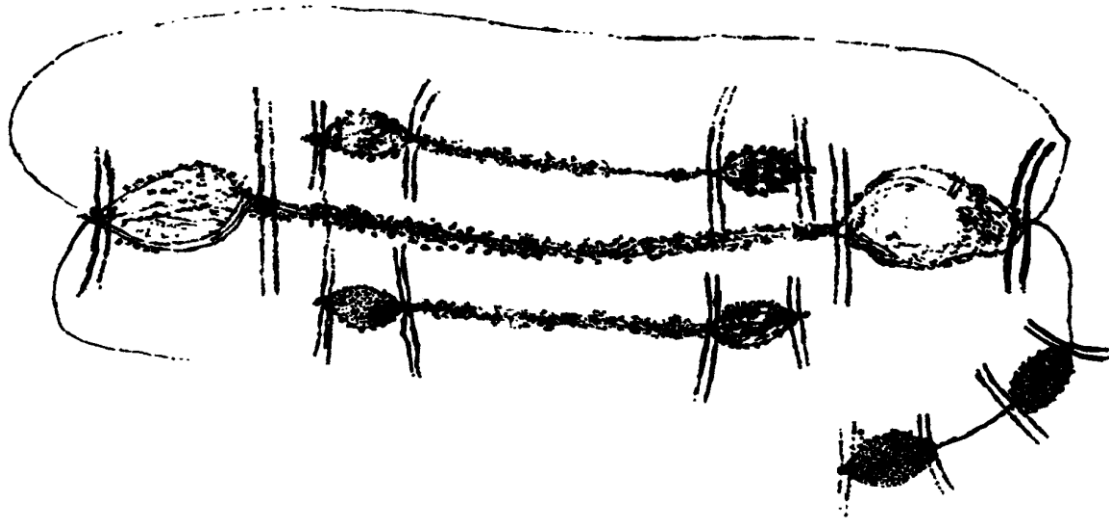


FIGURE 144.
 'Hooked Stick' Period.
 Deaf Adder Creek.
 An arrangement of yams from the Rainbow snake complex.
 Faded dark red.
 Maximum dimension: 120 cm.

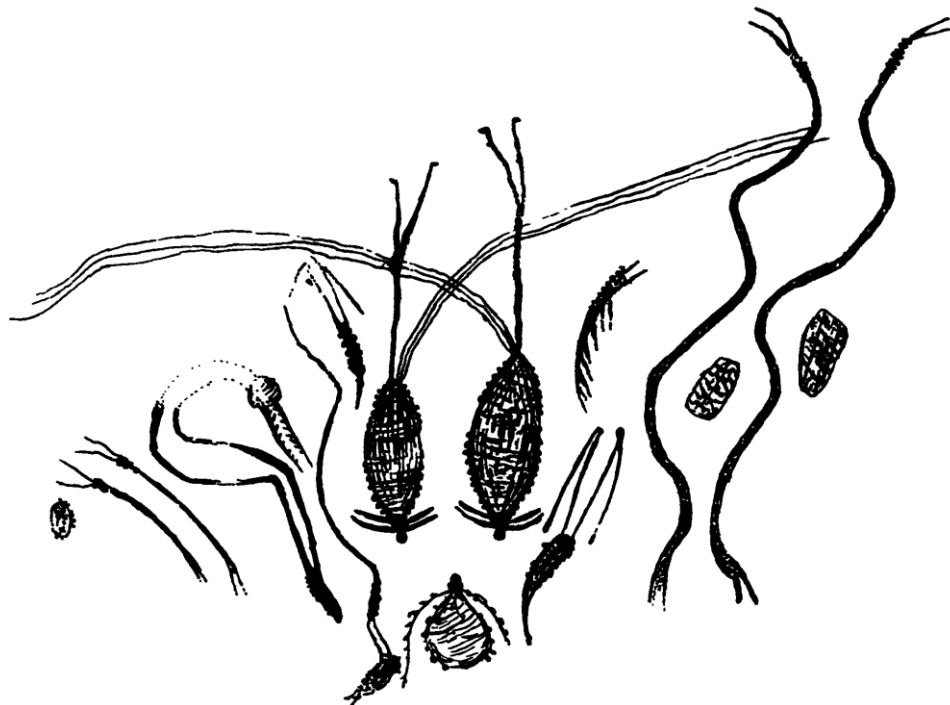


FIGURE 145.
 'Hooked Stick' Period.
 Baroalba Creek.
 Yams, and bands with forked ends that may represent stylised inflorescences of the
 yam plant (cf. Figure 154). The other motifs have not been identified.
 Red.
 Yam figure at right: 56 cm.



FIGURE 146.

'Hooked Stick' Period.

Upper East Alligator River.

Two very large yams. The figure on the right has been badly affected by spalling of the rock surface.

Dark red.

Larger figure: 260 cm. (from memory).



FIGURE 147.

'Hooked Stick' Period.

Baroalba Creek.

A very large yam with associated motifs including a 'yam-bird', a fish, and lines with forked ends that may represent inflorescences of the yam plant.

Dark red.

Length of large figure: 233 cm.



FIGURE 148.

'Hooked Stick' Period.
Waterfall Creek.

A yam-headed being and other motifs from the Rainbow snake complex. Note the dillybag, single-pronged spear, multi-pronged spear, and 'hooked stick'.

Red.

Main figure: about 106 cm.

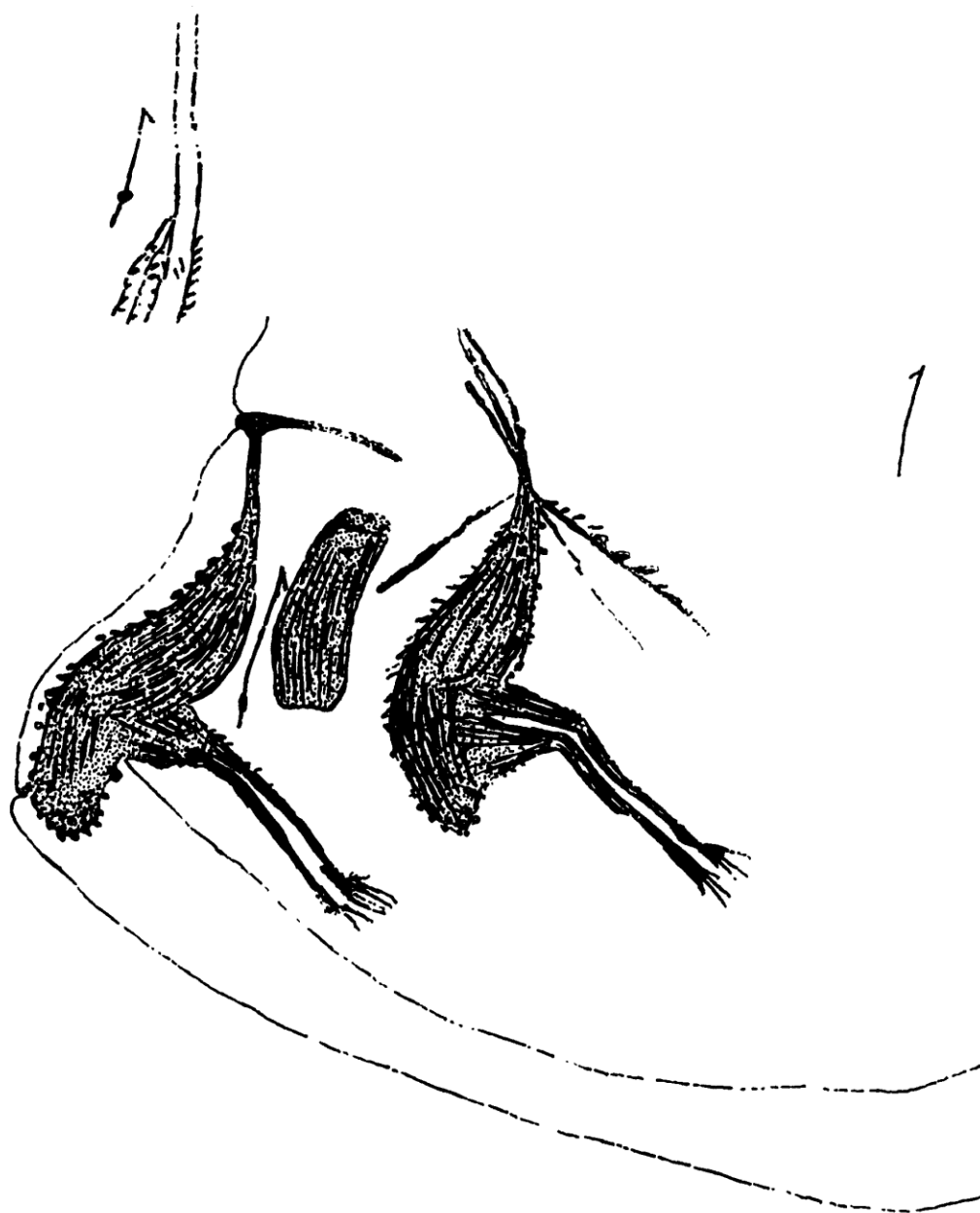


FIGURE 149.

'Hooked Stick' Period.

Ubirr (Obiri Rock).

Two 'yam-birds' associated with an unidentified object, single and multi-pronged spears, and 'hooked sticks'.

Very faded dark brown, probably red originally.

Bird on the left: about 40 cm.

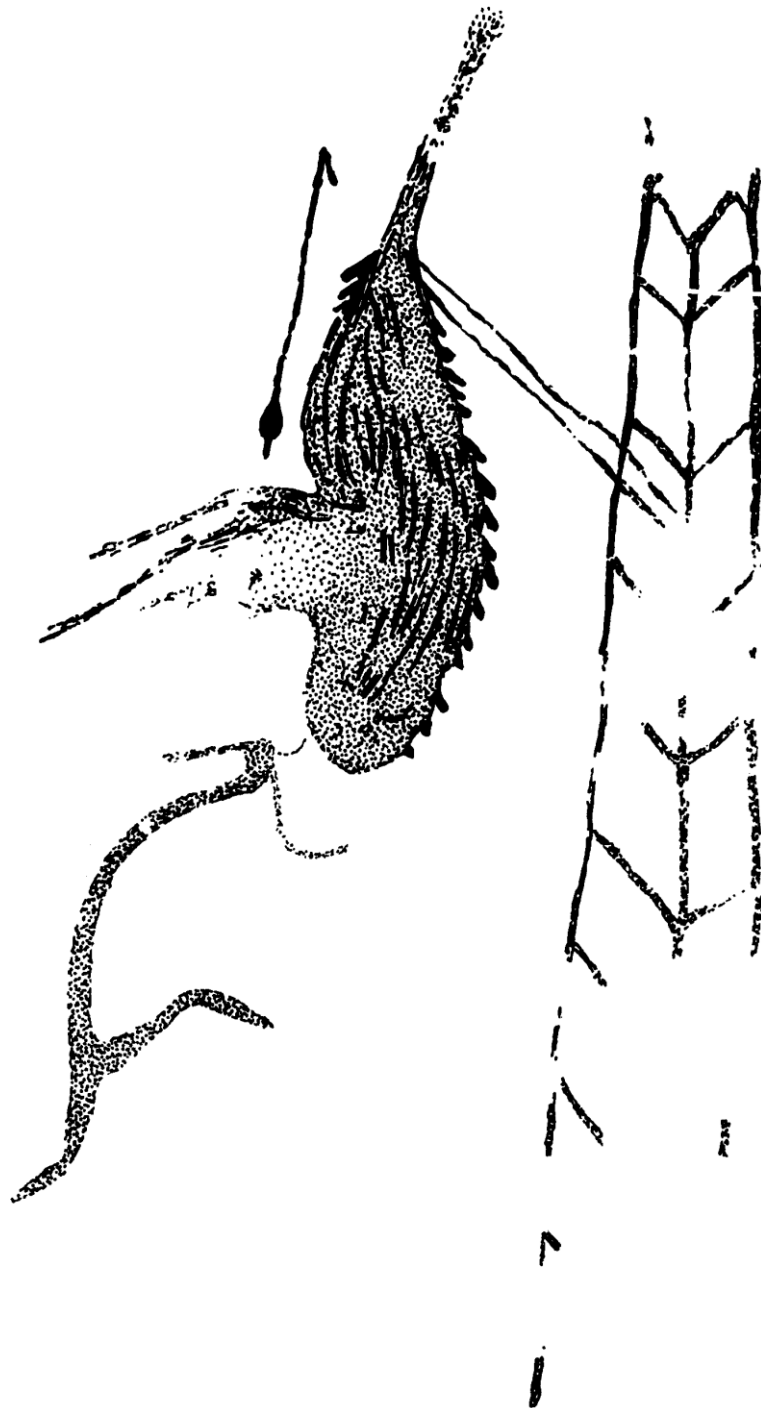


FIGURE 150.

'Hooked Stick' Period.

Ubirr (Obiri Rock).

A 'yam-bird' with a 'hooked stick', an Oenpelli 'hooked stick' figure, and an unidentified grid pattern. The Oenpelli 'hooked stick' figure and the lower part of the 'grid' are extremely faded

Faded dark red.



FIGURE 151.

'Hooked Stick' Period.

Cannon Hill.

Two 'yam-birds' connected by lines, associated with disembodied human limbs, two 'hooked sticks', and an unidentified pronged object.

Dark red.

Maximum dimension: about 100 cm. (estimate).

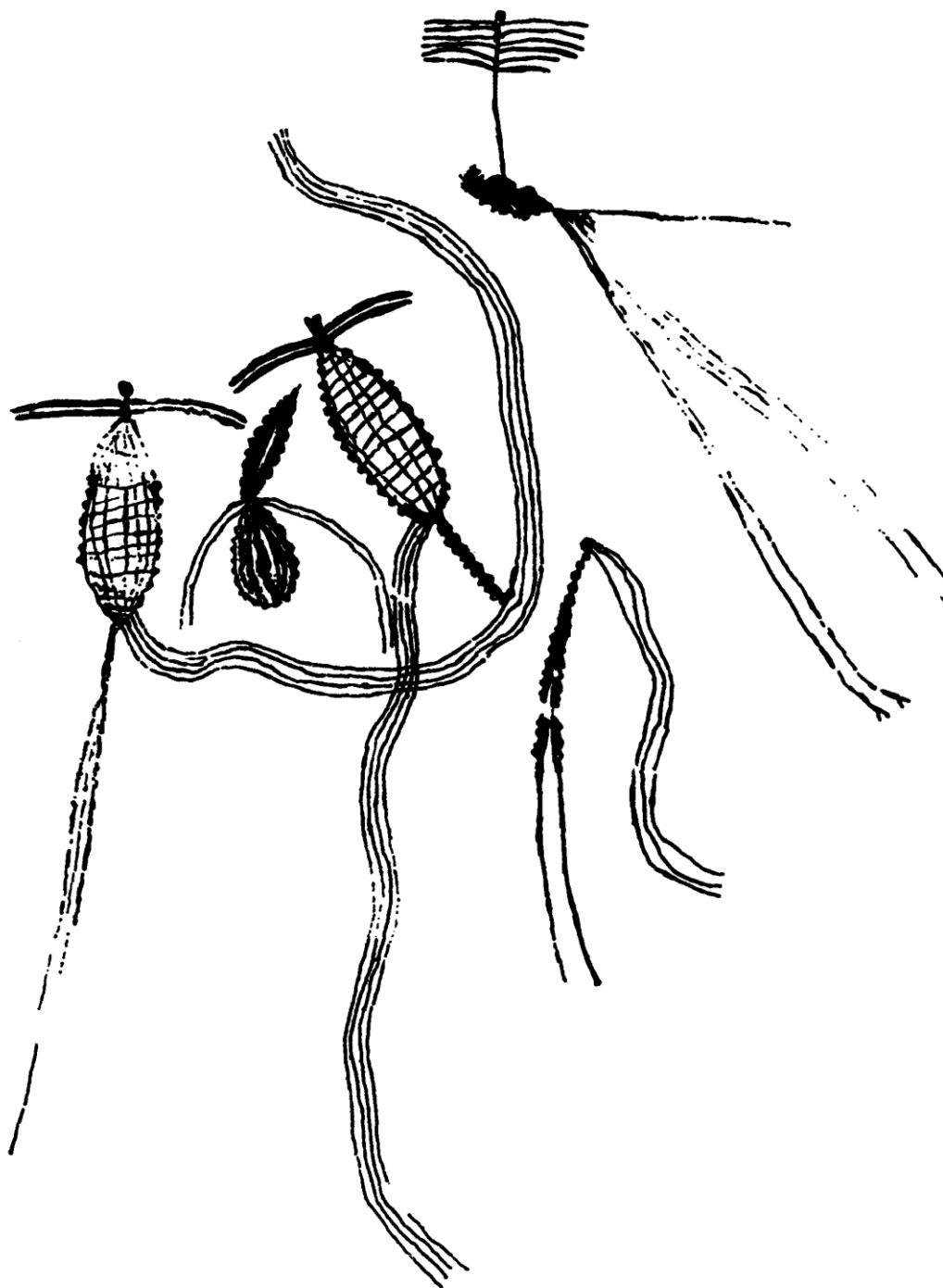


FIGURE 152.

'Hooked Stick' Period.

Jim Jim Creek.

Yams and other motifs from the Rainbow snake complex (see Plate 28). Note the headdress on the figure at right (cf. with Figures 75, 76 and 77).

Dark red.

Maximum length of figure at right: 80 cm.

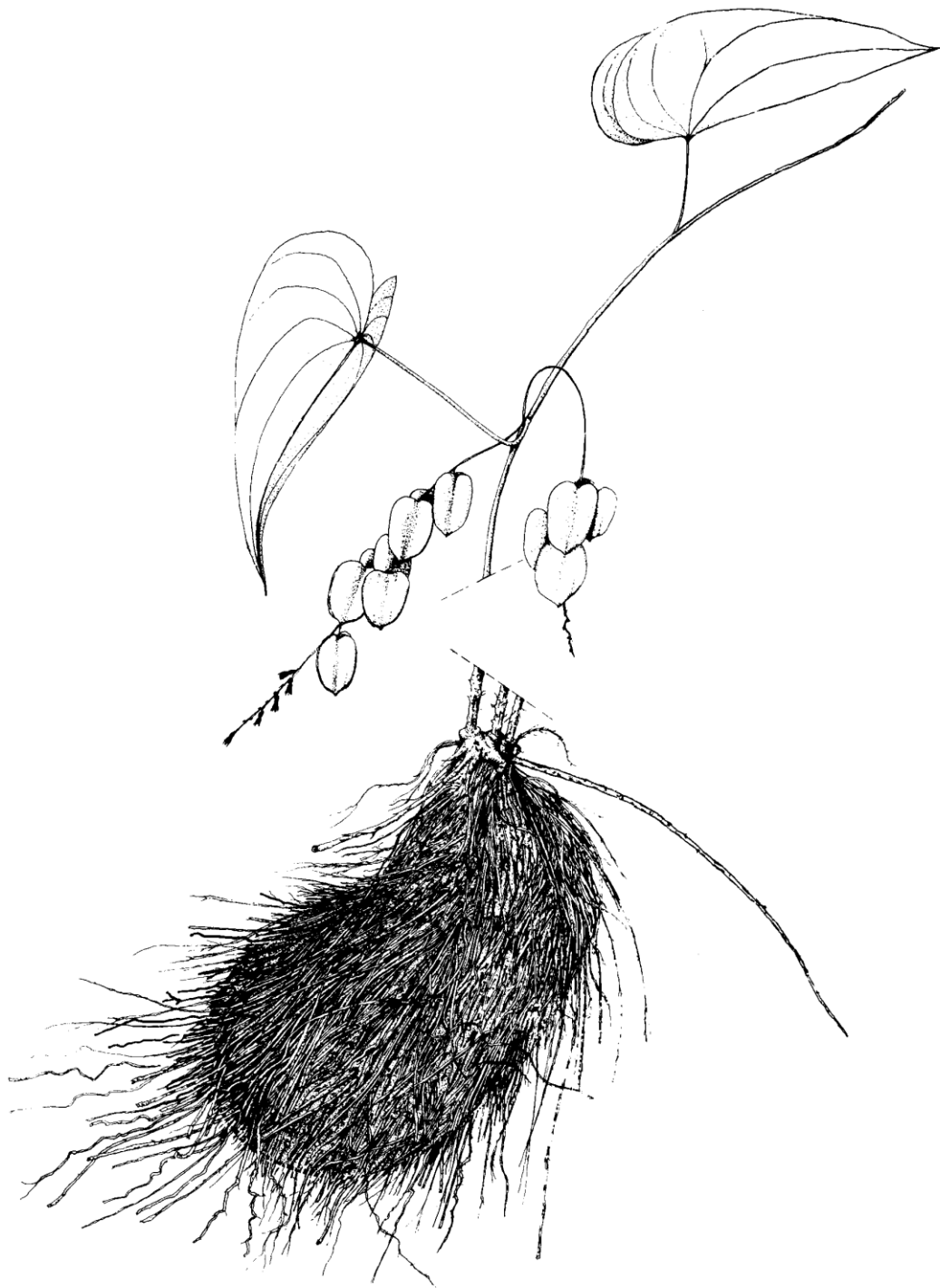


FIGURE 153.

Dioscorea bulbifera. Note the female inflorescence extending below the seed capsules at right. Before the seeds have formed, these flowers are much longer and resemble the lines with short strokes along their edges, sometimes associated with yam paintings (eg Figure 142, on the right hand side). Reprinted by permission of the publishers from *Plants and People* by D. Levitt and published by the Australian Institute of Aboriginal Studies.



FIGURE 154.

Leaves, seed capsules, and male inflorescences (flowers) of *Dioscorea transversa*. These parts of the plant closely resemble those of *Dioscorea bulbifera*. Note the forked ends of the male inflorescences and their similarity with motifs that are often included among paintings from the Rainbow snake complex (cf. Figures 120, 142, 145 and 147).

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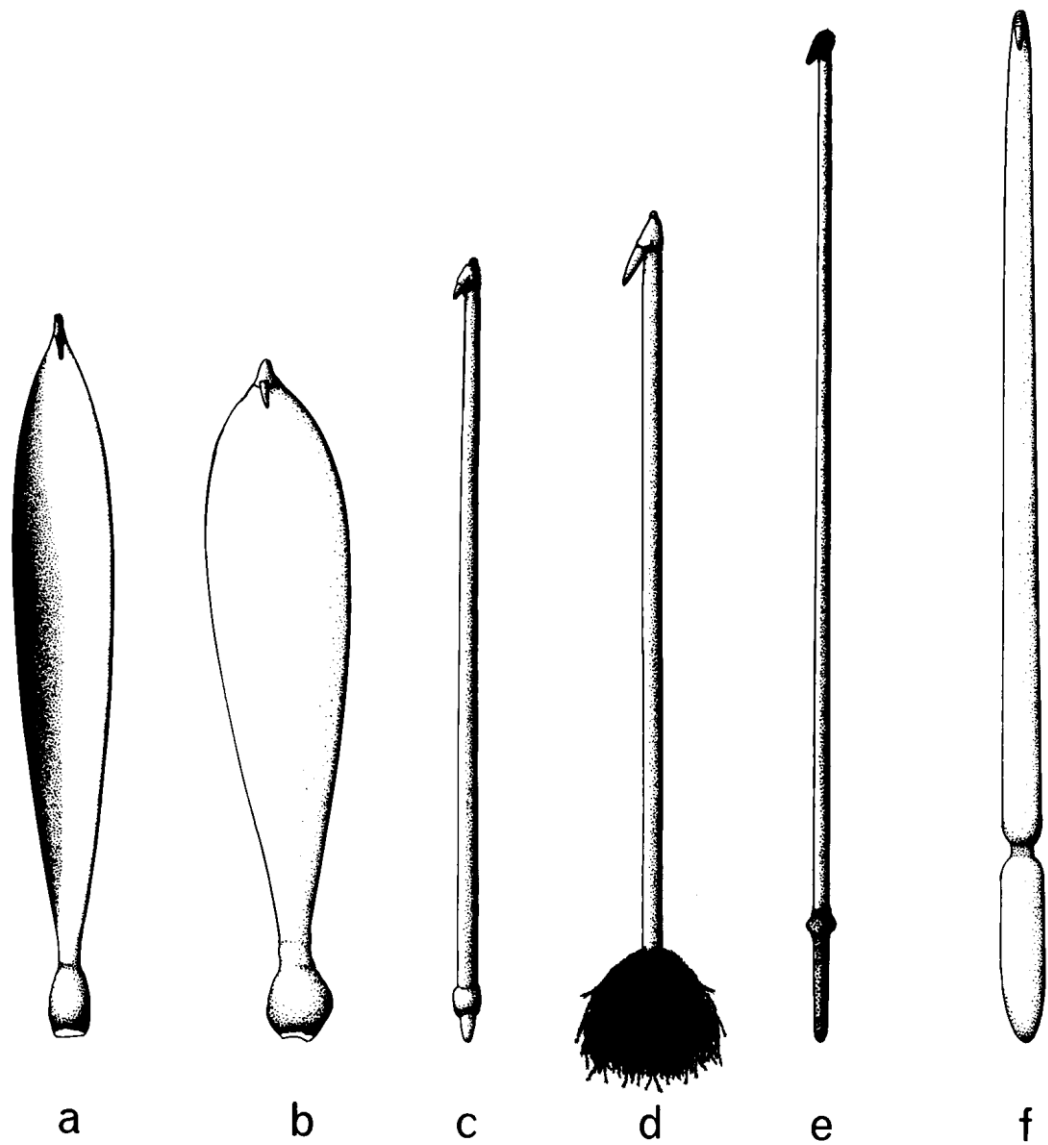


FIGURE 155. Spearthrowers.

a: Central Australia. Concave cross-section, stone adze set in resin grip.

b: Western Australia. Flat cross-section, stone adze set in resin grip.

c: North-central cylindrical. Round cross-section, resin grip.*

d: North-central cylindrical with hair string tassel at grip.

e: 'Goose' spearthrower, with resin grip and resin covering at proximal end.

f: North Australian notched lath spearthrower.

(* About 80 cm. All artefacts correct relative scale).



Figure 156.

Broad Spearthrower Period.

Deaf Adder Creek.

Human figure with dillybag, two unidentified artefacts (clubs ?), spearthrower, and three different types of spears.

Red.

Maximum dimension: about 50 cm.



FIGURE 157.
Broad Spearthrower Period.
Nabarlek area.
Four human figures. Note the tri-pointed spear, a type unknown in the ethnographic record.
Dark red.
Maximum dimension: about 85 cm.



FIGURE 158.

Broad Spearthrower Period.

Deaf Adder Creek.

Two human figures with weapons. The figure on the left carries a broad spearthrower. On the right, a figure partly encircled by a line holds a boomerang in each hand. This is the only example yet found of boomerangs depicted in the Broad Spearthrower Period.

Red.

Figure at left: 38.5 cm.



FIGURE 159.

Broad Spearthrower Period.

Magela Creek.

A human figure with spearthrower and spear, club, dillybag, and an object resembling a 'dancing skirt' attached to the waist.

Yellow.

Maximum dimension: about 105 cm.



FIGURE 160.

Broad Spearthrower Period.

Jim Jim Creek.

A human figure with broad spearthrower in one hand, and what appears to be a fighting pick in the other. Note the round object suspended from the face, and the exaggerated size of the penis.

Red.

Length of figure: 85 cm.



FIGURE 161.

Broad Spearthrower Period.

East of Djawumbu-Madjawarnja massif.

A group of human figures. The large number of spears among the smaller figures in the lower half of the illustration suggests that they are engaged in a fight.

Dull black, possibly red originally.

Large spearthrower: 12.5 cm.

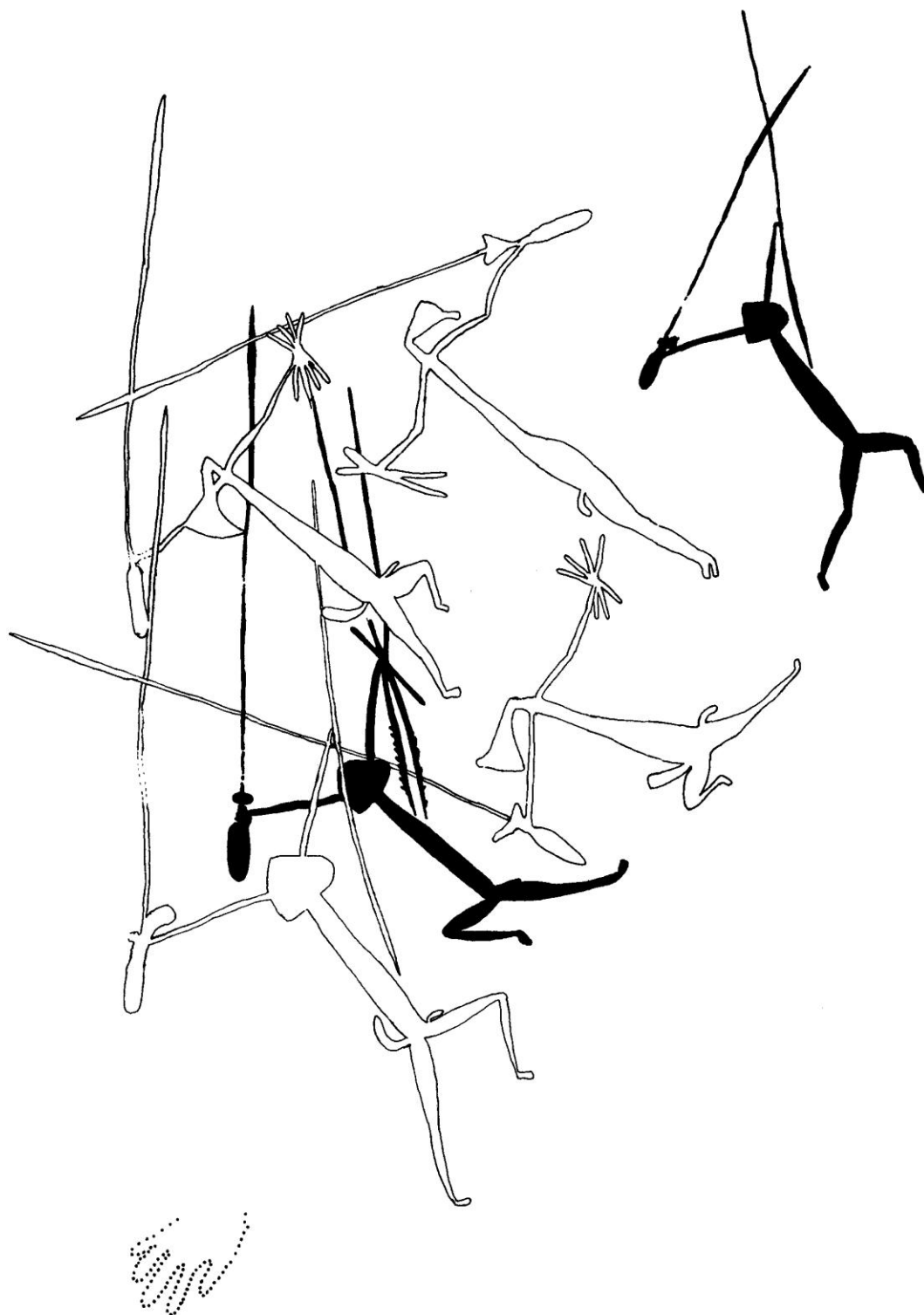


FIGURE 162.

Broad Spearthrower Period

Upper East Alligator River.

A hand stencil, and six human figures with weapons. Note the 'crossed sticks', probably throwing sticks, held by several of the figures.

Outline figures are yellow silhouettes, the others are red.

Lowest figure: 54 cm. from head to foot.



FIGURE 163.

Broad Spearthrower Period.

Upper East Alligator River.

Human figures with spearthrowers, spears, and 'crossed sticks' (see Plate 33). Note the headdress on the larger figure. The circles on the arm of the lowest figure are superimposed beeswax pellets, added to the painting at a later date.

Red, except for the outline figure which is a yellow silhouette.

Largest figure: about 120 cm.



FIGURE 164.
Broad Spearthrower Period.
Magela Creek.
A human figure with spearthrower and spear, 'crossed sticks', and head decoration.
Weathered yellow.
Spear: about 60 cm.

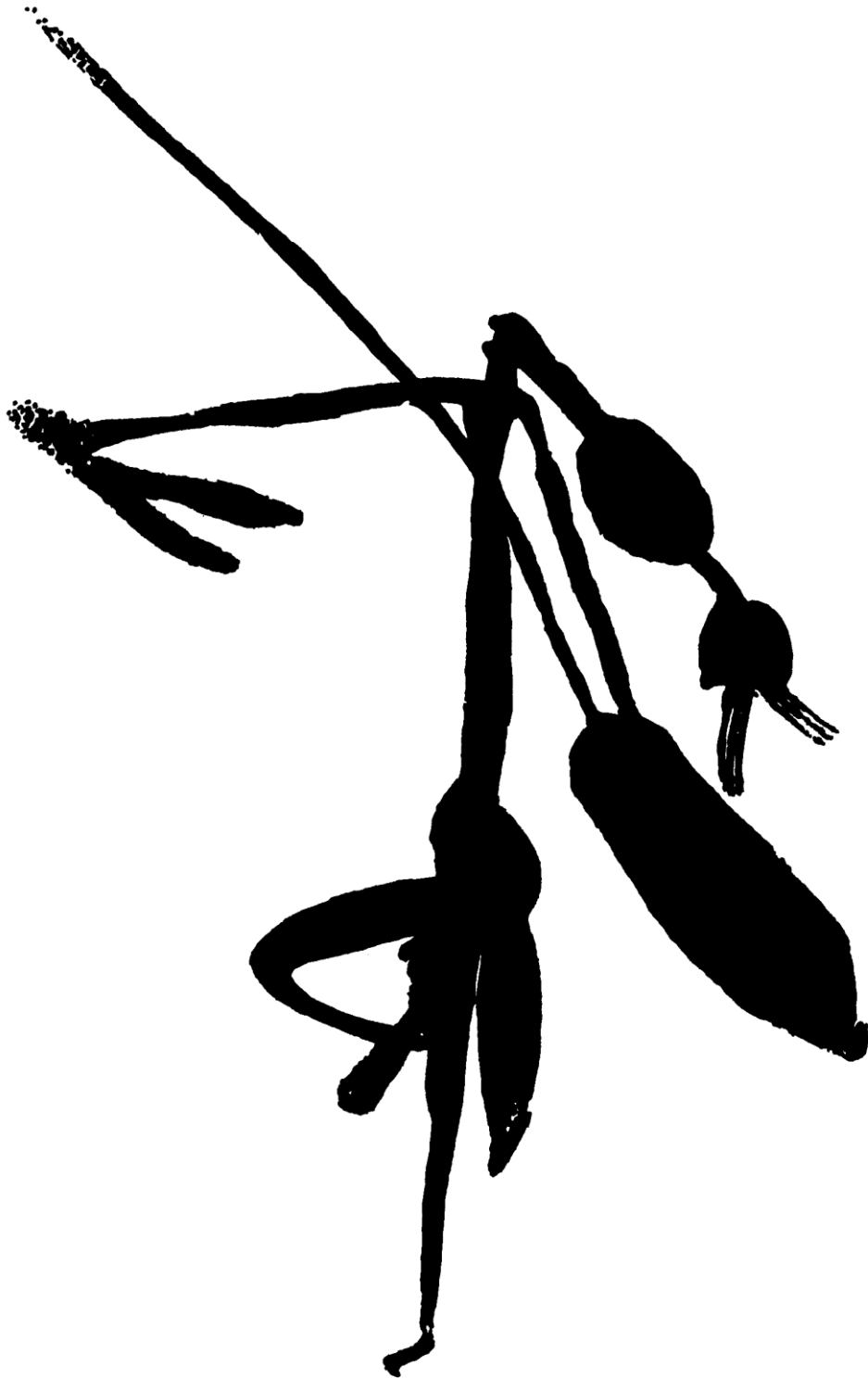


FIGURE 165.

Broad Spearthrower Period.

Mt. Brockman Massif.

A human figure with spearthrower and spear, 'crossed sticks', headdress, and waist decoration.

Weathered yellow.

Head to toe: 27.5 cm.

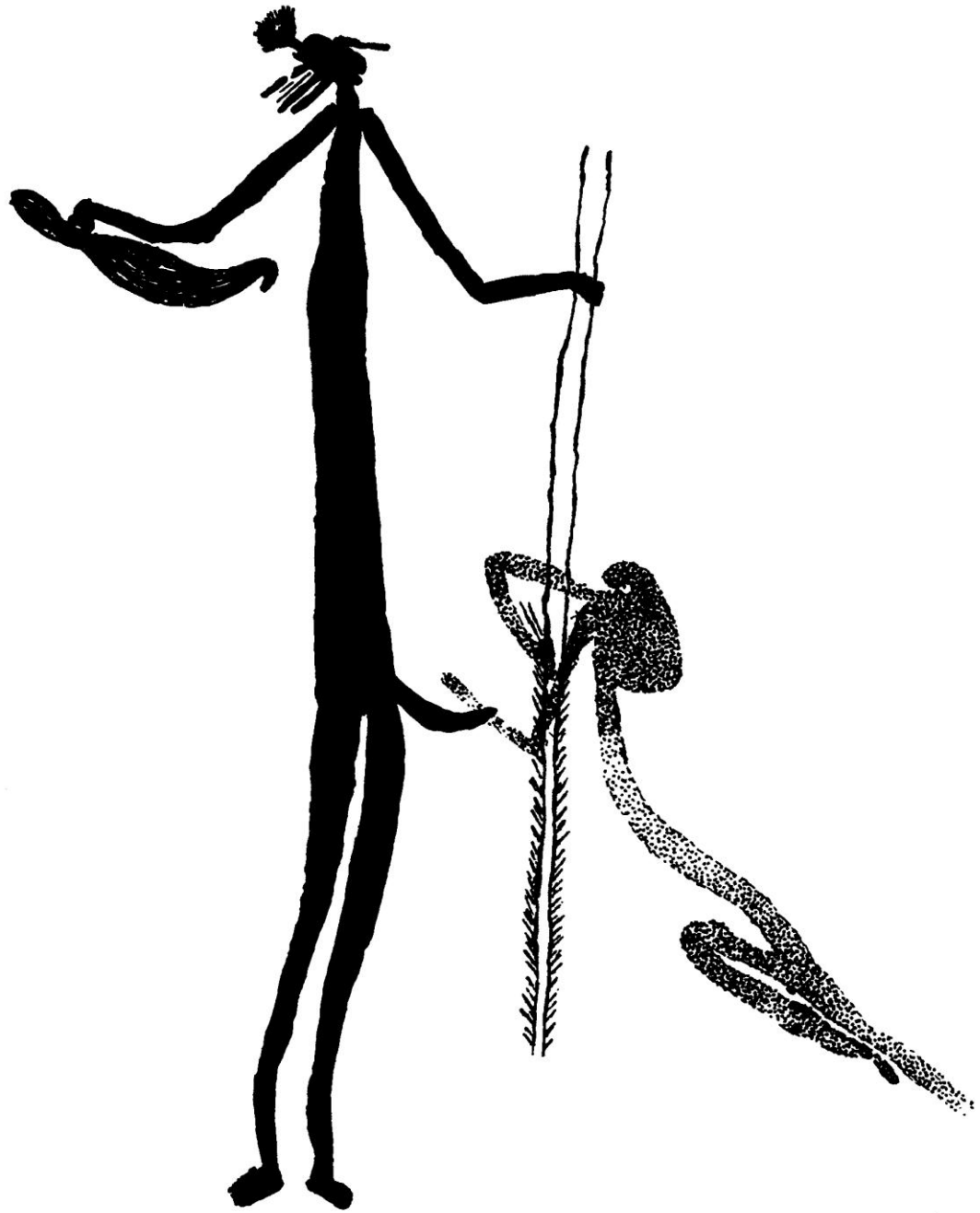


FIGURE 166.

Broad Spearthrower Period.

Cannon Hill.

Two human figures. The larger figure has head decoration and weapons, including a spearslinger that is infilled with closely spaced parallel lines that resemble the fluting seen on Central Australian spearslingers. The other painting is of an Oenpelli 'hooked stick' figure.

Spearslinger figure is dark red. The 'hooked stick' figure is extremely faded red.

Large figure: 82 cm.

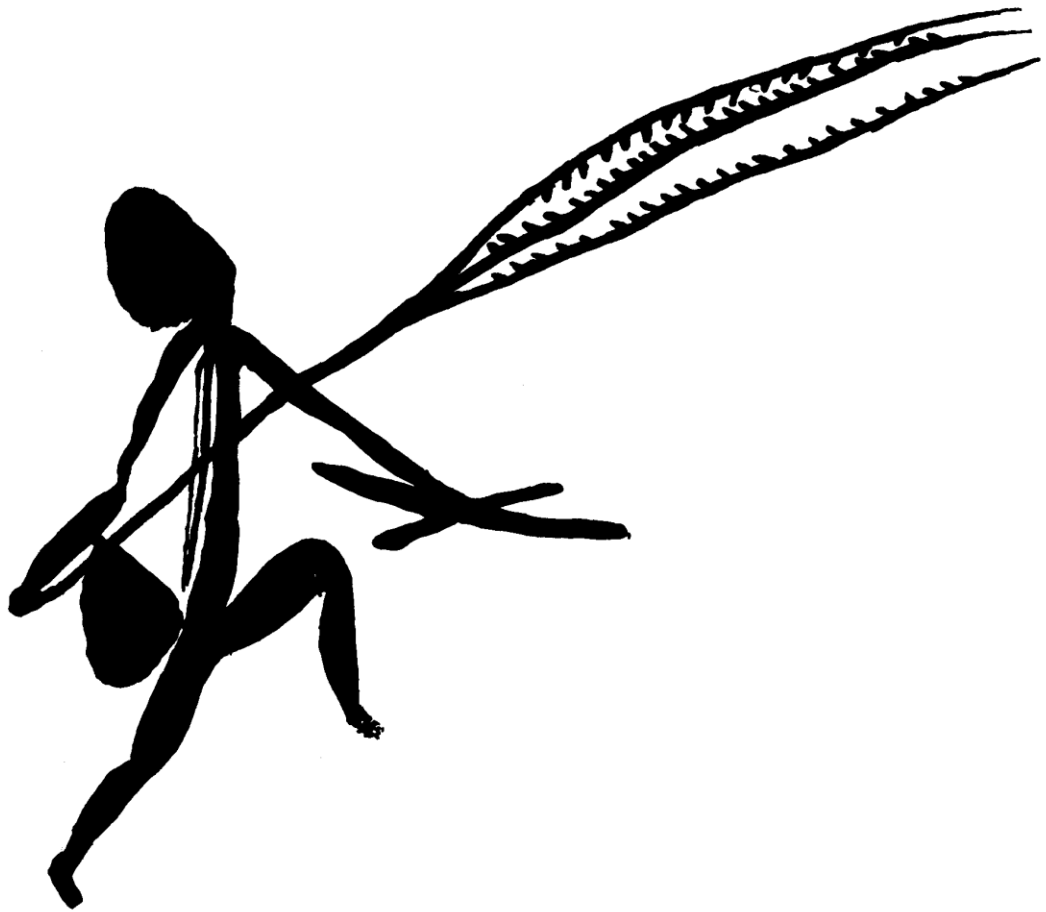


FIGURE 167.

Broad Spearthrower Period.

Magela Creek.

A human figure with spearthrower, multi-pronged and multi-barbed spear, and 'crossed sticks'. The object below the spearthrower may represent a fan.

Yellow.

Spear: about 55 cm.

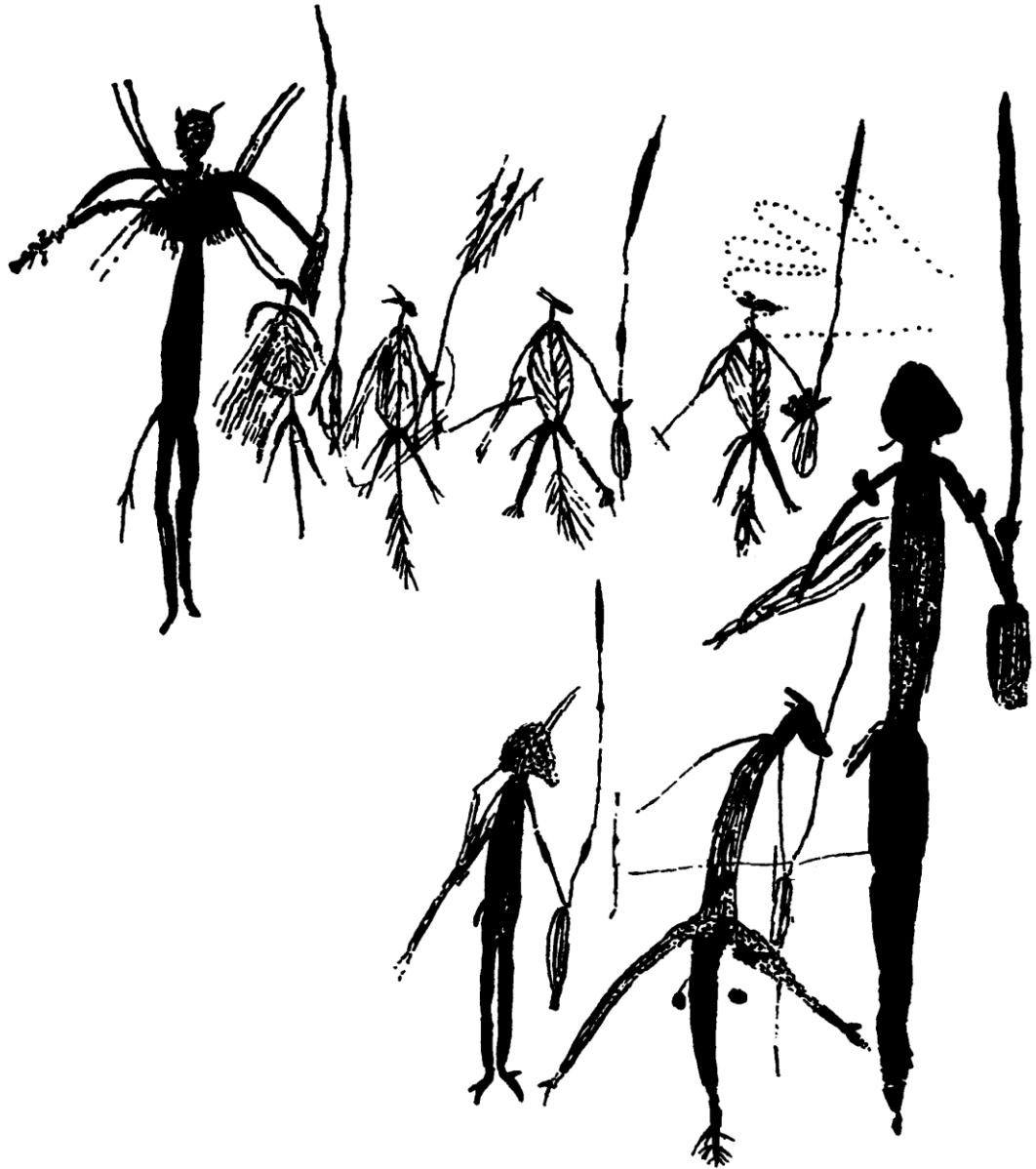


FIGURE 168.

Broad Spearthrower Period.

Deaf Adder Creek.

A hand stencil, and human beings and animal-headed beings with weapons. All of the figures carry their spears mounted in their spearthrowers and held vertically. Note the lanceolate blades on most of the spears, and the rib cages on the four animal-headed beings at the top.

Dark red.

Maximum length of figure at right: 63 cm.



FIGURE 169.

Broad Spearthrower Period.

Nourlangie Rock area.

A human being with spearthrower, multi-pronged spear, and 'crossed sticks'. The figure does not have a head. From the appearance of the remaining pigment it seems likely that in the original painting the head was a different colour and that this colour has not survived on the rock face.

Red.

Length: 75 cm.

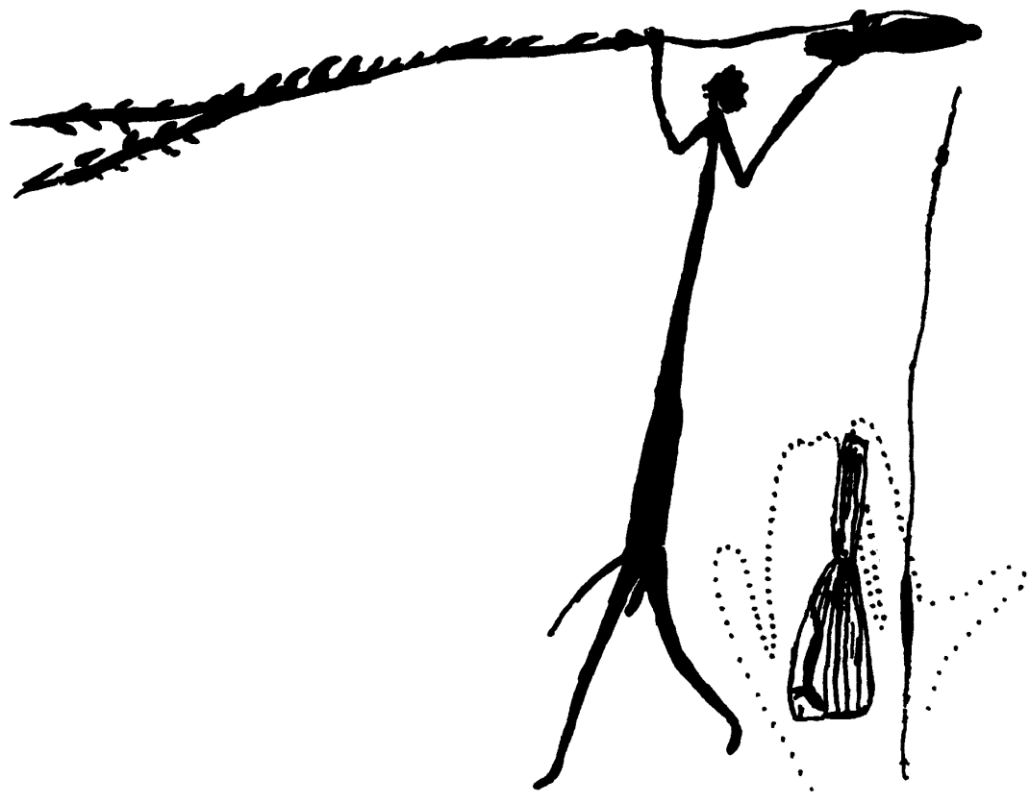


FIGURE 170.

Broad Spearthrower Period.

East Alligator River Crossing area.

A hand stencil, and a human figure with spearthrower, double-pronged spear, and dillybag. The extensive barbing along the shaft of the spear is highly unusual. No other examples have been found and it cannot be determined whether spears of this type were actually made or if it is the result of artistic license.

Dark red.

Spear: about 60 cm.

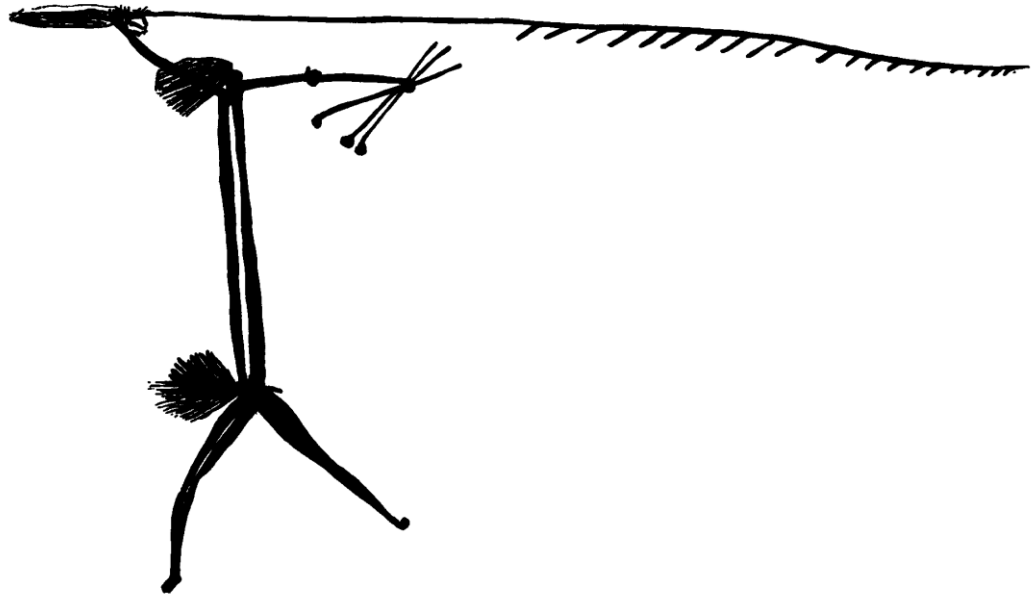


FIGURE 171.

Broad Spearthrower Period.

Magela Creek.

A human being with waist ornament has a spear set for throwing from a spearthrower in one hand, and holds three throwing clubs in the other. Note the incipient X-ray feature - a space inside the body.

Red.

Head to foot: 27 cm.

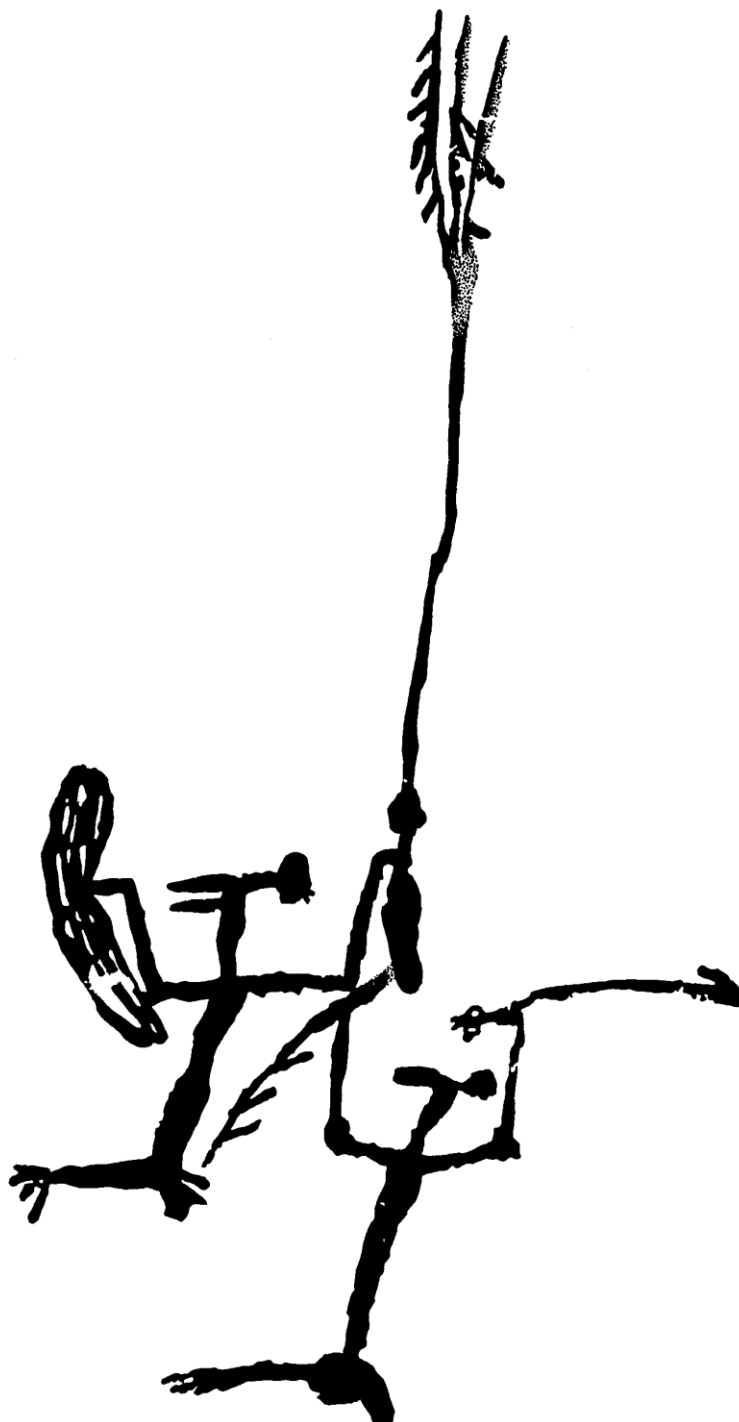


FIGURE 172.

Broad Spearthrower Period.

Deaf Adder Creek. Two animal-headed beings. The figure on the right holds a spear and a stick-like spearthrower. The left hand figure holds a vertical multi-pronged spear and a spearthrower in one hand, and a shield in the other. Shields were not made or used in Arnhem Land in at European contact and are rare throughout the sequence of rock paintings (see Figure 226 for another example). The few examples seen in the art probably represent rare acquisitions from the south.

Black, probably the result of chemical colour change from red.

Maximum length: 52 cm.

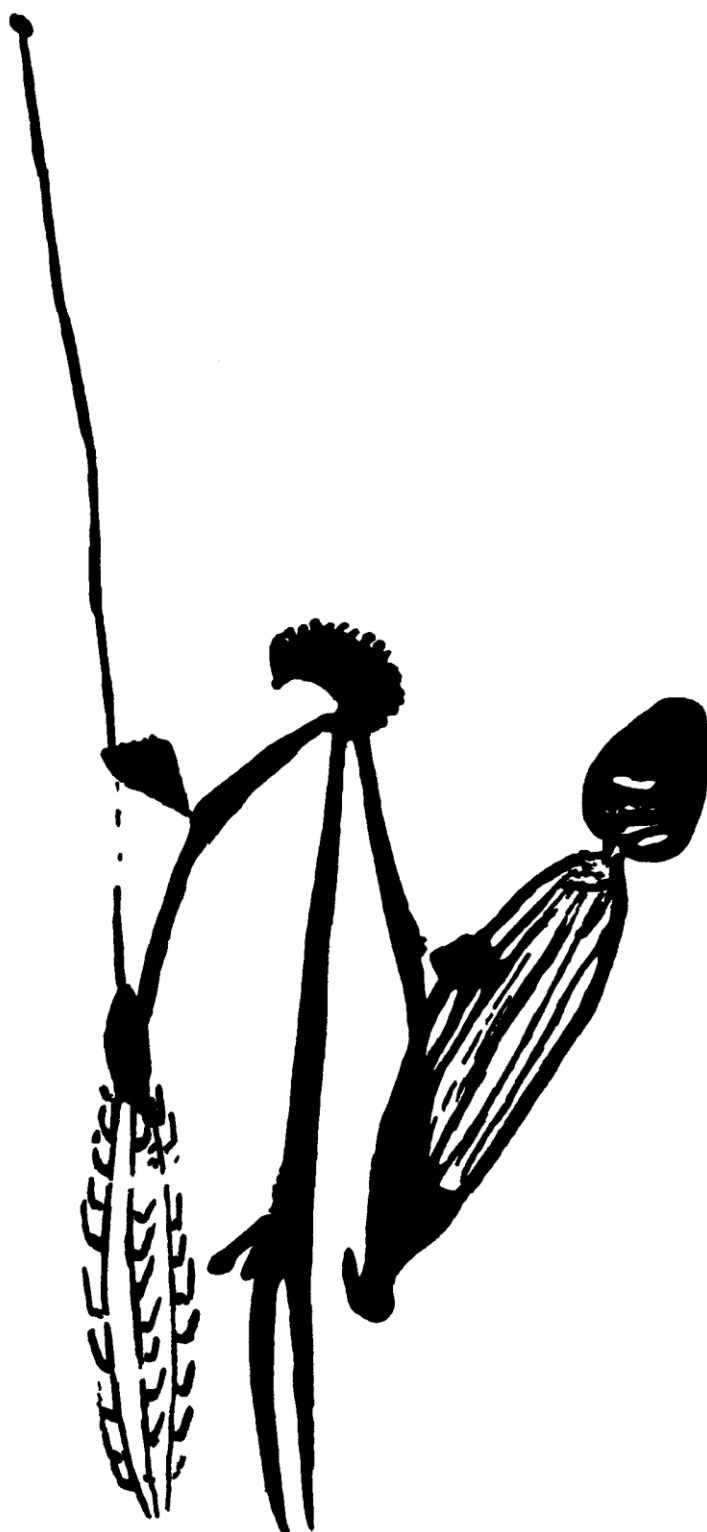


FIGURE 173.

Broad Spearthrower Period.

A human figure with elbow ornaments, a multi-pronged multi-barbed spear, and a broad spearthrower.

Red.

Spear: about 80 cm.

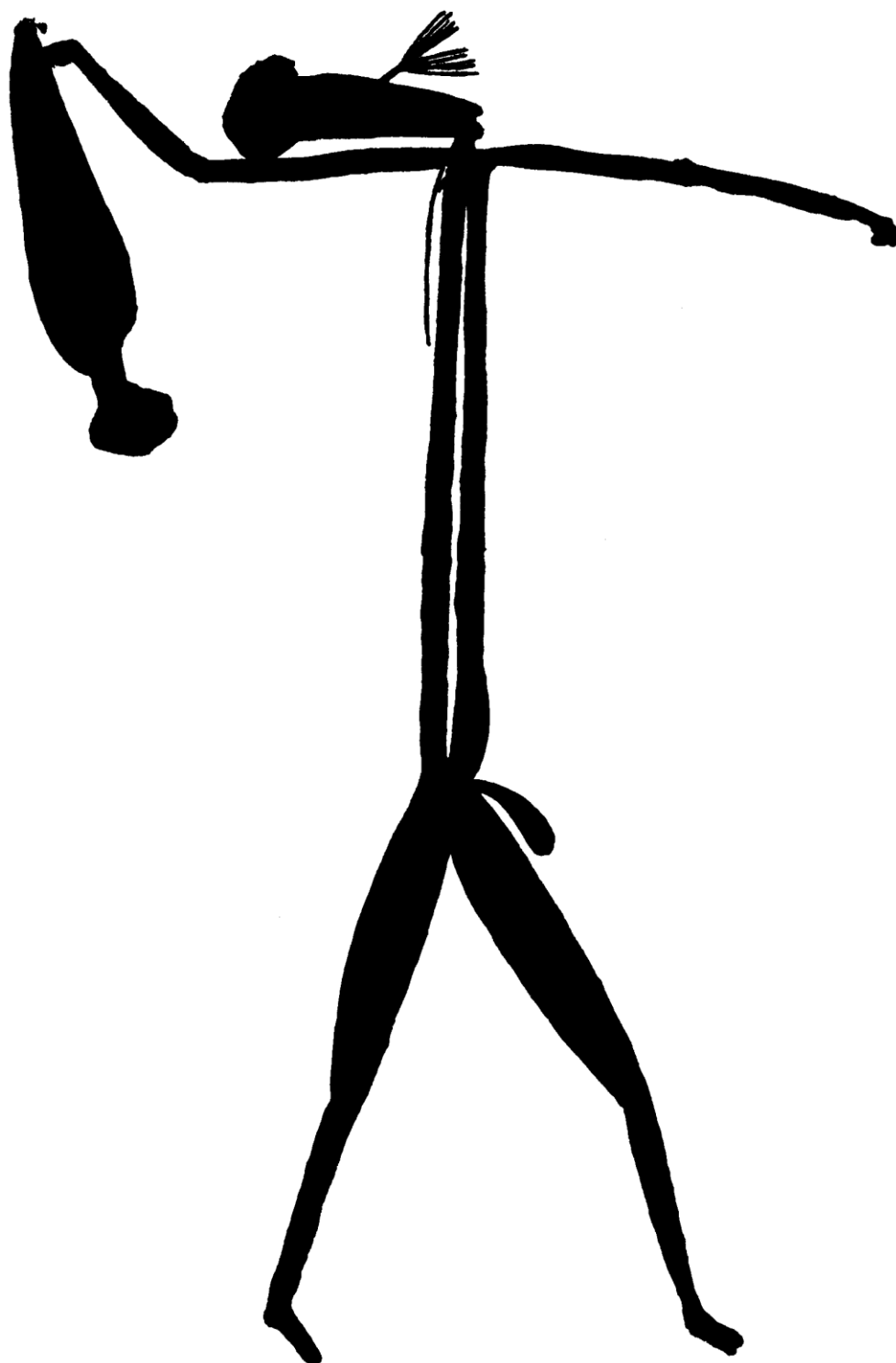


FIGURE 174.

Probably Broad Spearthrower Period.

Mt. Brockman Massif.

A human figure with spearthrower and head ornament. The figure is depicted holding the spearthrower at the distal end, as though about to throw the spearthrower itself.

Yellow.

Maximum length: about 88 cm.



FIGURE 175.
Broad Spearthrower Period.
Baroalba Creek.
A human being with spearthrower, several spears, and a club (?).
Dark red.
Length of figure: about 32 cm.

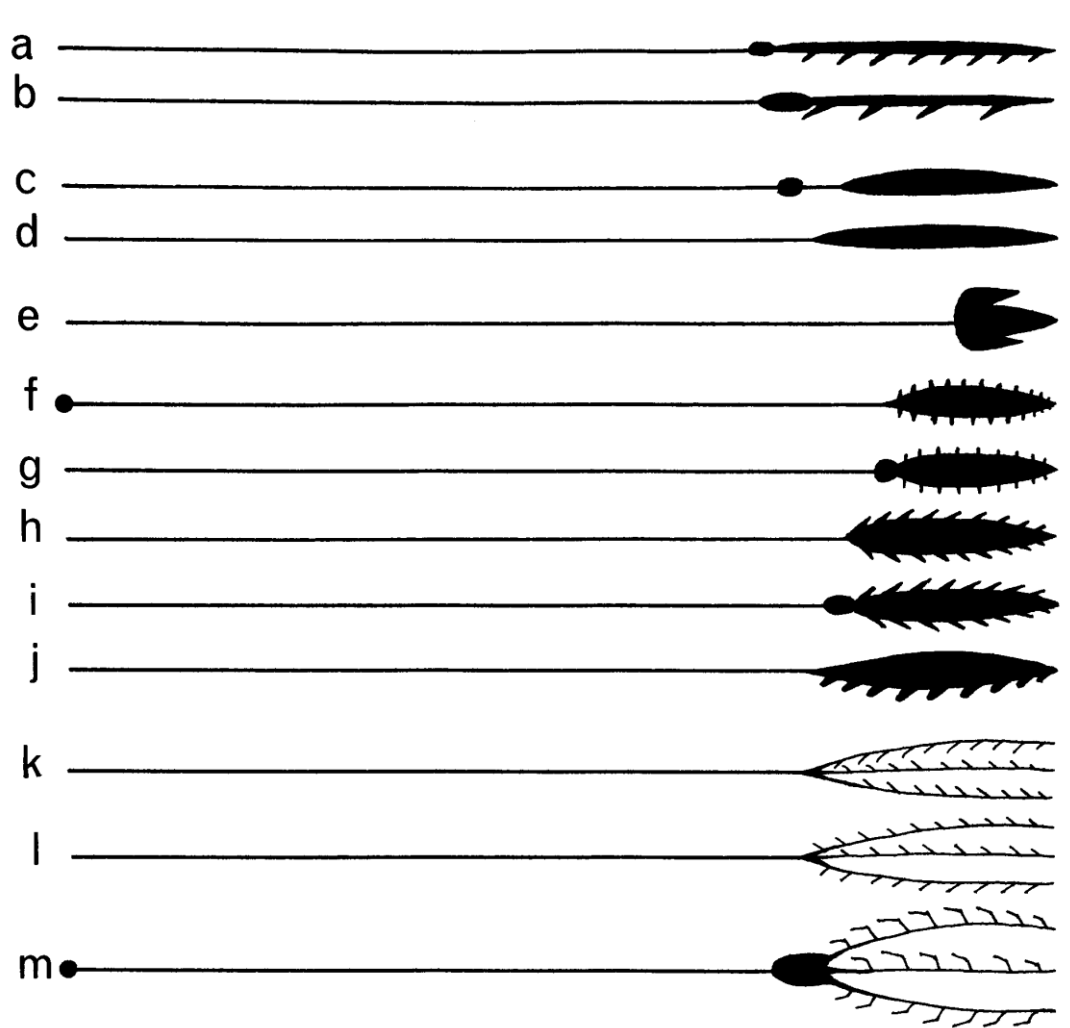


FIGURE 176.
Spear types associated with broad spearthrowers.

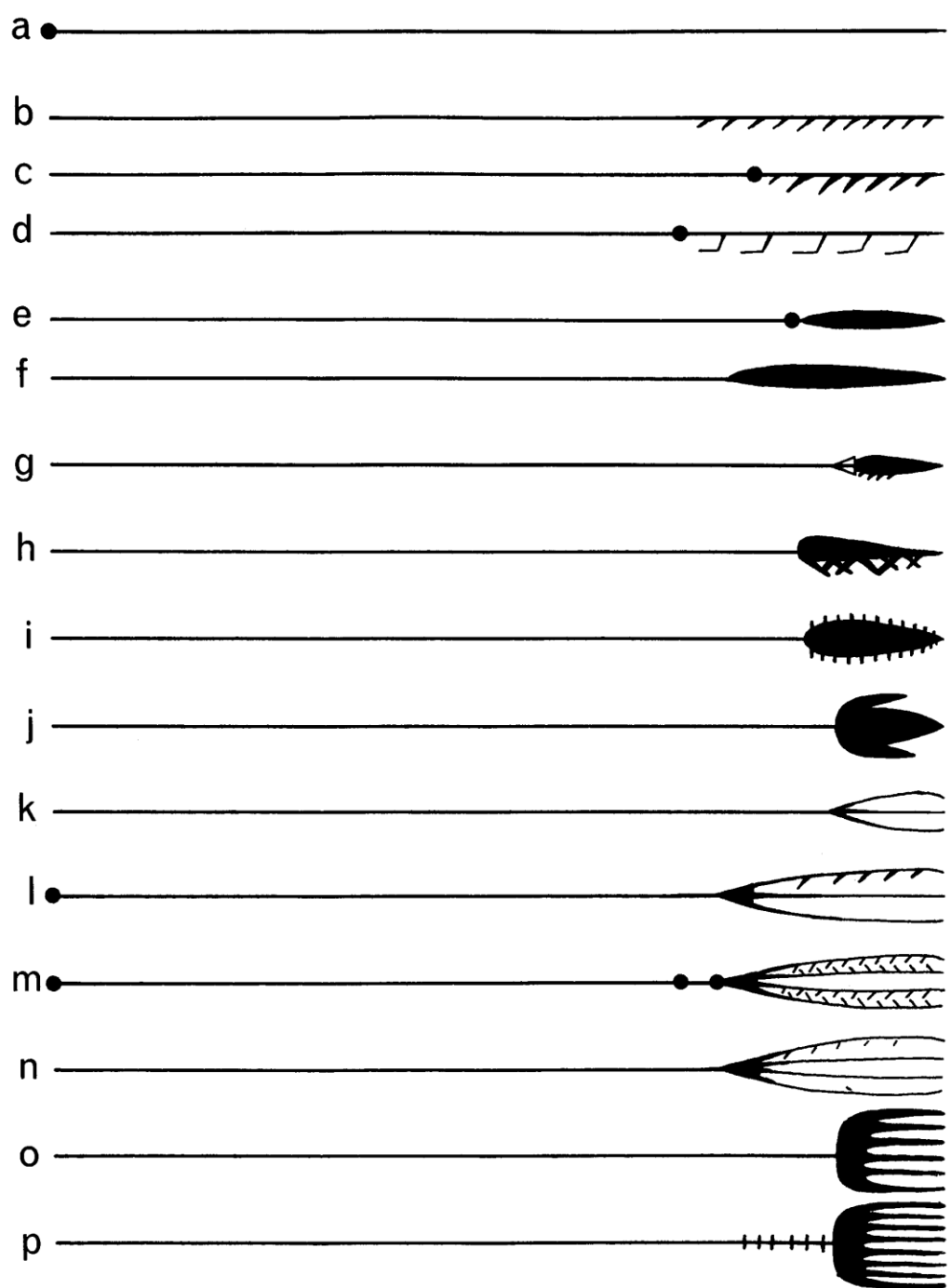


FIGURE 177.
Spear types associated with stick-like spearthrowers, Broad Spearthrower Period.

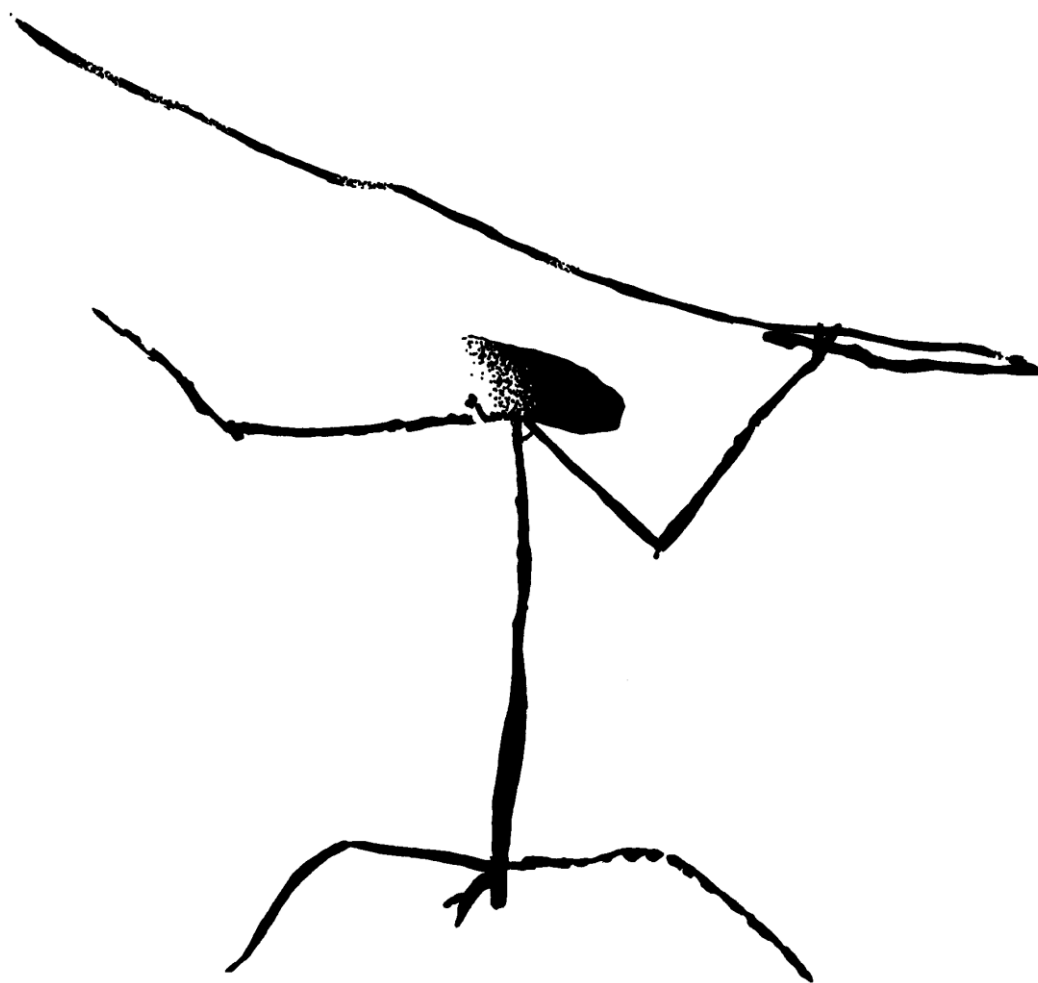


FIGURE 178.
Tentative Broad Spearthrower Period.
Nourlangie Rock area.
Human figure with a 'hooked stick' that is clearly a spearthrower.
Dark red.

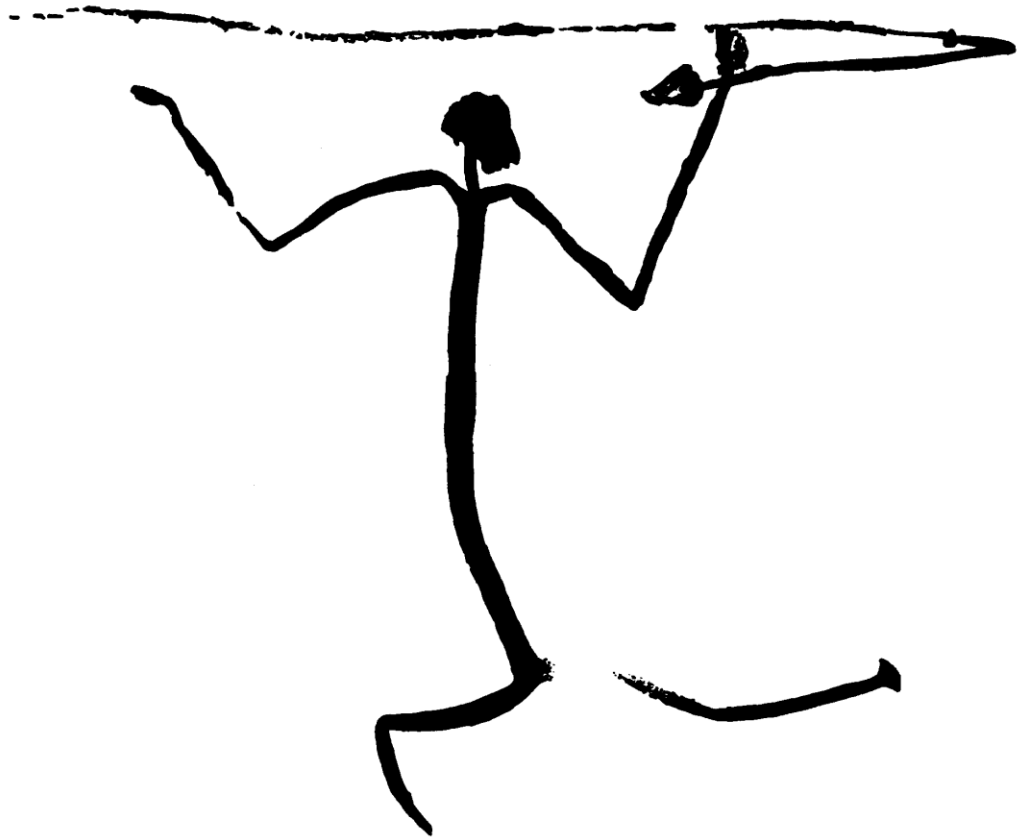


FIGURE 179.

Broad Spearthrower Period.

Cannon Hill.

A human figure with a 'hooked stick' that is clearly a spearthrower.

Dark faded red.

Spear: about 50 cm.

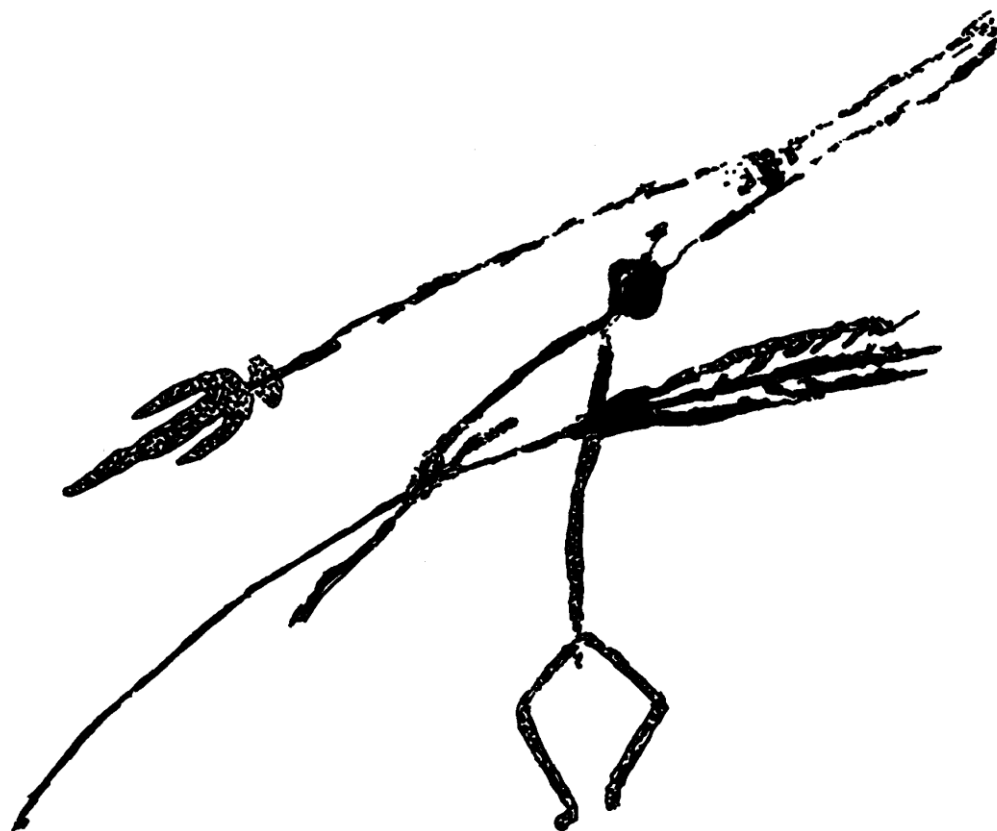


FIGURE 180.

Broad Spearthrower Period.

Mt. Brockman Massif.

A human figure with a tri-pointed spear set for launching from a stick-like spearthrower.

Spears of this type are restricted to the Broad Spearthrower Period and are not known in Australian ethnographic records. The figure also carries a multi-pronged spear and a 'stick'.

Very dark red, very weathered.

Maximum length: about 30 cm. (estimate).

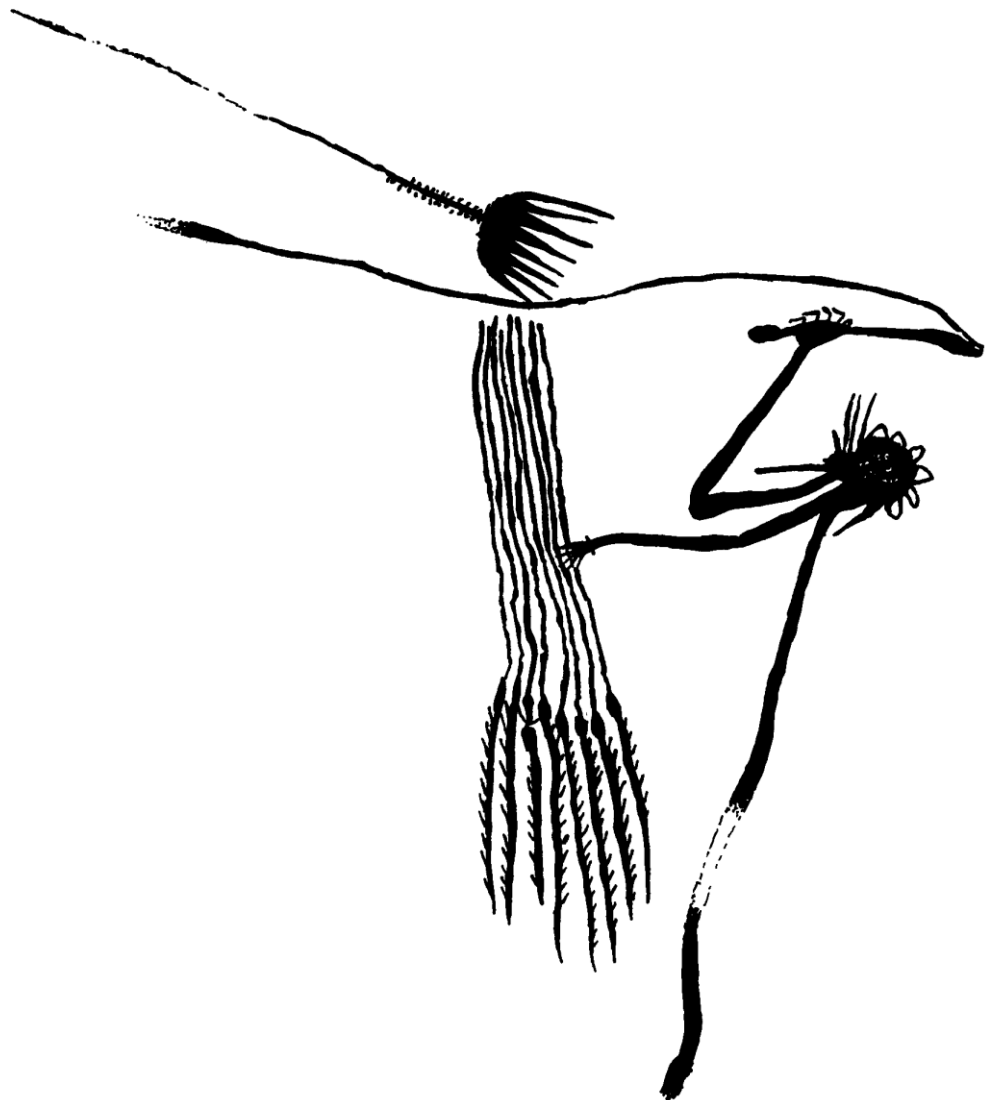


FIGURE 181.

Broad Spearthrower Period.

East Alligator River Crossing area.

A human figure with stick-like spearthrower and a bundle of uniserially barbed hafted spears. Another spear with eight unbarbed prongs is angled towards the figure. Spears of this type are rare in the art (see Brandl 1973: 54 figure 104; Mountford 1956: 160, figure 46a and 46b).

Dark red. The lower part of the human figure is highly weathered.

Length of figure: about 40 cm. head to foot.



FIGURE 182.

Broad Spearthrower Period.

Baroalba Creek.

A human figure with stick-like spearthrower and hafted uniserially barbed spear.

Note the depiction of fingers holding both spearthrower and spear.

Red.

Spear: 52.5 cm.

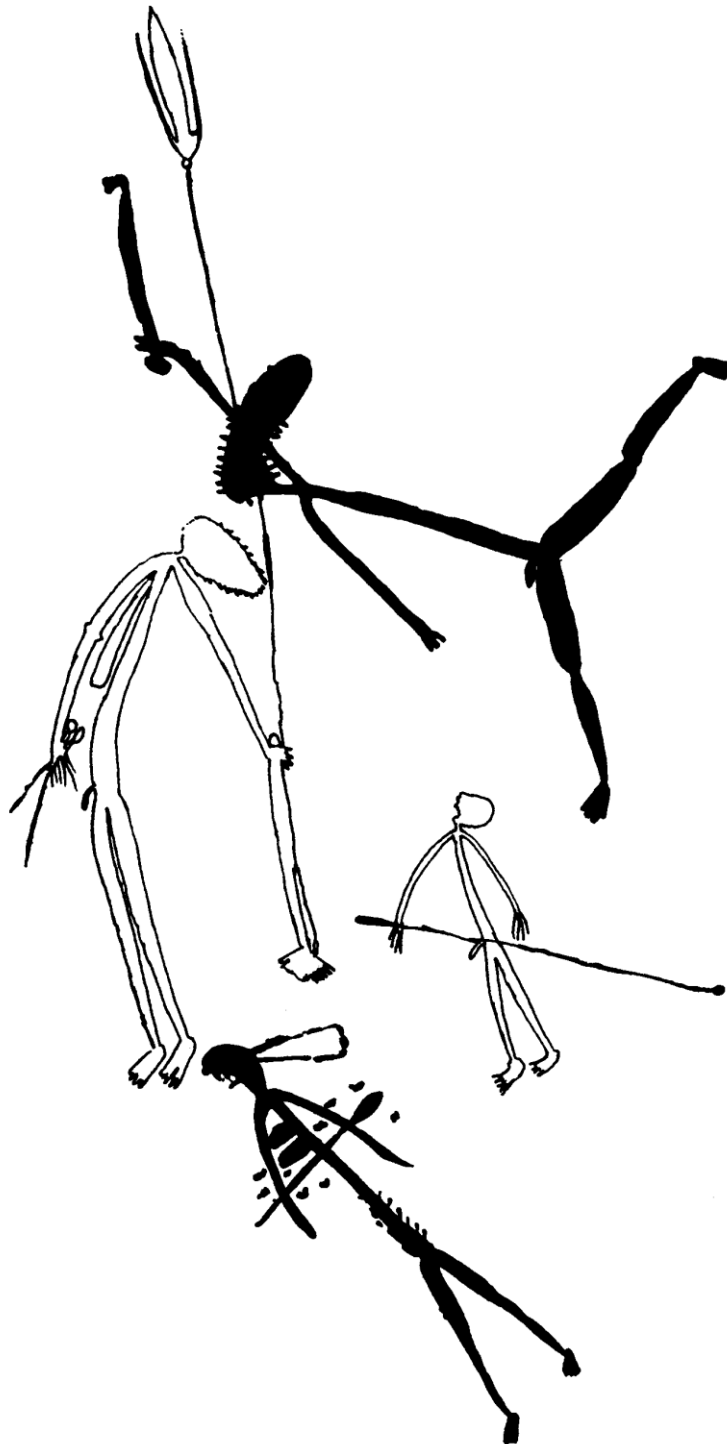


FIGURE 183.

Broad Spearthrower Period.

Three male figures with weapons, and one female figure that appears to have been speared through the body. Note the dots around the woman's body that possibly indicate blood from a wound. One of the male figures holds two knobbed throwing clubs and a vertical tri-pointed spear in what appears to be a stick-like spearthrower with a tasseled end.

Outline figures are yellow silhouettes, others are red.

Top figure: 32.5 cm. end of spearthrower to foot.



FIGURE 184.

Broad Spearthrower Period.

South of East Alligator River crossing.

Two human figures with stick-like spearthrowers and tri-pointed spears. Note the asterisk-like motif below the right arm of the figure on the right. Motifs of this type are virtually restricted to the Boomerang Period (eg see Figure 21 and 32). The space in the body of this figure is an incipient X-ray feature.

Red. The figure on the right has white dots along the body and penis.

Figure on right; 6.25 cm. knee to knee.



FIGURE 185.

Broad Spearthrower Period.

Baroalba Creek.

Human figures spearing a kangaroo. The manner of infill and the unpainted space inside the body of the kangaroo are incipient X-ray features.

Red.

Kangaroo: 234 cm. maximum dimension.



FIGURE 186.

Broad Spearthrower Period.

Magela Creek.

Three human figures with throwing clubs, spearthrowers and spears. The figure on the left has a pubic cover and also holds a bag. The central figure holds an object, possibly a fan.

Extremely faded, dull red. Many of the details are indistinct.

This illustration is an approximation.

Figure at right: 21 cm. head to left foot.

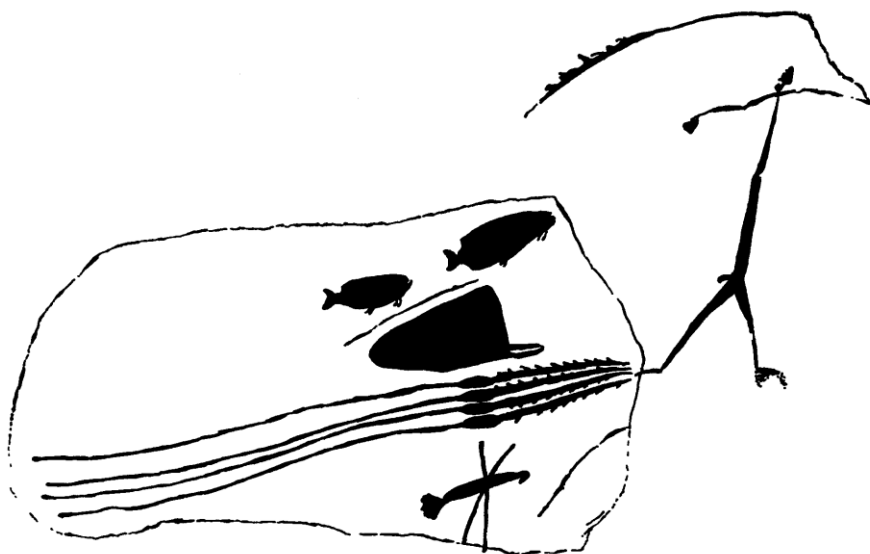


FIGURE 187.

Broad Spearthrower Period.

Mt. Brockman Massif.

A human figure with spear set for launching. To the left of the figure, encircled by a line, are spears, spearthrower, dillybag, digging stick, and two fish. In this context the fish probably represent food items. The reason for the encircling line is unknown.

Pale orange-red.

Maximum dimensions: about 90 cm.

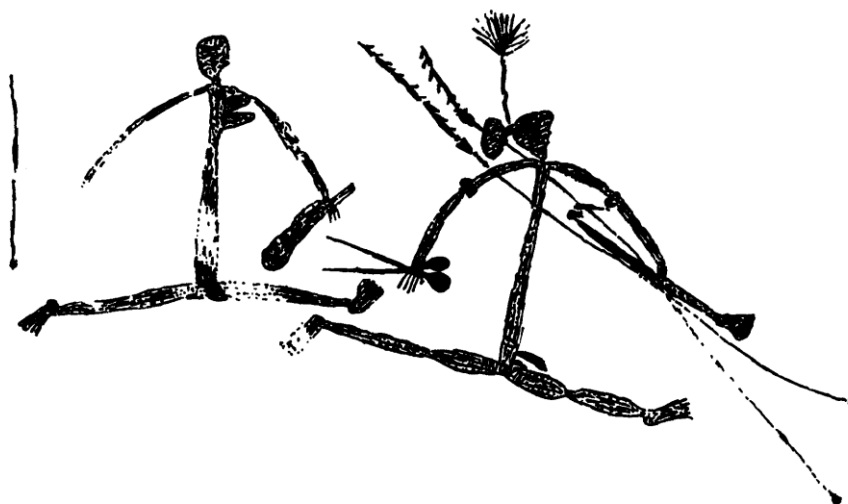


FIGURE 188.

Broad Spearthrower Period.

South of East Alligator River crossing.

Male and female human figures. The male wears a headdress and carries throwing clubs, a tasseled stick-like spearthrower, and spears. The woman holds a dillybag and digging stick.

Very weathered red base silhouettes with white lines added later.

From left foot of woman to right foot of male: 31.5 cm.

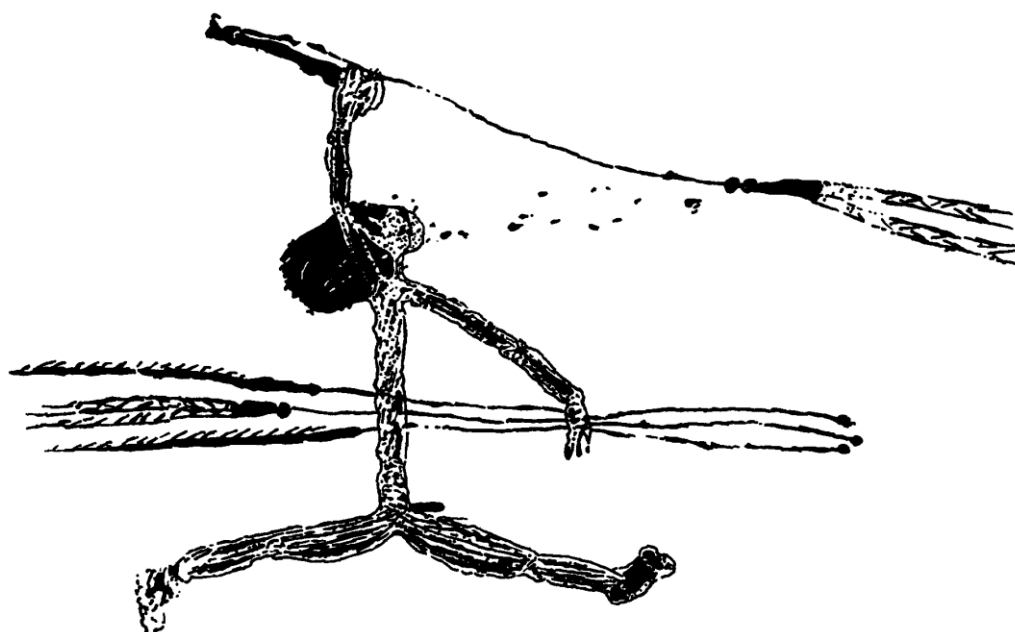


FIGURE 189.

Broad Spearthrower Period.

South of East Alligator River crossing.

A human figure with spearthrower and spears. Note the dots in front of the figure's head, representing breath or body warmth.

Weathered red base silhouette with white lines added more recently.

Length across feet: 21.75 cm.



FIGURE 190.
Broad Spearthrower Period.
A human figure with tasseled stick-like spearthrower and spear, and an animal-headed
being with branched or barbed limbs.
Dark red.
Head to foot: 35 cm.

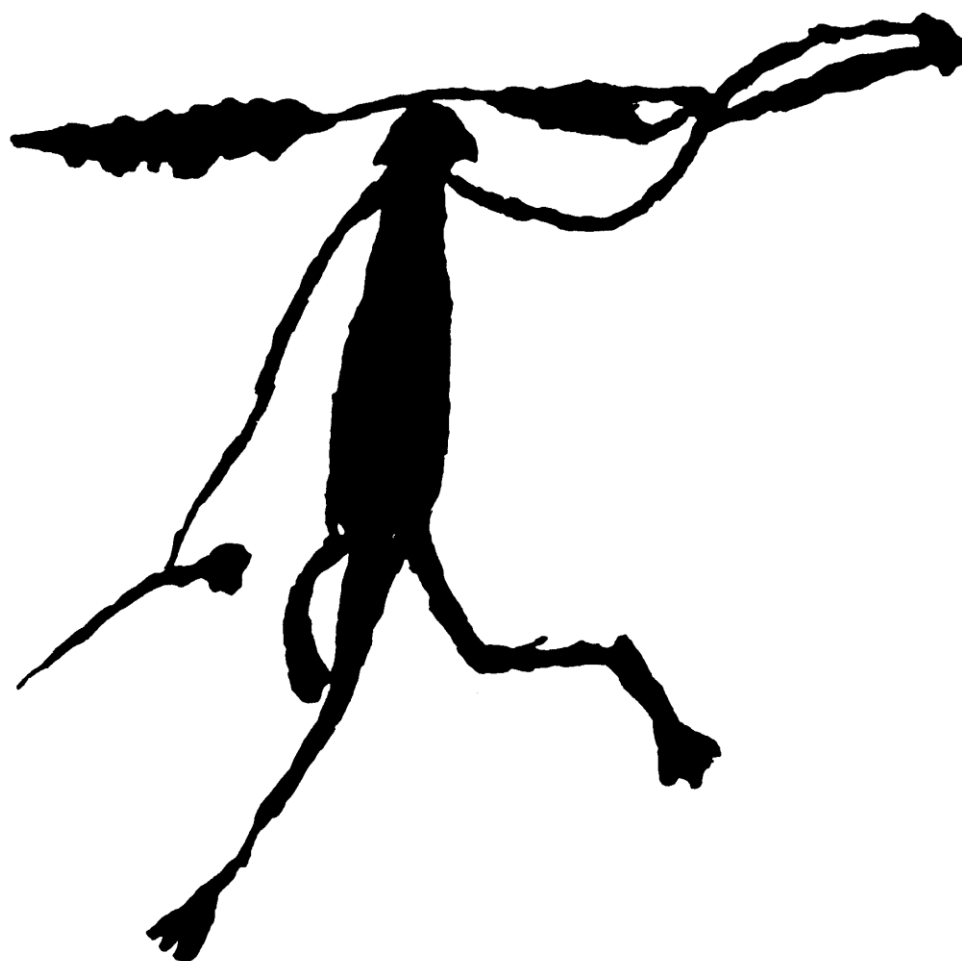


FIGURE 191.

Broad Spearthrower Period.

Nabarlek area.

A human being with a spear set for launching from a spearthrower, and a knobbed club.

Faded dark red.

Maximum dimension: 15 cm.



FIGURE 192.

Broad Spearthrower Period.

Magela Creek.

A male figure with spears, a tasseled stick-like spearthrower and two unidentified artefacts, and a female figure with dillybags and digging stick. The spears include one with a multi-pronged unbarbed blade and one with a lanceolate blade.

Note the unusual headdress (?) on the male figure.

Weathered red.

Length of larger figure: about 80 cm.



FIGURE 193.

Broad Spearthrower Period.

Deaf Adder Creek.

Human figures with stick-like spearthrowers, spearing a kangaroo. Note the different spear types, and the internal organs in the kangaroo.

Red.

Vertical spear at right about 85 cm.

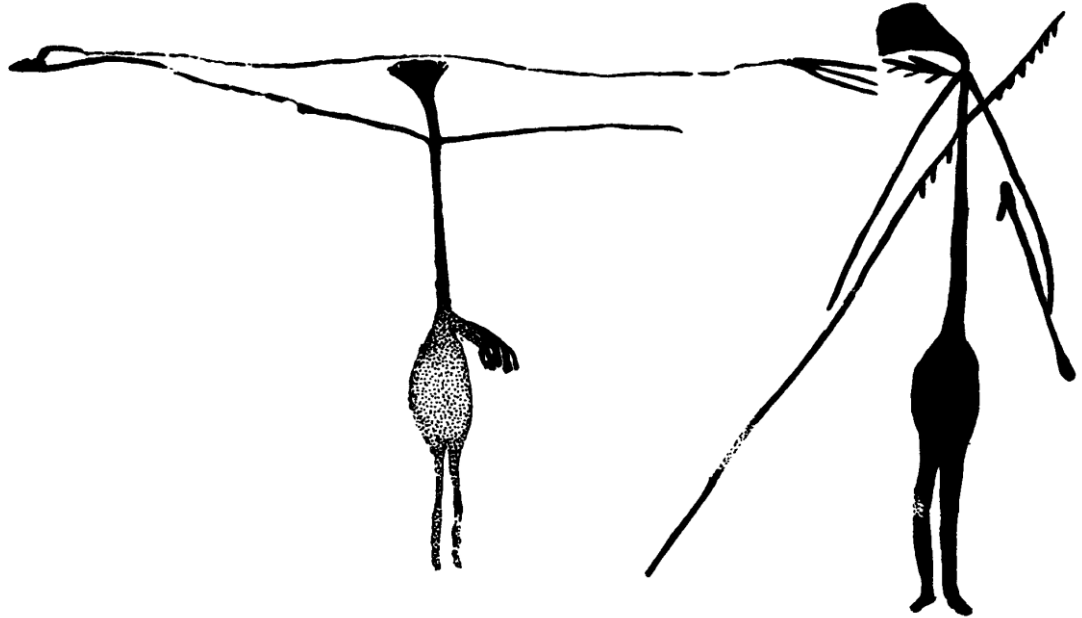


FIGURE 194.
Broad Speartrower Period.
Upper East Alligator River.
Two human figures with stick-like speartrowers, and spears.
Faded purplish-red.
Figure at right: about 50 cm. tall.

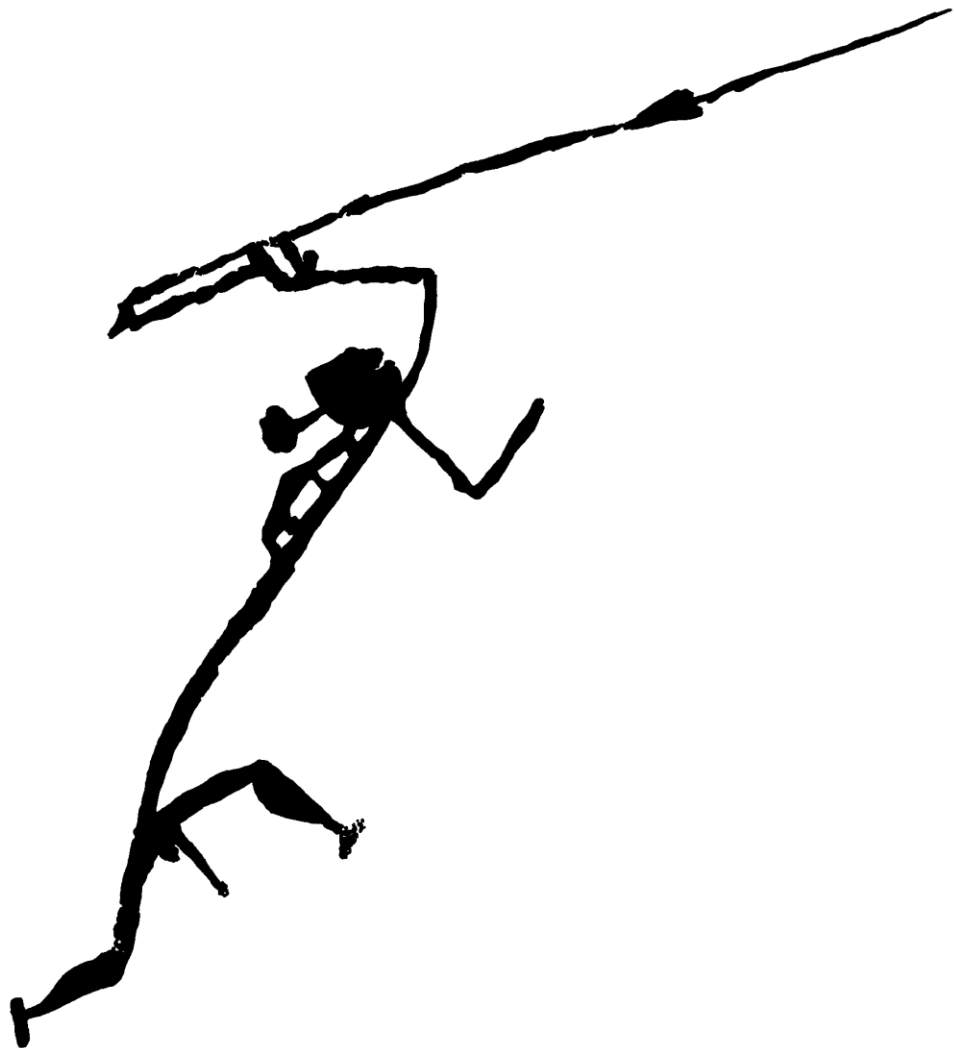


FIGURE 195.

Broad Spearthrower Period.

Ubirr (Obiri Rock).

A human figure with stick-like spearthrower and hafted unbarbed spear. The figure resembles the classic Oenpelli regional style of 'hooked stick' figure, but has stylistic features not usually found among figures in that style (see 3:5).

Red.

From foot to spearthrower-spear connection: 21 cm.



FIGURE 196.

Broad Spearthrower Period.

Ubirr (Obiri Rock).

A human figure with a 'hooked stick'. As with Figure 195, this figure resembles the classic Oenpelli regional style of 'hooked stick' figures, but has stylistic features not characteristic of that style (ie the lack of fluidity of line and the large hands).

Red.

Length: about 46 cm.

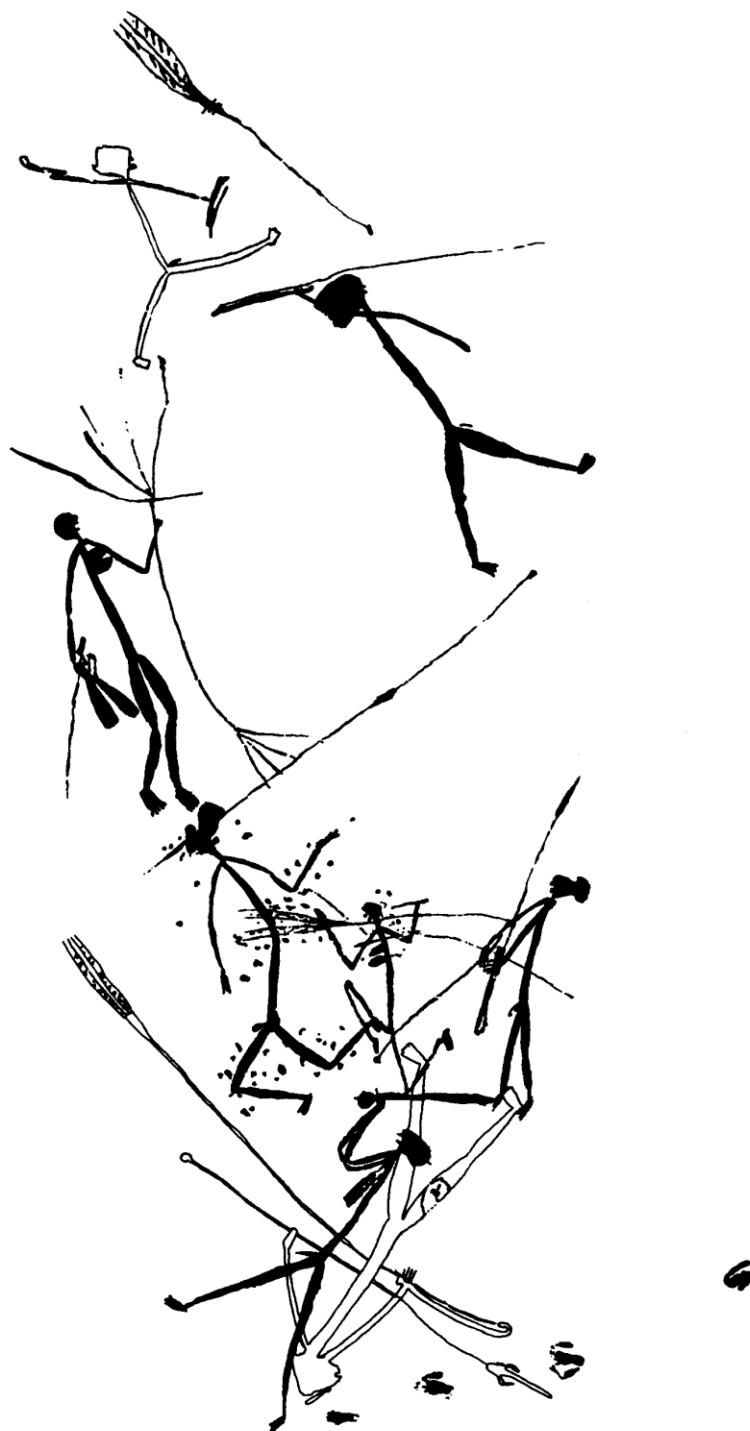


FIGURE 197.

Broad Spearthrower Period.

South of East Alligator River crossing.

A group of male and female human figures. One of the males and one of the females have been speared (centre of group). Another figure wields a club. A female figure holds a tree-like object. Note the different spear types, including the archaic tri-pointed variety. Outline figures are yellow silhouettes, the others are red.

Multi-pronged spear at bottom: 45 cm.

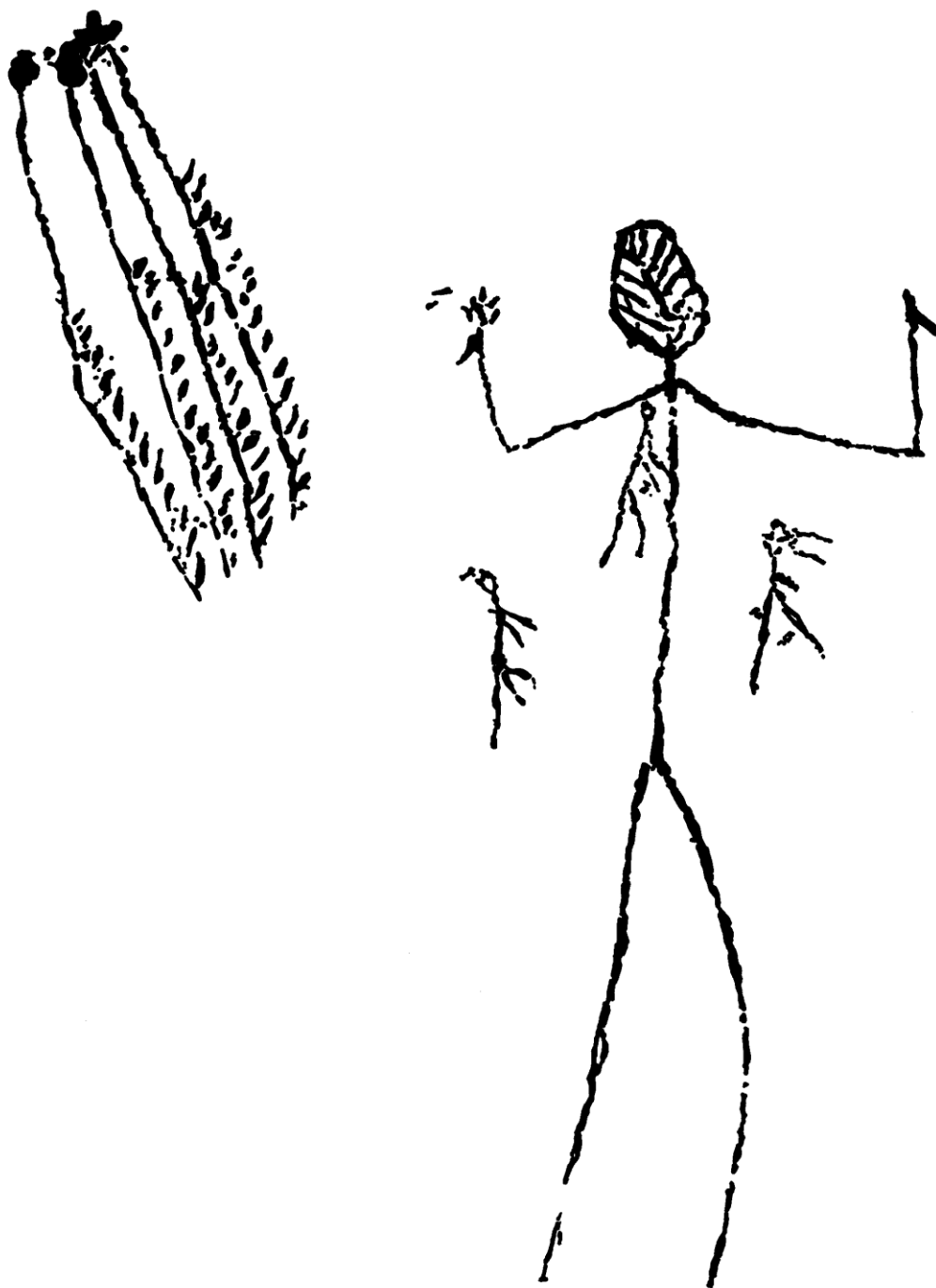


FIGURE 198.

Broad Spearthrower Period.

Mt. Brockman Massif.

Human figures and spears. Note the knobs that represent beeswax or resin reinforcing at the butt of the spears. This feature indicates that the 'hooked stick' held by the larger figure is a spearthrower.

Dark red.

Large figure: 26 cm.

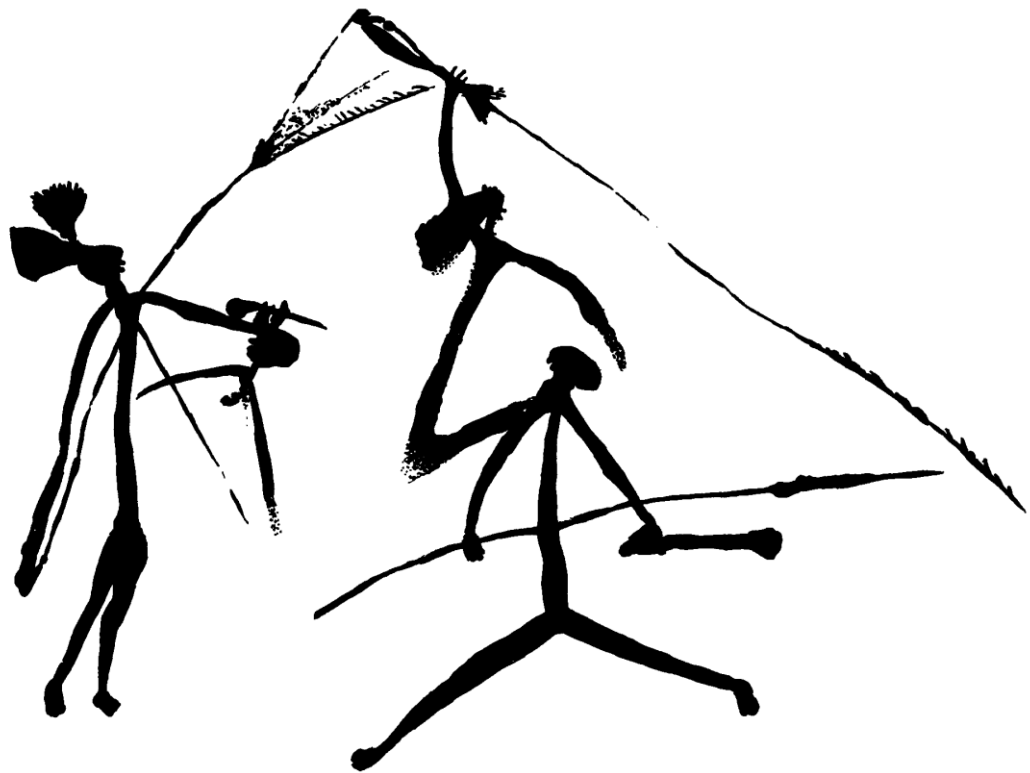


FIGURE 199.

Broad Spearthrower Period.

East Alligator River Crossing area.

A group of weathered human figures with spearthrowers and spears. At least one of the spearthrowers has a tassel fixed near the butt-end. The figure at the left has a head decoration. Note the different spear types.

Weathered grey, probably white originally.

Maximum width of panel: 52 cm.



FIGURE 200.

Broad Spearthrower Period.
Deaf Adder Creek.

A male figure with headdress, spears, and a 'hooked stick', is chopping into a tree with a hafted stone axe. A female figure with dillybag suspended from her head stands to his right. The absence of a boomerang and the depiction of large male genitalia both suggest that the 'hooked stick' is a spearthrower.

Dark red.

Length of male figure: about 100 cm.

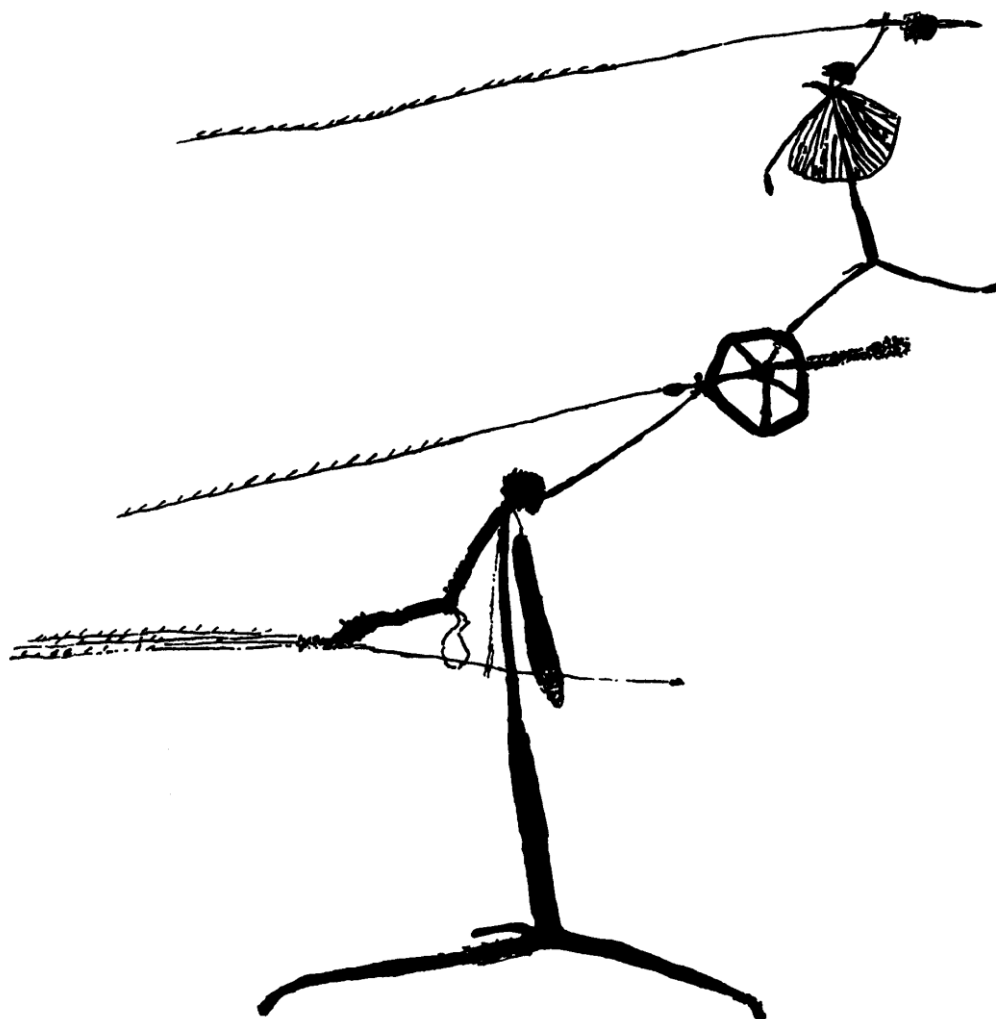


FIGURE 201.

Broad spearthrower period.

Djawumbu-Madjawarnja massif.

Two human figures with long-necked spearthrowers. The top figure has a 'cape' suspended from the shoulders. These capes seem to be largely restricted to figures with long-necked spearthrowers (eg see Figures 207, 211, 212, 217). Note the lines that segment the broad section of the larger spearthrower. Patterns within this section of long-necked spearthrowers are common and varied (see Figures 202-207, 212, 214).

Large figure is orange-red, smaller figure is dark red with a purplish tinge.

Top spear: about 60 cm.

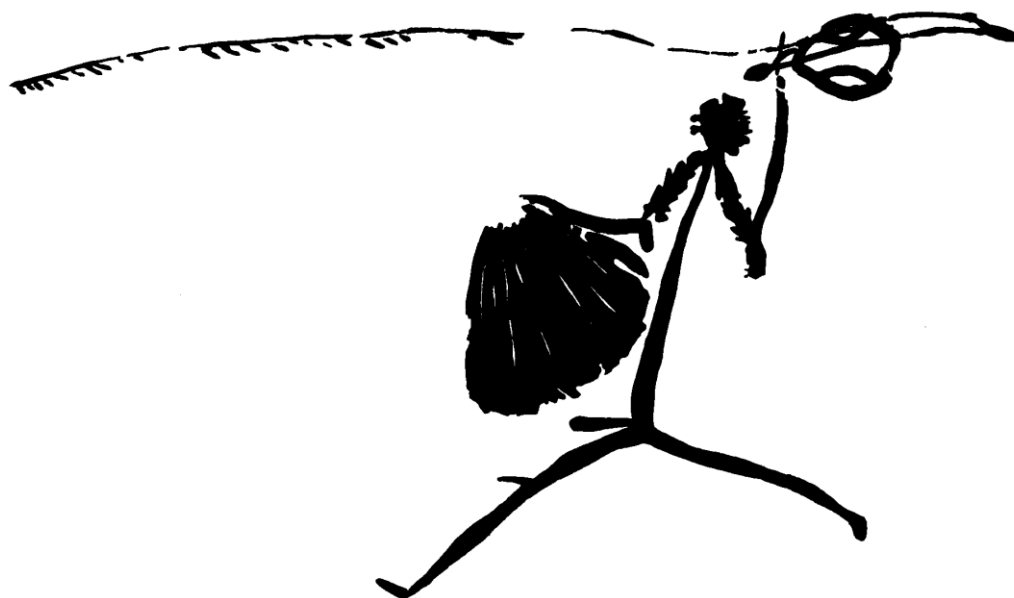


FIGURE 202.

Broad Spearthrower Period.

Djawumbu-Madjawarnja massif.

A human figure with fan, arm decoration, long-necked spearthrower and spear (see Plate 34). Note the pattern inside the broad section of the spearthrower (cf Figure 203).

Brownish-black.

Spear: about 40 cm. (from memory).

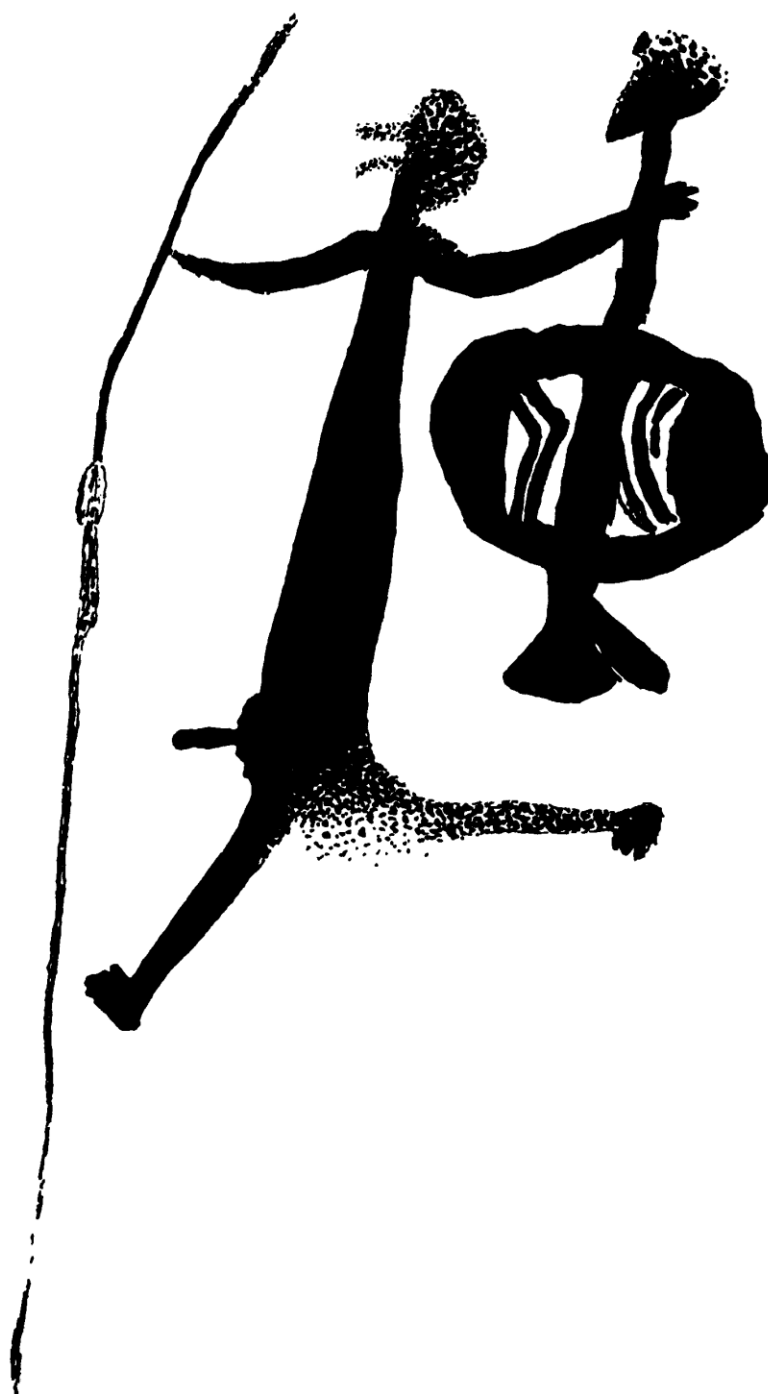


FIGURE 203.

Broad Spearthrower Period.

Cannon Hill.

A human figure with spear and long-necked spearthrower of exaggerated size.

Note the pattern inside the broad section of the spearthrower (cf Figure 202).

White.

Spearthrower: about 30 cm.

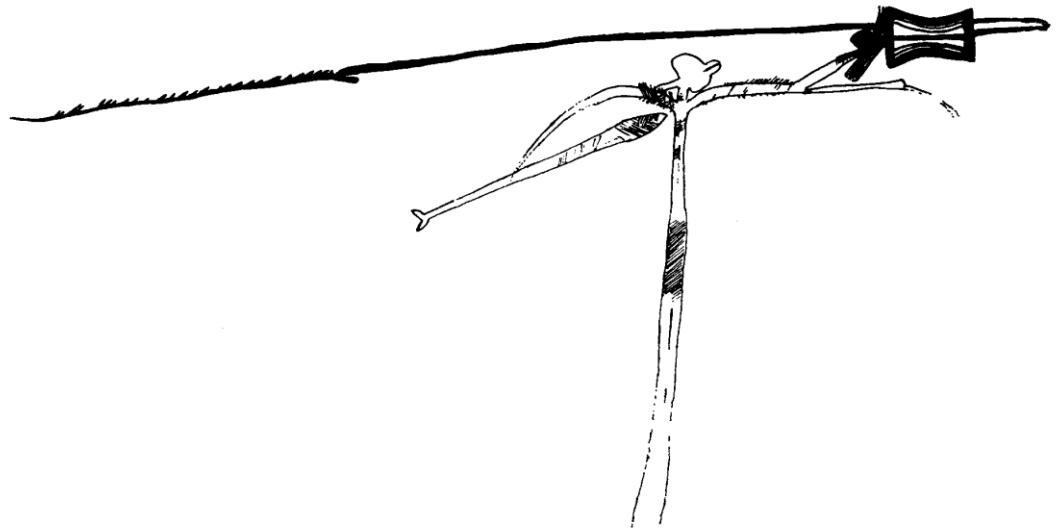


FIGURE 204.

Broad Spearthrower Period.
Cannon Hill.

A human figure with club, long-necked spearthrower, and spear. The club appears to be the type called **Periperiu**, recorded by Spencer (1914: 367 and plate 16-4; cf Figure 95-a).

In contrast with Figures 201-203, the spearthrower here has concave sides. Note the pattern inside the spearthrower.

Red base silhouette with white outline and cross-hatching.

Only an outline of the figure has been provided here in order to be able to highlight the white lines.

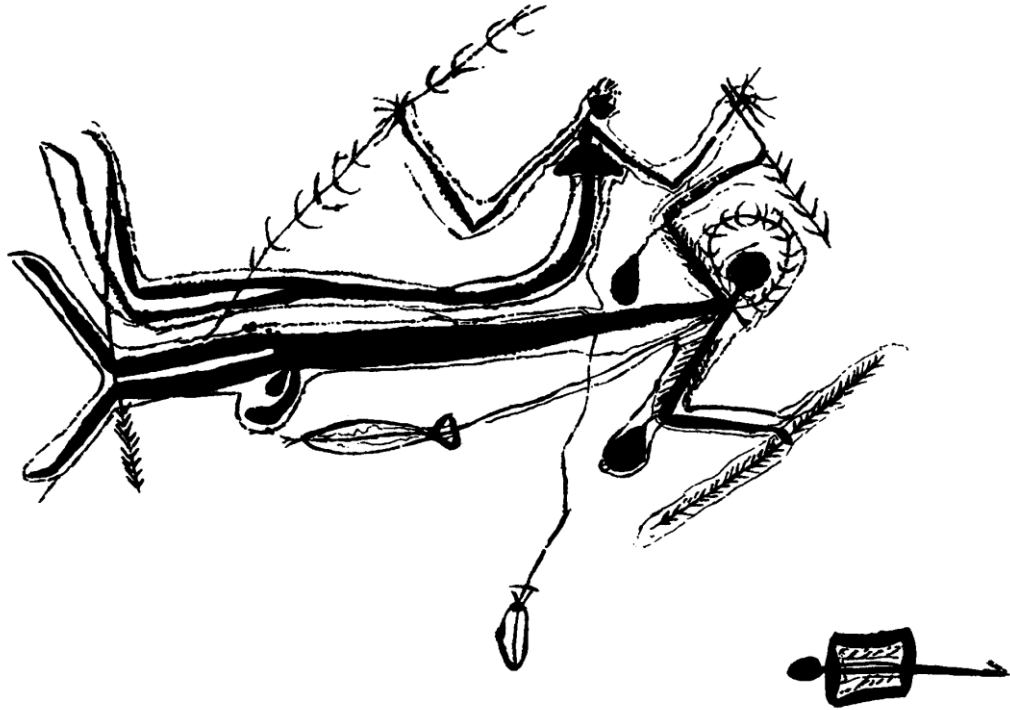


FIGURE 205.

Broad Spearthrower Period.

Mt. Brockman Massif.

Male and female anthropomorphic figures (see Mulvaney and White 1987: 46, for a colour reproduction of this painting). Each figure is surrounded by a line and each holds unidentified barbed objects. The male figure has a barbed line encircling his head and two round objects suspended from his elbows. Both figures have objects suspended from their shoulders.

These resemble the sacred bags that Arnhem Land Aboriginal men carried in ethnographic times (see 4:6). Similar bags are carried by many of the figures in recent styles of paintings (eg Figures 224, 232, 244, 250).

Dark red.

Maximum length: 155 cm.

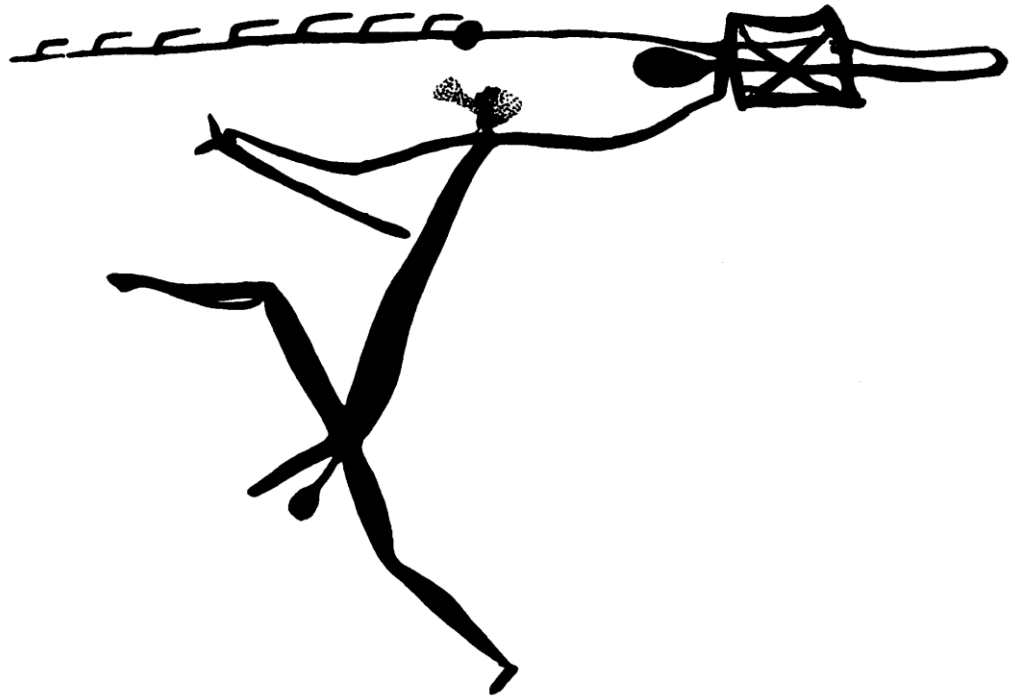


FIGURE 206.

Broad Spearthrower Period.

Magela Creek.

A human figure with club (?), long-necked spearthrower, and hafted uniserially barbed spear.

Note the pattern inside the broad section of the spearthrower.

Weathered red.

Length of spear: about 65 cm.



FIGURE 207.

Broad Spearthrower Period.

Cannon Hill.

Animal-headed (?) being with long-necked spearthrower and spear. The being has a cape-like garment suspended from the shoulders.

Note the pattern inside the spearthrower.

Dark purplish-red.



FIGURE 208.

Broad Spearthrower Period.

Cannon Hill.

Human figure with arm decoration, long-necked spearthrower, and multi-pronged multi-barbed spear.

Dark red.

Length of spear: approximately 45 cm. (from memory).

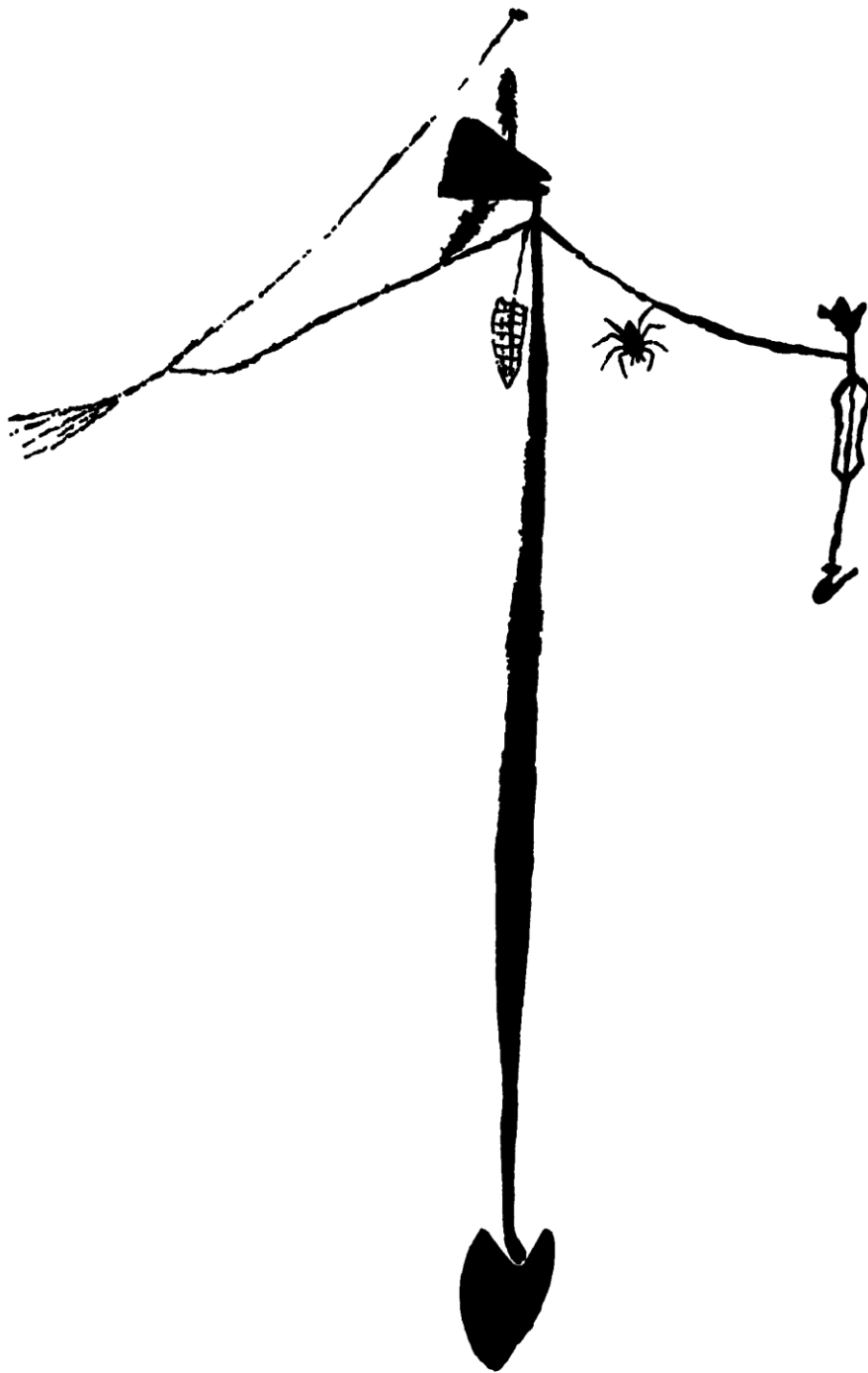


FIGURE 209.

Broad Spearthrower Period.
Cannon Hill.

Anthropomorphic figure with dillybag, multi-pronged spear, and long-necked spearthrower. The figure has barb-like objects protruding from the head and its body ends in a yam or lily leaf. Note the spider beneath the right arm.

Red.

Length: about 100 cm.

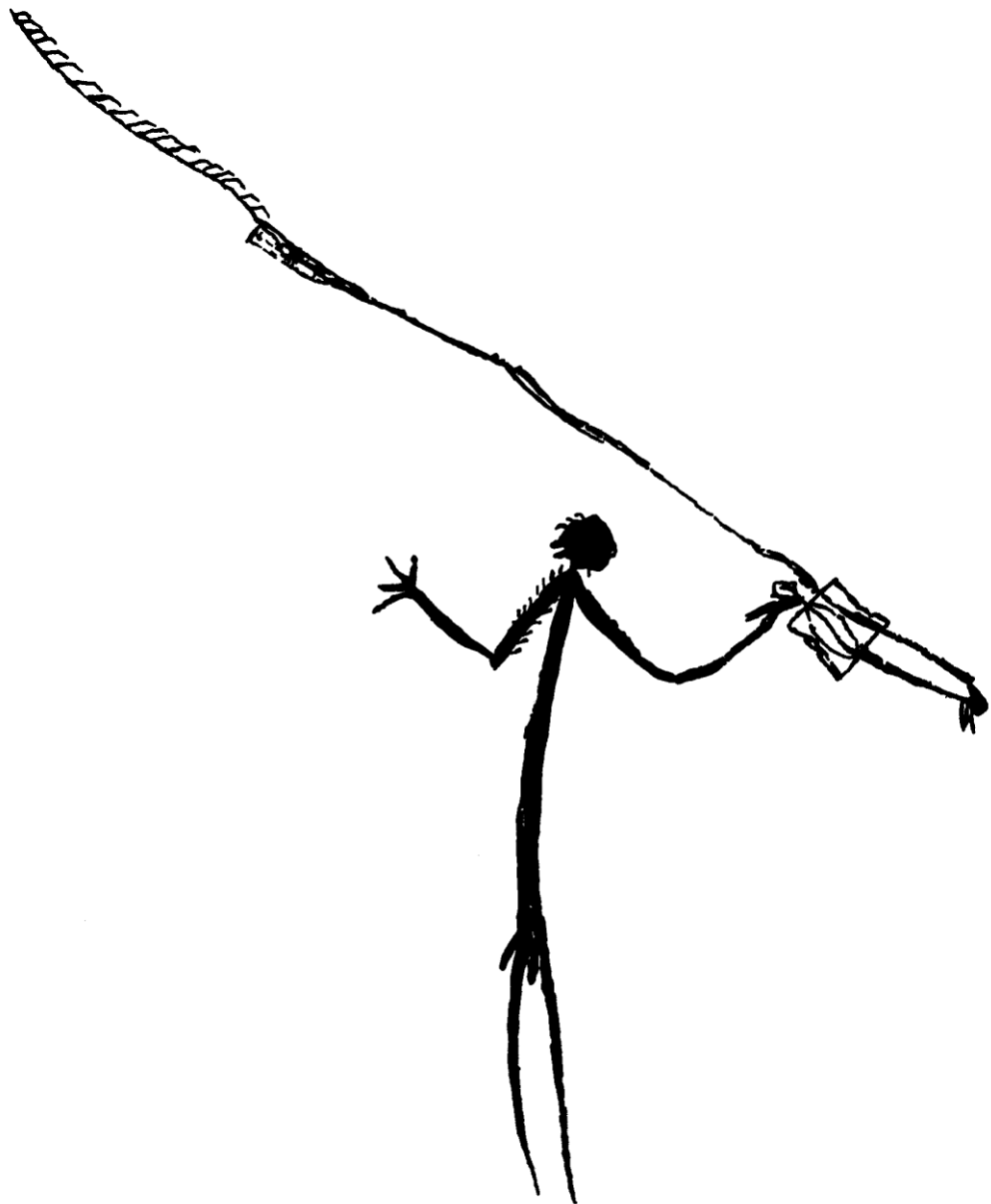


FIGURE 210.

Broad Spearthrower Period.

Cannon Hill.

A human figure with upper arm decoration, long-necked spearthrower, and spear.

Note the tassel near the peg on the spearthrower.

Dark red.

Spear: about 110 cm.

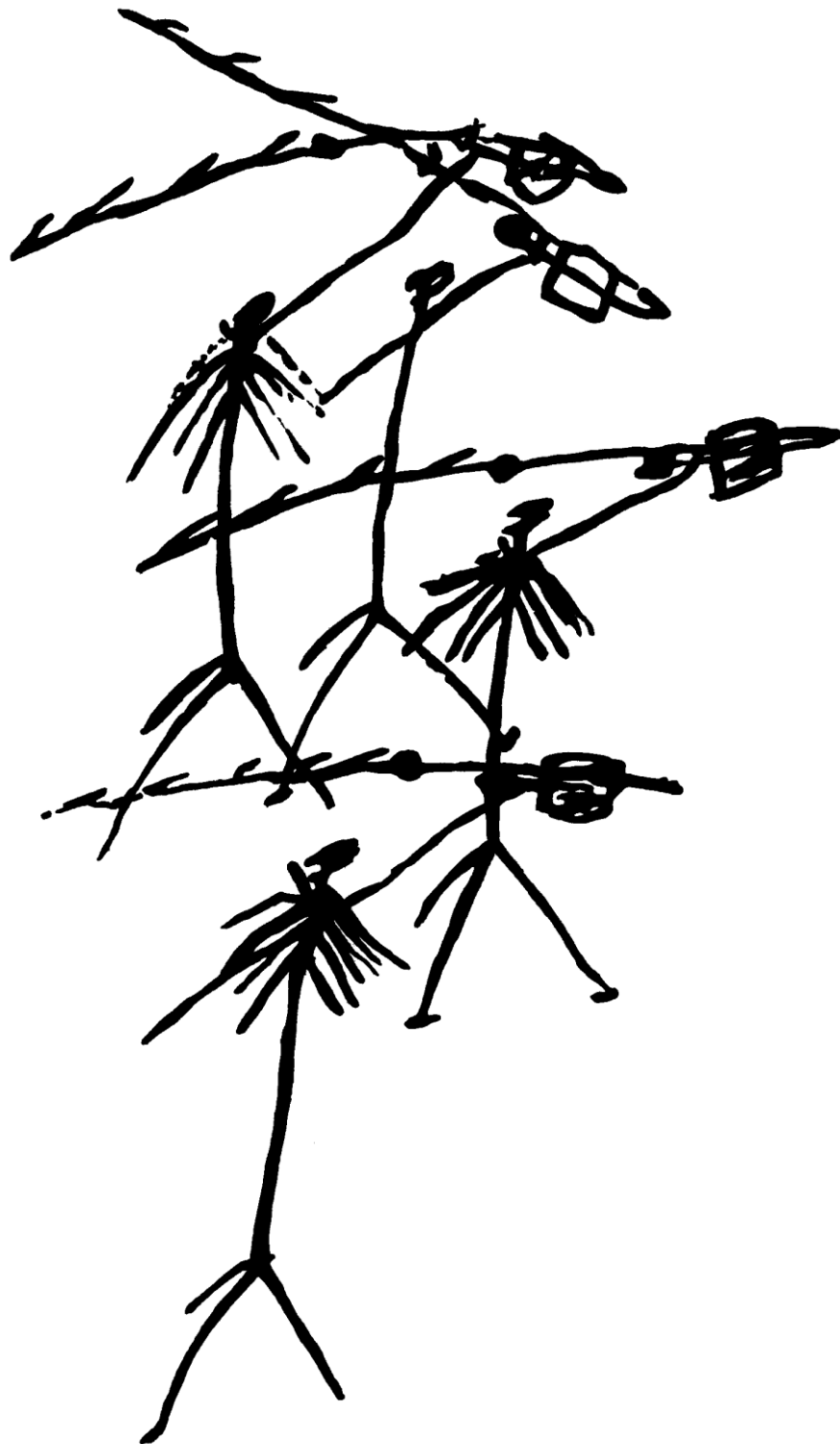


FIGURE 211.
Broad Spearthrower Period.
Cannon Hill.
Human figures with long-necked spearthrowers, spears, and capes suspended
from their necks.
Bright red.
Height of panel: 21.5 cm.



FIGURE 212.

Broad Spearthrower Period.
Cannon Hill.

A fight scene. In the bottom half of the panel several figures with long-necked spearthrowers, spears, and capes suspended from their necks, face towards another figure that appears to have been speared. At the top of the panel one figure appears to have been speared and another figure with a 'cape' wields a spearthrower.

Red.

Width of lower group: about 75 cm.



FIGURE 213.

Broad Spearthrower Period.

Cannon Hill.

A human figure with elbow ornaments, long-necked spearthrower, and spear.

Bright red.

Maximum dimension: about 85 cm.

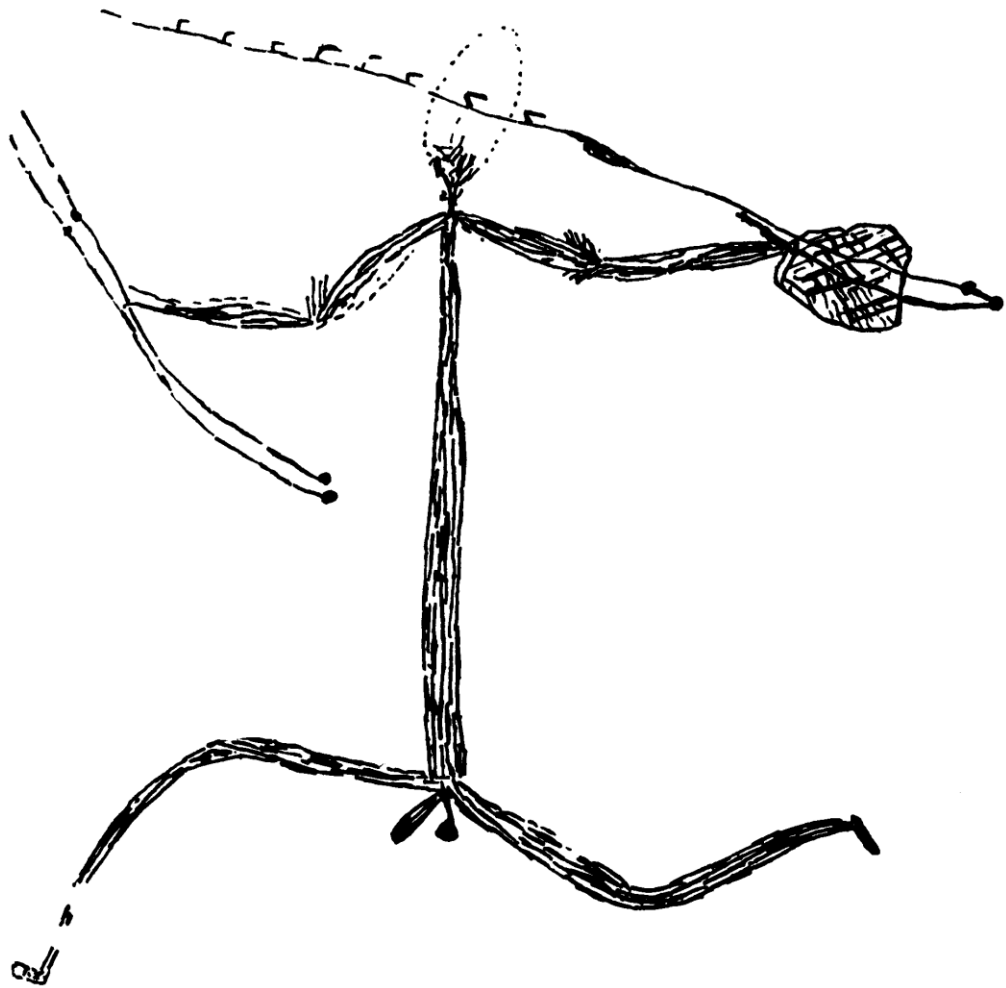


FIGURE 214.

Broad Spearthrower Period.

Mt. Brockman Massif.

A running human figure carries two spears in one hand, and a long-necked spearthrower and spear in the other. Note the elbow decoration.

Bright red (the top part of the head has weathered away).

Length of spear: 52 cm.

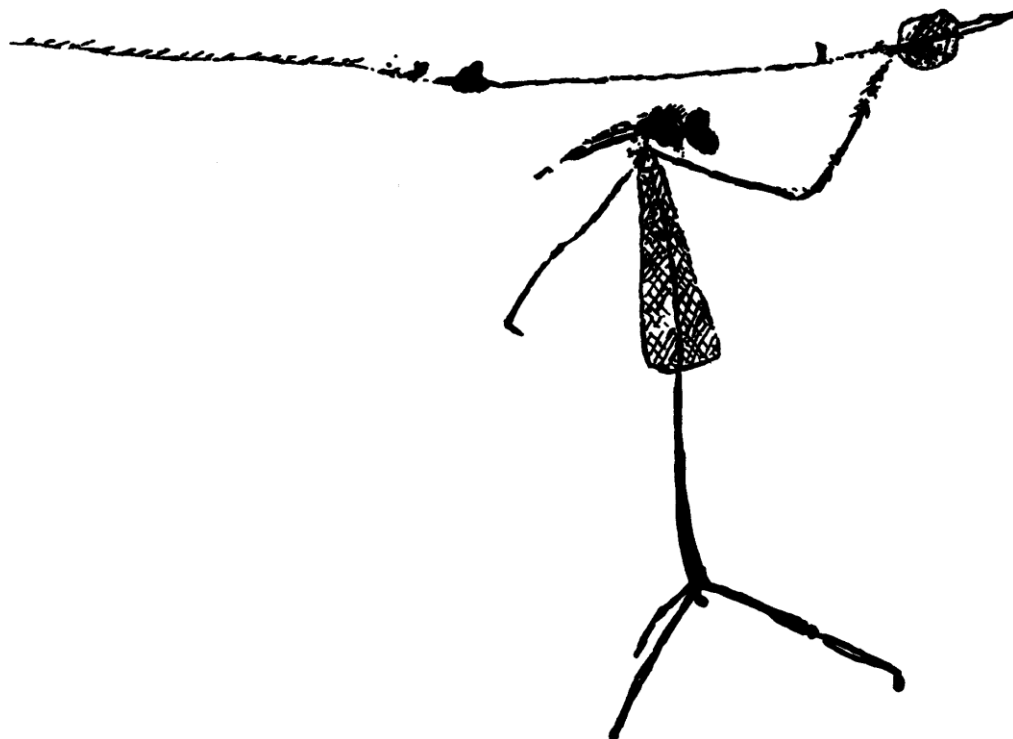


FIGURE 215.

Broad Spearthrower Period.

South of East Alligator River crossing.

A human being with dillybag suspended from the shoulder holds a spear set for launching from a long-necked spearthrower.

White.

Head to right foot: 38 cm.

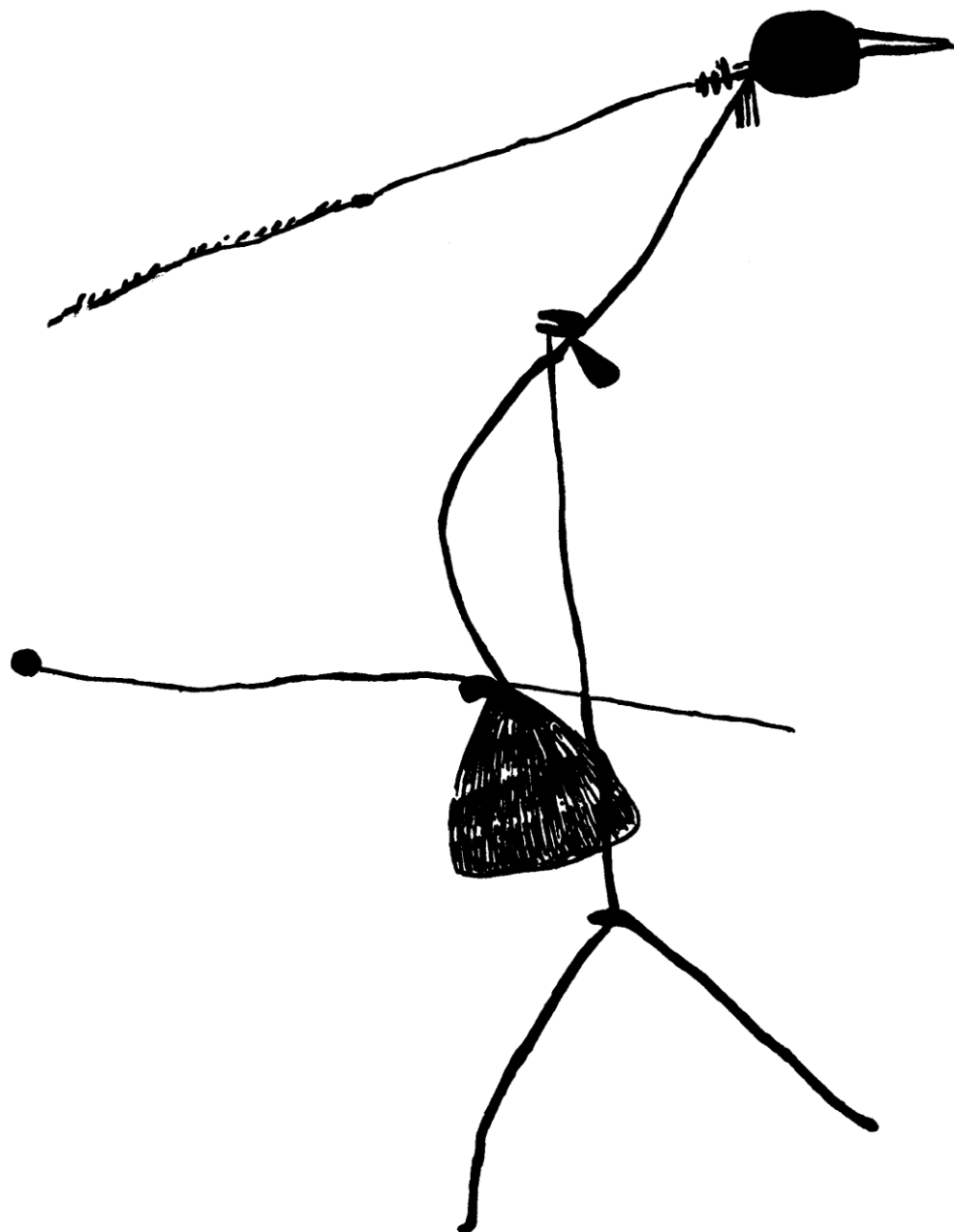


FIGURE 216.

Broad Spearthrower Period.

Djawumbu-Madjawarnja massif.

A human being with fan and spear in one hand, and long-necked spearthrower and spear in the other.

Dark purplish-red.

Maximum dimension: about 50 cm.

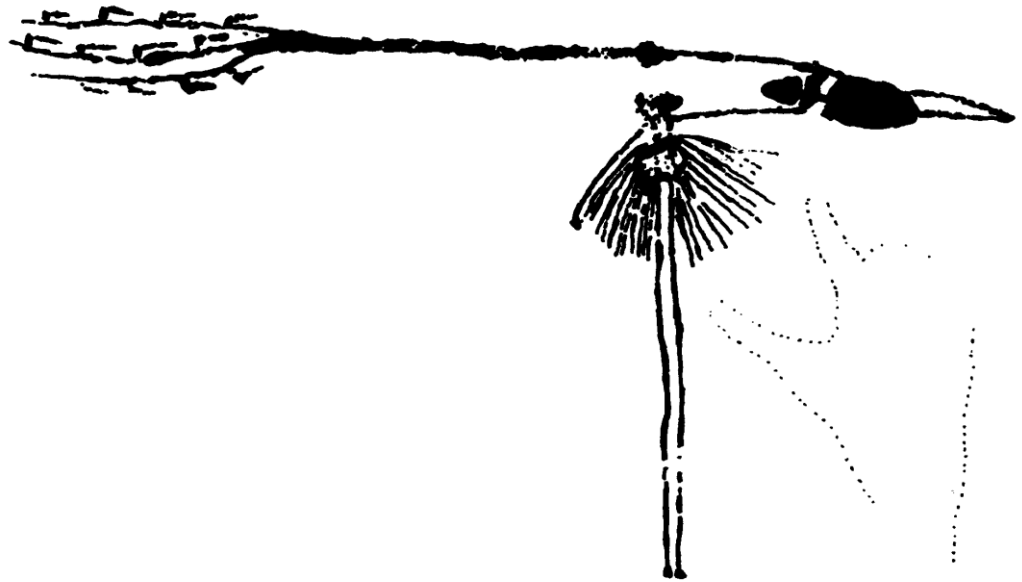


FIGURE 217.

Broad Spearthrower Period.

Near Narradj Warde Djobkeng.

A hand stencil, and a human figure with long-necked spearthrower, multi-pronged multi-barbed spear, and a 'cape' suspended from the shoulders.

Dark red.

Spear: about 65 cm.

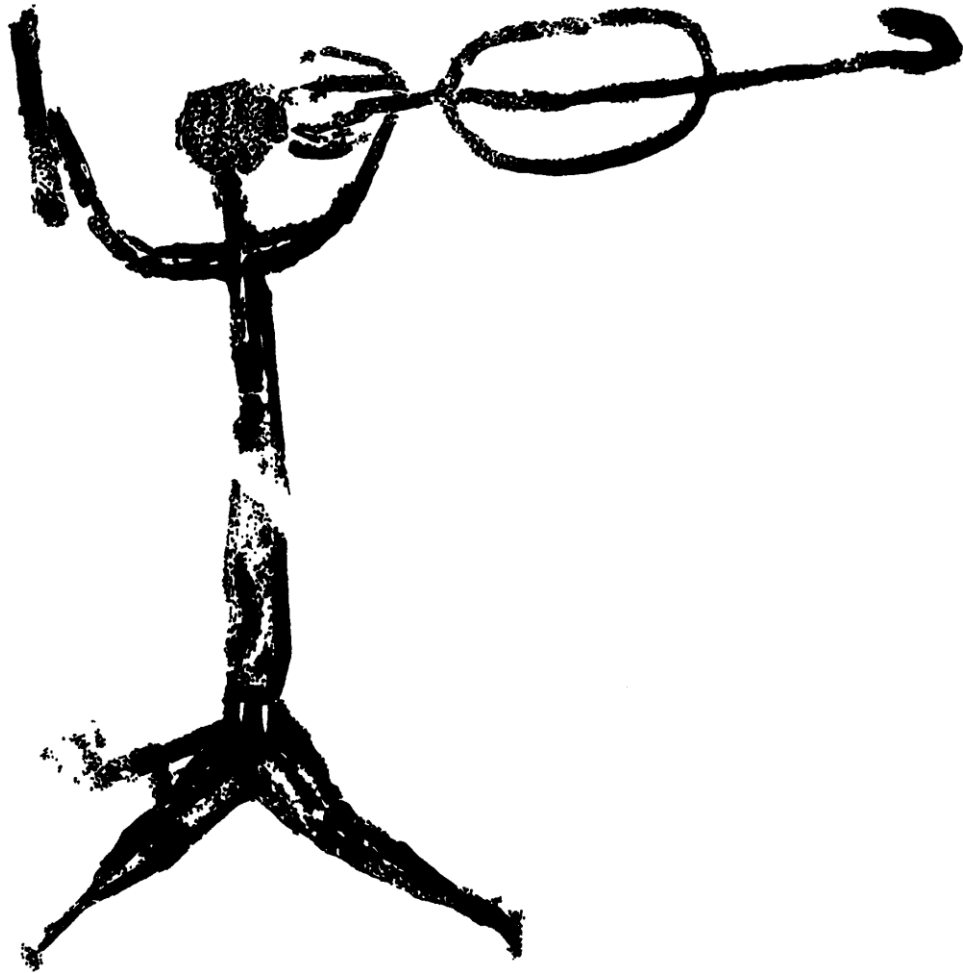


FIGURE 218.
Broad Spearthrower Period.
Upper East Alligator River.
A crudely painted human figure with long-necked spearthrower.
Weathered red.
Length of spear: 35 cm.

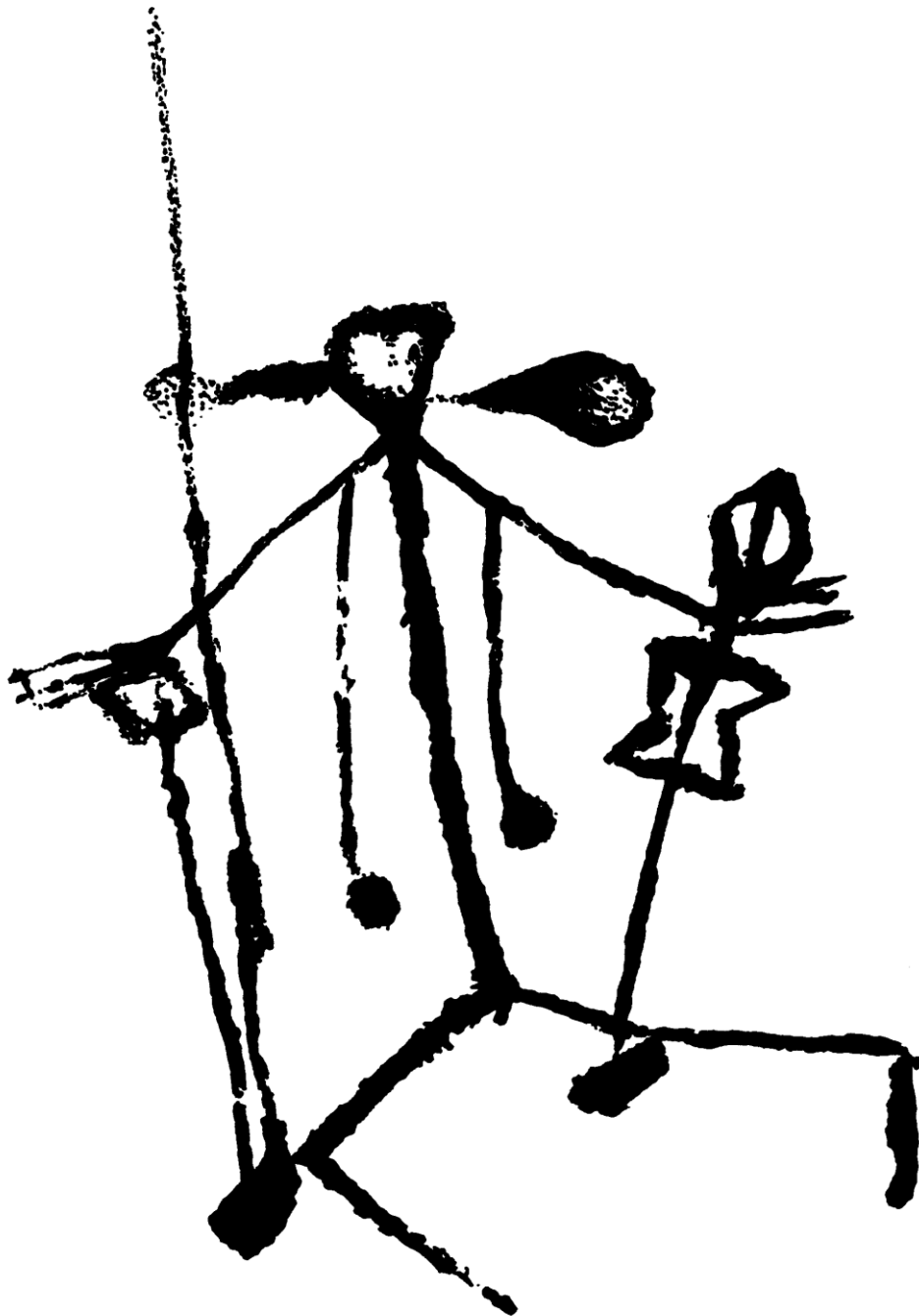


FIGURE 219.

Broad Spearthrower Period.

Cannon Hill.

A human figure with pendants from the elbows, a long-necked spearthrower in the right hand, and a stick-like spearthrower and spear in the other.

Red.

Height of figure: about 27 cm.

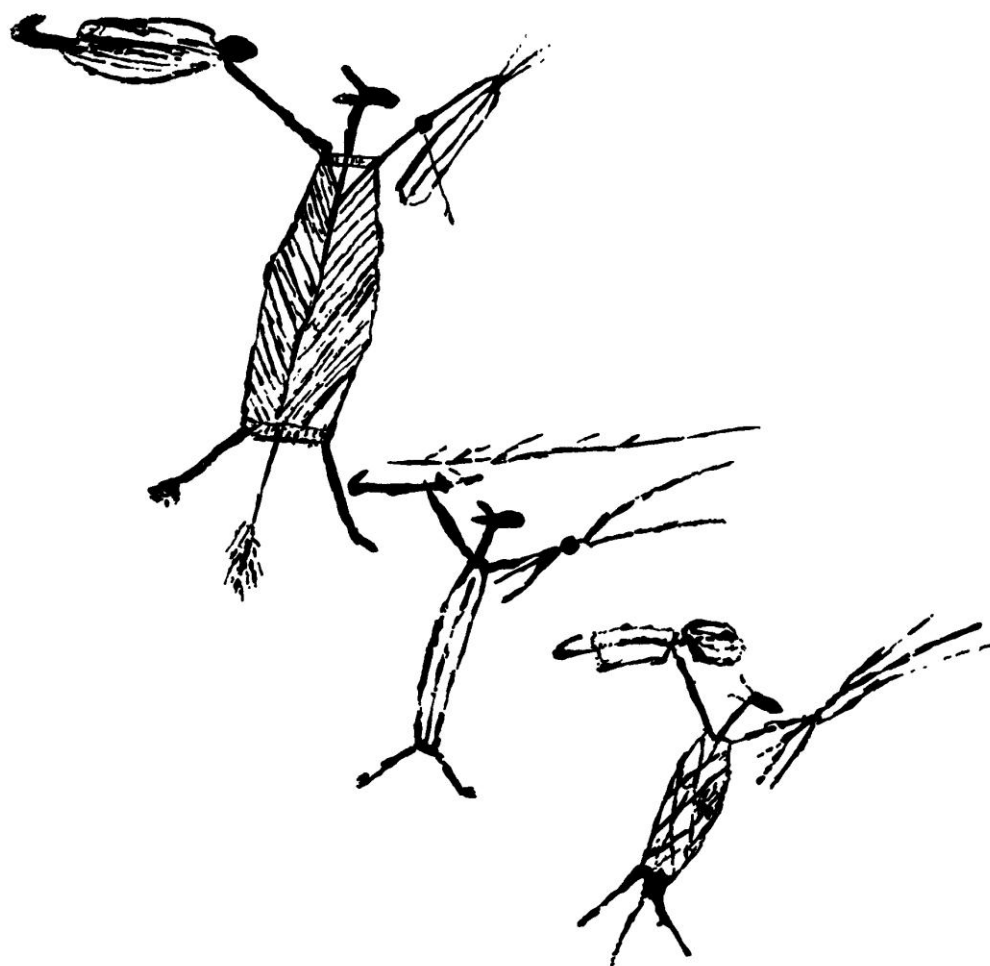


FIGURE 220.

Tentative Broad Spearthrower Period.
Deaf Adder Creek.

Three animal-headed beings with weapons. The central figure holds a stick-like spearthrower and spears. The other two figures wield spearthrowers that are somewhat ambiguous as to form although the example at the right has a square body that resembles a long-necked spearthrower more than it does other types. Each of the figures appears to have its backbone and ribs indicated, that is, each has simple X-ray features.

Red.

Maximum dimension: about 50 cm.

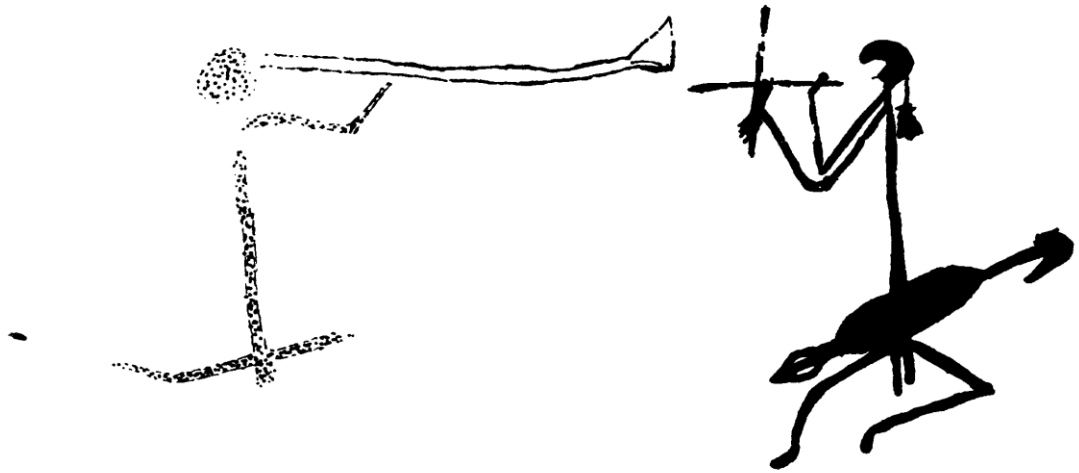


FIGURE 221.

Long Spearthrower Period.

South of East Alligator River crossing.

A human figure with didgeridoo and another with music sticks and long-necked spearthrower.

This painting provides evidence that the didgeridoo was present either before the long spearthrower appeared or appeared at a time when long-necked spearthrowers and long spearthrowers co-existed.

Red.

Spearthrower: about 25 cm. (from memory).

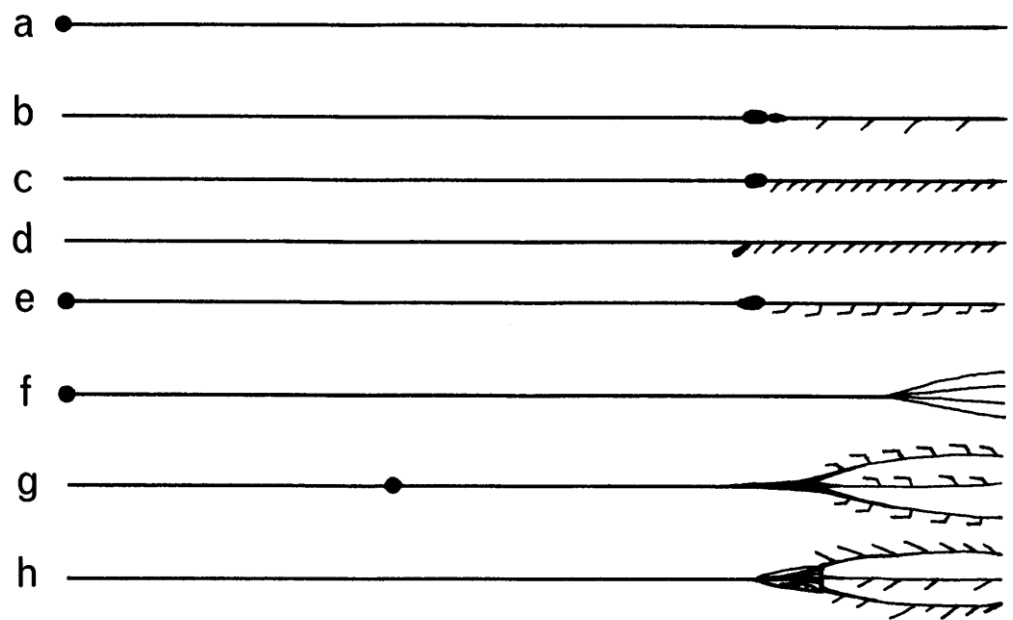


FIGURE 222.
Spears types associated with long-necked spearthrowers.

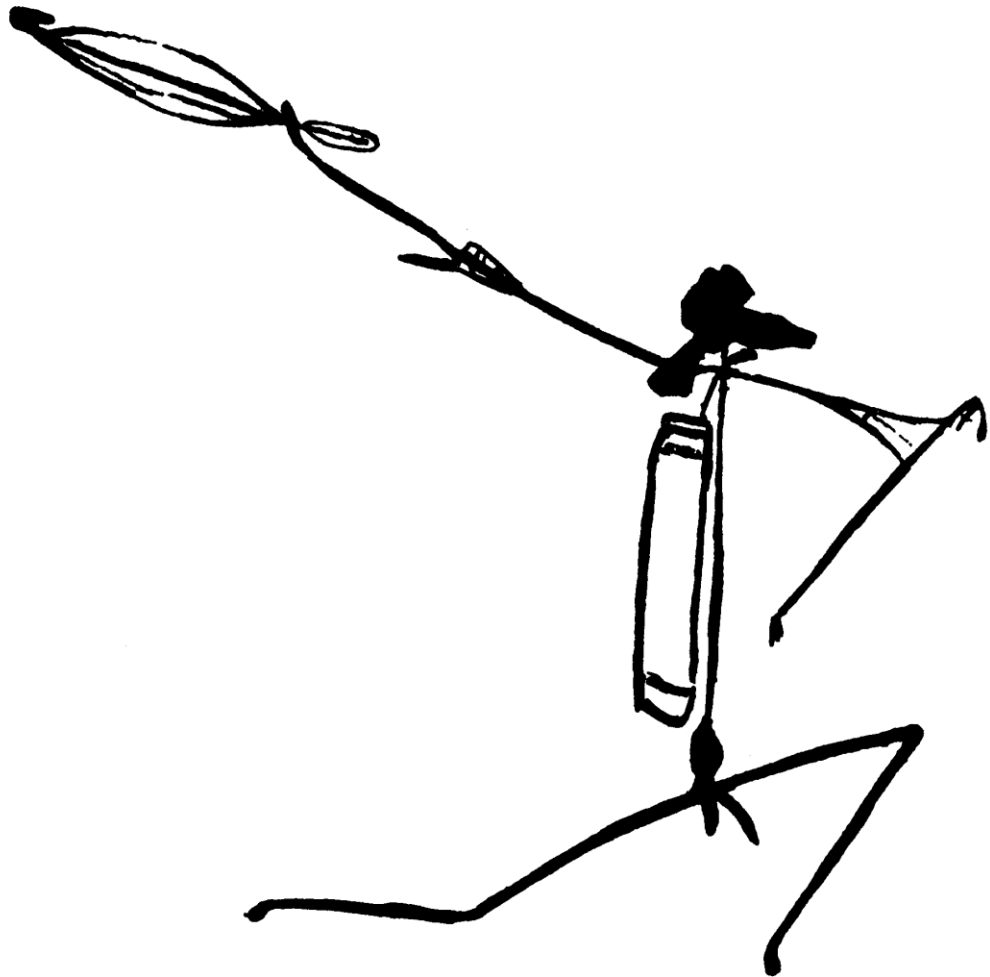


FIGURE 223.

Tentative Long Spearthrower Period.

Upper East Alligator River.

A human figure with dillybag and spearthrower. In form, this spearthrower resembles the broad type, but the figure has stylistic affinities with figures in the Long Spearthrower Period (cf Figures 244, 251).

Faded red.

Maximum dimension: about 45 cm.



FIGURE 224.

Long Spearthrower Period.

Nabarlek area.

A human figure with spearthrower. The spearthrower depicted here does not have the shape of a typical long spearthrower, but the bag suspended from the neck is of a type commonly found among long spearthrower figures (eg Figures 232, 244, 250).

Red.

Length: about 200 cm.

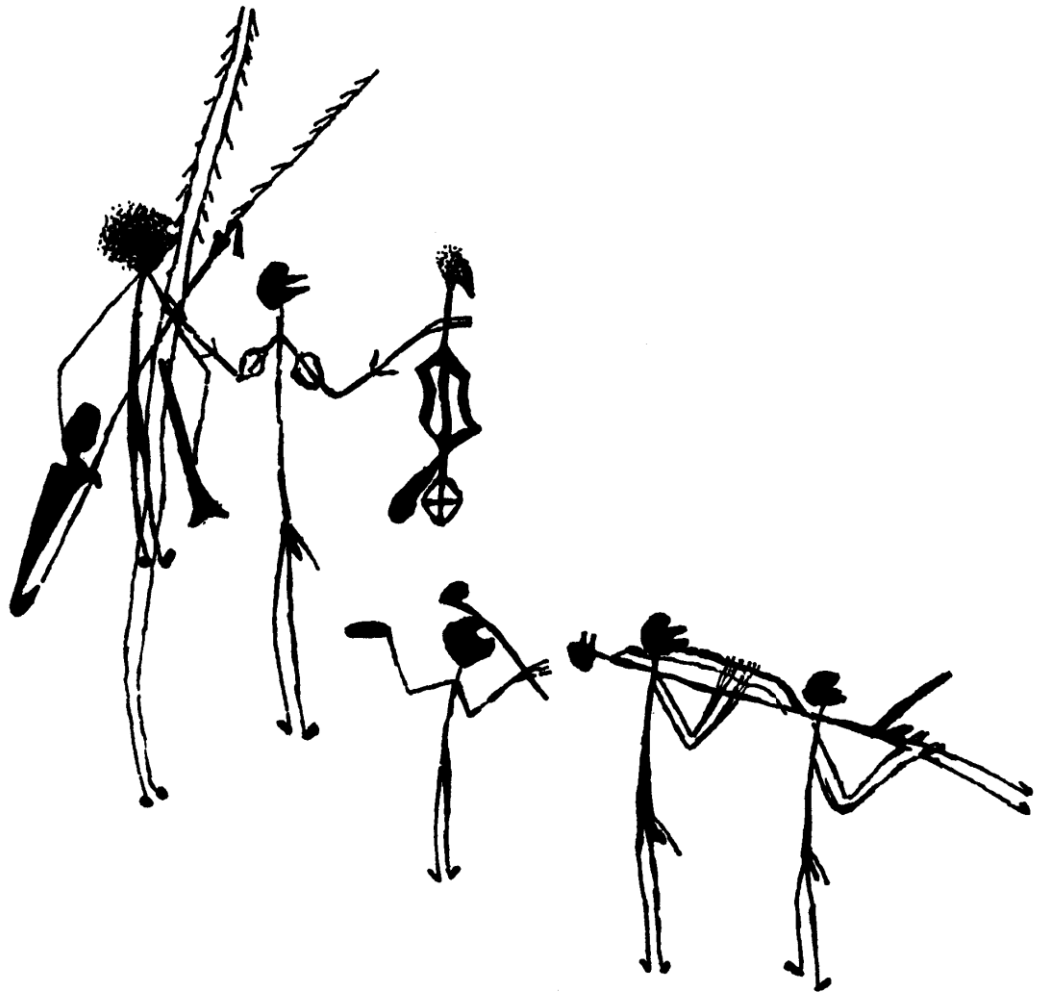


FIGURE 225.

Long Spearthrower Period.
Cannon Hill.

A mortuary scene. Two figures carrying a body are followed by three figures with weapons. Among the weapons are a long-necked spearthrower and a long (notched lath) spearthrower, indicating that at one stage both types co-existed. Other weapons include spears, a club, and what could be a hafted stone axe (see Edwards 1979: 57 plate 17 at bottom for a colour reproduction of this scene).

Red.

Maximum dimension: about 50 cm.

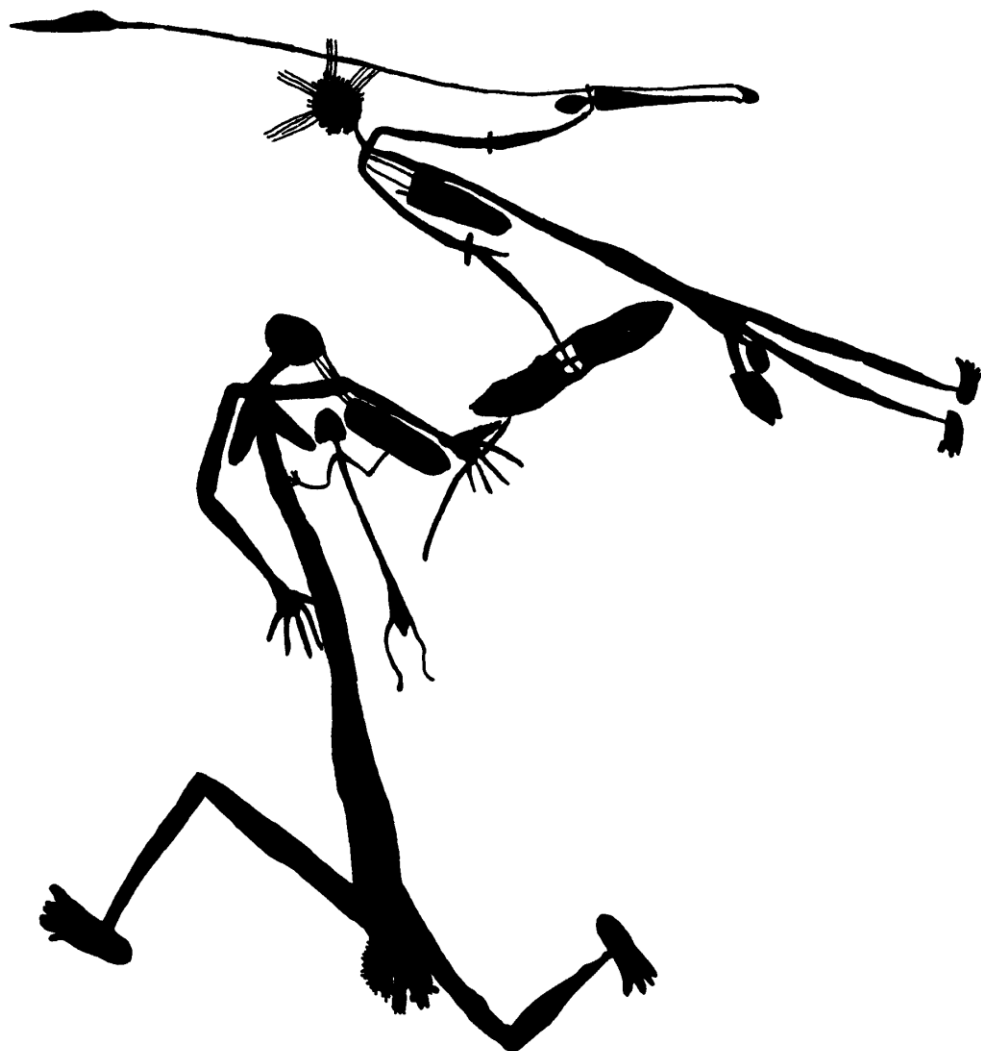


FIGURE 226.

Long Spearthrower Period.

Baroalba Creek.

Human figures: a man, woman and child (see Plate 36). The man carries a dillybag, a long spearthrower, a spear with a stone or iron blade, and a shield. Shields were not made in Arnhem land at European contact and their rarity in the art suggests that they were not made there in the more distant past. The few examples seen in the art (eg Figure 172) probably represent chance acquisitions from other areas.

Bright red.

Length of male figure: 132 cm.

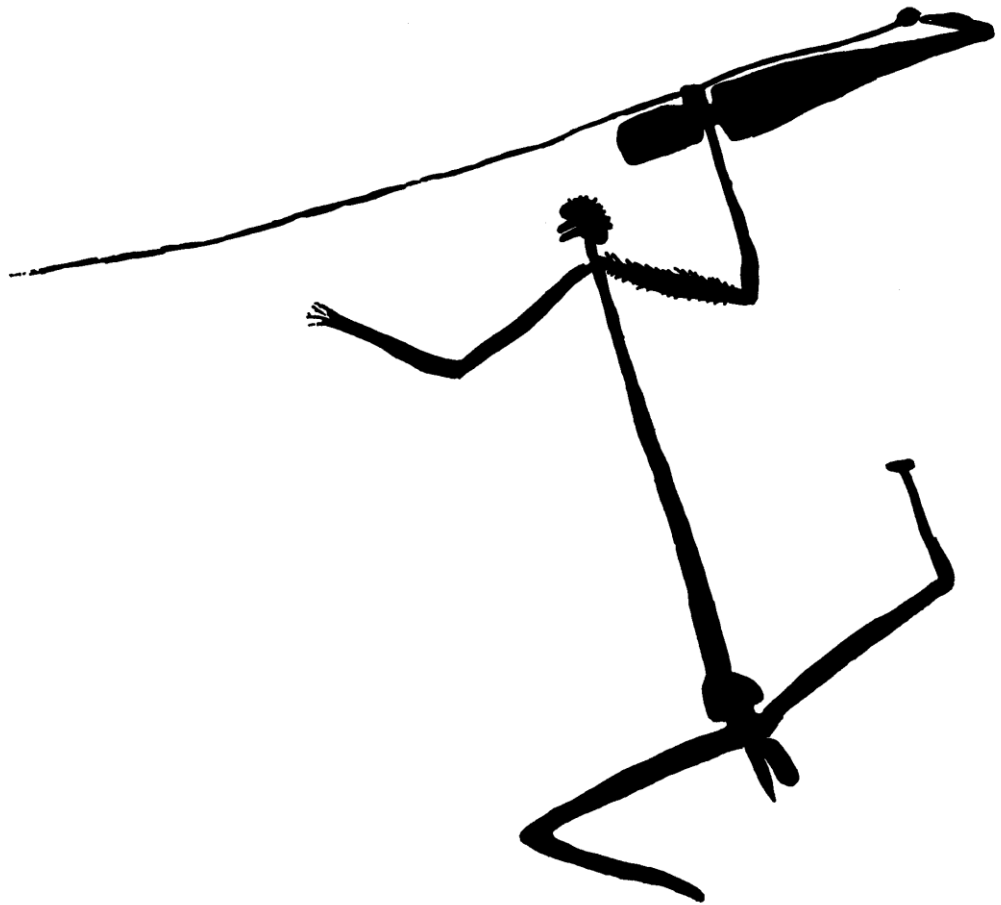


FIGURE 227.

Long Spearthrower Period.

Ubirr (Obiri Rock).

A male figure with arm decoration, spearthrower and spear. Note the distinctly notched handle on the spearthrower and the beeswax or resin reinforcing at the butt of the spear. Bright red although faded.

Height: about 70 cm.



FIGURE 228.
 Long Spearthrower Period.
 Magela Creek.
 Two human figures with weapons.
 Yellow silhouettes. The figure on the left has outline and internal details in red.
 Figure at left: about 100 cm.



FIGURE 229.
 Long Spearthrower Period.
 Ngarradj Warde Djobkeng.
 An anthropomorphic figure with a multi-pronged spear and a spearthrower.
 Dark red.
 Length: about 90 cm.

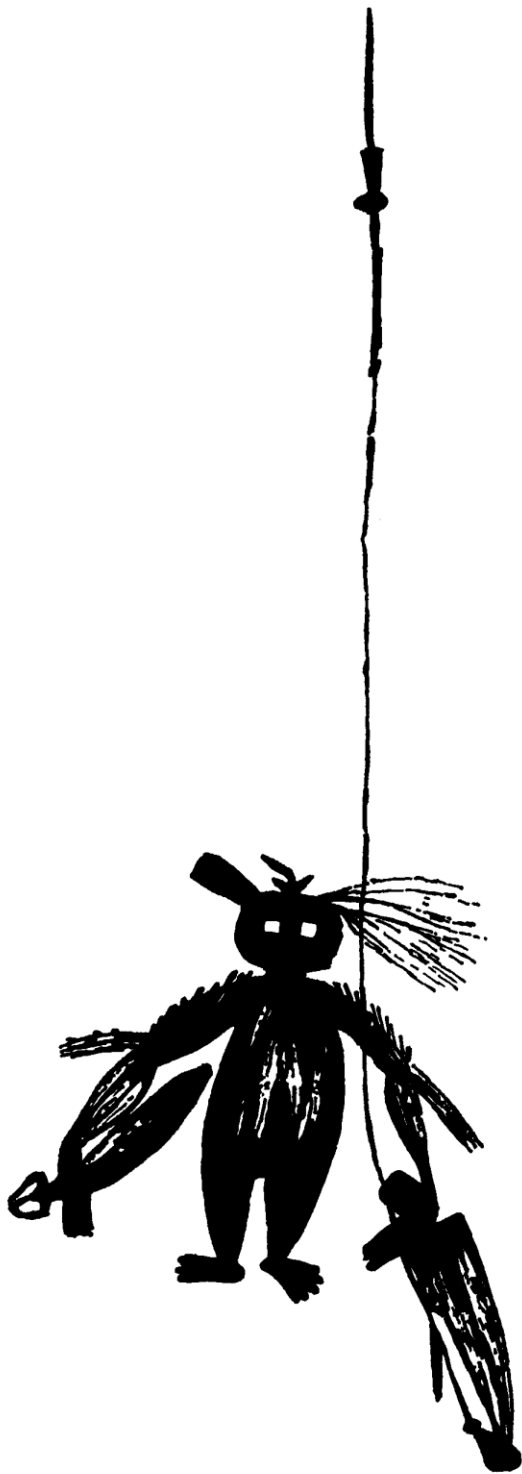


Figure 230.

Long Spearthrower Period.
Cannon Hill.

An anthropomorphic figure with head and arm decoration, a spearthrower and spear. The spear has a hafted plain wooden or bone point. The spearthrower has a distinct notch for the handle.

Dark yellow.

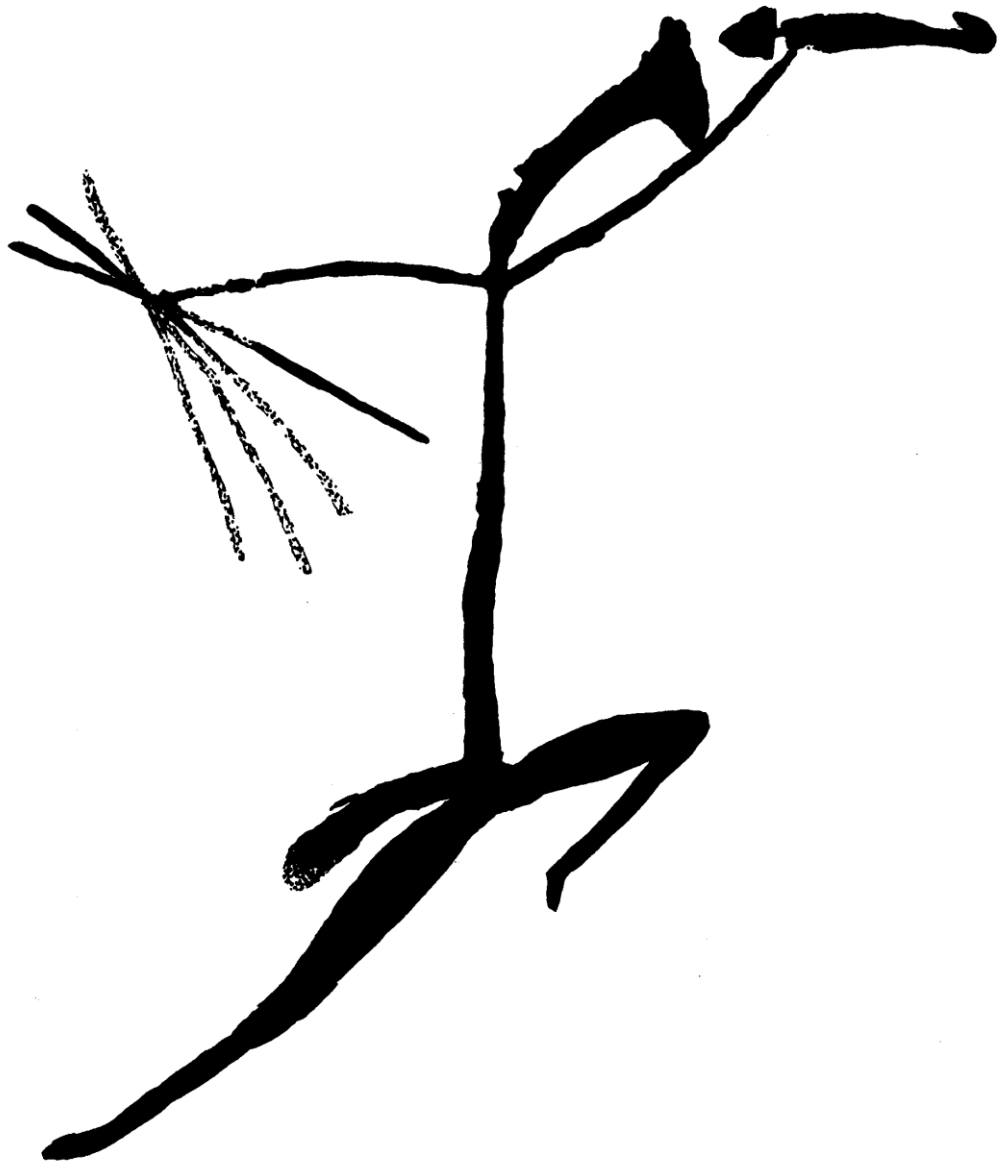


FIGURE 231.

Long Spearthrower Period.

Upper East Alligator River.

A human figure with spearthrower and 'crossed sticks', possibly throwing sticks.

Faded red.

Maximum dimension: about 60 cm.



FIGURE 232.

Long Spearthrower Period.

Nabarlek area.

An anthropomorphic being. The feet of the figure appear to be clawed, and it has spines protruding from its thighs, elbow joint, head and mouth. It appears to have only one arm. A single arm, and spines and barbs inserted into sensitive or vulnerable parts of the body in this manner, are indications of sorcery (Brandl 1973: 186, and figures 168, 177-82). Suspended from the shoulders are a fan, and three 'sacred bags' (see 4:7). A pendant hangs from the elbow. The figure carries a notched lath spearthrower with a multi-pronged, multi-barbed spear set for launching.

Red.

Maximum dimension: about 115 cm.

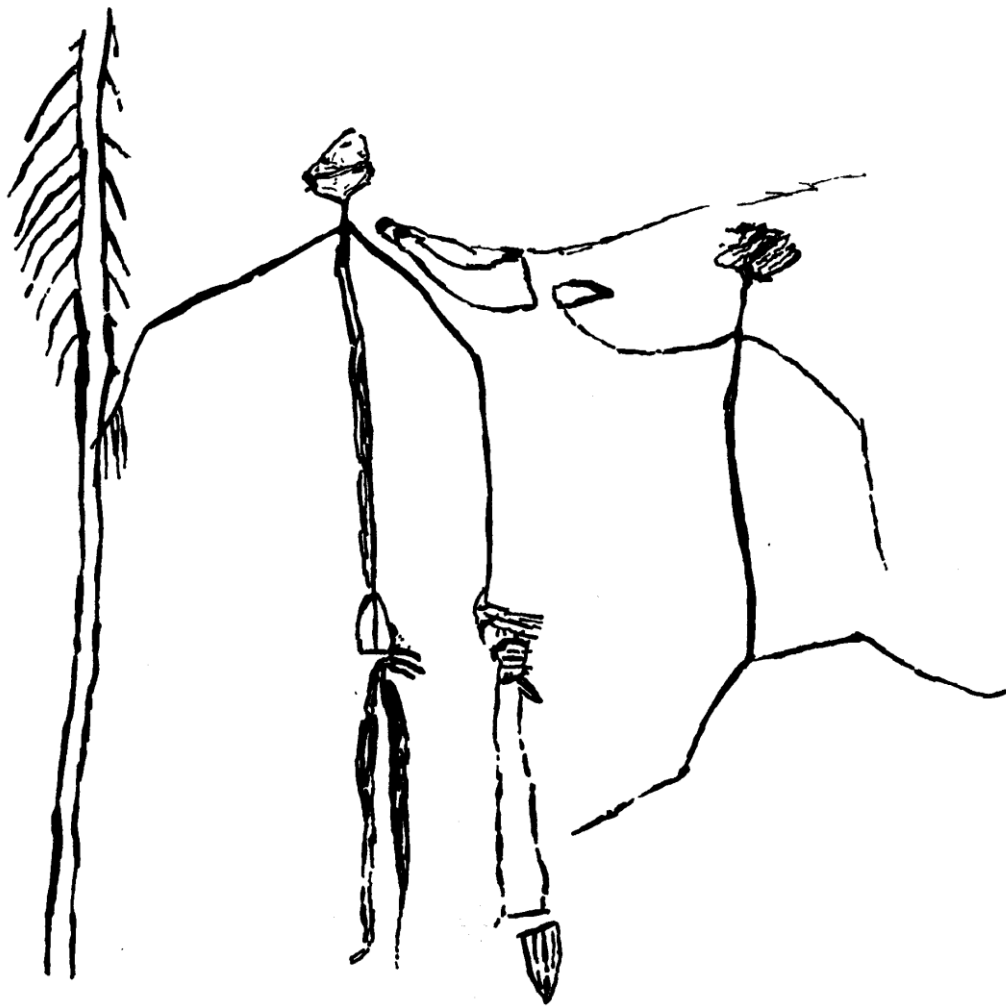


FIGURE 233.

Long Spearthrower Period.

East of Djawumbu-Madjawarnja massif.

Two human figures with spearthrowers and spears. Each spearthrower has a gap between the main body of the thrower and the butt end. It is possible that in the original painting these sections were connected with another colour that has not survived on the rock face.

Faded dull red.

Spears: about 50 cm.

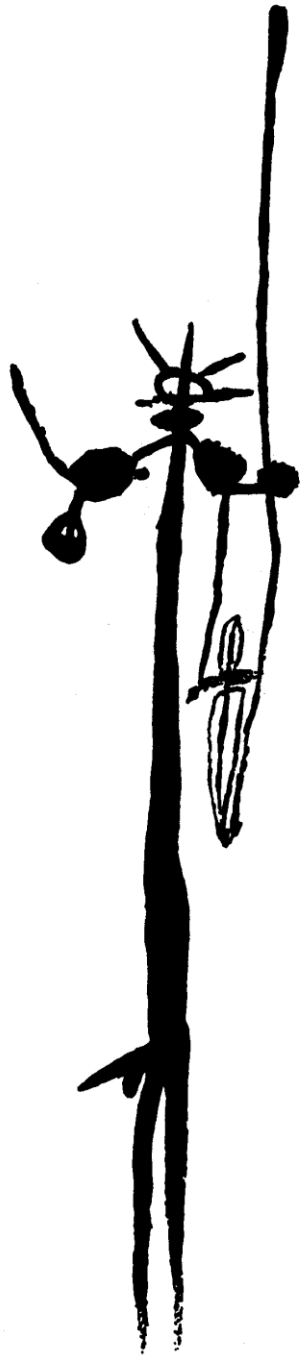


FIGURE 234.

Long Spearthrower Period.
Cannon Hill.

A human figure with spearthrower and spear shaft. Note the depiction of eyes by dividing the circular head with a vertical line. This type of face is often seen in recent art styles.

Red.

Height: about 70 cm. (estimate).



FIGURE 235.

Long Spearthrower Period.
Nabarlek area.

Male and female human beings. The figure with weapons carries a multi-pronged unbarbed spear, a multi-pronged multi-barbed spear, a spearthrower, and three knobbed throwing clubs. Note the incipient X-ray features – the space inside the body – on two of the figures. Red.



FIGURE 236.

Long Spearthrower Period.

South of East Alligator River crossing.

Human figures and weapons. A woman with dillybags suspended from her head appears to be striking a man with a club. The male has a spear through his chest. The spearthrower and spears on the left belong to another figure that has been covered by other paintings. Note the lanceolate blade.

Red. The same shade of pigment has been used for each figure.

Figure at left, head to right foot: 16 cm.

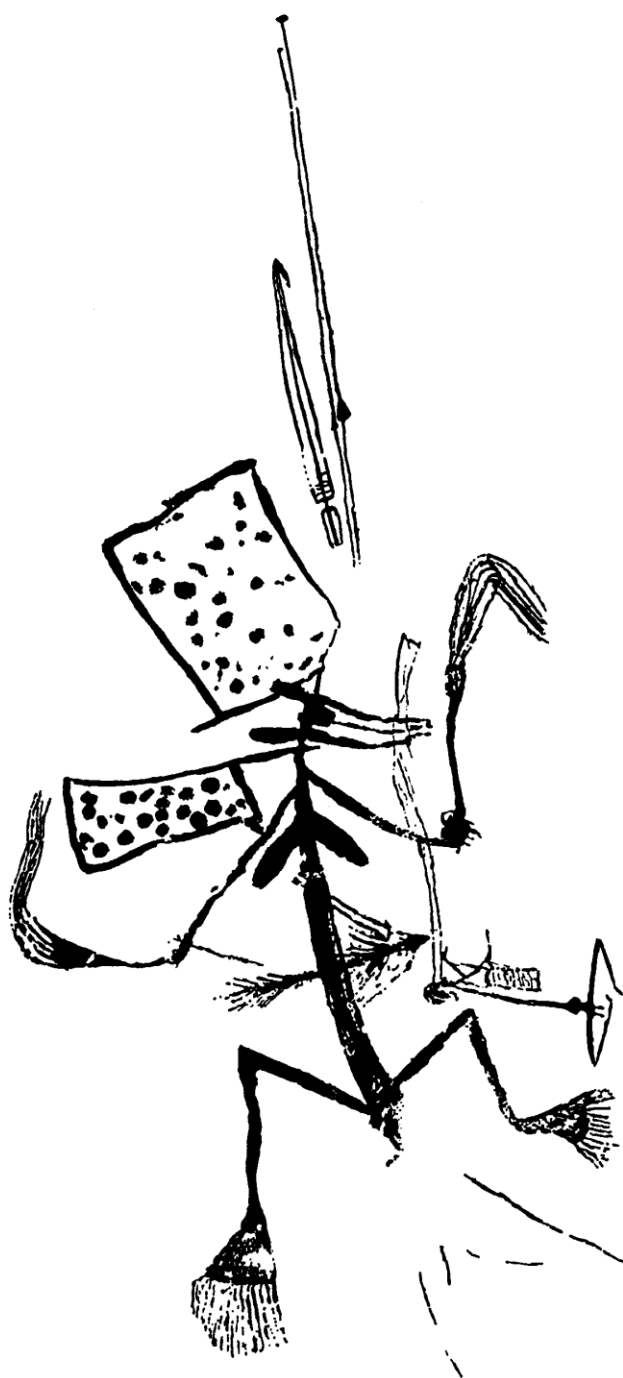


FIGURE 237.

Long Spearthrower Period.

East Alligator River crossing area.

An animal-headed being with dillybags and weapons, and a human figure playing a didgeridoo. The distorted and enlarged hands and feet of the animal-headed being, and the barbs through its body, are features associated with sorcery. This panel is actually horizontal on the rock face.

Dark red.

Spears: about 40 cm.

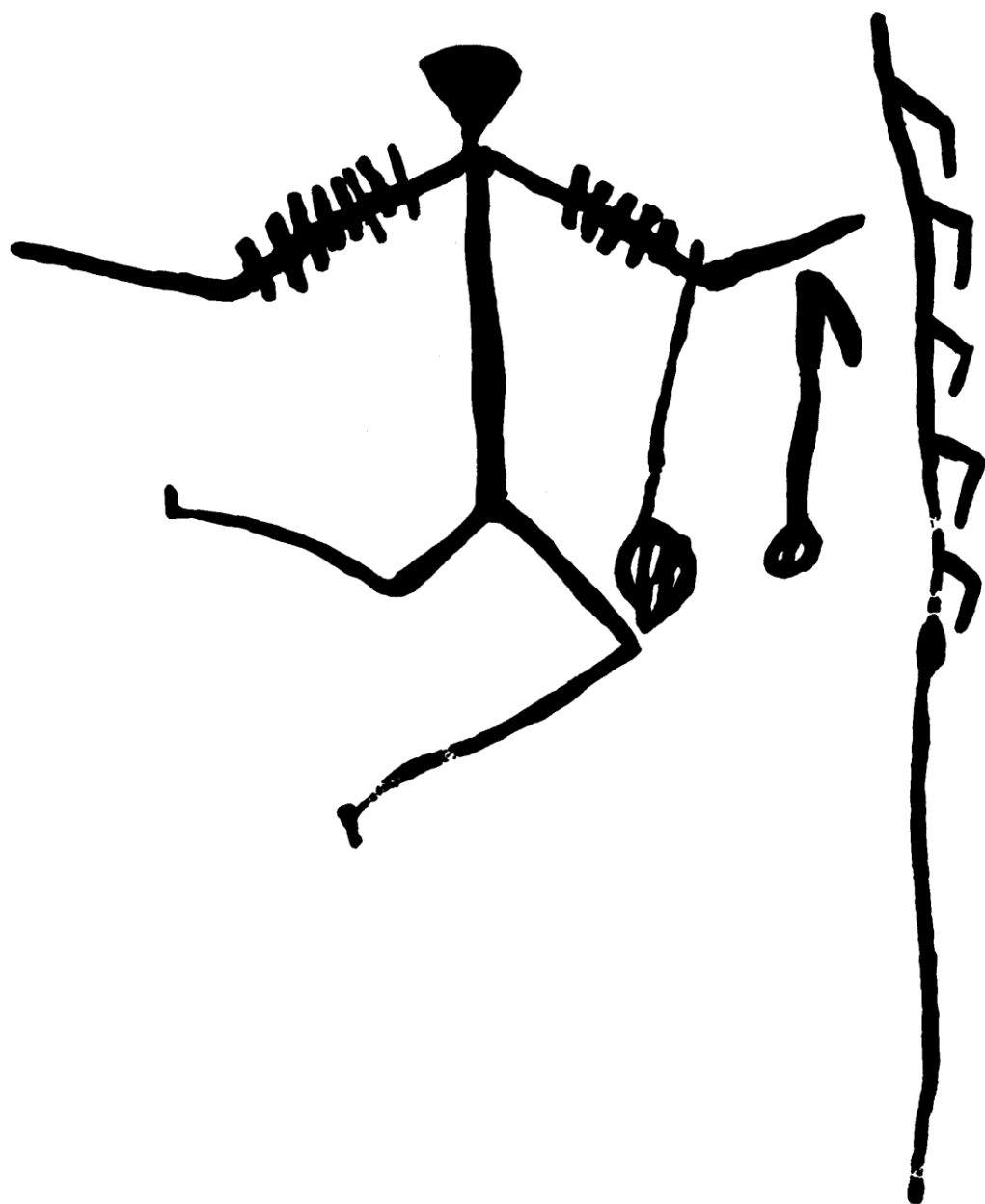


FIGURE 238.

Long Spearthrower Period.

Mt. Brockman Massif.

A human figure with arm decoration, elbow pendant, stick-like spearthrower and spear.

Stick-like spearthrowers occur throughout the period of spearthrower use. I have assigned this painting to the Long Spearthrower Period largely because of its very fresh appearance.

Bright yellow.

Length of spear: about 70 cm.

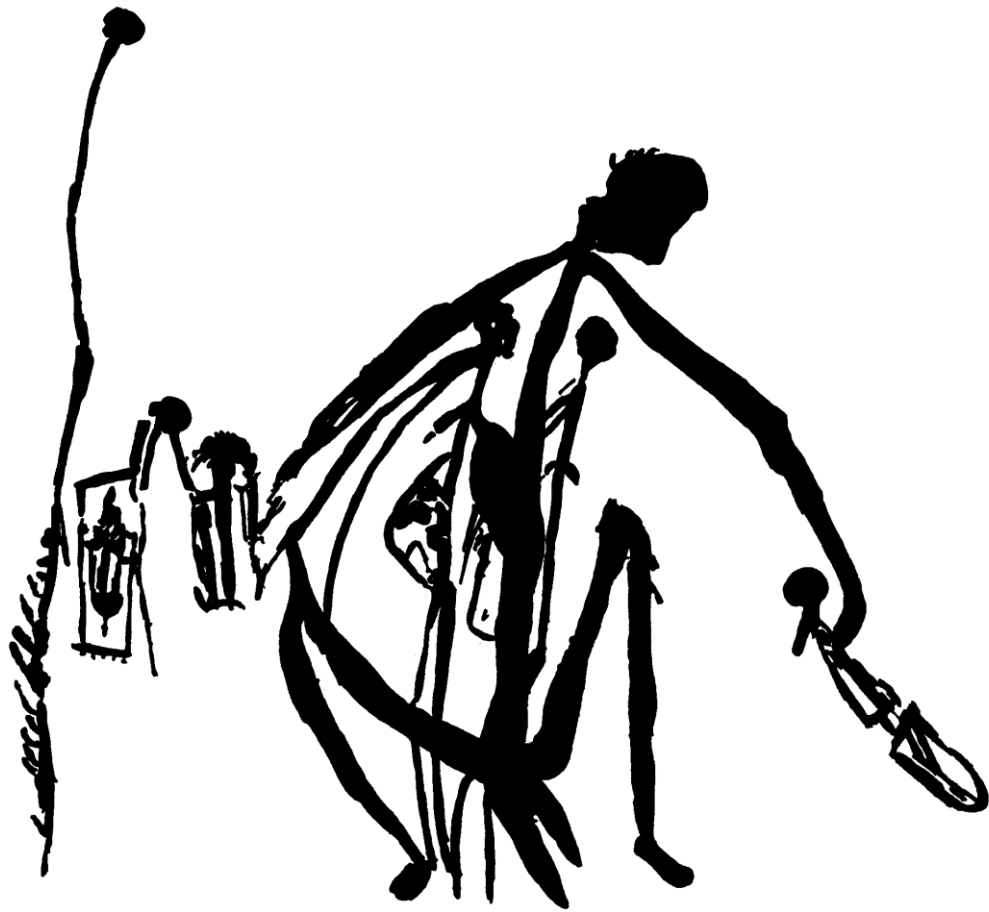


FIGURE 239.

Long Spearthrower Period.

South of East Alligator River crossing.

A 'family' scene (Brandl 1973: 174 and plates 95 and 96). A large male figure with dillybags, spearthrower and spear, has his arms encircling two females, one of whom appears to be pregnant.

Bright yellow.

Maximum height of male figure 21.5 cm.



FIGURE 240.

Long Spearthrower Period.
Ubirr (Obiri Rock).

A human figure with spears and a stick-like spearthrower. The figure also has a dillybag, pubic cover, fan, elbow pendants, and anklets (see Edwards 1979: 27 plate 10, for a colour reproduction of this painting). Stylistic features and the material culture items portrayed indicate that this painting belongs to the Long Spearthrower Period rather than the earlier Broad Spearthrower Period.

Red.

Height: about 120 cm.

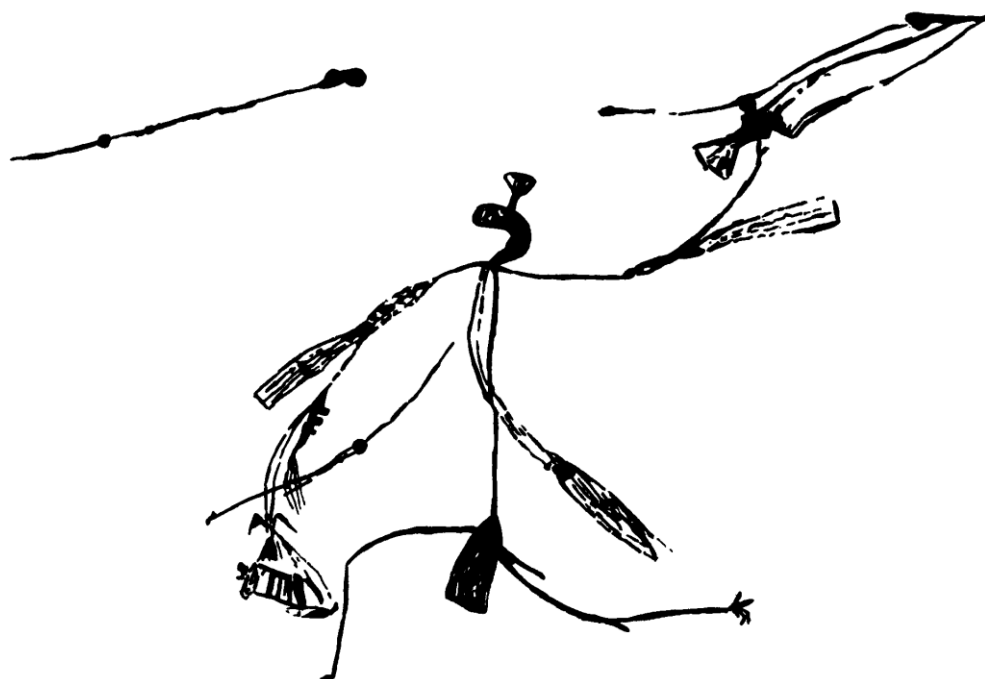


FIGURE 241.

Long Spearthrower Period.

South of East Alligator River Crossing.

A human figure painted in a style restricted to the area between Oenpelli and the Djawumbu-Madjawarnja massif (see also Figures 242-253, and Plates 37, 38, cf Plate 41).

The figure wears a sacred bag suspended from the neck, elbow and head ornaments, a pubic cover, and carries a spearthrower, spears, and a goosewing fan. The spears appear to be 'goose' spears. Large polychrome versions of this type of figure indicate that these small red figures are contemporary with fully developed X-ray art.

Red.

Hind foot to top of head ornament: 37 cm.



FIGURE 242.

Long Spearthrower Period.

Djawumbu-Madjawarnja massif.

Male and female human figures with weapons and dillybags. All the spears have large triangular hafted blades that probably represent the large 'leilira' stone blades in common use throughout Arnhem Land at European contact (see 7:4). The line along the long axis of these blades probably indicates the ridge formed where two facets of the stone blade meet. Note the extensive arm decoration on the largest figure.

Red.

Spears at left: about 50 cm.

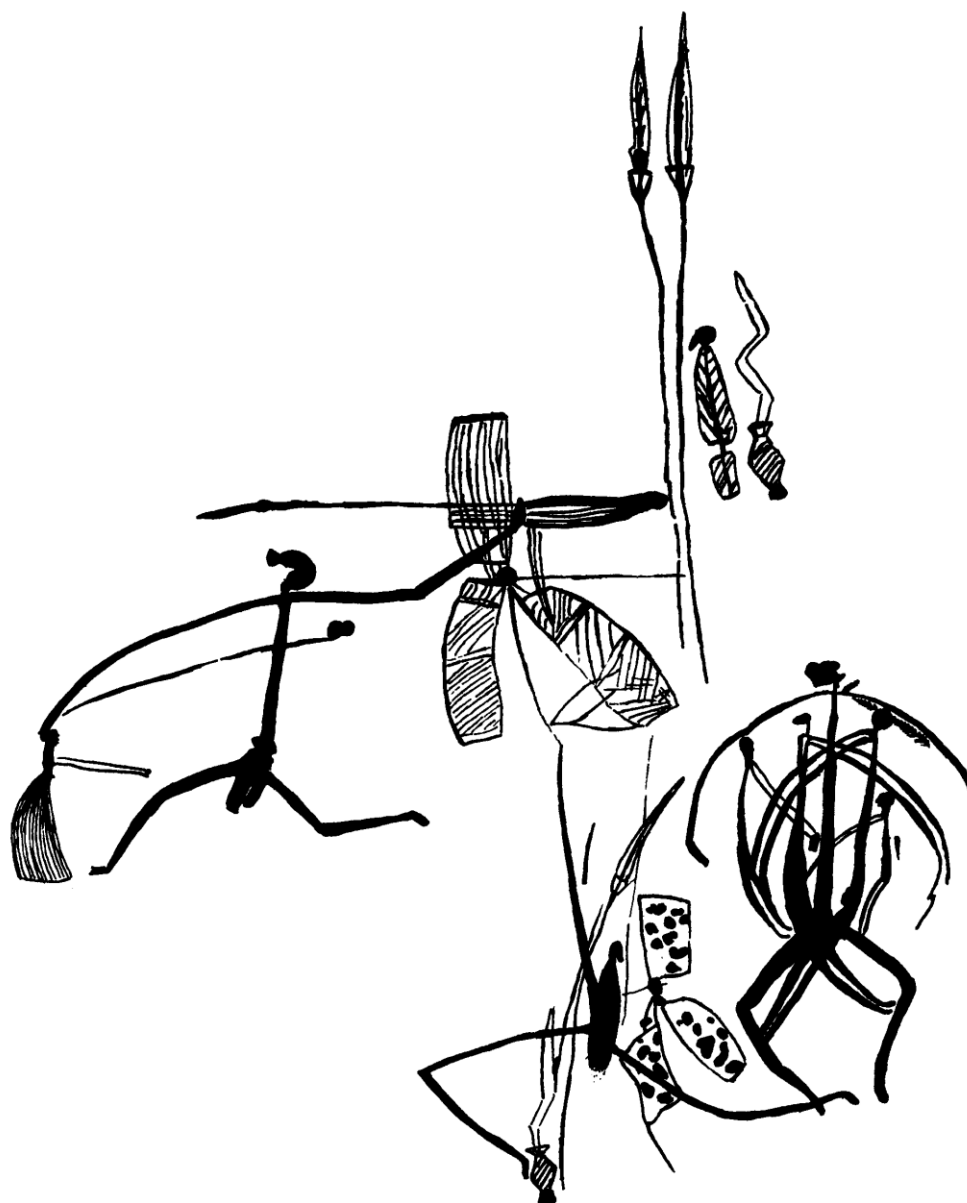


FIGURE 243.

Long Spearthrower Period.

East of Djawumbu-Madjawarnja massif.

Human figures, weapons, and other material culture items (see Plate 38). In the centre of the panel and to the left of the 'family', there appears to be groups of three dillybags joined together. At the top right there are stone-bladed spears, a spearthrower, and a sacred bag. Chaloupka (1984: 48 figure 24 b) has identified this sacred bag as a Macassan kris. However, comparison of this item with the bags suspended from the necks of males in Figures 224, 232, and 243 leaves little doubt that the object in question is a sacred bag and not a kris. A similar artefact is located at the bottom of the panel.

Red.

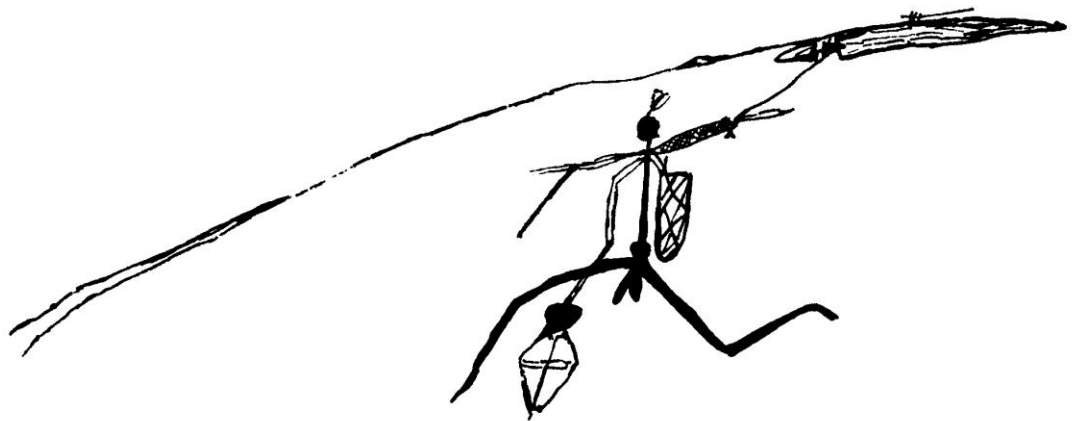


FIGURE 244.

Long Spearthrower Period.

Ngarradj Warde Djobkeng.

A human figure with dillybag, sacred bag, head and elbow ornaments, spearthrower and spear.

Red.

Spear: about 110 cm.

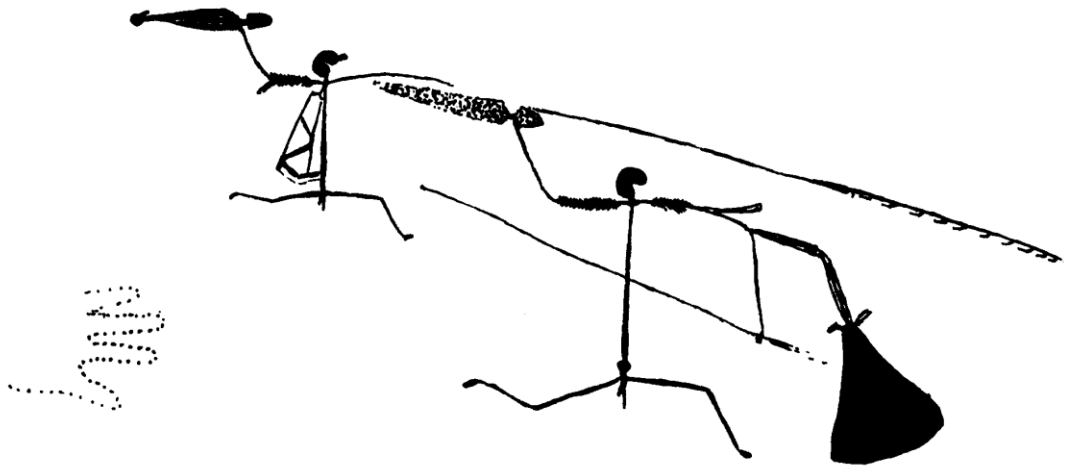


FIGURE 245.

Long Spearthrower Period.

Ngarradj Warde Djobkeng.

A hand stencil and two human figures. The figure on the left has a dillybag, arm decoration and spearthrower. The right hand figure has a spearthrower and spear, arm decoration, elbow pendant, and fan.

All the motifs are white.

Maximum dimension: about 110 cm.



FIGURE 246.

Long Spearthrower Period.

South of East Alligator River Crossing.

A human figure in the Oenpelli regional style of long spearthrower figures. The figure carries a goosewing fan and spears in one hand, and a spearthrower and lanceolate-bladed spear in the other. It also has a dillybag suspended from the neck, a pubic cover, elbow and head ornaments. Red.

Spear tip to hind foot: 61.5 cm.



FIGURE 247.
Long Spearthrower Period.
Djawumbu-Madjawarnja Massif.
A human figure painted in the Oenpelli regional style of long spearthrower figures.
Orange-red.
Height of figure, head to foot: 30 cm.

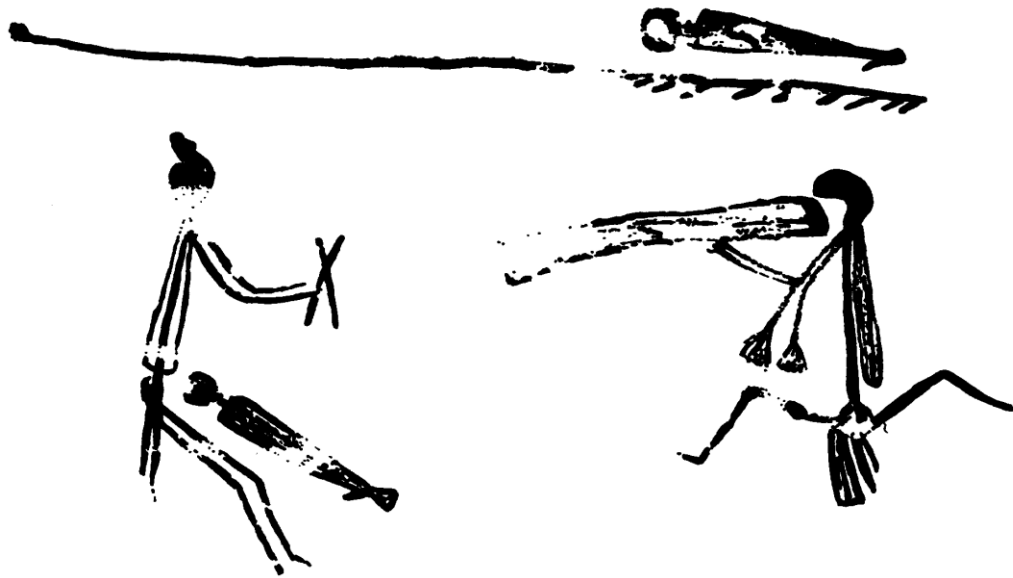


FIGURE 248.

Long Spearthrower Period.

South of East Alligator River crossing.

A human figure with clap sticks and spearthrower, and, at the right, a figure playing the didgeridoo. Both figures resemble the Oenpelli regional style of long spearthrower figures.

Red.

Spear: 56 cm.

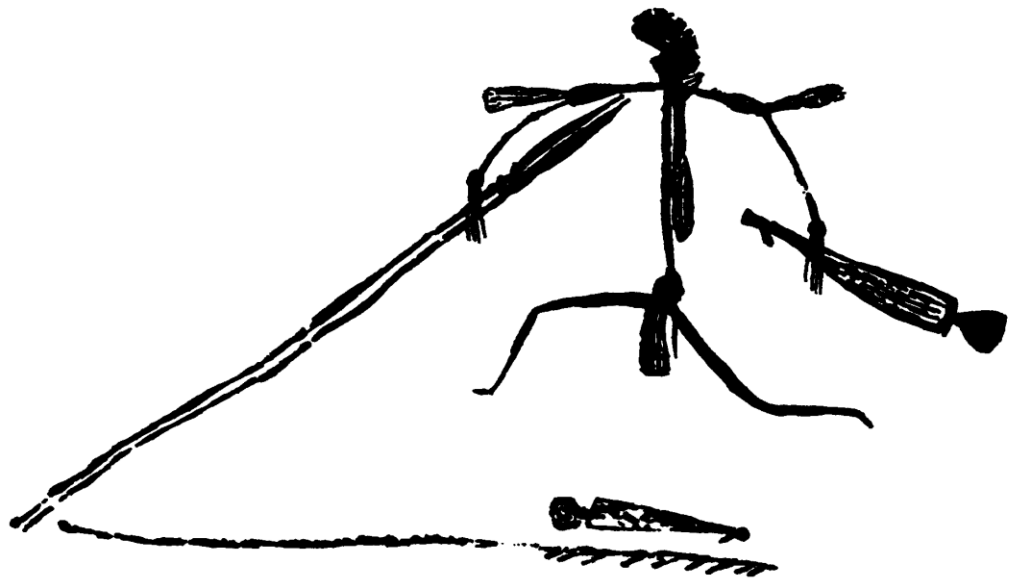


FIGURE 249.

Long Spearthrower Period.

South of East Alligator River crossing.

A human figure in the Oenpelli regional style of long spearthrower figures. Note the lanceolate blades on the spears carried by the figure.

Red.

Lower spear: 56 cm.

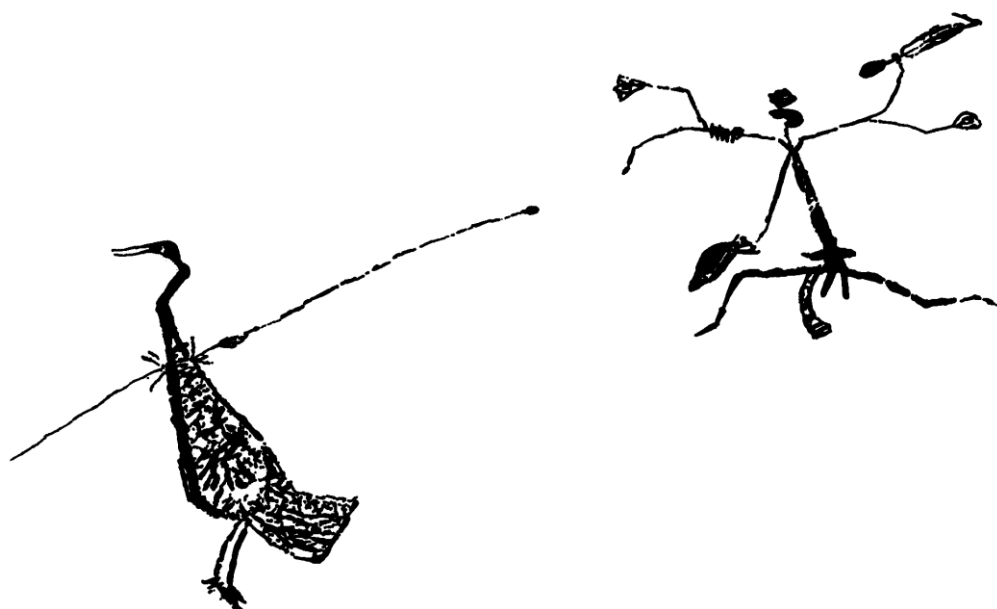


FIGURE 250.

Long Spearthrower Period.

Ngarradj Warde Djobkeng.

A hunter spearing a bird. The human figure is painted in the Oenpelli regional style of long spearthrower figures.

Dark red.

Bird: about 25 cm.

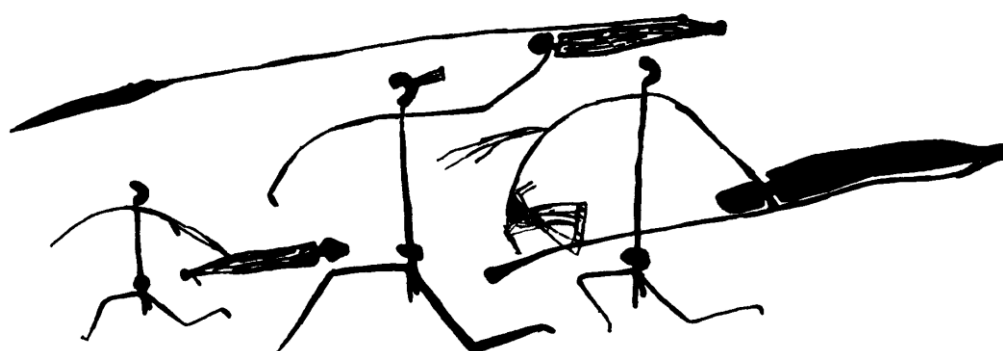


FIGURE 251.

Long Spearthrower Period.

Ngarradj Warde Djobkeng.

Three human beings painted in the Oenpelli regional style of long spearthrower figures.

Red.

Maximum dimension: about 90 cm.

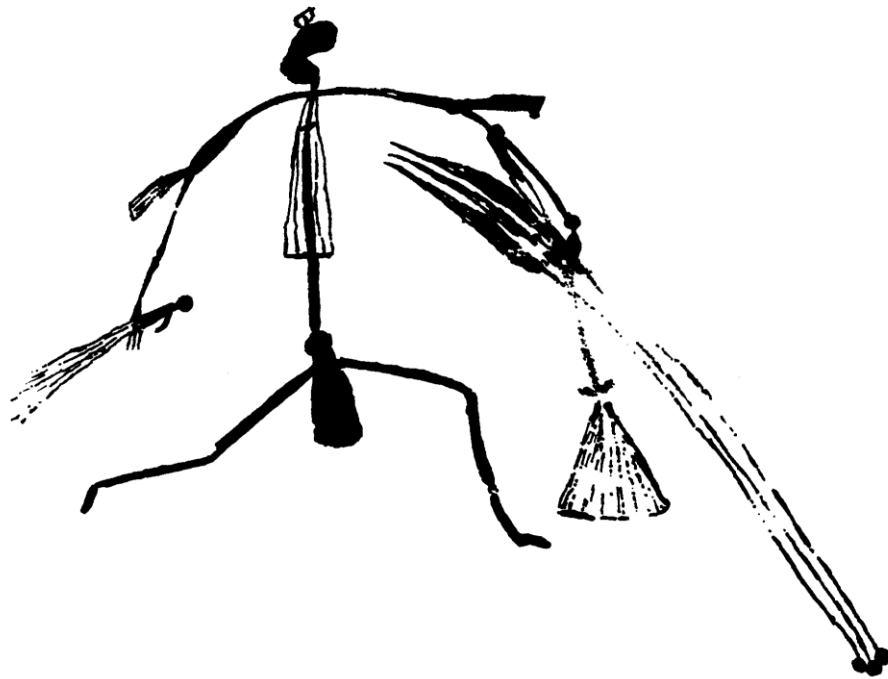


FIGURE 252.

Long Spearthrower Period.

South of East Alligator River crossing.

A human being in the Oenpelli regional style of long spearthrower figures.

Red.

Spears: approximately 45 cm.

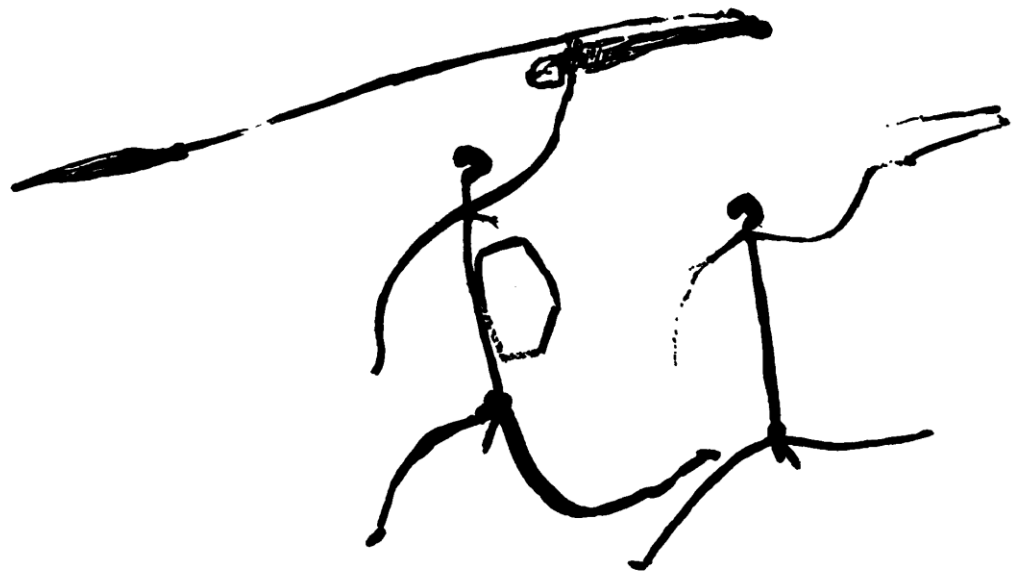


FIGURE 253.

Long Spearthrower Period.

Ngarradj Warde Djobkeng.

Two human beings in the Oenpelli regional style of long spearthrower figures.

Wheathered white.

Maximum width: 70 cm.

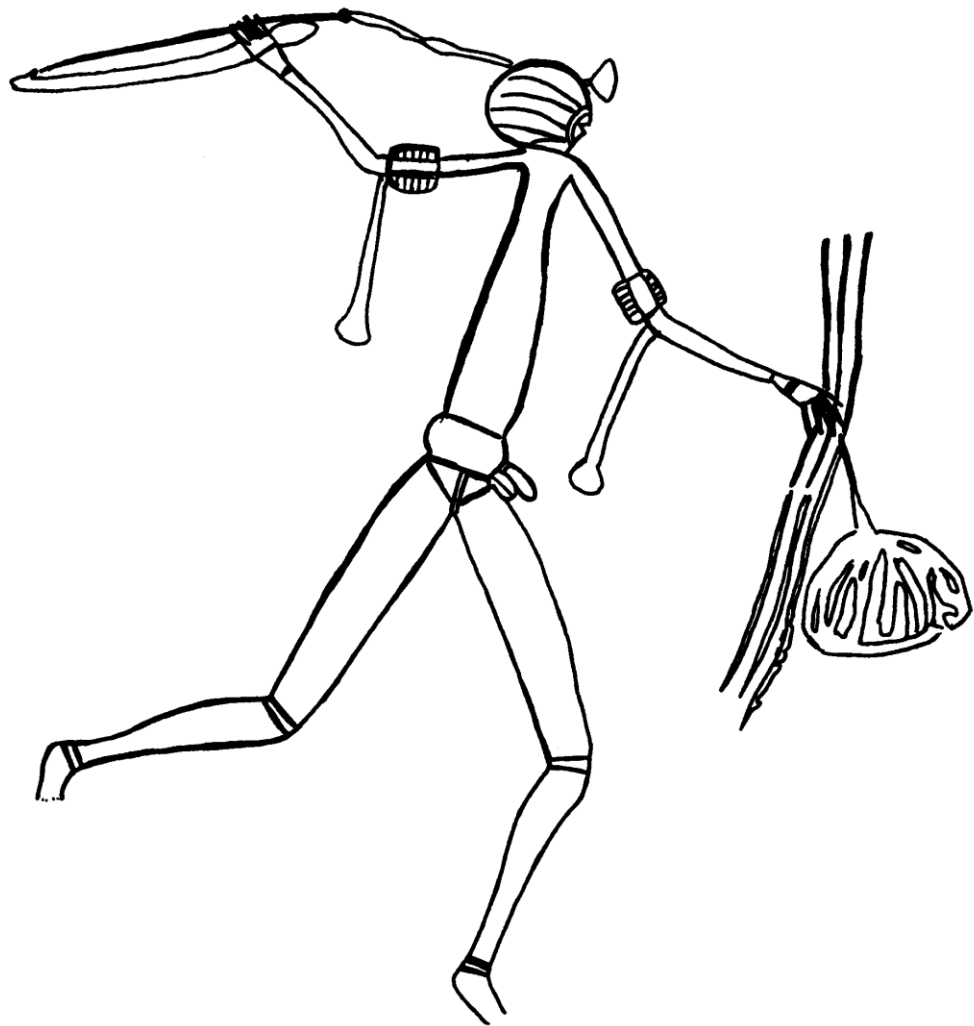


FIGURE 254.

Long Spearthrower Period.

Northern end of Mt. Brockman Massif.

A large bichrome human figure contemporary with fully developed X-ray art. The figure wears arm and head decorations, elbow tassels, and carries a long spearthrower, 'goose' spears, and a goosewing fan.

Red lines on a yellow base. The pigments used are coarse-grained and form a layer on the surface of the rock.

Height: 145 cm.

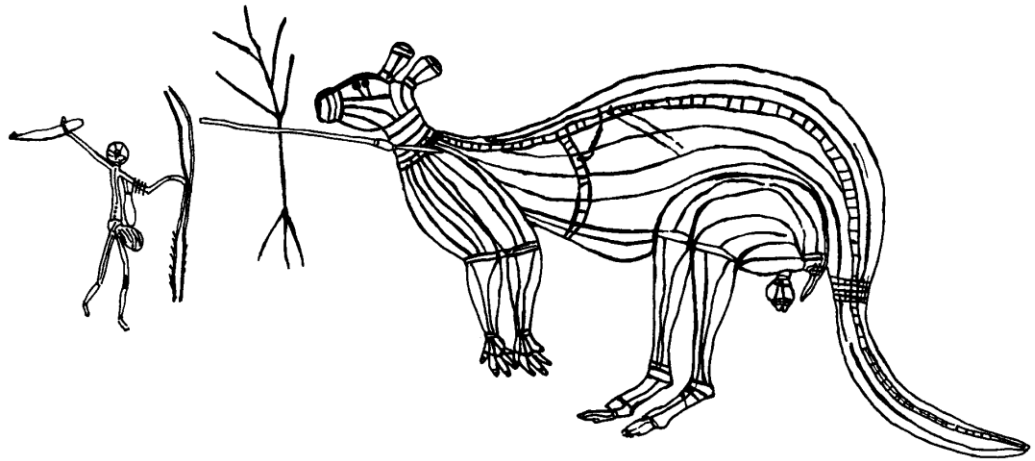


FIGURE 255.

Long Spearthrower Period.

Northern end of Mt. Brockman Massif.

From the same gallery as Figure 254, a bichrome painting of a human being spearing a kangaroo from behind a tree. The man carries a long spearthrower, two spears, and a dillybag. The kangaroo has its backbone and joints indicated (compare this scene with Plate 13). In common with much recent art, coarse-grained pigments have been used. These do not bond with the rock face, but form a surface layer which is subject to rapid weathering.

Red lines on a yellow base.

Maximum dimension: about 250 cm.

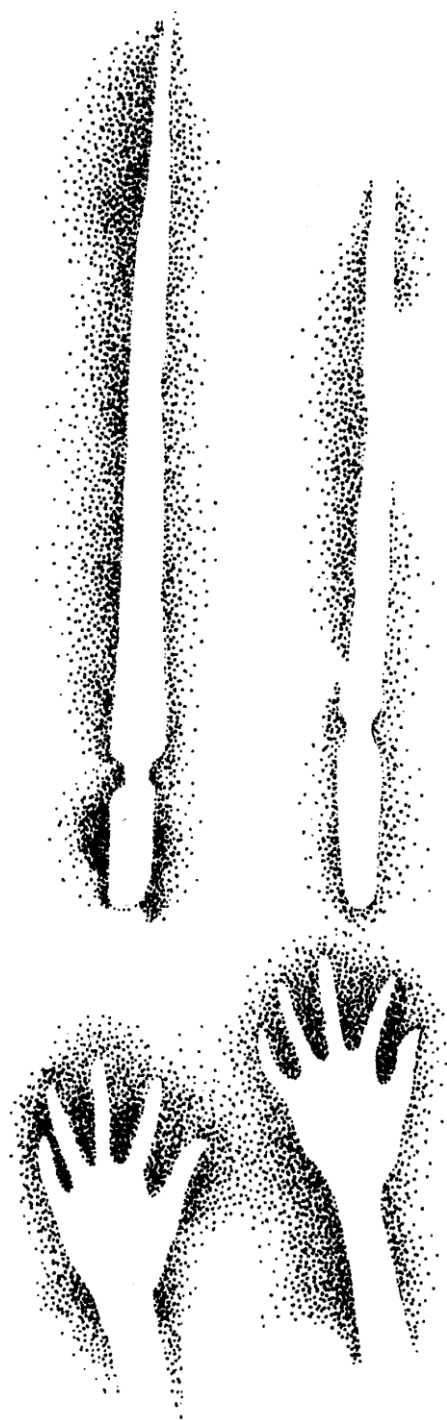


FIGURE 256.

Long Speargunner Period.

Magela Creek.

Stencils of hands and of long (notched lath) spearguns. These are the only stencils of spearguns yet reported from Arnhem Land.

White.

Longest speargunner: about 100 cm.

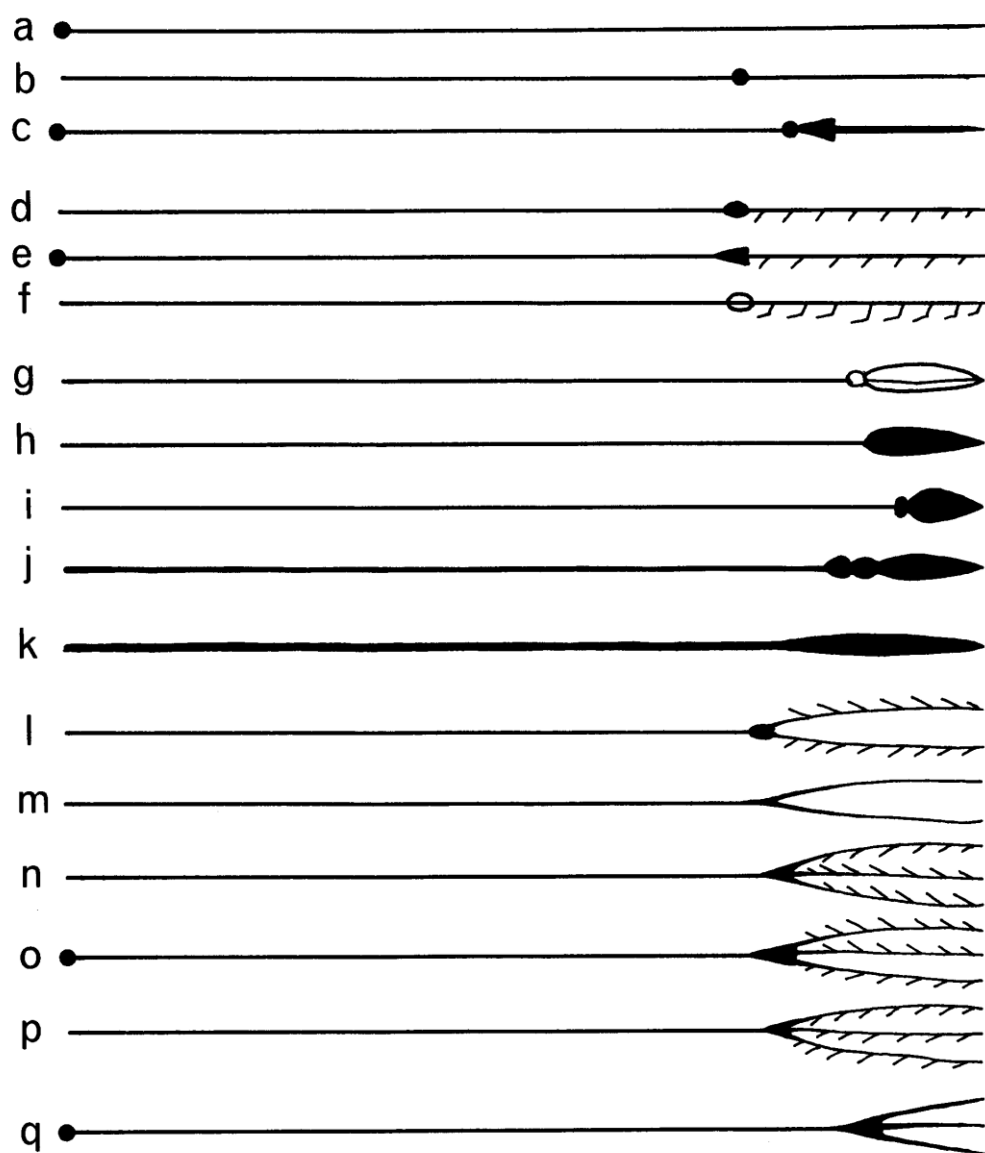


FIGURE 257.
Spears associated with long spearthrower figures.

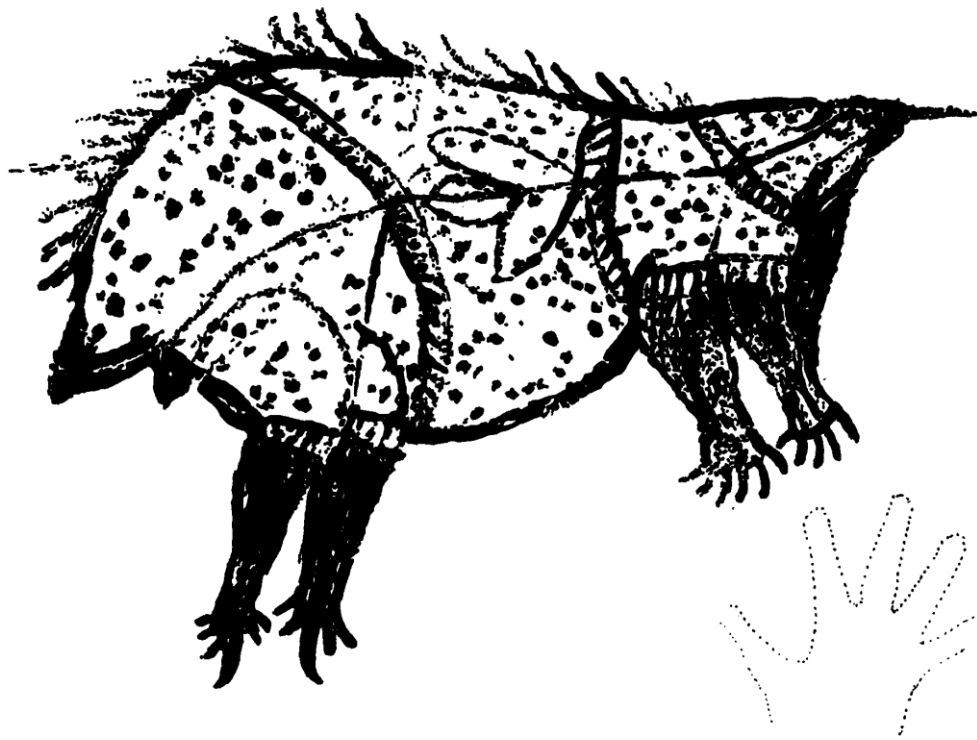


FIGURE 258.

Broad Spearthrower Period.

Nabarlek area.

A hand stencil, and an echidna with simple X-ray features. This echidna is transitional between early styles where the surface of the subject was emphasised, and later styles where internal features dominated the thoughts of the artists. The quills of the animal are still indicated as dots within the body and as short strokes along the back line.

Internal features and other features not normally seen include the heart and lungs, a line from head to anus representing the alimentary canal, and bands across the body and limbs that represent joints in the animal's body (Brandl 1973: 168, 176-77, cf figure 112).

Dark brown with yellowish-brown in the hind legs and rump area.

Length: about 68 cm.

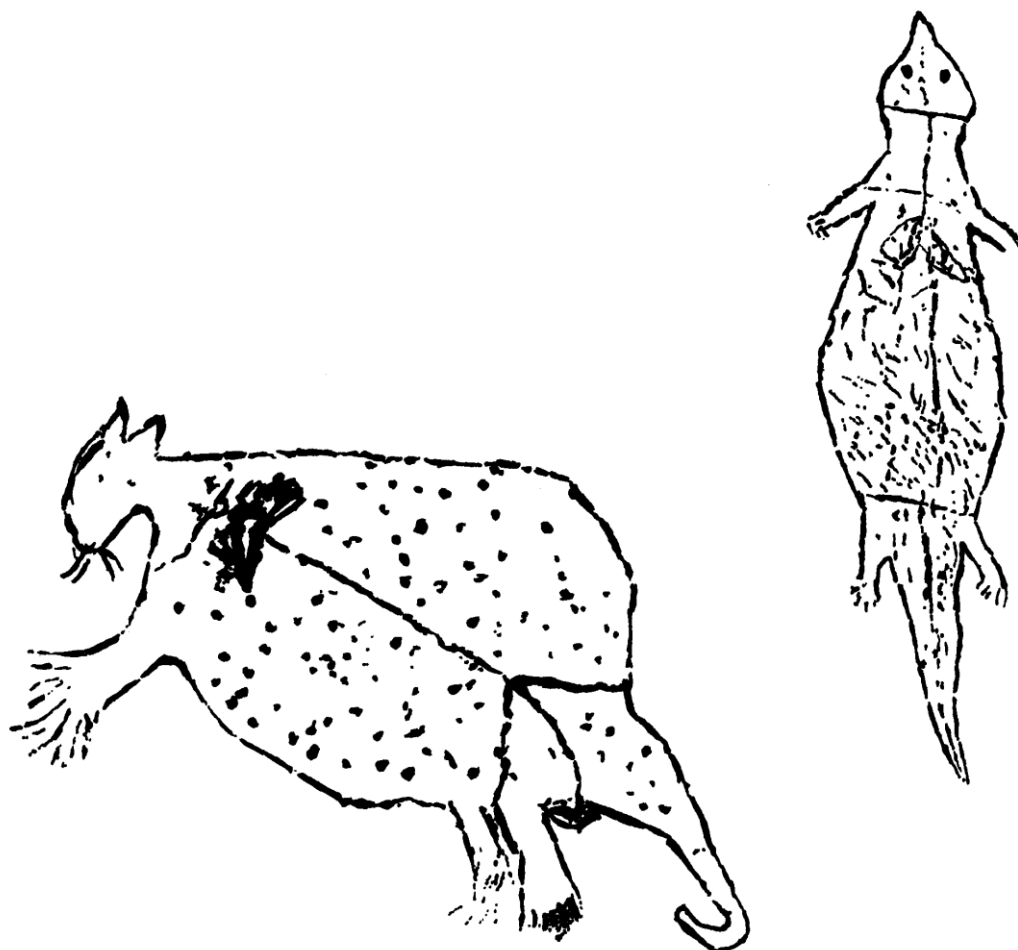


FIGURE 259.

Broad Spearthrower Period.

North of Djawumbu-Madjawarnja massif.

A possum and a (bluetongue ?) lizard. Both animals have surface features as well as simple X-ray features indicated. They are examples the transition between Mimi art and X-ray art.

The possum is red, lizard dark red-brown.

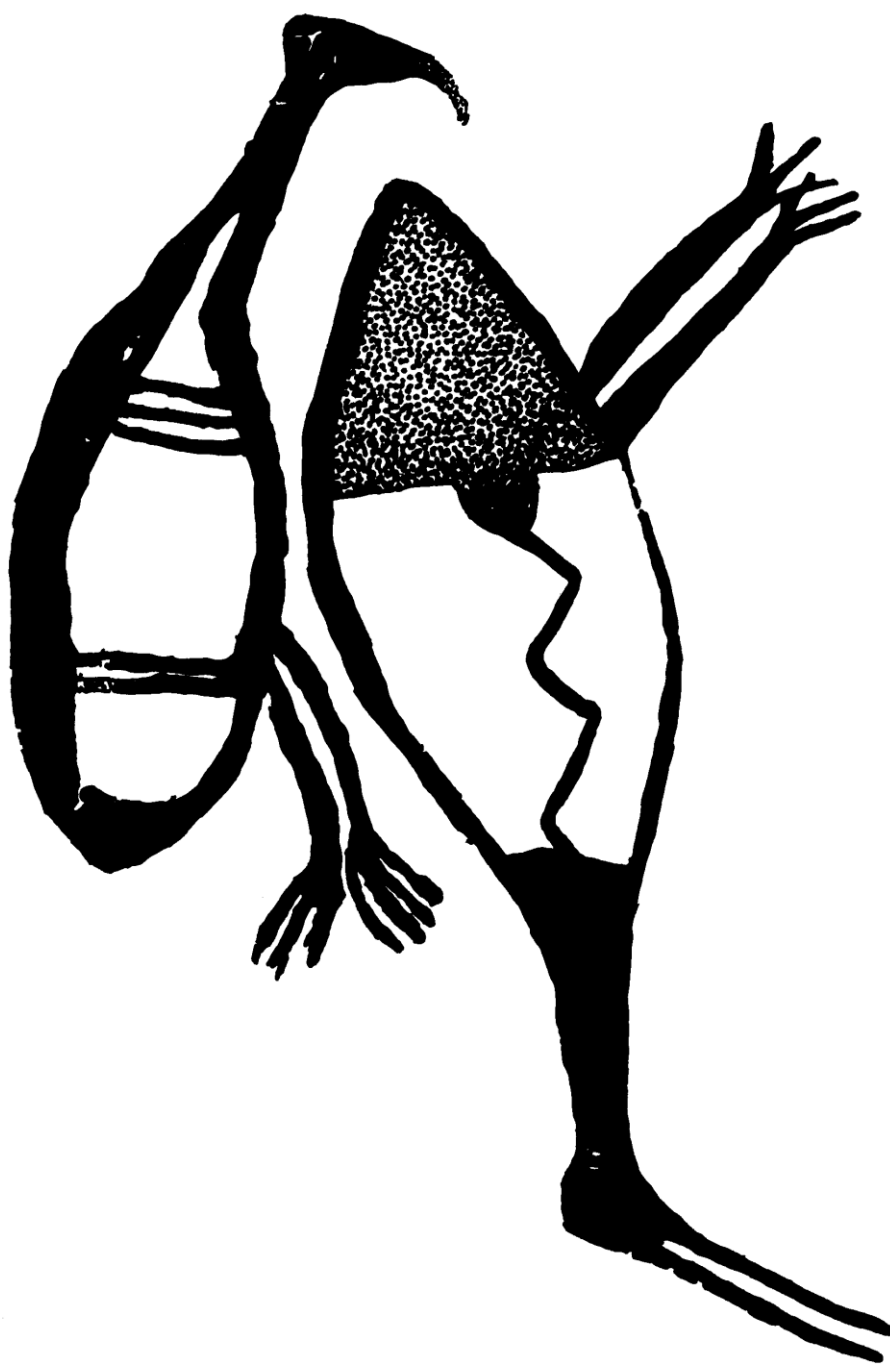


FIGURE 260.

Broad Spearthrower Period.

Ubirr (Obiri Rock).

An ibis and another bird, both with simple X-ray features.

Red.

The paintings are on a ceiling beyond reach for measurements.

The ibis is approximately 100 cm. long.



FIGURE 261.

Long Spearthrower Period.

East Alligator River Crossing area.

A group of fish, several of which are depicted emitting bubbles.

All are monochrome red except the largest which has remnants of white cross-hatching over the red base.

Largest fish: 19 cm.

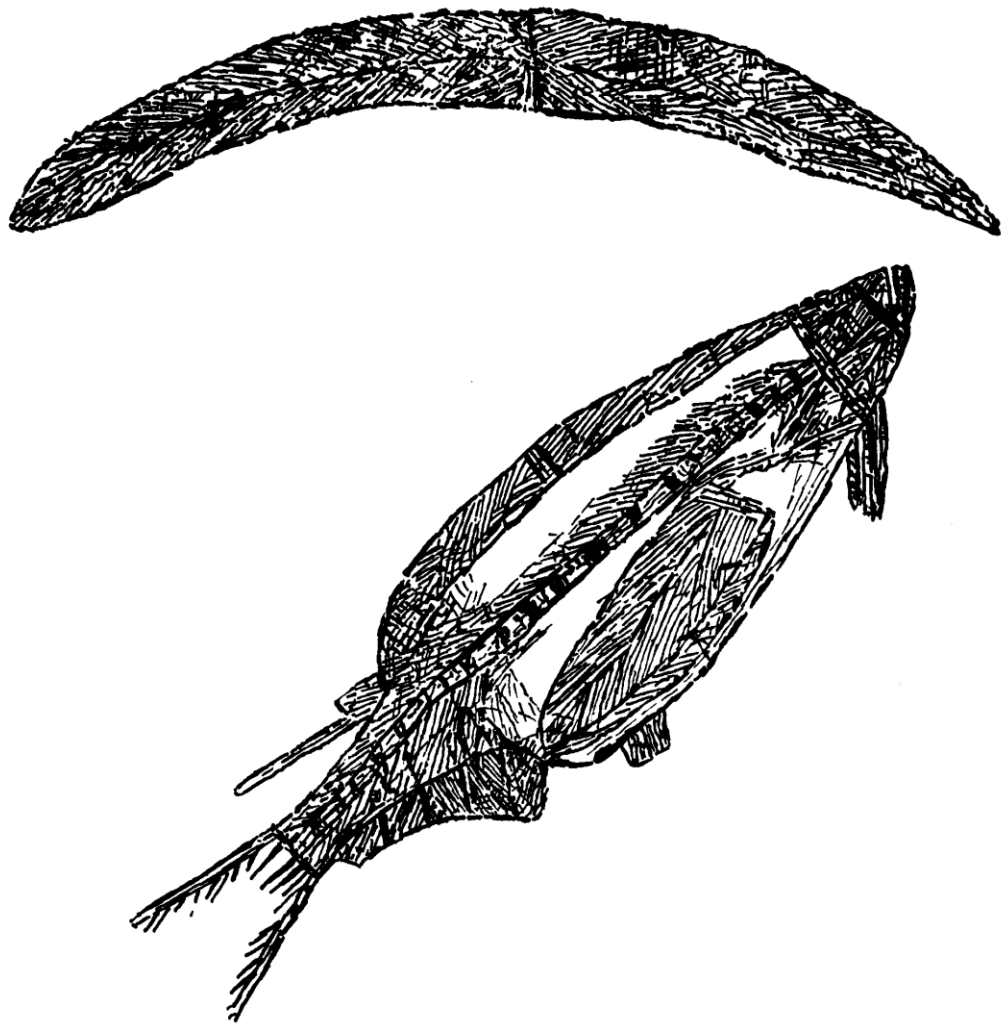


FIGURE 262.

Long Spearthrower Period.

Ngarradj Warde Djobkeng.

A fish and an unidentified boomerang-like object. The fish has its backbone and internal organs portrayed and clearly belongs to the period of fully developed X-ray art, that is, the Long Spearthrower Period.

The fish has dark red lines on a dirty yellow base. The boomerang-like object has the same dark red lines on a white base.

Boomerang-like object: about 55 cm.

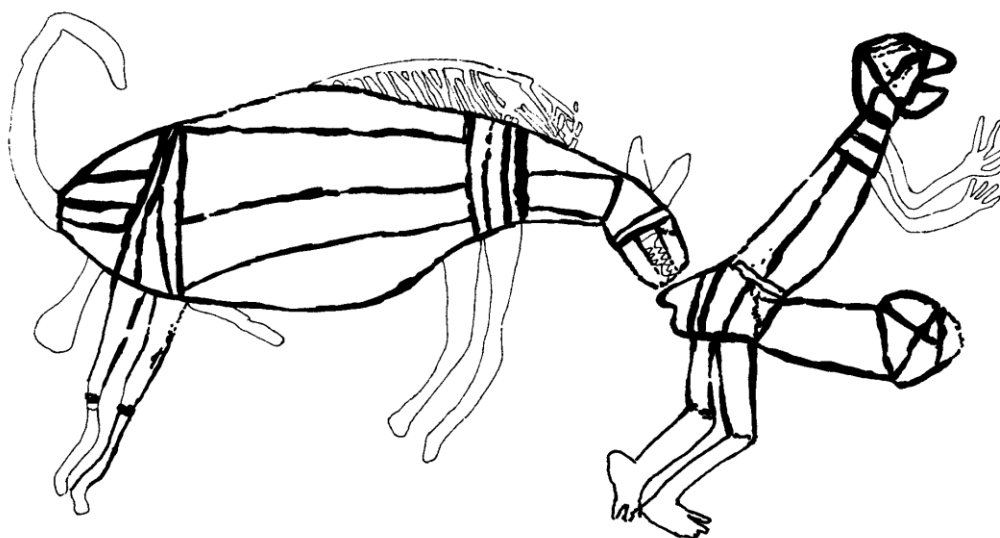


FIGURE 263.

Long Spearthrower Period.

Cannon Hill.

A dog or dingo biting a man on the buttocks. Paintings of dogs are rare in Arnhem Land rock art; this is one of the few I have recorded. Note the huge penis on the male figure.

The heavy black lines indicate where red lines overlaid the white base silhouettes of each painting.

Maximum dimension: about 100 cm.



FIGURE 264.

Long Spearthrower Period.

South of East Alligator River Crossing.

A human being with hafted stone axe.

Irregular stripes of orange-red, purplish-red, and white.

Height: 59 cm.



FIGURE 265.

Long Spearthrower Period.

East Alligator River Crossing area

Eight human figures in a canoe tied to a stake. Another figure squats near the stake.

Red, with beeswax pellets for the eyes.

Squatting figure: 23 cm.

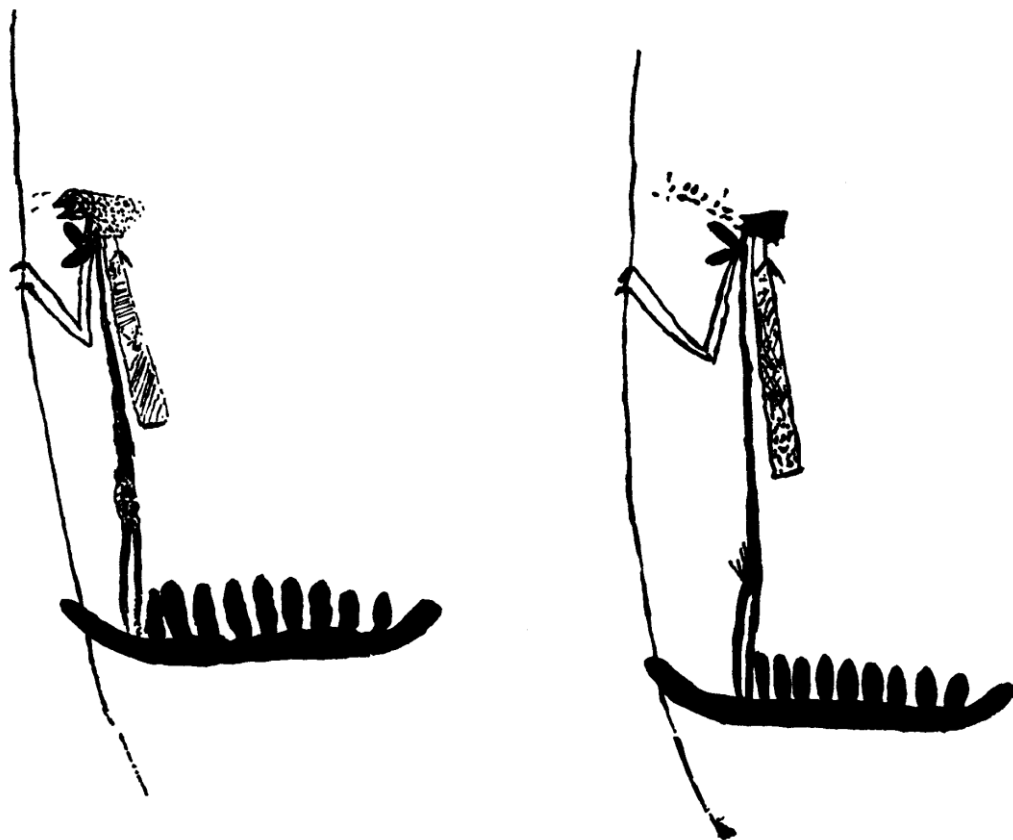


FIGURE 266.

Long Spearthrower Period.

Djawumbu-Madjawarnja massif.

Two women poling rafts loaded with waterfowl eggs (see Plate 42). Each woman has a dillybag suspended from her head. Note the dots in front of the mouth of the woman on the right. These paintings are located within a few kilometres of major wetlands on Magela Creek (see Plate 43).

White.

Pole at the left: about 70 cm.

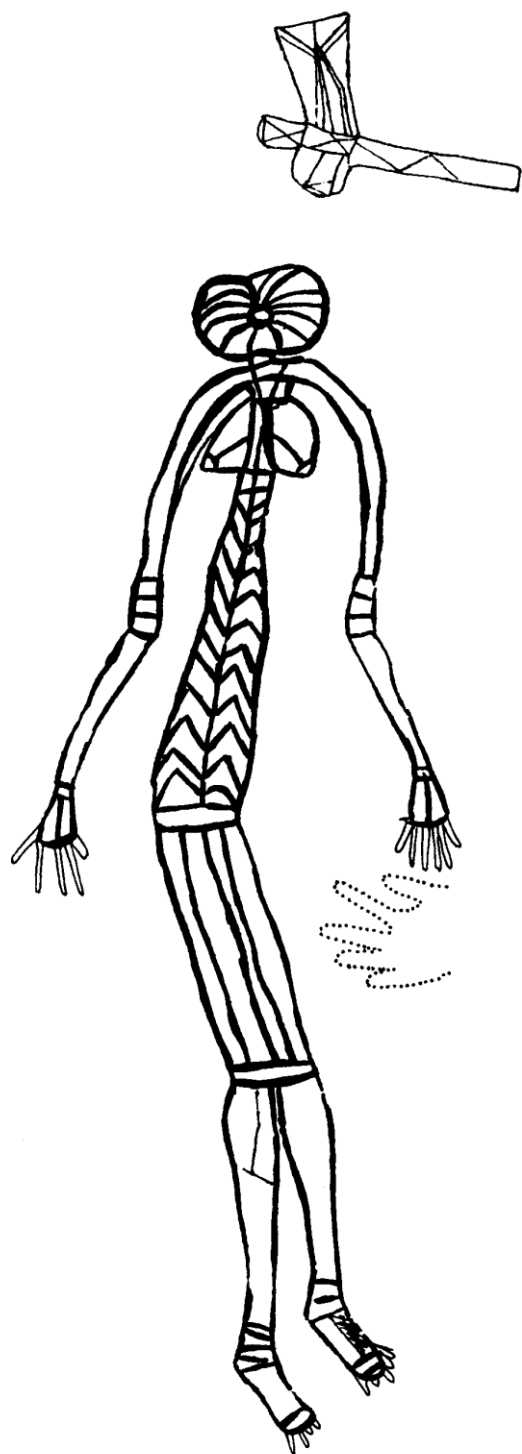


FIGURE 267.

Long Spearthrower Period.

Magela Creek.

A hand stencil, and paintings of an iron axe and a woman, contemporary with fully developed X-ray art.

Red lines on a white base.

Length of woman: about 142 cm.

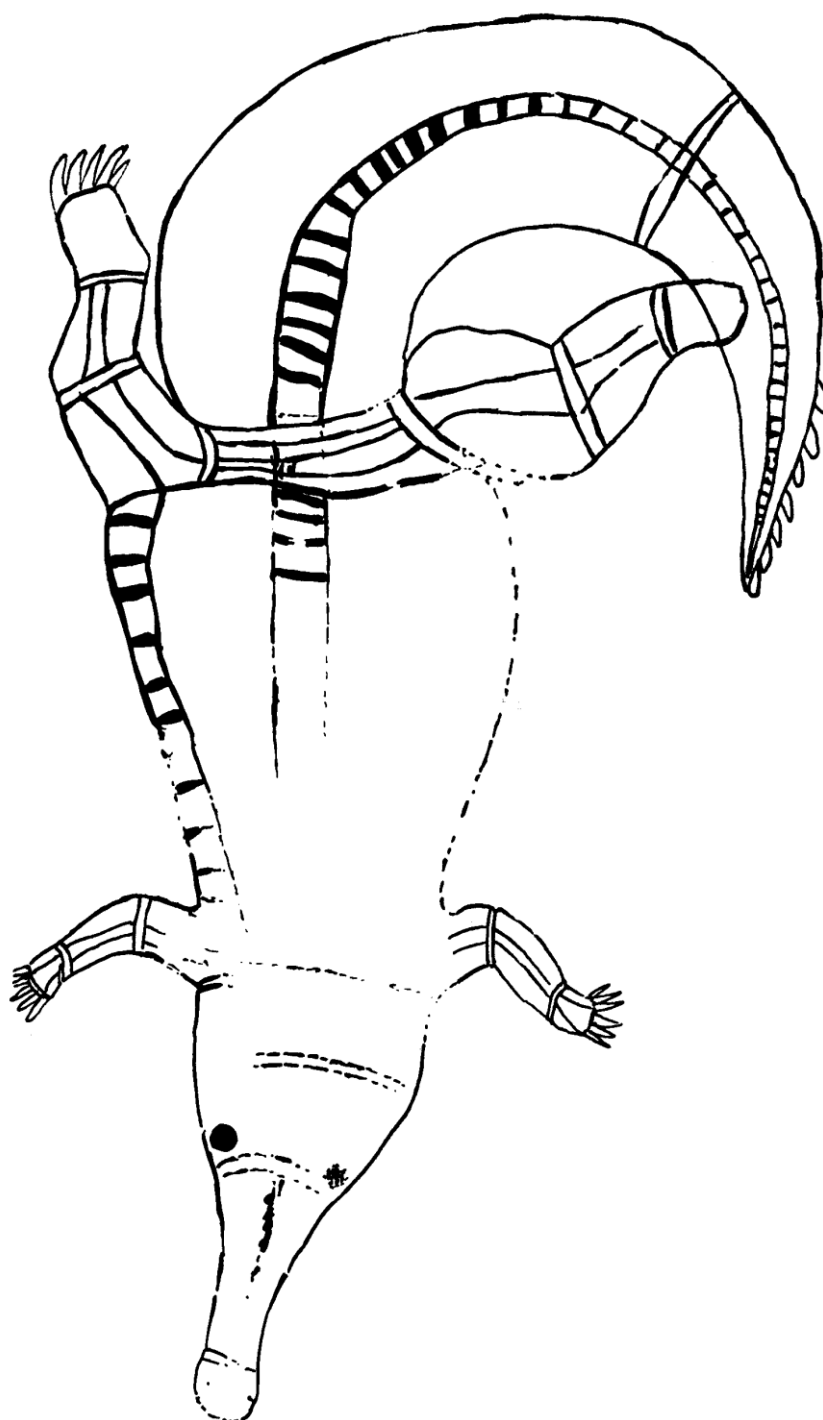


FIGURE 268.

Long Spearthrower Period.

Upper East Alligator River.

A crocodile in X-ray style.

Yellow base silhouette with purple outline and internal details.

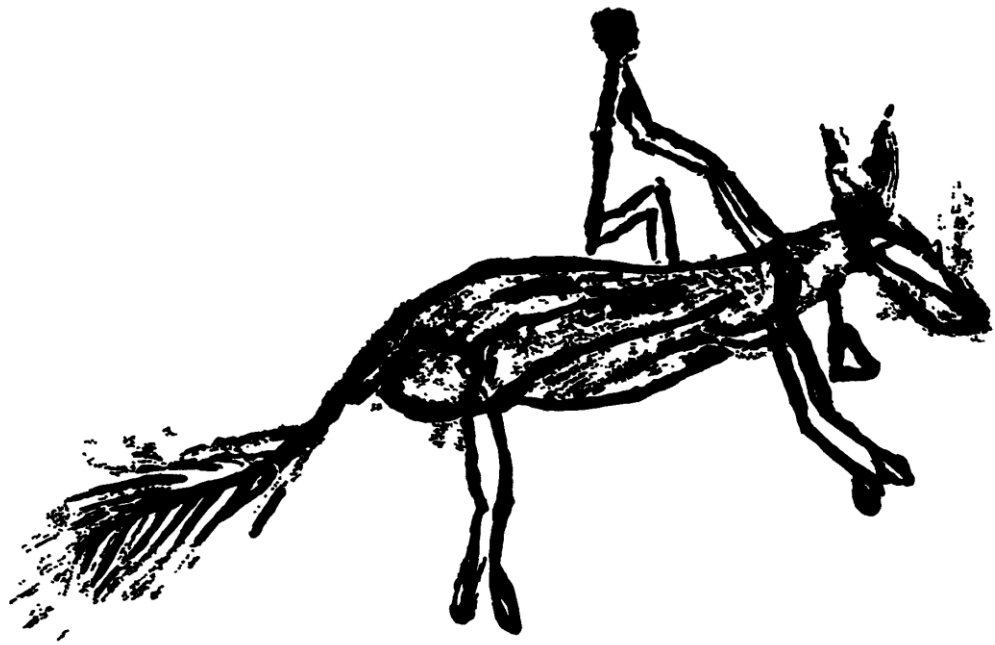


FIGURE 269.

Long Spearthrower Period.

East of Djawumbu-Madjawarnja massif.

Contact painting of a mounted horseman, one of eight similar figures (see Plate 37).

The site that contains these paintings was first recorded by Chaloupka (1979: 92-95) who labelled it the 'Packhorse Gallery'. In reality, none of the horses are depicted carrying packs. Note the bell on the horse's neck.

Red.

Length: about 35 cm.

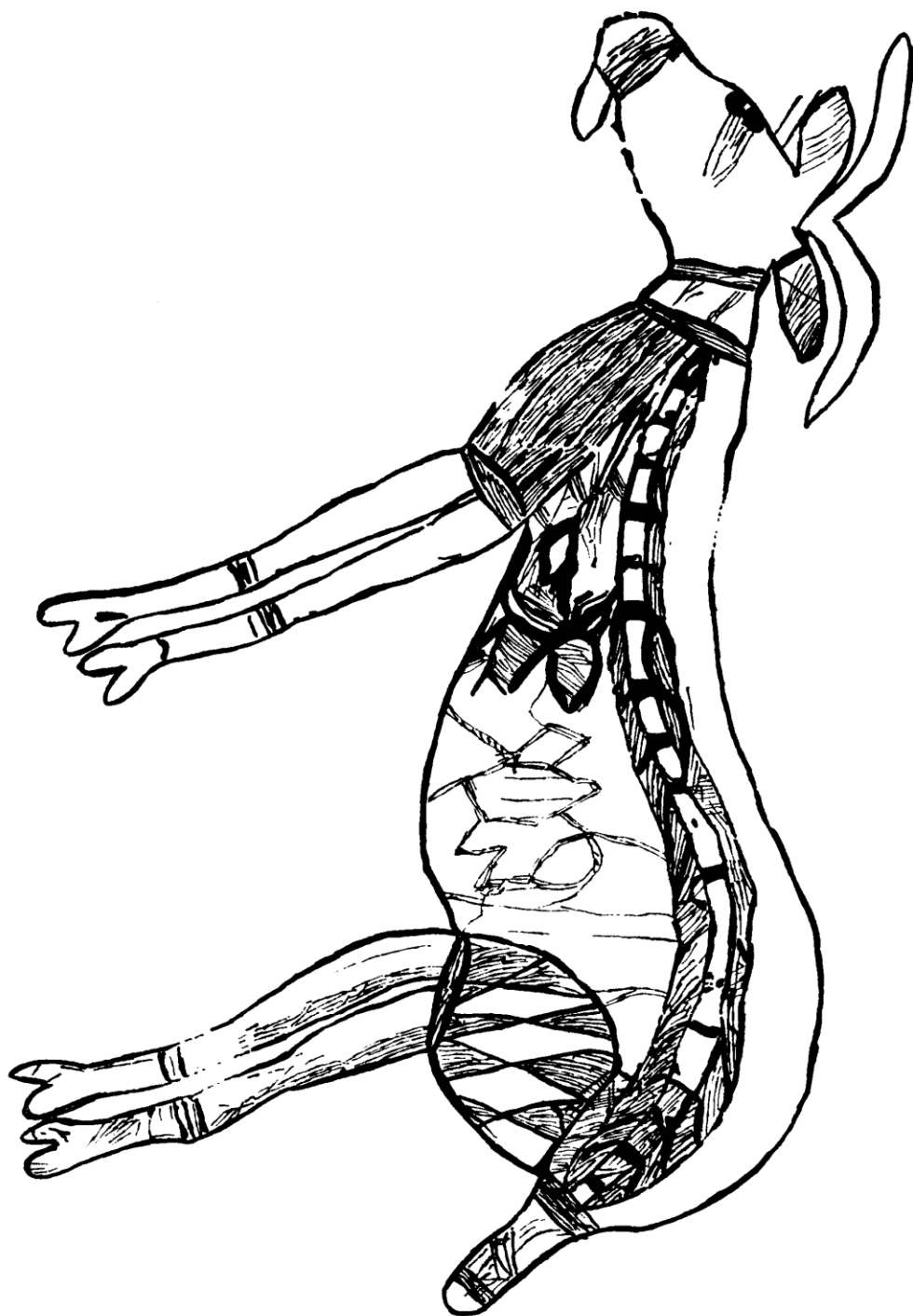


FIGURE 270.

Long Spearthrower Period.

Upper East Alligator River.

Painting of an introduced species, a goat, identified by the cloven hooves, the horns, 'beard' and short tail, in fully developed X-ray style.

Creamy-white base silhouette with dark yellow outline and major divisions, and purplish cross-hatching.

Length about 95 cm.

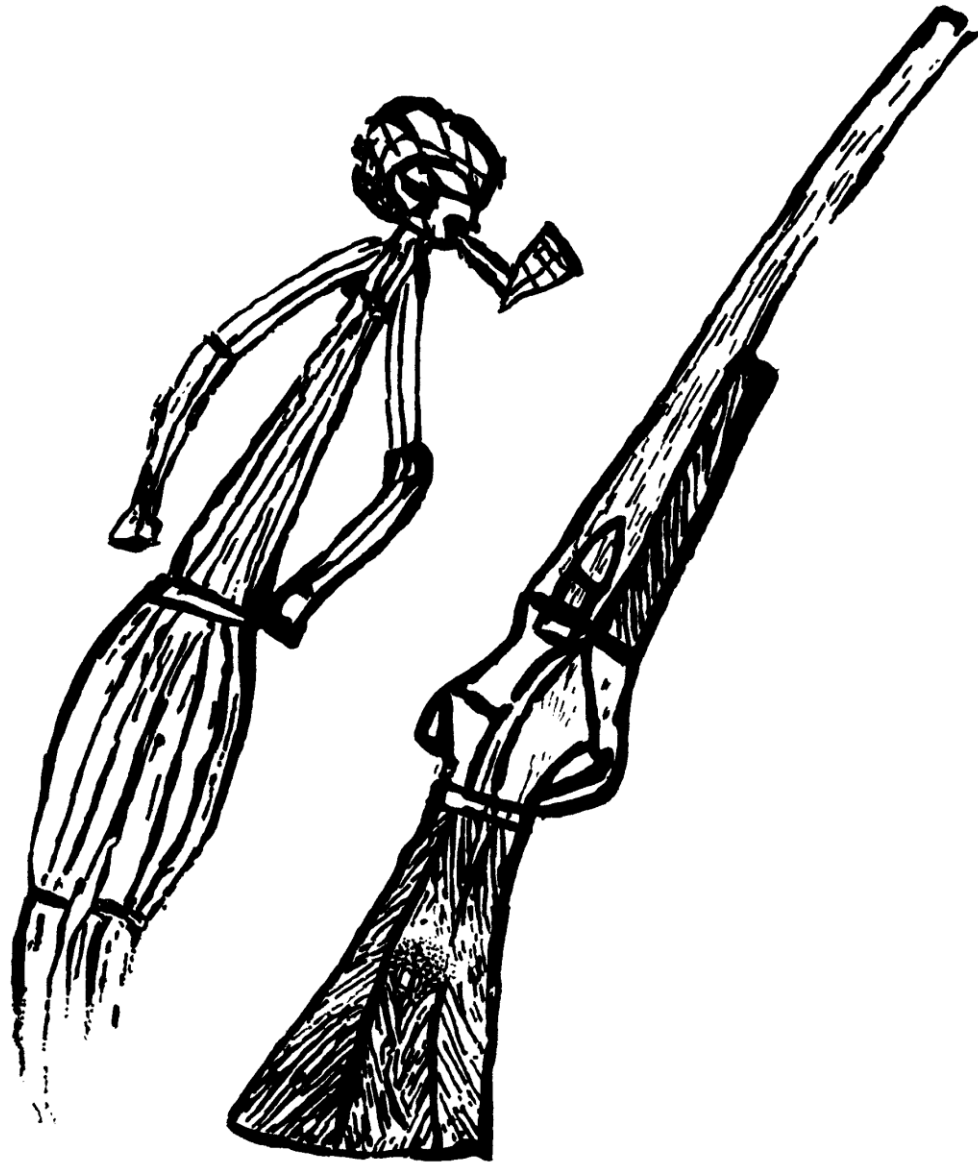


FIGURE 271.

Long Spearthrower Period.

Upper East Alligator River.

A European smoking a pipe, and a rifle (see Plate 47). From the shape of the receiver it is possible to identify this rifle as a 450-577 calibre Martini-Henry. Firearms of this type were used to hunt buffalo in the late 19th and early 20th centuries. Note the cartridge visible in the breech.

White base silhouette with purplish-red outline and internal decoration.

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