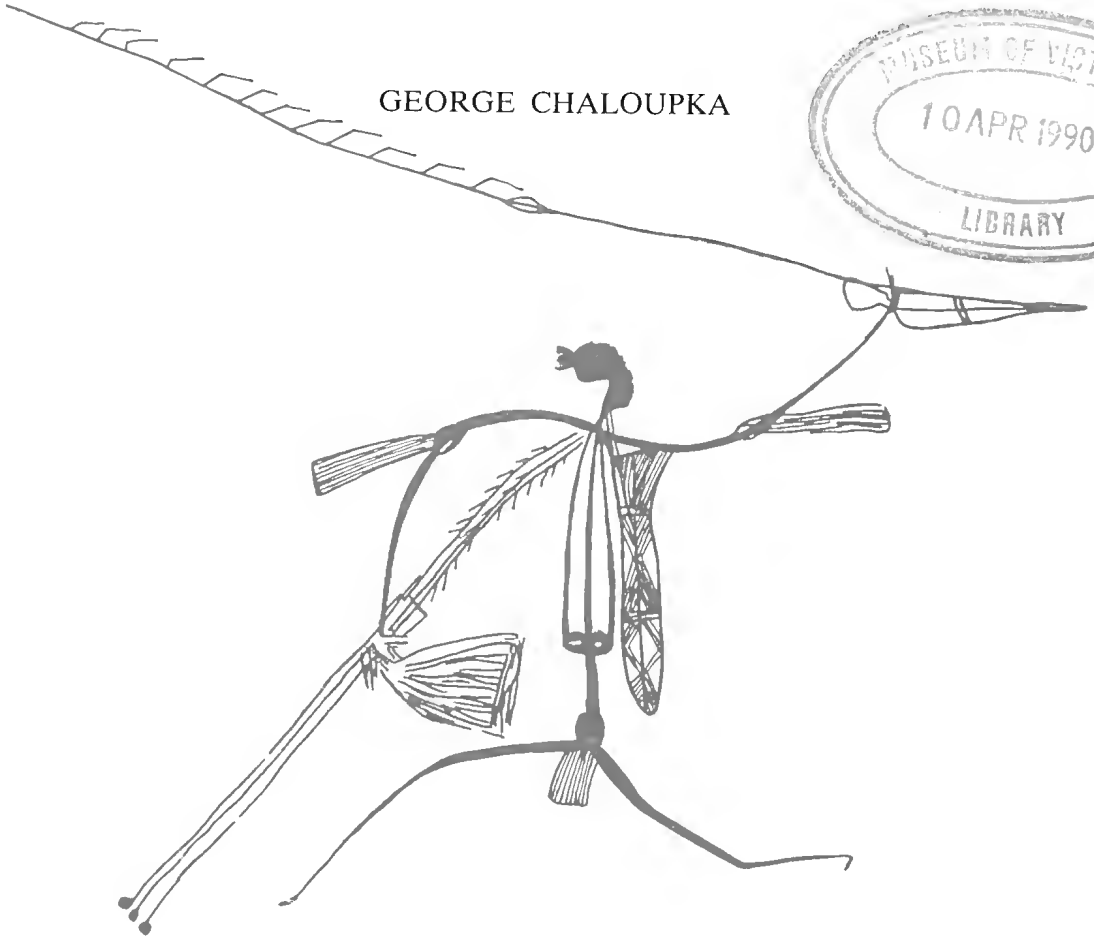


# FROM PALAEOART TO CASUAL PAINTINGS

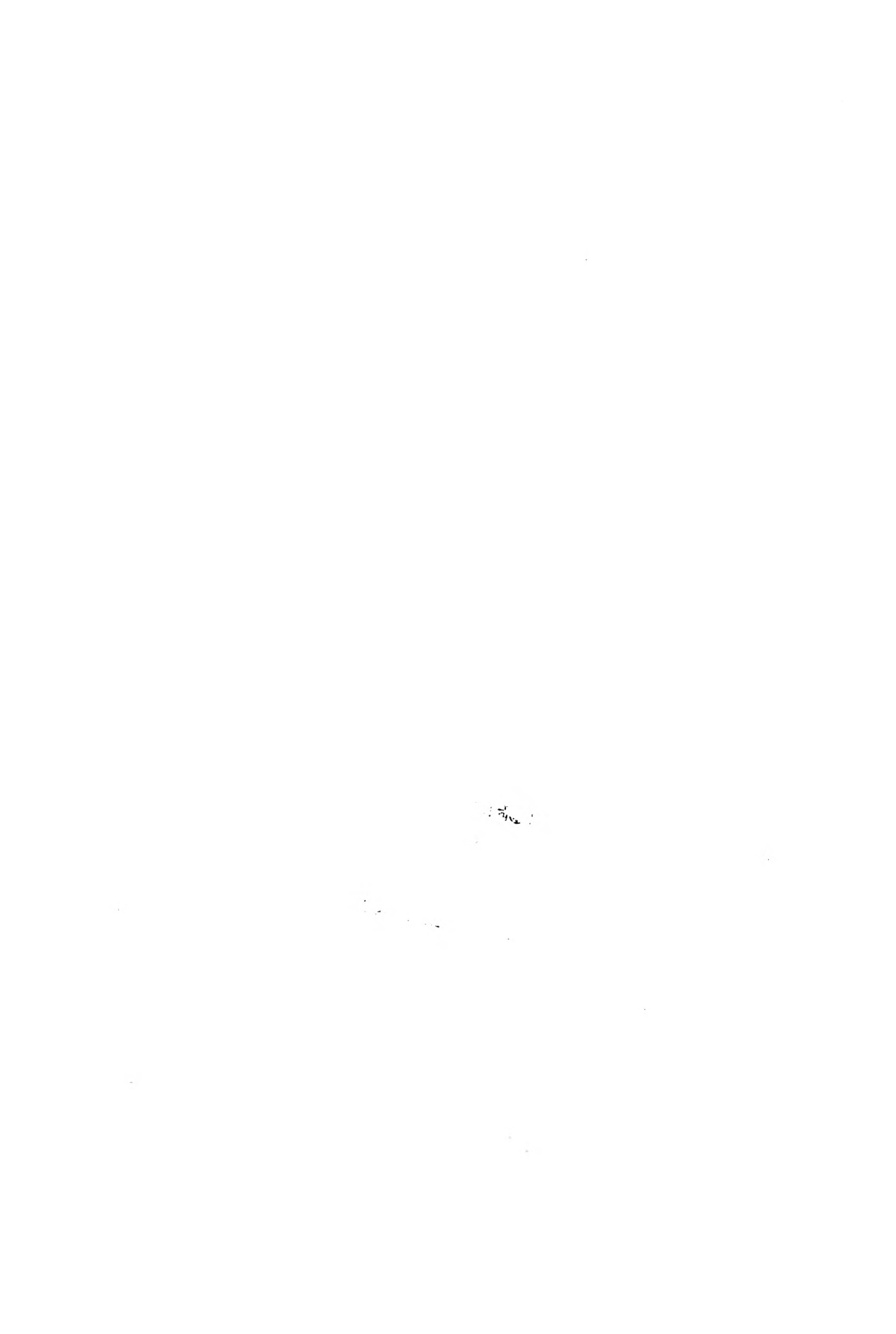
GEORGE CHALOUPKA



**MONOGRAPH SERIES**

**1**

Northern Territory Museum of Arts and Sciences



The Monograph Series of the Northern Territory Museum of Arts and Sciences, Darwin, Australia, reflects the results of research conducted in the Natural, Human and Physical Sciences and the Arts in Tropical and Arid Australia, South-East Asia and the South-West Pacific.

By virtue of its location at the centre of this region of scientific and cultural unity and diversity, abundantly rich in unique and significant areas for enquiry, the Darwin Museum of Arts and Sciences is singularly placed to foster this research.

**MUSEUM VICTORIA**  
Main Library

Location: .....  
Date: 29/4/11 .....  
Bar code: ..... 63248 .....  
Call no.: .....



Nipper Kapiengi, traditional owner of the Badmardi clan's estate at a pre-estuarine paintings site.

MONOGRAPH SERIES

1

**FROM PALAEOART TO  
CASUAL PAINTINGS**

The chronological sequence of Arnhem Land Plateau  
Rock Art



**GEORGE CHALOUPKA**

Northern Territory Museum of Arts and Sciences  
Darwin, Australia  
1984

This is Number One in the Monograph Series of the Northern Territory  
Museum of Arts and Sciences.

Editors for this volume: Colin Jack-Hinton and Peter Murray.

Museums and Art Galleries of the Northern Territory, 1984.

This book is copyright in all countries subscribing to the Berne Convention.  
Reproduction in whole or in part without the written permission of the author is  
forbidden.

ISSN 0814-0034

ISBN 07245-0604-7

National Library of Australia Card No. and ISSN

Distributed by: Northern Territory Museum of Arts and Sciences  
G.P.O. Box 4646,  
DARWIN, N.T. 0801  
Australia

## CONTENTS

	Page
Introduction	(vii)
Colonization of Australia	1
Physical setting	5
Geology	7
Prehistory of the region	8
Rock art of the Arnhem Land Plateau	11
The proposed chronology of Arnhem Land Plateau rock art	12
Pre-estuarine period	17
Estuarine period	42
Freshwater period	49
Contact period	49
Permanence of rock paintings	52
Conclusion	54
Referenees	56

### TABLE

1. Proposed chronology of Arnhem Land Plateau rock art	16
--	----

### FIGURES

Figure 1.	Northern rivers and locations of major archaeological sites within Great Australia	2
Figure 2.	Arnhem Land Plateau and its residual outliers	6
Figure 3.	Pre-estuarine period: hand prints, the earliest images in rock art	18
Figure 4.	Pre-estuarine period: imprints of grass	19
Figure 5.	Pre-estuarine period: multiple superimposition of paintings in the <i>large naturalistic animals and human beings</i> style	21

Figure 6.	Pre-estuarine period: a group of animals no longer present within the region	23
Figure 7.	Pre-estuarine period, <i>dynamic figures</i>	26
Figure 8.	Pre-estuarine period, <i>dynamic figures</i>	27
Figure 9.	Pre-estuarine period, <i>dynamic figures</i>	28
Figure 10.	Pre-estuarine period, <i>dynamic figures</i>	30
Figure 11.	Pre-estuarine period, <i>dynamic figures</i>	31
Figure 12.	Pre-estuarine period, <i>dynamic figures</i> , sensory symbols	32
Figure 13.	Pre-estuarine period, <i>post-dynamic figures</i>	33
Figure 14.	Pre-estuarine period, <i>post-dynamic figures</i> , Mountford's variation	35
Figure 15.	Pre-estuarine period, <i>simple figures with boomerangs</i>	36
Figure 16.	Pre-estuarine period, <i>yam figures</i>	37
Figure 17.	Pre-estuarine period, <i>yam figures</i>	38
Figure 18.	Pre-estuarine period, <i>yam figures</i>	39
Figure 19.	Pre-estuarine period, <i>yam figures</i>	40
Figure 20.	Estuarine period, introduced fauna	43
Figure 21.	Estuarine period, <i>Namarrgon</i> , the Lightning Man	44
Figure 22.	Estuarine period, paintings of the <i>descriptive x-ray</i> style	45
Figure 23.	Freshwater period paintings	47
Figure 24.	Contact period paintings	48
Figure 25.	Contact period, beeswax design.	51

(Reproduced figures are copies of colour transparencies. Sizes as used here, unless indicated otherwise, are the measurement of the motif along its major axis)



## INTRODUCTION

Rock art is the most common, the most varied and, also, the most complex Australian artefact. Whereas in the majority of excavated sites, stone tools, used pieces of ochre, bone remnants and traces of charcoal only partially reveal man's early pursuits and technologies, rock art documents the ephemeral objects of his material culture and portrays modes of human experience, behaviour and relationships. A study of rock art can provide some of the missing chapters of Australia's prehistory, as the representations of given subjects depict recognisable changes in the artist's physical, social and cultural environment. This monograph outlines a proposed chronological sequence for the rock art of the Arnhem Land Plateau, correlated with other aspects of Australian prehistory. The proposed rock art periods, phases and styles are related to climatological, geomorphological, archaeological and historical data and zoological and botanical evidence.

The most complex body of Australian rock art is found in the tropical area located north of a line between Derby in the west and Cairns in the east.

Within this area lie three major rock art regions:

- (a) The Kimberley in Western Australia,
- (b) The Arnhem Land Plateau in the Northern Territory, and
- (c) the sandstone plateau of southern Cape York in Queensland, as well as a number of intermediate locales with additional rock art sites. The total number of shelters and sites with rock paintings and rock engravings in this northern area is very considerable, some 1 420 sites having been recorded in the Arnhem Land Plateau region alone, and clearly many more await discovery.

The most recent rock art styles of the three regions share similar forms. The subjects of this period are large, multicoloured representations with internal subdivisions and decoration. In Kimberley these are the mythologically based **Wandjina** figures with associated animals and plants (Crawford 1968). In the Arnhem Land Plateau they are the **X-ray** style depictions of animals, men and even inanimate objects, with internal organs and structures shown within their external features. In Cape York they are the stylised forms of animals and man (Tresize 1971). For the moment it is suggested that only the rock paintings of Kimberley and those of Arnhem Land Plateau are of the same antiquity and may, indeed, have common origins, as some of the early rock art styles depict similar subjects, share similar forms of expression and development, and were, perhaps, contemporaneous and culturally related.



## COLONIZATION OF AUSTRALIA

The proposed antiquity of the Arnhem Land Plateau rock art relates to the human settlement of Australia and sea level variations. It is generally assumed that the colonization of Australia was from the north; that the initial colonizing routes followed the major river systems, and that the settlement of the new continent was quite rapid (Birdsell 1958, Bowdler 1977, Jones 1972, Mulvaney 1975, Shawcross 1975). Jones (1973: 281) has asserted that, by at least 20 000 B.P., man was occupying almost all of the major zones of greater Australia. Interpretative evidence for the early colonization of the internal areas has also been postulated (Jones and Bowler 1980, Maynard 1980, Lampert and Hughes 1980, Hughes and Lampert 1980).

Urry (1978) has critically re-examined recent ideas relating to man's antiquity in Australia, his origins and routes of entry. Although he has suggested that man could have migrated at periods when sea levels were as they are at present, he does agree that lowering of the sea increased the possibility of human migration. Using the sea level variations for the past 240 000 years, as calculated by Chappell and Thom (1977), Urry suggests that the sea level change which occurred 160 000 years B.P., because of its gradual fall and rise, was the most suitable for human migration to Australia. During that glacial maximum the conditions prevailing over the Sunda-Sahul region were stable for a long period of time. He calculates this favourable period to have been in the order of  $\pm 6\ 000$  years, contrasting with a period of quite rapid fall and rise at about 50 000 years B.P. of only some  $\pm 2\ 000$  years duration, which was considerably more rapid than at 20 000 years B.P. when a similar period was of the order of  $\pm 4\ 000$  years duration. But he also suggests that a rapid rise of sea level, after people had recolonized the emerged lands and islands during a glacial maximum, would have caused greater movement of populations than a gradual rise, and that it could have been this factor which may have caused the first colonists to cross the water barriers to the shores of the Sahul shelf. This alternative proposal would favour the 50 000 B.P. year period of low sea levels as the time of initial colonization, a date which is supported by the available archaeological evidence, although earlier crossings cannot be entirely dismissed anymore than later continuing crossings.

If we accept that initial colonization occurred during a glacial maximum, and that the initial movement of man was along the Sahul coast and up the river systems, such movement may have been two-directional, north towards New Guinea and south into present day Australia. Verstappen (1975) illustrates a schematic river system for both the Sunda and Sahul regions. His model has been reconstructed

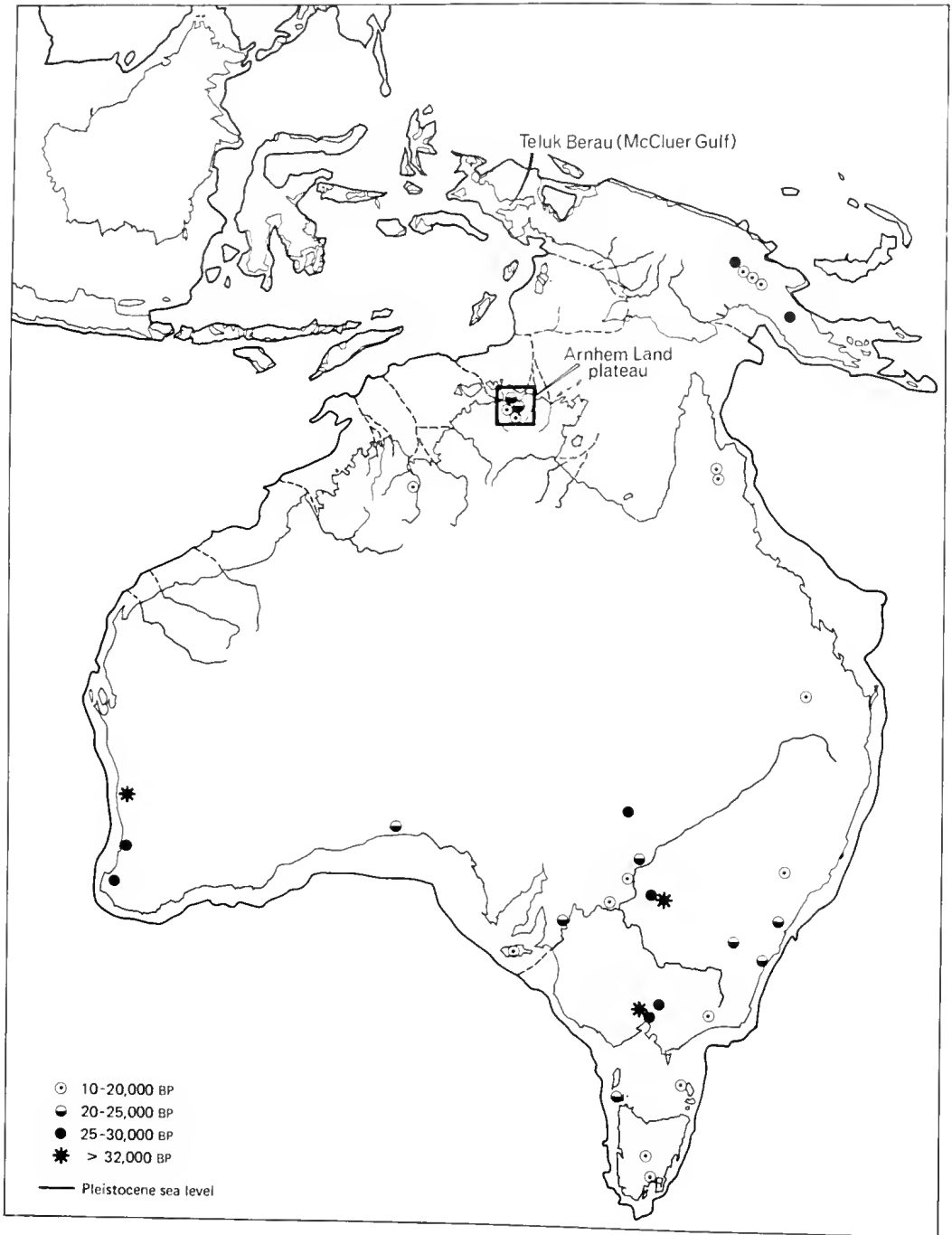


FIG 1: Northern rivers and locations of major archaeological sites within Great Australia.

and the northern Australian rivers portrayed as they may have appeared during such a period (Fig. 1).

Although the rainfall during a period of low sea level would have been considerably less than at present (Nix and Kalma 1972), there are two topographical areas in northern Australia which would have continued to have adequate run-off to produce major rivers. These are the Kimberley in Western Australia and the Arnhem Land Plateau in the Northern Territory. This suggests that, in the north-west of the continent, the rivers originating in the Kimberley and flowing across the Sahul into the Indian Ocean were the Fitzroy (with the Isdell, Charnley and Prince Regent Rivers as its tributaries); the combined Mitchell, King Edward and Drysdale Rivers; and further east the river formed by the Durack, Pentacost and Ord, joined by the Victoria and Fitzmaurice Rivers flowing in from the Northern Territory. It is also likely that this last river was joined further out on the Sahul shelf, by the Daly River and its tributaries.

The Arnhem Land Plateau was the source of the “**Arnhem**” River with the Adelaide, Mary, and the Alligator Rivers as its main tributaries. Although this river is reconstructed as flowing across the exposed shelf to the sea, it is possible that during one period of low sea level it may have been a tributary of a river draining the southern slopes of New Guinea. This connection with the Sahulian river catchment is suggested by the common freshwater fish fauna and that of the pig-nosed turtle (*Carettochelys insculpta*) only found now in the two areas. The combined Goomader, Liverpool, Cadell and Blyth Rivers would have formed a tributary of this “**Sahul**” River. The rivers flowing into the shallow Gulf of Carpentaria may have then, as during the last glacial maximum, fed what Jones and Bowler (1980) claim to have been a vast, brackish swamp, perhaps the biggest in the world.

Assuming such a Sahulian river system, and human colonization following the coast and major rivers, the Kimberley and Arnhem Land Plateau would have been the two initially settled areas of the present Australian continent. It is also suggested that further colonizing movement was southwards along the coast, with the Dampier region an early settled area and its rock art of, perhaps, similar antiquity to that of Kimberley and Arnhem Land. The movement of people continued down the western and along the southern coasts of the continent and then up the Murray River system, the first major river to be encountered after the rivers of the north. As the colonization of Great Australia is assumed not to have been uni-directional, similar movement north, towards New Guinea can also be proposed. If we accept that the Gulf of Carpentaria was a vast, uninviting, brackish swamp, it would have been a barrier, forcing people to move first upstream along rivers flowing down from New Guinea, and perhaps only then moving southwards to Cape York.

Birdsell (1977) suggests a rapid colonization of Australia. If one accepts his hypothesis, which has, however, recently been questioned (Bowdler 1977), and applies Urry's model of a cut-off point for man's convenient crossing at 50 000

years B.P. with a low sea level period calculated at  $\pm 2\ 000$  years, and even if the colonizers arrived at midpoint of this 4 000 year period, much of the Australian continent was settled before any major change occurred in the then coastlines.

The initial settlement of the north could indeed have been quite rapid as the colonists would not have had to adapt to a completely strange environment. They would have possessed the skills to exploit the marine ecosystem, the produce of the littoral being similar to that of their place of origin, and inland they would have found many familiar edible plants (Golson 1971). The colonists, like the present coastal communities were probably not exclusively marine oriented, and from the beginning they would also have exploited the produce and animals of the hinterland (Meehan 1977). An early move inland along the major rivers, is suggested by Chappell and Thom (1977) who argue that, although coastal fringes had adjacent food resources, the freshwater stress must have been high and the environment would have offered little permanence of tenure for early human settlement.

Although the earliest occupational sites on the edge of the Sahul shelf are now submerged, the time that it took the colonists to expand from the first coastal sites to those located along the major rivers, at present some 200-300 km inland, was probably less than the given accuracy differential of the carbon dating technique. For all practical purposes, the early dates of human occupation, yet to be established in the Kimberley and Arnhem Land sites, could be accepted as those of the initial settlement.

The variations in sea levels during the following glacial maximum are of primary importance in dating the rock art of this region. The accompanying environmental changes, the faunal and floral response, the introduction of new animal species, man's invention of new technologies and perhaps also the movement of populations are reflected in the rock art.

## PHYSICAL SETTING

The Arnhem Land Plateau (Fig. 2), the western and northern edges of which form the spectacular escarpment, is a vast sandstone complex standing from 250 to 300 metres above the adjacent lowlands, with residuals on the plateau, such as Mt. Gilruth, rising to 520 metres. Outliers of the plateau range from small residuals within the flood plains to large massifs such as that of Nourlangie - Mt. Brockman, and the Wellington Range, which delineate its former extent. The rock art sites and occupational shelters have been formed by weathering and erosion of this sandstone plateau.

The strongly jointed, highly delineated plateau is criss-crossed by creeks and rivers which flow across it either in shallow valleys or in deep gorges with numerous waterholes and waterfalls. A third of the plateau consists of virtually bare rock, with little soil and vegetation. A further third has shallow sandy soils supporting a varied flora of heathlike shrubs and spinifex — the sandstone scrub. Sandstone woodland and tall open forest, dominated by evergreen eucalypts, occur on deeper sands, in restricted pockets, or on dissected portions of the plateau. A peculiar monotype rainforest, dominated by the myrtaecous evergreen tree, lies along the escarpment's margins.

The plateau is the source of major Northern Territory rivers. The north-western section is drained by the South and East Alligator Rivers and their tributaries — Jim Jim, Nourlangie, Deaf Adder, Magela and Cooper Creeks. The Goomadeer, Liverpool, Mann, Cadell and Blyth Rivers drain the northern sector. In the south-eastern part lie the headwaters of the Wilton, Mainoru, Flying Fox, Maiwok and Waterhouse Rivers, major tributaries of the Roper River which flows into the Gulf of Carpentaria. The south-westerly part of the plateau is drained by the King, Katherine, Edith and Fergusson Rivers, tributaries of the Daly River.

The north-western edge of this plateau, generally known as Western Arnhem Land, is located only fifty kilometres inland from the shores of the Van Diemen Gulf, whilst some of its outliers lie even closer to the coast. From the coast the estuary of the East Alligator River meanders through the tidal flats and flood plains past several large sandstone residuals, through alluvial plains and weathered outliers, its tidal reach terminating in the escarpment itself. This north-western edge of the plateau is now the Kakadu National Park, listed as part of the World Heritage.

The people living in this region at contact time exploited not only this rich riverine environment, but also the adjoining floodplains and freshwater swamps,

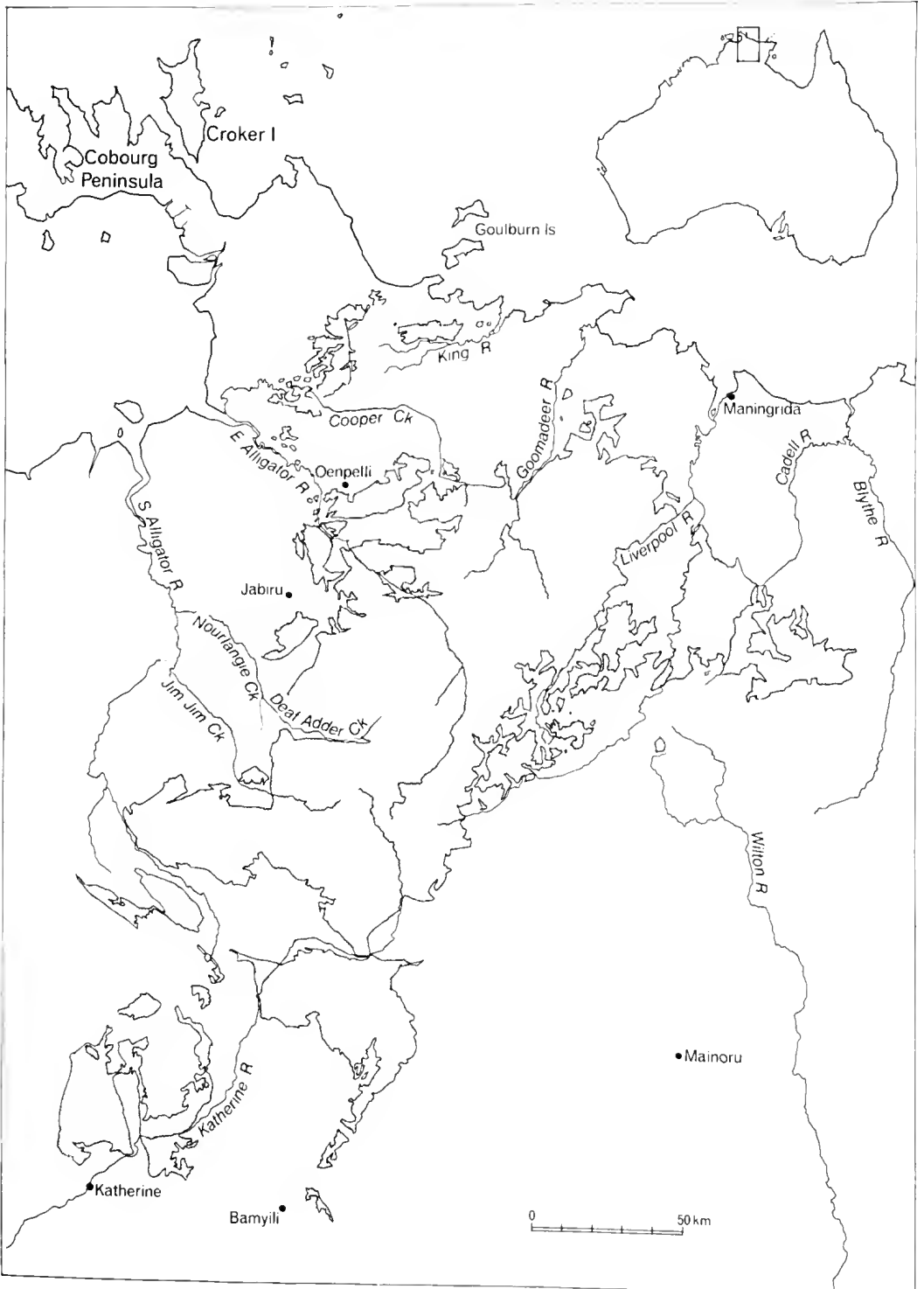


FIG 2: The Arnhem Land Plateau and its residual outliers.



and the lowlands and pockets of savannah environment. The presence of water, a relative abundance of food resources and the availability of rock shelters around the escarpment and in the escarpment valleys, made the plateau an attractive area for settlement and exploitation, at least for part of the year.

## **GEOLOGY**

The geology of the plateau is dominated by the Kombolgie Formation, a Middle Proterozoic quartz sandstone which overlies older rocks including volcanics, coarse and medium sediments and metamorphic and granitic rocks. The Kombolgie Formation includes a volcanic member and is locally overlain by Cretaceous sandstone. The rocks of the lower Proterozoic age in the form of granite, are exposed in the lowlands below the Jim Jim Falls (Galloway 1976).

The Kombolgie Formation is dominantly medium to coarse quartz sandstone with frequent ripple-marked cross bedding. The preliminary petrological investigations by Watchman (1979) indicate that the rock types of this formation fall into two groups: **orthoquartzites**, which are generally stable because they still retain at least some of the original interlocking silica outgrowth structure which cements the quartz grains together, and **quartz sandstones**, which are less stable as they have a matrix of koalinate, a clay mineral, and sericite, a mica, with small and variable but highly significant amounts of phosphates, sulphates and carbonates. Such a matrix is liable to break down by hydration and solution processes. These two rock types can be found interfused, although generally the stable scarps of the plateau and the plateau valleys are orthoquartzites, whilst the residuals are of quartz sandstone.

The major rock painting sites with well preserved representations of what, it will be argued, constitute the early styles, are found mainly in the shelters formed in the orthoquartzitic rocks. Many such shelters have deep overhangs and provide ideal, smooth surfaces for paintings. In contrast, those early paintings which were executed on the quartz sandstones are usually badly weathered, and where the rock surface is disintegrating only traces of such paintings remain.

## PREHISTORY OF THE REGION

The Aboriginal perspective of their **history** differs from that proposed by Europeans. They believe that they originated within this continent, and substantiate this view in religious beliefs in which their creator heroes first formed the land, implanted all life, and then created a design for its survival. Europeans, sceptical of such a traditional belief, commenced in 1948 to inquire into the past occupation of the Arnhem Land Plateau region and to infer changes that have occurred in the physical and cultural environment of the local populations.

In 1948, McCarthy and Setzler (1960) excavated occupational sites at **Inyalak (Gunbalanya)** and **Argulug**, two residual outliers located in the immediate vicinity of Oenpelli, with the rather ambitious aim of establishing "the origin, or at least the prehistory of the Aborigines of this region". It seems, however, that the primary purpose of this exercise was to obtain objects, because the economic evidence was not analysed and the stratigraphy of material was not established. In the same year Macintosh (1951) excavated the Tandandjal shelter in the southern foothills of the Arnhem Land Plateau. Between 1963 and 1965 Mulvaney and Golson surveyed the south-western margins of the Plateau. Mulvaney excavated Kintore Cave and Golson sites at Katherine and Sleisbeck (Mulvaney, 1975). The latter also visited the Alligator River area and reported the presence of rock painting sites in the Deaf Adder and Jim Jim Creek area.

The major research in the region began in mid-1960 when Carmel White (now Schrire) excavated five sites and tested seven others in the general area of the East Alligator River (White 1967a, 1967b, 1967c, 1969, 1971). The excavated sites were the **Nawamoy**n shelter at Cannon Hill; **Malangangerr** in the vicinity of the East Alligator River crossing; **Padypadiy** (Paribari), eight kilometres to the west; and **Tyimede** I and II located twenty-three kilometres to the east of that river.

The occupational deposits of the two major sites, **Malangangerr** and **Nawamoy**n consisted of an upper shell midden dating from 7 000-6 500 B.P. to the recent present, overlaying discontinuous sandy deposits dated between 23 000 B.P. and 18 000 B.P. On the basis of the stratigraphic division of the deposits White proposed the basic chronology and stone tool sequence for the region. This two-fold sequence consisted of an earlier tradition dating from 23 000 to 6 500 B.P. typified by steep edged scrapers and core scrapers, retouched flakes and edge ground stone axes, followed by the appearance of unifacially and bifacially flaked stone points, small rectangular scrapers and bone and shell implements.

White proposed that this change in the stone tool tradition occurred at the same time as the ecological change which is indicated by the accumulation of shell midden deposits following the inundation of the river valleys by the post glacial rise of the sea, and argued that the stratigraphy and carbon 14 dates of these two sites suggested that a considerable time had elapsed before the sites were re-occupied and the later midden deposits began to accumulate.

White's work was of major scientific importance, because the basic dating back to about 23 000 years documented for the first time man's Pleistocene occupation of tropical Australia, whilst the edge ground stone axes, some with grooves on their side, were at the time the world's oldest examples of that technology.

In 1972 and 1973 Harry Allen and Johann Kamminga carried out an archaeological survey of the Alligator River region during which more than 120 sites, mostly rock shelters with significant occupational deposits, were recorded (Kamminga and Allen 1973). Test excavations were carried out at eight sites, of which two, **Malakunanya II** and **Nawulabila**, the so-called Lindner site, had dates extending back to between 18 000 and 20 000 B.P. In general terms their excavations confirmed the sequence established by White, confirming also the presence of edge ground axes with the lower industry. They also recovered a red ochre stained grindstone older than 18 000 years.

Following this survey Allen (1977) excavated **Ngarradj Warde Djobkeng**, one of the tested sites with terminal Pleistocene date, situated in proximity to White's **Malangangerr** and **Padypadiy**. The stratigraphy of this site was similar to that observed by White, in that the shell midden deposits were overlaying sandy layers containing stone tools of White's two-fold sequence. However, in his excavation there was no marked stratigraphic break, the transition of stone tools between lower sands and upper midden being gradual, implying the evolution of technical changes rather than the presence of an unchanging tradition. Allen also recognised a sequence in the composition of the shell midden, where the basal layers are characterised by estuarine mangrove-mud flat species and the upper ones by shells of the freshwater **Velesunio** mussels (Kamminga and Allen, 1973; Allen, 1977). Allen argues that this change in the composition of the shell midden occurred when the broad saline clay pans, connected by shallow tidal channels fed by the East Alligator River were blocked, forming a large shallow lake upstream, or alternatively when the buildup of deposits raised the height of the flood-plain above tidal influence creating the freshwater wetland of the present day. This recent and major shift in the local environment of the **Ngarradj Warde Djobkeng** site, and elsewhere in the region, occurred only recently, perhaps even a thousand years ago.

Following Allen's discussion, Schrire (White), whilst re-writing her thesis for publication, dealt with the original misinterpretation of her data, such as the first appearance of the small tool technology, which, after careful analysis, were

found to appear halfway up the middens, some 4 000 to 5 000 B.P., and not at the previously stated basal date of c. 6 500-7 000 B.P.

During 1981, a multidisciplinary archaeological research project led by Rhys Jones was undertaken by the Department of Prehistory, Research School of Pacific Studies, Australian National University, on a consultatory basis to the Australian National Parks and Wildlife Service. This archaeological and palaeoenvironmental transect through the present landscape, from the open wetland margin sites of the South Alligator River plains, past the shelters of the residual outliers alongside that river's tributary, to the **Nawulabila** rock shelter in the escarpment valley, may further increase our knowledge of the history of human occupation of this region, and also provide a record of the development of the landscape during that period. The collection of samples of rock surfaces from painted shelters and their chemical, mineralogical and petrological analysis, was an integral part of this project (Watchman, 1982).

## ROCK ART OF THE ARNHEM LAND PLATEAU

The rock art of the Arnhem Land Plateau reflects the basic cultural unity of the people who live around its margins, though there are certain stylistic variations just as there are regional variations of myths and ceremonies. The majority of recorded rock art sites are located along the western and northern escarpment of the Plateau, whilst a considerably smaller number of sites have been recorded on its southern and eastern edge where more probably await discovery.

The first Europeans to see and report rock painting in this region were Leichhardt and his party. In November 1845, towards the end of its epic journey from Moreton Bay in Queensland to the Victoria Settlement at Cobourg Peninsula, the expedition entered the southern parts of the Arnhem Land Plateau, where Calvert, came across a shelter with a painting of a long-necked turtle (Leichhardt 1847). This early discovery was followed by those of Stockdale, who, in 1891, located 40 shelters containing some 200 paintings in the Alligator Rivers area (Edwards 1974).

The existence of paintings in the vicinity of the East Alligator River was reported by Dashwood (1897:8) the former Government Resident, after his visit to the first buffalo shooters camp in 1894. From his description of the site and its location this was the **Winjdjawanjdawa** shelter, in the residual rocks adjacent to the Cannon Hill massif. Spencer (1914, 1928), visiting Oenpelli in 1912, described some of the rock paintings of that area and commented on the continuation of the art in the form of painting on sheets of bark. However, it was not until 1948, when the East Alligator River region was visited by Mountford (1956), leader of the American-Australian Expedition into Arnhem Land, that the wealth and complexity of the Arnhem Land Plateau's rock art was suggested. Rock art from other regions of the plateau was subsequently described by Elkin (1952), Macintosh (1952), Mountford (1956, 1958), Arndt (1962) and Maddock (1970). In 1965 Brandl (1968) recorded sites between Magela Creek and East Alligator River, and in 1968 (1970) eighty sites in Deaf Adder Creek. Accompanying the Czechoslovak Scientific Expedition into Arnhem Land in 1969, Brandl (1973) recorded a number of sites on the north-eastern margin of the plateau at Cadell River. Further sites in Western Arnhem Land were recorded by Edwards (1974), Novotny (1975), Jelinek (1977, 1978) and Chaloupka (1977). Most of the writers provided a description of selected subjects, whilst only Maddock considered the socio-cultural aspects of rock art.

## A PROPOSED CHRONOLOGY OF ARNHEM LAND PLATEAU ROCK ART

This proposed chronological sequence of Arnhem Land Plateau rock art is based on a survey of some 1 420 rock painting sites, during which the individual rock art styles were identified and their sequence of superimpositions established.

The research methodology used was at first to sample a transect of sites along the western escarpments and east across the plateau. The purpose of this initial survey was two fold: to identify the locus of language and clan groups and to establish their membership and to get some idea about the general distribution of sites and rock painting styles. Once the traditional ownership of land was known, detailed recording of sites in selected territorial units commenced. The traditional owners of given sites, or their nominees, as well as an Aboriginal trainee took part in the survey. Over the period of ten years, thirty four traditional owners from thirteen language groups and four Aboriginal trainees participated in the research programme. The traditional owners delineated the extent of their territories, identified sites of significance, interpreted rock painting subjects, and in several instances were able to attribute some of the most recent paintings to certain artists.

The actual rock art recording methodology is to locate a site in space, establish its ownership and status, and to describe its environmental setting and its contents. The site and its subjects were then photographed. A prominent subject in each frame was measured and sketched in a field book, so that all the paintings within a given photograph could be later scaled-off. Detailed information as to the presence of given subjects and their styles of execution were subsequently entered on an art analysis form. This form was developed after the region's main rock art styles were identified and placed by their order of superimposition into a chronological sequence. This was followed by a detailed analysis of each style's contents, when it became obvious that certain subjects were present in one or more styles, but absent in others. The quest for the answers as to why this occurred culminated in this monograph. Up to the present over 1 500 Aboriginal sites of significance of which 1 420 are rock painting sites were recorded in the Arnhem Land Plateau region.

The complex body of rock art styles and subjects, executed over many thousands of years, were reduced by most writers to two all encompassing traits and described as belonging to either the *mimi* or to the *X-ray* styles of painting. Brandl (1973) considered the rock art in greater detail, but continued to use the terminology of the time. He subdivided the *mimi* art into "early" and "late" period, and the *X-ray* paintings into "incipient", "simple", "standard" and

“complex” types. He also suggested that there were reasonable grounds for assuming antiquity for certain sites and motifs, and gave the painted representation of thylacines as an example of a subject which might indicate temporal sequence and relative age. Brandl also recognised that weapons and implements might indicate relative age, because boomerangs and certain types of spears appear to belong exclusively to the **mimi** period, while European subjects seem to be limited to the **X-ray** style. He used the introduction of the spear-thrower in the paintings depicting weapon assemblages to divide the **mimi** art into the “early” and “late” periods.

In the following chronology of rock art styles the term **mimi** is not used. In the past it was not used consistently, being applied to paintings not only of hunter figures but also of other human and animal subjects of various styles and periods. To Aborigines **mimi** are spirit people who live in the stone country of the plateau, possessing certain physical peculiarities, but otherwise leading the same way of life as contemporary people. The stories about the **mimi** people continue to be told, whilst a number of Aboriginal **clever** men still associate with these spirits. It is said that it was the **mimi**, in their role as some of the “first people”, the genitors of populations and creators of their physical and spiritual environment, who first painted the images on the rock walls of their shelters and thus “taught” the people this skill. Consequently, when the Aborigines are confronted with a painted representation which depicts subjects with which they are not familiar, such as different kinds of weapons, tools, and now extinct animals, or, with unusual conventions of style or technique, they will say that such paintings were done by the **mimi** people.

Once the region’s chronological sequence of rock painting styles was established, an examination of styles within each art period commenced. To give an example, a detailed analysis of 60% of rock painting sites and a search of data from the remaining sites revealed the following distribution of pre-estuarine styles. Hand imprints occur in 34 sites, grass imprints in 18 and thrown objects in six shelters. The large naturalistic figures were found in 126 sites, dynamic figures are represented in 260, post-dynamic figures in 43, simple figures with boomerangs in 115 and paintings of yam figures style in 146 shelters. Thylacines are depicted at 25 sites, in several instances by more than one representation. There are also six sites where the animal representation may have been that of a thylacine but the image is now too weathered to make a positive identification. At the other end of the region’s rock art spectrum, beeswax designs were recorded in 41 shelters.

Clear superimpositions of all the styles of this period confirming the proposed chronological sequence, and those of the subsequent periods were recorded. The dynamic figures were found superimposed over the large naturalistic paintings 32 times; post-dynamic representations over the dynamic figures in four instances, simple figures with boomerangs superpose dynamic figures nine times, while yam figures overlay dynamic figures five times (Fig. 19).

When comparing the number of times one style superimposes another with the number of sites in which the given styles are found, it must be realised that both styles are not always represented within the same shelter. It is only in the most extensive shelters that all of the pre-estuarine styles may be found, while many sites have examples of a single style only. Thus, although the dynamic and yam figure style paintings are found, respectively, in 260 and 146 sites, both styles are represented in 36 sites only. The number of representations of each style found within a given shelter also varies. Detailed analysis of the dynamic figure style documents its presence in 260 sites totalling 1 719 individual figures, ranging from a single representation to 148 figures, giving an average of 6.6 figures per shelter. Paintings of a given pre-estuarine style, like those of the later periods are also found in their multiple superimpositions. Paintings of the dynamic figures style were found superimposed, in two or three layers 21 times (Fig. 8), while yam figures superpose other figures of that style in six shelters (Figs. 16, 17). These sequences of given representations are usually also differentially weathered. Judging by their relative degree of weathering, considerable time lapsed between their execution, suggesting a lengthy period of duration for each of these styles.

In grouping the rock paintings into styles I have followed Schapiro (1953:287) to whom style means “the constant form, and sometimes the constant elements, qualities and expressions in the art of an individual or a group”. He recognised that an archaeologist, an art historian, a historian of culture or a philosopher of history consider different aspects of style. To an archaeologist, he says, style:

“is identified in a motif or a pattern . . . which helps him to localize and date the work and to establish connections between groups of work or between cultures . . . a symptomatic trait, like the non-aesthetic features of an artefact . . . studied more often as a diagnostic means than for its own sake as an important constituent of culture”.

An art historian, meanwhile, considers broader aspects of art. To him style is an essential object of investigation:

“above all a system of forms with a quality and meaningful expression through which the personality of the artist and the broad outlook of a group are visible . . . he studies its inner correspondences, its life history and the problem of its formation and change”.

To a historian of culture or a philosopher of history, style is a manifestation of the culture as a whole, the visible sign of its unity. In the majority of instances in the past Australian rock art was studied in an archaeological manner. To achieve greater understanding of this art, its changes through time and the people who produced it, its study and analysis must be broadened beyond the investigation of its archaeological aspects.



From the very beginning of this survey it was obvious that the terms and divisions previously used to describe the multiplicity of styles of rock art of this region were not only inadequate but also inappropriate. This fact had already been commented on by White (1967a: 121-122), who noted that, stylistically, the rock paintings at **Padypadiy (Paribari)** do not entirely conform to Mountford's classification, as there are some designs which do not fall into either of his two categories of **mimi** and **X-ray** art. That the body of this region's rock art is more complex was also recognised by Schulz (1971) who, between 1954 and 1956, studied and copied rock paintings in the vicinity of Oenpelli. Schulz found that the so-called **mimi** figures were not only contemporaneous with the **X-ray** style paintings, because they superimposed each other, but also recent, as the depicted weapons and objects were still used by the local Aborigines during her visit. Her interest was centred on the earlier horizons of rock art, where she recognised animal paintings in styles preceding that of **X-ray**, and also on the compositions of human figures in movement. The constricting absolutism of the established term becomes apparent when Schulz writes:

The most interesting of them show mostly small, anthropoid figures, usually painted in large groups. In spite of being quite distinct from the stick figures, following Mountford they are called "mimi".

Consequently, in the following examination of a proposed sequence for Arnhem Land Plateau rock art a great range of styles is recognized, and it is suggested that further elaboration will occur in the future, as some styles are still broadly defined to allow for a range of variability in the morphology of the figures.

This proposed rock art sequence was first tentatively suggested during the 1974 symposium, *Schematization in Art* (Chaloupka 1977), and was thereafter tested and, where necessary, adjusted and elaborated, during further field research. Because logical and significant groupings of art styles are a basic requirement for study and reference, the styles were divided into art periods and phases and positioned between time indices provided by known climatological, geomorphological, archaeological and historical data and by zoological and botanical evidence. The outcome is a rock art sequence of four main periods which have been named the **Pre-estuarine, Estuarine, Freshwater** and **Contact** (Table 1).

**TABLE 1: PROPOSED CHRONOLOGY OF ARNHEM LAND PLATEAU ROCK ART**

	PHASE	STYLE	MAJOR OR IDENTIFYING SUBJECT
35 000		Object imprints	Hand prints, 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, Tachyglossus, macropods, rock python, stencils: hand of 3MF convention, boomerangs, clubs, spears
	Stylisation	Post Dynamic Figures	Mainly human beings, some macropods
	Schematization	Simple figures with boomerangs (SFB)	Mainly human beings, man using fighting pick
	Naturalistic symbolism	Yam Figures	Anthropomorphised yam, phytomorphised animals: flying fox, birds, short necked turtle, Rainbow Snake; abstract symbol of segmented circle
9 000	Intellectual realism	X-ray descriptive	Barramundi, mullet, saltwater crocodile, estuarine catfish, Lightning Man, stone-headed spear
7 000			
1 000		X-ray decorative	Maggie geese didjeridu
150			Macassan praus, European boats, buffaloes, horses, guns, sorcery paintings
Years B.P.		Casual paintings	

PERIOD:  
FRESHWATER,  
CONTACT

## **PRE-ESTUARINE PERIOD**

The Pre-estuarine Period of rock art, covering considerable time span and consisting of a number of rock art styles, ends, as the name suggests, with the rise of the sea after the last glacial maximum and the development of the estuarine environment along the north-western margin of the Arnhem Land Plateau.

The beginnings of this period are tentatively placed at the height of the last glaciation, and may even predate it as, by that time, Aboriginal man had lived in the region for 20 000 years or more and was perhaps reoccupying the then emergent Sahul. The Pleistocene sea levels, 150 m lower than at present, further extended his domain, which, even at the beginning of the last glaciation was considerably larger than at present, as the high sea levels of 30 000 years ago peaked 40 m below the present maximum. The edge of the Arnhem Land Plateau at the beginning of this pre-estuarine period was some 320 km from the nearest coast. A period of considerable aridity at that time is suggested by the available climatological evidence (Bowler et al. 1976), and also by comparison with the present rainfall pattern, with precipitation values decreasing rapidly from the coast inland. The savannah expanded northwards and may have also extended over the Sahul shelf (Jones and Bowler 1980).

### **Sequence of Styles**

1. Hand prints, grass prints, and imprints of thrown objects
2. Large naturalistic animals and human beings
3. Dynamic figures
4. Post-dynamic figures
5. Simple figures with boomerangs
6. Yam figures

#### **1. Handprints, grass prints, and imprints of thrown objects**

The earliest images in rock art, superimposed upon by all the subsequent art styles are hand prints, appearing usually not at random but as compositions. In several instances they are found superimposed upon each other and differentially weathered, suggesting a considerable time period between their execution. They were made by placing the hand into a wet pigment and then pressing it against the rock surface (Fig 3).

The grass prints, considered to be contemporaneous with hand prints, are found less frequently and are spatially restricted. They are usually located on vertical rock surfaces, above the range of hand prints. Although most of these prints are



FIG 3: Pre-estuarine period: handprints, the earliest images in rock art of this region with imprints of thrown objects above.

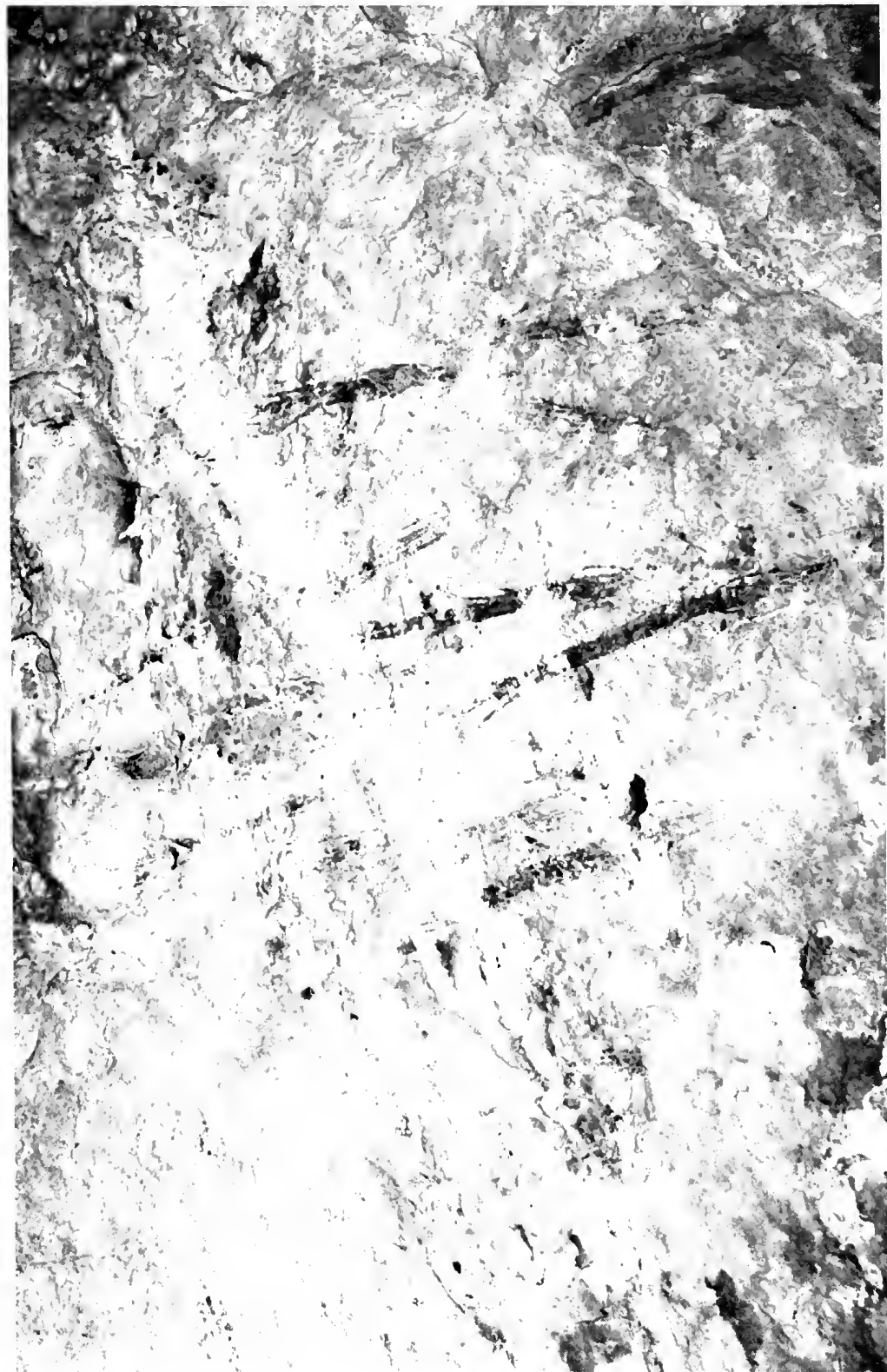


FIG 4: Pre-estuarine period: imprints of grass.

weathered, several examples may show sufficient detail for species identification. They were made by immersing a handful of grass in wet pigment and striking it against the rock surface (Fig. 4). It is suggested that these grass prints were made at the time when the grass seeds formed a part of the staple diet of the local populations. The grindstone excavated at **Malakunanya II** in the 18 000 year old context implies the collection and use of such cereals. Elsewhere, engravings of grasses on stone and bone have been recovered from Hoabinhian deposits in Vietnam (Colani 1927) where cereals were widely used. The paucity of the grass prints representations may be due to their original limited distribution and overpainting by designs of succeeding periods. Because the general subjects depicted in rock art of this region usually reflect the economies of local environments, the grass prints would have been mostly made in the shelters of lowland residual rock formations, and in the margins of the escarpment adjoining the plains, sites that were also later favoured by the populations of the estuarine and subsequent periods.

Imprints of thrown objects are in all instances found on the high ceilings of overhangs or on vertical walls above the reach of man's hand. Originally it was thought that the curvilinear images were uncoordinated brush strokes made perhaps by a brush attached to a long, flexible stick, over which the artist had lost movement control. Recently, several distinct examples have been located in a well protected shelter which suggest that at least some of these images may have been skeins of string which were wetted in the pigment and thrown against the rock surface, imprinting the individual loops. However, there are also imprints of more solid objects which appear as splashes of pigment. These were perhaps made by compressed pieces of paperbark or similar substances, soaked in the pigment and hurled against the surface.

## 2. Large naturalistic animals and human beings

It seems that the naturalistic portrayal of subjects was practised from the moment that man discovered the ability to draw. The earliest constructed images of man in this region are not, however, undefined collections of lines gradually evolving into a definite representational configuration, and in the earliest horizon of this rock art style all the figures are confidently drawn, presupposing long development of such tactile skills.

The animals are usually drawn in outline and are textured or filled with contour lines, stipples, patches and, occasionally, with ochre wash. Frequently they are painted larger than life, and those details most characteristic of the species concerned are emphasised (Fig. 5). The majority of animals represented are macropods: the antilopine wallaroo (**Macropus antilopinus**), the northern black wallaroo (**Macropus bernardus**), the Alligator River euro (**Macropus robustus alligators**) and the agile wallaby (**Macropus agilis**). Other depicted animals are the rock possum (**Petropseudes dahli**), bandicoot (**Perameles**), echidna (**Tachyglossus**), rock python (**Python oenpellienses**) and the freshwater crocodile (**Crocodylus johnstoni**). However, there are also a number of representations

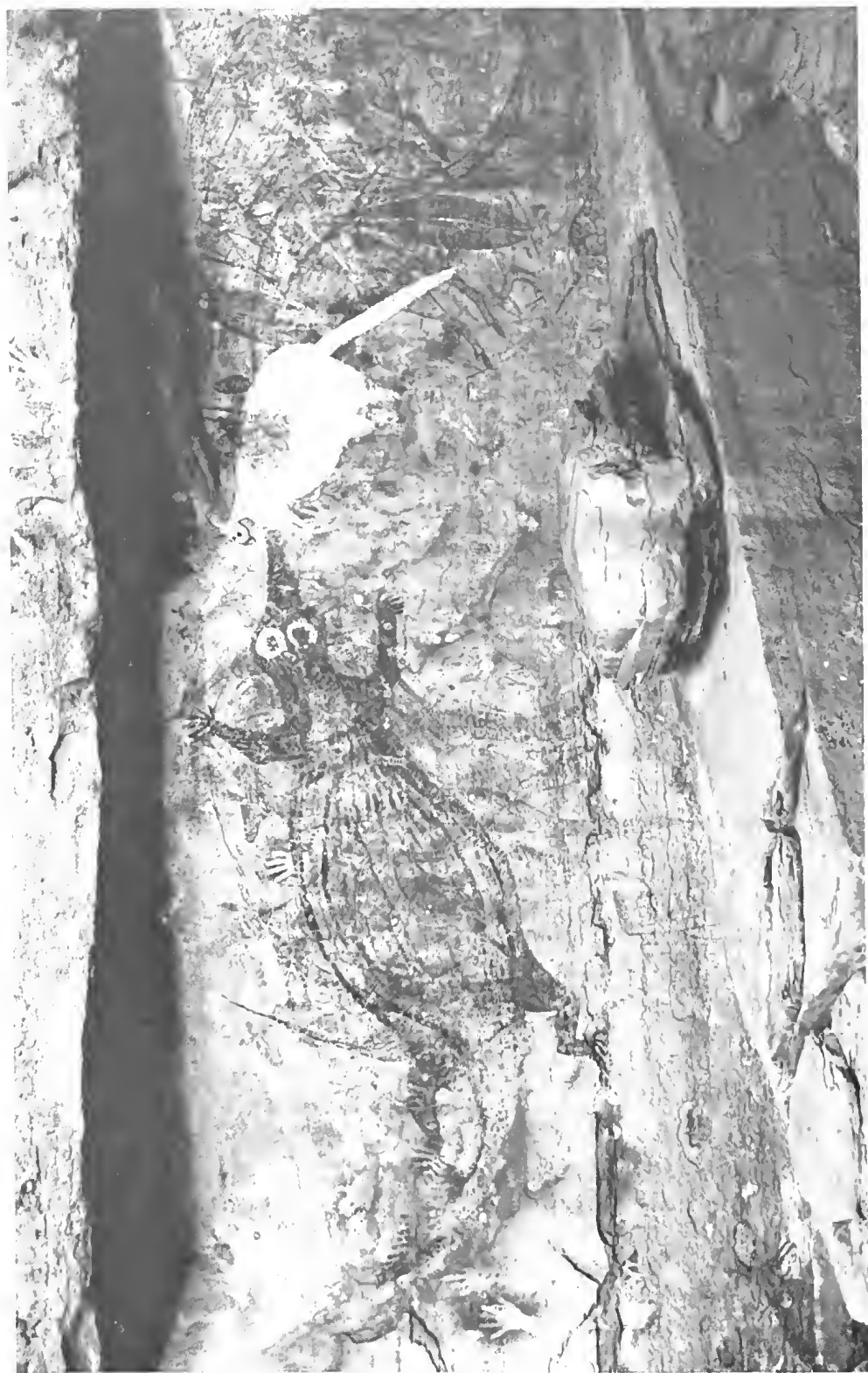


FIG 5: Pre-estuarine period: multiple superimposition of paintings in the large naturalistic animals and human beings style. The freshwater crocodile (*Crocodylus johnstoni*) is 337 cm long.



which are not recognised by Aborigines as belonging to the present day fauna (Fig. 6). One such animal is the thylacine (*Thylacinus cynocephalus*), described by them as a mythological dog associated with the Rainbow Snake. Others are the numbat (*Myrmecobius fasciatus*) and the Tasmanian Devil (*Sarcophilus harrisi*), whilst others have recently been tentatively identified as possible representations of extinct megafaunal species. These are the *Zaglossus*, *Thylacoleo*, *Sthenurus* and *Palorchestes* (Chaloupka and Murray, in preparation). In the past such representations were thought to be imaginary or mythological, or depictions of arrivals which survived for some time in the new environment but were not able to adapt or reproduce. The possibility of the accidental landfall of large as well as small animals was proposed by Calaby (1976), who suggests that the crossing of the large species could be facilitated by their greater buoyancy, whilst the smaller creatures had the ability to cling to driftwood.

The most convincing representation of these extinct animals is that of *Zaglossus*, the long beaked echidna, extinct in continental Australia for some 18 000 years, but surviving in the highlands of New Guinea (Murray, 1978). It differs from the Australian genus *Tachyglossus* in being a larger, longer legged animal with an elongated, downcurved beak. *Tachyglossus* has a short, straight or slightly upturned beak. As the representation of *Zaglossus* in rock art may have been drawn during full glacial times, it is possible that certain previously unidentified animal figures could represent other members of the extinct megafauna. It is suggested that one such large animal, accompanied in the composition by its young and associated in the gallery with paintings of thylacines, represents the extinct diprotontoid *Palorchestes*, a marsupial tapir. The animal in the painting is short legged and has steeply inclined hindquarters terminating in a heavy tail. The claws on the forepaws are long and curved. The neck is short, the head proportionately small, with a long, slender tongue protruding from its mouth. *Palorchestes* is known only from fragmentary remains which indicate that it had short, powerful, equal length limbs, large claws, a well developed tail, an elongated narrow tongue and accentuated nasal bones suggesting a trunk like upper lip. Independent reconstructions of this animal by R. Wells, Alan Bartholomai and Peter Murray, closely resemble the rock painting. Assuming that this painting does represent *Palorchestes*, it would indicate an age of more than 18 000 years for the commencement of this style.

As well as paintings of thylacines, there are also representations of other dog-like animals, some of which may represent the marsupial lion *Thylacoleo*, and one painting has been tentatively identified thus. There are also paintings of one-toed kangaroos, and their tracks, which may represent the extinct short-faced kangaroo of the genus *Sthenurus*, as the extant macropods and their tracks are depicted in the three-toed schema. Also present in this horizon of rock art are paintings of large birds which await identification.

The time of extinction of these megafaunal elements may be determined by considering their functional morphology and the habitat which they required for





FIG 6: Pre-estuarine period: a group of animals no longer present within the region. At left a numbat (*Myrmecobius fasciatus*), in the centre a female thylacine (*Thylacinus cynocephallus*) with her young feeding off the milk ducts, whilst in the upper right is a *Zaglossus*, the long beaked echidna (45 cm long).

survival. For example, according to sources quoted by Murray (1978), *Zaglossus bruijni*, surviving in New Guinea, feeds on earthworms of the soft humus layers of montane forests. Similar ground environment may have existed in the Arnhem Land Plateau region before the retreat of the sandstone rainforest, of which remnants are now found only in small protected areas of the plateau. This retreat was marked by massive erosion and sediment transport, which began to fill the occupational rock shelters at the base of the escarpment and surroundings with sand some 25 000 years ago.

Human figures of this style are depicted in two distinct forms. In one form the figures are large, portrayed frontally or in a twisted perspective. Noticeable attention is given to faces, shown in profile with recognisable features, and also to hands and feet. They are drawn in detailed outline and filled with ochre wash. In the other form the human male appears as a small, one-line, thick stick figure in the act of spearing a large naturalistic animal. These are the first meaningful compositions in the rock art of this region, as the hand and grass prints of the previous style, although intentionally grouped, do not reveal any obvious purpose of intent. The weapons used by the ambiguous stick figures consist of two spear types — the single multibarbed and a three-pronged multibarbed spear, and also, perhaps the fighting pick. According to the paintings both spear types were used for spearing macropods, but only the single multi-barbed spear was used to spear freshwater crocodiles. Of all these weapons only the single multibarbed wooden spear is represented as being used in the following pre-estuarine styles. The fighting pick appears again in the second last style of this period, whilst the three-pronged spear appears to have come into use again during the following estuarine period.

### 3. Dynamic Figures

This style consists of small drawings of human figures, anthropomorphs, animals and composite beings, predominantly portrayed in animated action. In the depiction of running figures, with their widespread legs, the artist of this style has translated the intensity of physical motion into pictorial dynamics. It is this characteristic of the style which suggested the name now applied to it. Such expressive movement inherent in these and other rock art styles has been described in similar terms by a number of authors. White (1967a) speaks of a single line group of "dynamic" *Mimi* figures at *Padypadiy*. In Europe Ripoll Perello (1968) called the style of small animal and human figures found in the Spanish Levant "**Fase estalizada dinamica**," and Anati (1974), describing changes taking place in the Valcamonica engravings, says that during a certain period static representations were replaced by "dynamic figures" depicted in motion.

Representations of this style were recorded in 260 rock shelters, over an area extending from the residuals of the Wellington Range, near Aurari Bay, 180 km south to El Sherana and 200 km east, across the plateau, to the Cadell River, Of

all the subsequent styles only the conventions of the X-ray style had a comparable distribution, but with more noticeable stylistic variation.

Almost all the **dynamic figures** surviving are red images, although several examples, from elevated, well-protected shelters, reveal that originally, they were also painted in other pigments and combinations of pigments. The human male predominates as a subject, but females, animal-headed beings, a variety of other anthropomorphs and animals are also drawn. The animals are mainly macropods, and of these the representations of the northern black wallaroo (**Macropus bernardus**) predominate. Other animals commonly depicted are emus (**Dromaius novaehollandiae**), echidnas (**Tachyglossus**), rock possums (**Petroseudes dahli**) and thylacines (**Thylacinus cynacephalus**). Three representations of Tasmanian Devils (**Sarcophilus harrisii**) and one of a numbat (**Myrmecobius fasciatus**) have also been recorded. Snakes and lizards are uncommon in this style, and are limited in the sample to three representations of the rock python (**Python oenpellienses**) and one of a major skink (**Egernia frerei**). Other animals portrayed are the long-necked turtle (**Chelodina rugosa**) and several bird and freshwater fish species.

The figures are usually arranged in detailed narrative compositions depicting economic and socio-cultural activities (Figs. 7, 8, 9). The typical male figure wears an elaborate head-dress, and a hair belt from which are suspended one or two pubic fringes or "skirts" of varying size and shape (Fig. 7a). He also wears necklaces, pendants, armlets, tassels and leg ornaments. The penis is only occasionally depicted, and when this does occur it is in a sexual context. In some compositions male figures are portrayed without head-dress, suggesting that these may represent neophytes. The men's weapons consist of barbed, single-piece wooden spears, a number of boomerang and club types, a hafted stone axe and sticks. Dilly bags of several sizes are shown worn over the shoulder, hanging from the neck or carried in the hand. The actual boomerangs which the hunter of this style used also appear in sites as stencils, documenting their shape and dimensions. In a number of instances the boomerangs are placed in a compositional context, with hand stencils of both the open-hand and the three middle fingers closed convention (3MF). In this latter stencil the three middle fingers are held tightly together, whilst the thumb and the little finger are extended. The two types of hand-stencils were also used as integral components of the figurative compositions of this style. Although the open-hand stencil continued to be used throughout subsequent styles and periods, the 3MF stencil is unique to this art style. Stencils of spears, dilly bags, necklaces and a hafted stone axe have also been recorded.

The female of this style wears no apparel and has no apparent bodily decoration. Her usual implements are a digging stick and a dilly bag, although in several instances she is also portrayed carrying spears, fire sticks and, in one example, a stone axe. Their bodies are more realistically portrayed than those of the male figures and there seems to be a total absence of children.

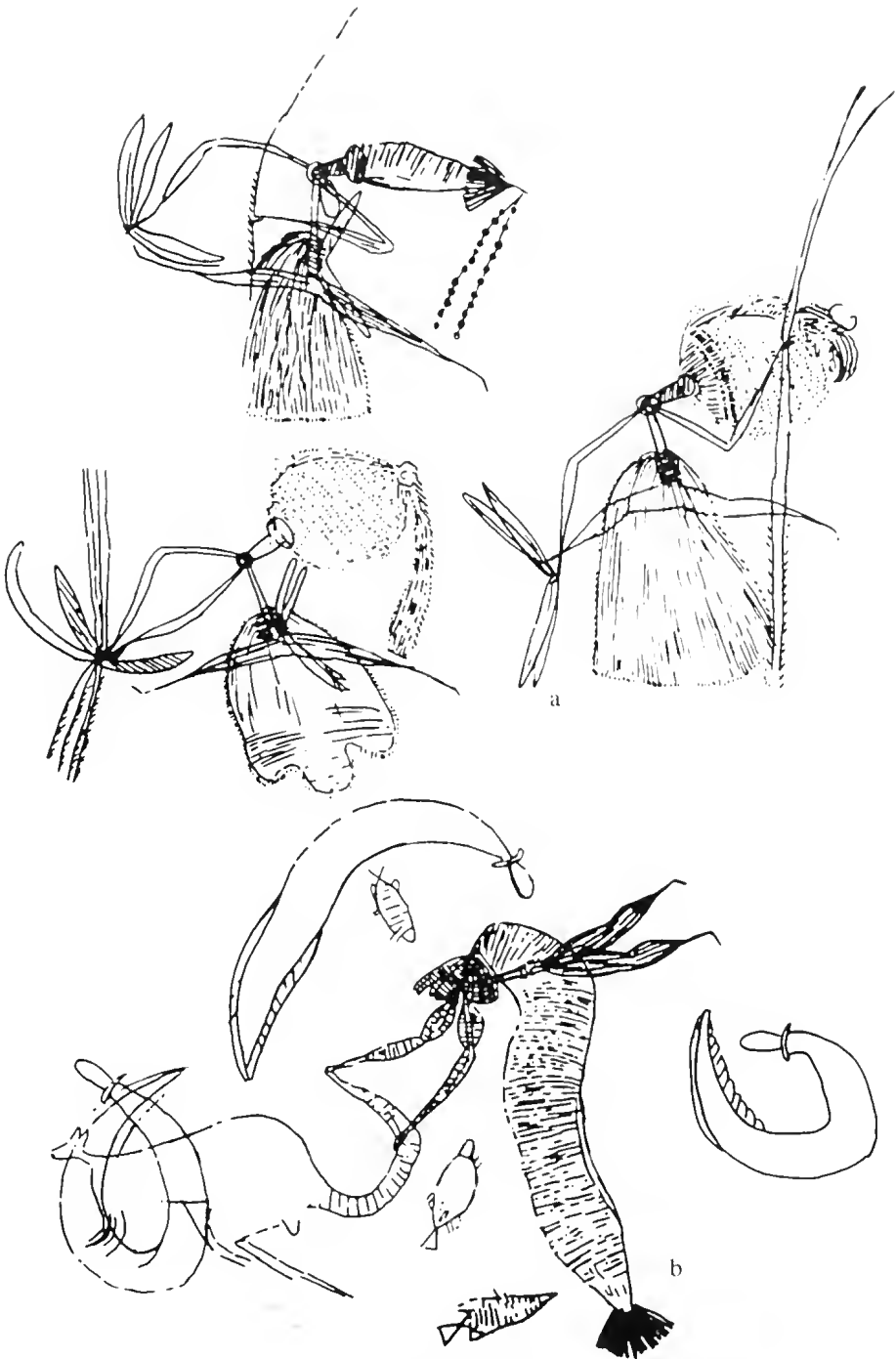


FIG 7: Pre-estuarine period, *dynamic figures*:

- (a) three male hunter figures in elaborate head-dresses (av. ht. 23cm), carrying barbed single-piece wooden spears and boomerangs (detail from a large composition);
- (b) a male figure with extremely large, long tasseled head-dress, leaping at a macropod and grasping it by the tail. The macropod was caught as it drank at a waterhole, suggested by the arrangement of freshwater fish around the two figures.



FIG 8: Pre-estuarine period, *dynamic figures*: detail from a complex composition of approx. 65 hunter figures (av. ht. 20cm).



FIG 9: Pre-estuarine period, *dynamic figures*: a composition of three couples. The males retaining their head-dresses and hair-belts have laid down their boomerangs and spears next to the females' dilly bags and joined them in a dance. Grass/fire symbols are an integral part of this composition.

The animal-headed beings are frequently depicted as participating with human beings in a number of activities. Although the shape of their bodies varies from those of male figures, they also wear hairbelts and “skirts” and carry spears and boomerangs. In many instances they are shown to have a long penis and large testicles, and in several paintings bear a close resemblance to the actual flying fox (*Pteropus alecto*) from which, it is proposed, these figures may have been stylised (Figs. 10). There are other anthropomorphic representations which cannot be classified into specific groups. The animal-headed beings and the anthropomorphs form the first evidence of mythogenesis in rock art.

Some of the human and anthropoid figures, animals and their tracks, are surrounded by dashes, and similar marks emanate from their mouths (Figs. 10, 11). It is suggested that these signs are perceptual inductions and inferences, depicting the non-visual aspects of the artist’s sensory experience, such as sound, smell, force, anxiety and, in the case of the animal tracks, their freshness (Fig. 12a). In the subsequent styles such signs are only used in several instances to depict a human voice. The different meanings symbolised by these dashes are well illustrated in a composition depicting a hunting technique in which a hunter, concealed behind a bundle of grass, successfully stalked and speared an emu (Fig. 12b). The symbols in this scene may indicate the following inferences:

1. power and/or speed of arm thrust;
2. movement of spear in projectile path;
3. large dashes from the emu’s beak — loud cries, or blood emission;
4. dashes from the hunter’s mouth — exclamation of success.

Elsewhere in the world symbols denoting human voice appear in the Aztec codices of the 15th and 16th century. They are usually depicted in the form of a downward curved tongue floating in front of a person’s face (Smith 1979: 154-164).

The artist of the dynamic figures style was not only an accomplished draughtsman, but also an innovator who, in his complex compositions, preceded similar achievement elsewhere by many thousands of years.

#### 4. Post-dynamic Figures

The **post-dynamic** figures, as the name suggests, have certain features in common with the previous style. The figures are usually silhouettes, at first closely resembling the **dynamic figures**, but becoming progressively stylised, and losing much of their previous animation, to finally appear as frontal, static figures (Fig. 13 a-c). The male figures continue to wear head-dresses, hairbelts and “skirts” and use the same weapons, except that the depicted boomerangs do not reveal the variety of types previously used. The fighting pick is a probable reintroduction, to become a common implement in the succeeding style. The range of figure motifs is limited, animal-headed beings and other anthropomorphs seem not to have been depicted, and there are few animal representations.





FIG 10: Pre-estuarine period, *dynamic figures*: an animal-headed being (20cm), a companion of the male figure wearing a head-dress, hair-belt and armlets, with dashes emanating from their mouth and surrounding their bodies. Both figures carry several spears and also boomerangs. The thicker lines of the fighting pick, or, perhaps a spear-thrower, is a later addition to the paintings.





FIG 11: Pre-estuarine period *dynamic figures*: life-size emu with its head turned back, dashes issuing from its beak, separates the running male and female figures, the later holding spears. A copulating couple is at upper left.

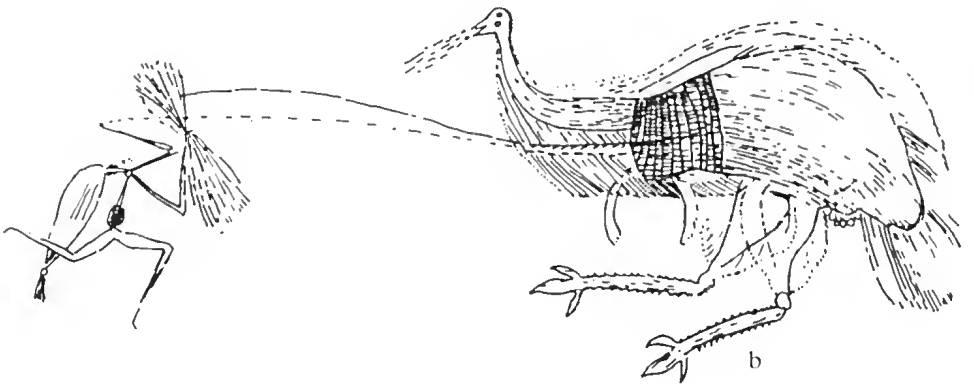
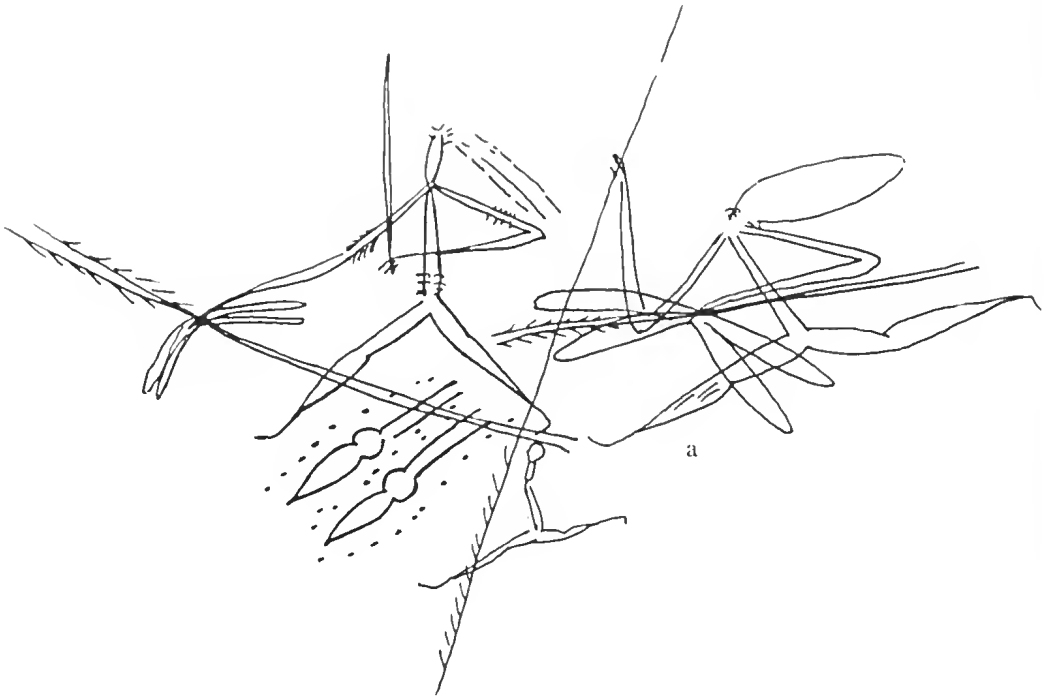


FIG 12: Pre-estuarine period *dynamic figures*: sensory symbols

- (a) hunter figures following single-toed maeropod tracks surrounded by dots, signifying perhaps their freshness;
- (b) hunter spearing an emu, dashes out of the man's mouth, the emu's beak and along the projectile path represent several sensory inferences.

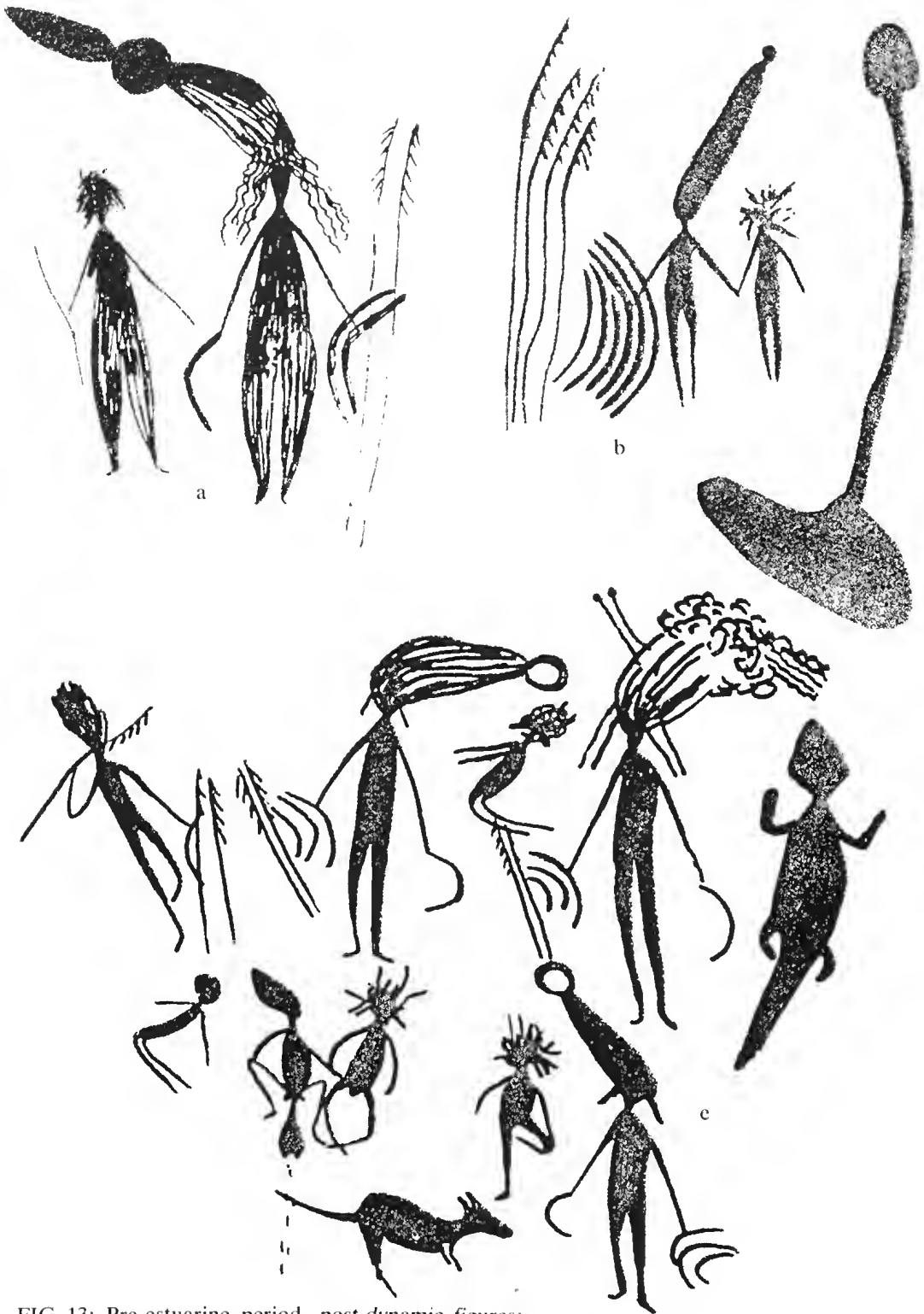


FIG 13: Pre-estuarine period, *post-dynamic figures*:  
 (a-b) two couples, males in head-dresses with spears and boomerangs, one pair associated with a hafted stone axe (av. ht. 22cm);  
 (c) composition of male figures and children with a macropod and a blue-tongue lizard.

In one locality, between Oenpelli and Ngarradj Warde Djöbkeng, the dynamic figures are replaced by sensuous, slender figures, first recorded by Mountford and typified by compositions of elongated silhouettes of running figures, in which the male is depicted with head-dress and penis (Fig. 14 a,b). Perhaps the best known examples of this style are the group of four running females and a large composition of male figures (Mountford 1956, Figs. 13 and 39).

### 5. Simple Figures with Boomerangs (SFB)

The human form, stylised in the previous period, was further schematised to become, in time, a one line thick, stick-like figure. However, even at this point of abstraction the figures are depicted wearing head-dresses and "skirts" documenting a continuation of tradition (Fig. 15 a-g). The male figures continue to use the simple multi-barbed spears and boomerangs of the two previous styles. The fighting pick becomes an integral part of the weaponry, and its use is shown in several scenes of conflict. To differentiate between the stick figures of this style, those present in the large naturalistic representations, and those of the more recent period, they have been named **SFB**, as boomerangs were not present in the earlier style, nor is this weapon to be found in use by similar figures in the art of subsequent periods.

The apparent decline in those draughting skills which are so obvious in the dynamic figures style, may perhaps, point not so much to variation of aesthetic principles in this region's populations as to their displacement.

### 6. Yam Figures

The figures of this style, expressed in symbolic naturalism, consist of yam images transposed into human and animal forms. The evolution of a human being from the outward shape of a yam tuber can be constructed stage by stage, with the final form representing man associated with weapons and animals. The yam forms are usually identified as **angindjek**, a "water yam" (*Discorea bulbifora*) although some are said to represent **karbada**, long yams (*Discorea transversa*) and other species. Most species of *Discorea* develop as underground tubers, usually producing a herbaceous vine, which dies away at the end of the growing season. The **angindjek** plant consists of a tuber, surfaced with nodules and hairy rootlets, and a knobbed "head", from which sprouts the stem of a twining vine adapted to climbing bushes and trees. The tuber is an annual. In harvesting it, the dried stem is followed into the soil, the tuber is dug up with the help of the digging stick and the knobbed head broken off and replanted for regeneration.

The basic figure of this style is a knobbed yam tuber with a number of vines, or strings, evolving in time into a phytomorphic being and finally a man (Fig. 16, 17). The style motif of the yam, its physiognomy, is also imposed over that of a turtle, flying fox, birds, Rainbow Snake and a number of unidentified zoomorphs. These are assembled with the "yam people", to become part of

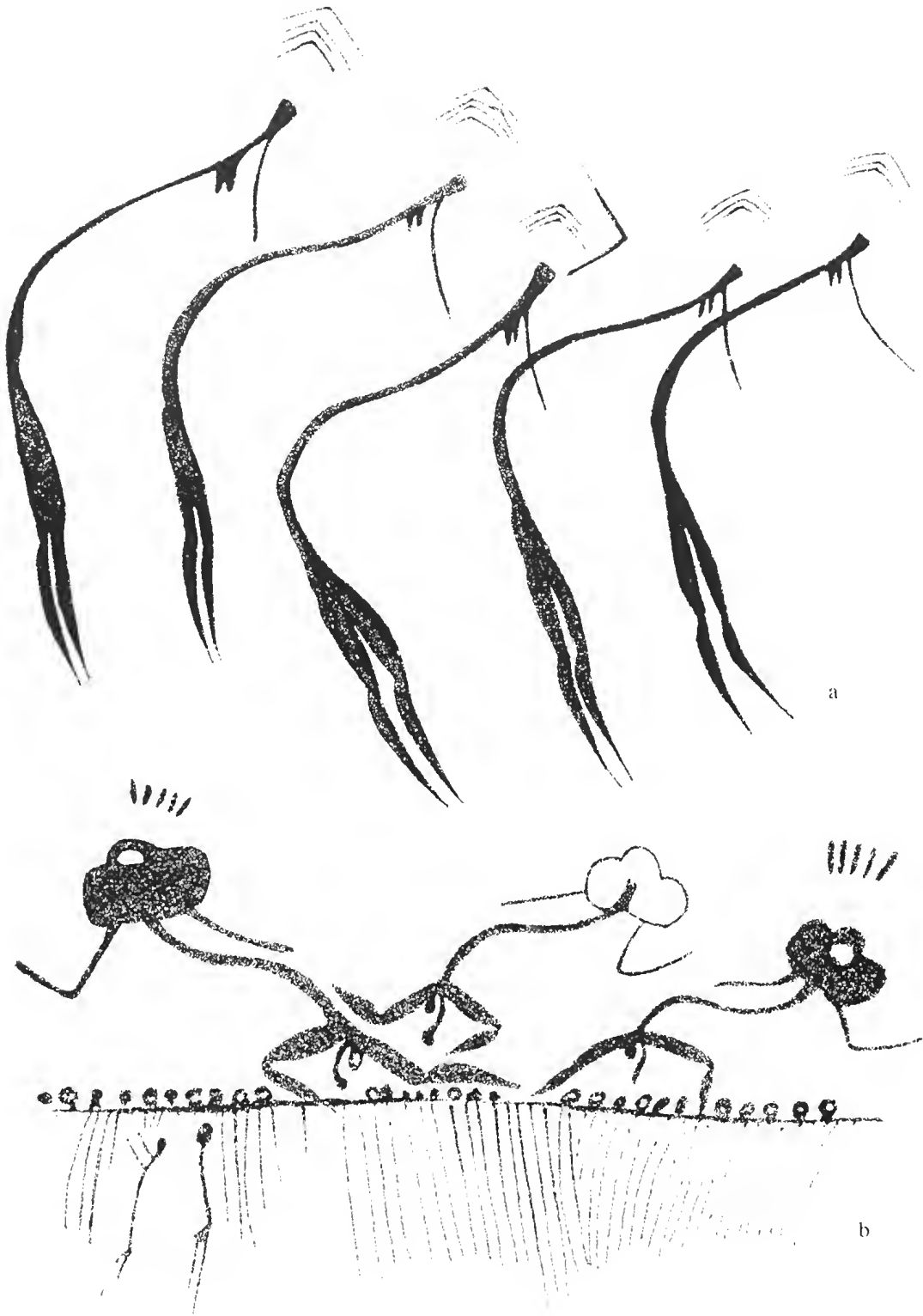


FIG 14: Pre-estuarine period, *post-dynamic figures*, Mountford's variation:  
(a) a group of dancing female figures (27cm);  
(b) male figures, detail of a complex composition (Mountford 1956, Fig. 39).

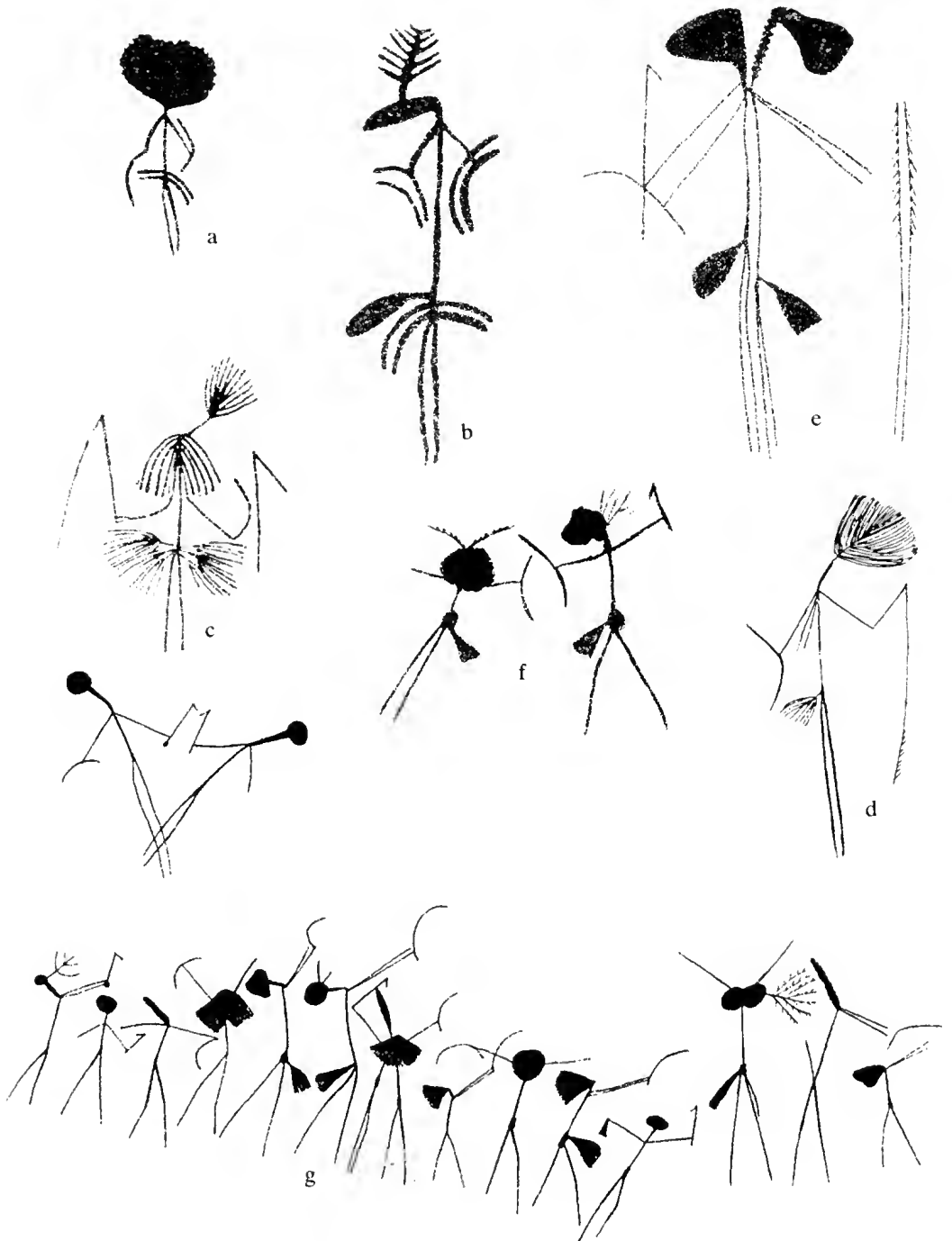


FIG 15: Pre-estuarine period, *simple figures with boomerangs*:  
 (a-d) SFB as single figures;  
 (e-g) SFB in composition, the last a detail of a scene of conflict (av. ht. 19cm).



FIG 16: Pre-estuarine period, yam figures:  
superimposition of simple and complex yam figures.



FIG 17: Pre-estuarine period, *yam figures*: multiple superimpositions of paintings in this style from simple *yam* images to human figures including a number of ibises.



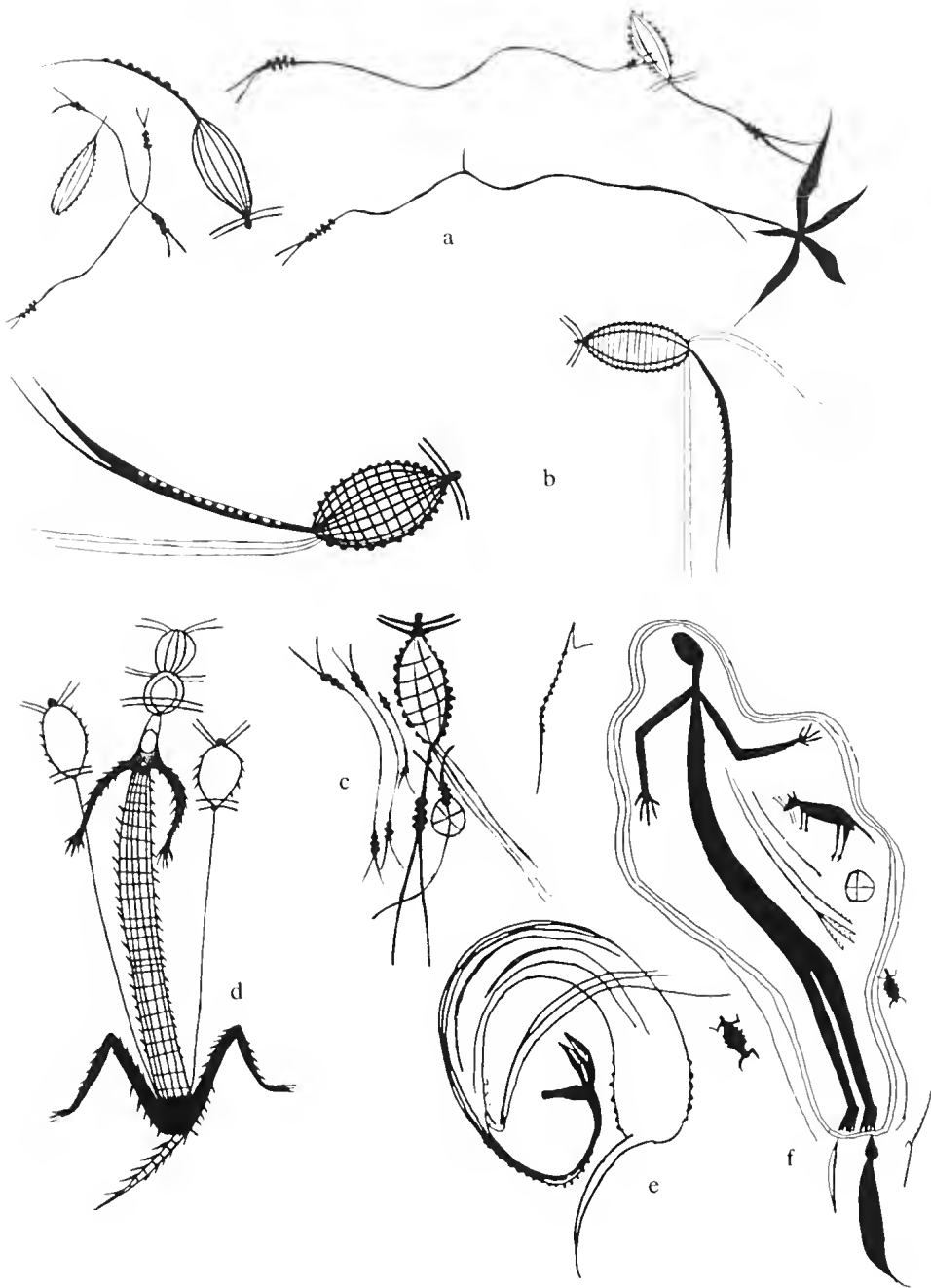


FIG 18: Pre-estuarine period, yam figures:

- (a) composition of yams, simple yam figures and yam "strings" (62 cm);
- (b) composition of two simple yam figures;
- (c) yam figures, "strings" and a segmented circle (55 cm);
- (d) unid. zoomorph with yams (121 cm);
- (e) Rainbow Snake (48 cm);
- (f) male figure with weapon complement segmented circle, macropod, frogs and a stylised blue-tongue lizard (165 cm).



FIG 19: Pre-estuarine period, *yam figures*:  
complex *yam figure* in its original red and white clearly superimposes earlier *dynamic figures*.

involved compositions. In many instances an abstract symbol, a segmented circle, is associated with such compositions (Fig. 18 a-f).

It is in this style that the Rainbow Snake is depicted for the first time in the rock art of this region. Although there are several simple forms of this being, the majority are complex representations which dominate the compositions of this period. The myths associated with the Rainbow Snake, who continues to be the main personage in the ritual of this region, are still current, and its representations in this early, and following styles documents the longest continuing religious belief in the world.

The conceptual change from the naturalism and schematisation of the previous styles to the symbolism expressed in the **yam figures** perhaps reflects change in the artists' psychological environment. This change in the world view and the introduction of new mythologies may have been due to population movements already commenced during the period of the two previous styles. The effects of the rising sea on human migration and land settlement have been commented on by Mulvaney (1975: 176) who suggests that the loss of large areas of land required adaptive efforts and a conciliatory philosophy, and by Blainey (1975) who proposes that this event disturbed the life of all Australians for thousands of years and affected their relationships, languages, marriage patterns, genetics, religion and mythology. Chappel and Thom (1977) suggest that shoreline migration rates laterally ranged up to several hundred metres every ten years. The rapidly rising sea may have caused the Rainbow Snake belief, for in the majority of the northern myths this being is associated with rain and floods, and in the coastal variations of this myth it emerges from the sea and swallows or drowns people.

There were no evident representations of yam plants in the preceding rock art styles, although the **dynamic figure** females are depicted carrying digging sticks and dilly bags, some of which are filled with rounded, tuber-like contents. The focus of a whole style on a plant subject suggests the importance of the **Discorea** to the artist and may have been due to several factors, all connected with the rising sea levels:

1. As the species **Discorea** requires about 120 cm of rainfall annually for growth (Alexander and Coursey, 1969), it may have been either absent from or dormant in the Arnhem Land Plateau during the last glacial maximum, and recolonised or regenerated the area with the increase in precipitation accompanying the rising sea.
2. People who had previously exploited the now submerging grasslands for cereal, found **Discorea** an important replacement for their supply of carbohydrates.
3. The retreating populations, which during the glacial maxima reoccupied the Sahul, and may have come into contact with their New Guinea neighbours, brought back with them the traditions associated with this species, for by

that time the wild yams may already have been of considerable importance to the New Guinea populations. In New Guinea, the wild yams were later replaced by cultivated plants, and their cultivation is at present associated with a ritual complex. The cultivation of yams and the accompanying ritual in New Guinea and elsewhere in Melanesia have been described by Haudricourt (1964) as the “**civilisation de l’ignome**”. The paintings of the **yam figure** style may be the expressions of an earlier “yam civilisation”.

### ESTUARINE PERIOD

The Estuarine Period of rock art commences with the first appearance of paintings representing animal species introduced into the region as the sea rose to its present level (Figs. 20 a-d, 22). Evidence from the Holocene chenier plain at Point Stuart, 85 km east of Darwin, indicates that the post glacial transgression had ceased by about 6000-7000 years B.P. (Clarke, et al 1979). The key representation identifying the beginning of this period was the giant perch, barramundi (**Lates calcarifer**) which was to become the dominant subject in rock art, reflecting its importance to the now riverine populations. Other introduced species frequently depicted in the rock paintings are the mullet (**Liza diadema**), the lesser salmon eatfish (**Hexanema tichthys leptaspis**) and the saltwater crocodile (**Crocodylus porosus**).

At the beginning of this period the rising sea filled the shallow valleys and trenches of rivers and creeks with seawater and estuarine clays, creating a broad salt marsh environment adjacent to the plateau and its outliers. The East Alligator River meandered through these sub-coastal plains, its tidal reach extending into the escarpment of the plateau. The environmental change not only introduced a range of new animal species, but also caused shifts in the habitat of the previously extant flora and fauna. The antilopine wallaroos, many of the smaller marsupials and also the emu, once occupying the pre-estuarine plains, were forced to move further inland. It is probable that the thylacine also retreated into the interior, or then became extinct, as it is no longer represented in the rock art styles of this period.

The modification of man's weapon complement accompanying the environmental change is also documented in rock paintings. Whilst boomerangs are no longer used, a number of new spear types and a spear thrower appear. These changes in the subject matter are clearly identifiable because the paintings of this period are again of the naturalistic mode, of animals and of man as hunter and gatherer. One such animal is the flying fox (**Pteropus alecto**) portrayed for the first time in its fully animal form, in the typical head down position, and not as a mythological being. The Lightning Man, **Namarrgon**, is also depicted for the

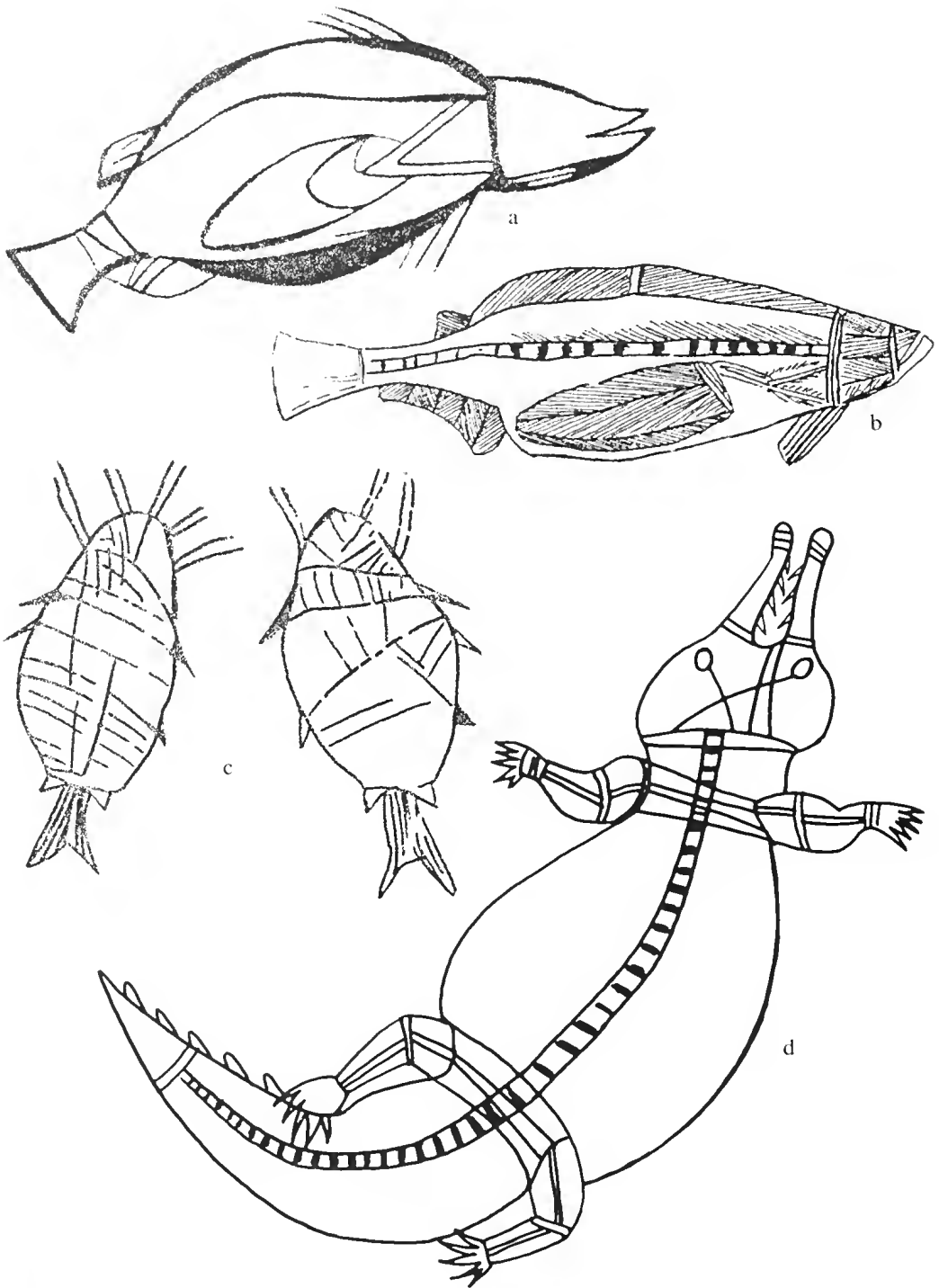


FIG 20: Estuarine period, introduced fauna:  
 (a) Barramundi (*Lates calcarifer*), 72 cm;  
 (b) mullet (*Liza diadema*), 52 cm;  
 (c) Lesser salmon catfish (*Hexanematchthys leptaspis*), 62 cm;  
 (d) saltwater crocodile (*Crocodylus porosus*), 260 cm.



FIG 21: Estuarine period, Namarrgon, the Lightning Man, as represented by different language groups:  
 (a) male Lightning, Gunwinggu (110 cm);  
 (b) male Lightning, Amurdak (170 cm);  
 (c) female Lightning, Wuningangk (42 cm);  
 (d) composite being with male, female and animal features, Djawonj (65 cm).



FIG 22: Estuarine period, paintings of the descriptive x-ray style, barramundi and lesser salmon catfish.

first time, as the region then became subject to prolonged wet seasons with electrical storms. This being is usually represented in its male form, holding stone axes with which it splits the clouds, while the band encircling its body symbolises the lightning. Further stone axes are attached to different parts of its body. In some instances the Lightning is portrayed as a female or a composite being. (Fig. 21 a-d).

The naturalistic phase of this period developed into the intellectual realism of the **X-ray** style. The **X-ray** style in its **descriptive** and **decorative** phases, became the dominant, but not the only, form of expression throughout this and the following periods.

### **Descriptive X-ray**

In this style the artist depicts the internal features of a subject as well as its external form. The animals are depicted in their dominant recognisable aspect, generally in profile, with their internal organs and bone structure (Fig. 22). The human body of this style is usually portrayed with a schematised skeletal form, whilst inanimate objects such as a rifle, introduced during a contact period, may show the bullet within its breach, and a Maeassan **kris** is depicted in its sheath. Although at a superficial level all the **X-ray** paintings of a given subject look the same, there is a noticeable spatial variation between the paintings of adjoining language and even clan groups. The first representation of a stone-headed spear appears in this style, and may be temporally associated with the appearance of the stone point in the stone tool sequence some 4 000 years ago.

The painting convention of this style was to paint the subject first as a full white silhouette, and then to outline the design and draw in the internal subdivisions with other pigments. Consequently in sites with **X-ray** paintings examples of earlier styles tend to be concealed. However, as the white pigment usually used is unstable, in shelters where the **X-ray** paintings are subject to weathering processes the earlier paintings are revealed. The **X-ray** style continued to develop in elaboration; the internal subdivisions and organs were not only outlined and filled in with different colours, but their interior was also hatched. There are examples of up to ten different types of hatching used in the one design, creating optical mixes of colour well beyond the four basic pigments used.

### **Decorative X-ray**

In the continuing elaboration of the **X-ray** style some artists appear to have lost interest in the anatomical details of internal organs and subdivided the animal's body for purely decorative purposes (Fig. 16b). However, the descriptive form of **X-ray** continued to be used until the most recent time. Although the **X-ray** style was the most prominent feature of this period, paintings in other forms are common. It is possible that, when several styles appear contemporaneously, they may have been used for different purposes and functions.



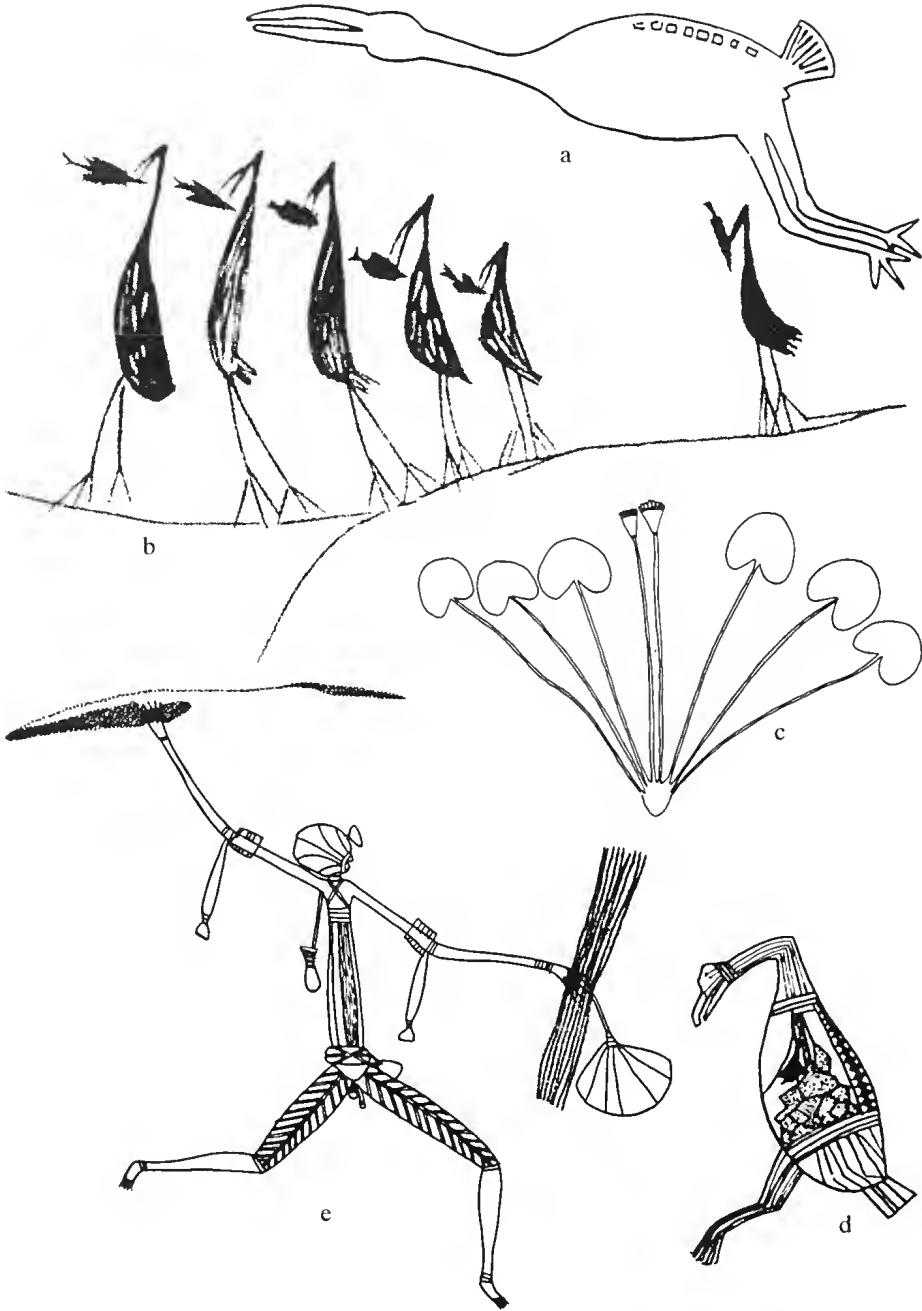


FIG 23: Freshwater period:  
 (a-b) jabiru (*Xenorhynchus asiaticus*);  
 (c) lotus lily (*Nelumbo nucifera*), 133 cm;  
 (d) magpie goose (*Anseranus semipalmata*), 55 cm;  
 (e) hunter figure with goose spears and a goose-wing ("fan"),  
 87 cm.

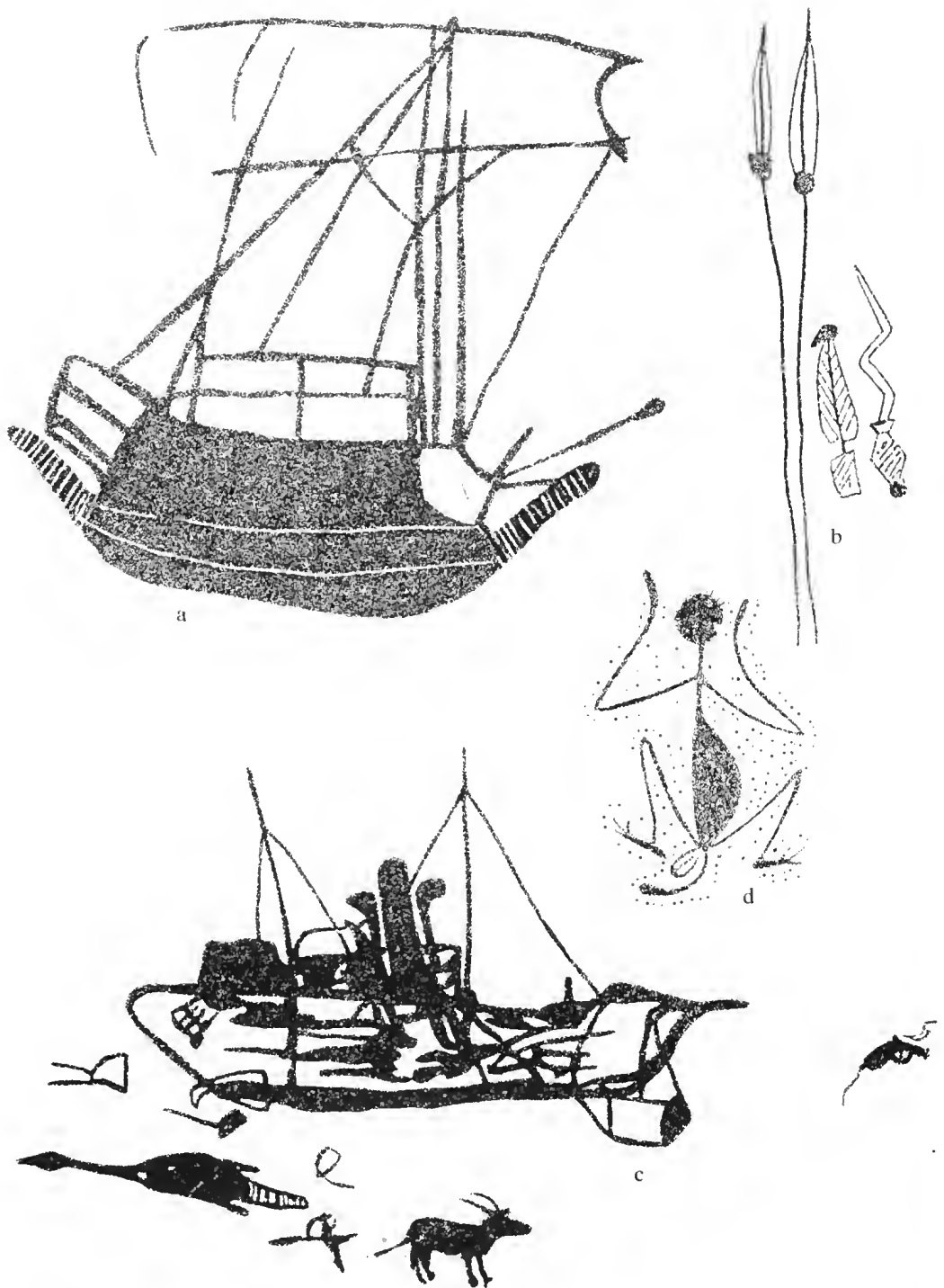


FIG 24: Contact period:  
 (a) Macassan prau, (46 cm);  
 (b) Macassan kris as a part of Aboriginal weapon complement (26 cm);  
 (c) European boat and its cargo (137 cm);  
 (d) sorcery figure (75 cm).

## FRESHWATER PERIOD

Another major environmental change within this region occurred when the freshwater billabongs and paperbark (*Melaleuca leucadendron*) swamps developed over previously saline plains. The annually flooded wetlands became a major habitat of important water fowl species such as the magpie goose (*Anseranus semipalmata*) and the water whistling duck (*Dendrocygma arcuata*) jabirus (*Xenorhynchus asiaticus*), and also a host to new, rich, floristic biota, including such food plants as wild rice (*Oryza fatua*), water lilies (*Nymphaea gigantea*) and lotus lilies (*Nelumbo nucifera*) (Fig. 23, a-d). This environmental change is reflected in the shell middens which in their upper layers contain the freshwater *Velesunio* mussels, and also in the rock art. Rock paintings of magpie geese and of their hunters, depicted carrying a bundle of the specialised “goose spears”, a short, light reed shaft tipped with a sliver of hardwood and a goose-wing “fan”, typify this period (Fig. 22d). The paperbark rafts poled by women into the wetlands to collect goose eggs in season are also portrayed in rock paintings as are the water lilies they gathered later in the year. The majority of these paintings are in the X-ray style, although other forms of expression were concurrent, such as the one-line thick running hunter figures with spears poised in spear-throwers held in their upraised arms, carrying goose-wing “fan”. It is suggested that the aerophone — the **didjeridu**, was invented or introduced during this period, for in the compositions depicting activities when this instrument is used the participants also carry a goose-wing “fan”. Environmentally this period has persisted into the present.

## CONTACT PERIOD

Paintings of the Contact Period vary from the previous styles only in the subject matter, and the stylistic conventions and painting techniques of the previous estuarine styles continued to be observed and used. This period commenced with the first visits by the Macassan fishermen to the northern coast (Fig. 24a,b). Prior to this there may have been other instances of arrivals, as, for example, when the dingo reached Australia, but these have not been identified in the rock art. The contact period could be further divided into the Macassan and European phases, although it is probable that Macassan subjects continued to be painted after the arrival of the Europeans, as their annual visits did not cease until 1907.

The boats which brought these visitors and their material possessions are depicted not only in the shelters close to the northern coastline, but also further inland where trade objects, steel axes and knives, were stencilled and painted.

The history of European settlement in the north could be reconstructed from the rock paintings. The first images are of boats and ships which sailed along the coast and the exotic animals which were landed from them (Fig. 24c). There are paintings of early explorers, of construction of the railway line to the Pine Creek goldfields, Darwin wharf in the 1890s, buffalo shooters pursuing their prey and a portrait of the first missionary to come into this region.

The internally painted and decorated hand stencils and beeswax designs belong to this period, for in a number of instances they are associated with contact subjects. The beeswax designs, as rows of pellets or anthropomorphic figures, were made by pressing shaped pieces of wax onto the rock face (Fig. 25). The physical change in one such figure observed over a fifteen year period, suggests that beeswax designs may last only several hundred years. The majority of the sorcery paintings are also associated with this period, being perhaps a direct product of stress and sickness introduced by contact, such as the documented epidemics of influenza, measles, and leprosy which affected perhaps the majority of the population in the vicinity of Oenpelli (Dashwood 1897), where most of these paintings are found (Fig. 24d).

The labour intensive buffalo shooting industry commenced in the Alligator River region in the 1890s, with each operator being supported by a labour force of one hundred or more Aborigines. It was then that much of the rock art ceased, although individual artists continued to paint occasional designs when visiting their countries. The last rock paintings in the **X-ray** tradition were executed at two sites in the Nourlangie Rock complex in 1964, whilst the last known paintings in this region, a white silhouette of an agile wallaby and a goanna, were painted in 1972.

For the majority of the younger people the incursion of Europeans and their institutions meant that they were unable to acquire traditional skills. The casual paintings, daubed onto the rock face with fingers, using the locally obtained clays or pigments, attest to this. White clays were now used in the execution of hand stencils of this period, as the trade patterns which ensured the availability of red pigments, were no longer in operation. The people who went to live on missions and settlements chose to use the alternative art form of bark painting, itself of a long tradition, to depict subjects previously painted on the walls of the rock shelters, and this then became the dominant art form of this region.



FIG 25: Contact period, beeswax design. A composition in which a buffalo is followed by a hunter holding a rifle and a skimming knife (52 cm).

## PERMANENCE OF ROCK PAINTING

When considering the proposed sequence of the Arnhem Land Plateau rock art and its early commencement, one question must be answered: how did the rock paintings of this region survive throughout the millenia, when elsewhere in Australia they are known to weather quite rapidly.

The permanence of rock paintings is dependent on a number of factors:

1. degree of protection
2. type and matrix of the host rock
3. pigment properties
4. methods of application
5. climate at the time of execution.

The degree of protection offered by the physical configuration of a shelter, and its prevailing microclimate are of considerable importance, especially for the more recent paintings which were executed first on a white base silhouette and then outlined and decorated in other pigments. Paintings in elevated shelters protected by deep overhangs have a better chance of survival than those situated in a ground level shelter surrounded by vegetation, where the prevailing moist conditions encourage the presence of a number of weathering agents, and also of animals which frequent such shelters.

Perhaps the most important factor affecting the permanency of designs is the type of the host rock, its matrix, and the chemical elements present in its composition, closely tied with the quality of used pigments. The two main rock types forming the Arnhem Land Plateau are the stable, hard orthoquartzites and the less stable quartz sandstones. The former type retains at least some of the original interlocking silica outgrowth structure which cements the quartz grains together and weathers imperceptibly over time, as is evident in the sheer cliffs forming the escarpments of the plateau. The quartz sandstone on the other hand, having a matrix of clay minerals and mica, is liable to break down by hydration and solution processes. It was this considerably rapid weathering of quartz sandstones which created the plateau's residuals. However, the pore volumes being larger in the quartz sandstones than in orthoquartzites allow the applied pigment to penetrate deeper into the rock surface than is the case with the more compact orthoquartzites. This permeability and subsequent bonding of the pigments with the host rock depends on its chemical properties and structures. The clay based pigments, applied as a thick paste to achieve opacity, coat, but do not penetrate into the rock surface. On the other hand iron oxides, particularly in their ferric form of haematites, when prepared, form a staining liquid of a

water colour consistency and penetrate the rock surface to a depth of several millimetres. Being chemically more active, such pigments then form bonds with the host rock. The penetration and bonding with rock matrix is also achieved, to a lesser extent, by the minute component particles of the rare white mineral huntite or magnesite. However, it must be stressed that, although the quartz sandstones of the Arnhem Land Plateau are not of such a hardness as the orthoquartzites, they are far more stable than, for example, the sandstone complexes of Delamere or the Hawkesbury River.

Another factor in the permanence of paintings is the methods and also techniques used in constructing a design. Where the design has been painted in red and the pigment has penetrated into the rock surface the painting has considerable permanency, but when, as in the paintings of the X-ray style, the red pigment has been applied over a base of clay white, and has not successfully penetrated the white layer to stain the rock surface, both pigments, if not protected will weather away. In the pre-estuarine styles the majority of surviving paintings were executed in red, although a number of examples indicate that some paintings were in other pigments and combinations. Fortunately the colour application sequence during that period was reversed, the subject being first painted in red and only thereafter further decorated in white.

The depth of rock surface pigment penetration is also subject to the influence of climate at the time of application. When pigment is applied to a dry rock surface it is readily absorbed into the rock matrix, whereas if the rock is saturated with moisture, as happens during the present wet seasons, the pigment remains on the rock surface. It was this observable, variable pigment penetration which originally suggested that the early paintings survived because they may have been executed during a considerable drier period than at present, and that their continued presence was due not only to being deeply bonded with the rock matrix, but also because they might be protected by silica skin which originated during such a climatic regime. The existence of such a silica coating was confirmed on a rock surface sample taken from a shelter with thylacine paintings (Watchman 1979). Further rock samples from painted shelters, representing both rock types, were analysed by Watchman (1982). From the twelve submitted surface samples, six were found to have multilayered complex silica skins up to sixty microns thick, forming a continuous surface layer across the quartz grains. Describing the formation of the mineral coatings from this region, Watchman states that the

“ . . . silica in the coatings is most probably derived from chemical weathering of the abundant quartz grains in the rock on which the layers have formed. The mechanism envisaged is for the solution of silica by groundwater, transportation of the fluid to the surface and evaporation of water combined with precipitation of silica. Even though this may seem like a simple process it is more complex

because certain conditions must prevail to aid silica mobility and deposition. Silica skins on the quartzites of this region are thin and apparently formed in hot and climatic periods over a long time span”.

Dry semi-desert conditions existed in this area during the height of the last glacial period some 18 000 years ago (Jones and Bowler 1980). Thus the formation of a silica skin over painted surfaces not only explains why the early paintings have survived, but may, with further research on how and under what climatic regime it forms, also confirm proposed antiquity of the paintings.

## CONCLUSION

The proposed temporal sequence of rock art styles of the Arnhem Land Plateau region over a determined time period was achieved by first identifying the individual styles of rock paintings 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.

It is proposed that the Pre-Estuarine Period commenced during the last glacial maximum and that it may even predate this event. The evidence for this claim consists of the appearance of certain animals tentatively identified as belonging to the extinct Australian megafauna, the presence of used pieces of ochre throughout 25 000 years old deposits in painted rock shelters, the evidence of pigment preparation on a grindstone older than 18 000 years, and the presence of silica layers on at least some early paintings apparently formed in hot, arid, climatic periods over a long time span. Early mythogenesis is suggested by the appearance of animal-headed beings and other anthropomorphs in the **dynamic figure** style, whilst the Rainbow Snake belief commences during the **yam figure** style, and establishes itself as the longest continuing religious belief in the world. The Estuarine Period commenced 7 000-6 000 years ago with the introduction of the giant perch-barramundi and other forms of estuarine fauna and their appearance in rock art. Thylacines became extinct, or, moved further inland, as did some other animal species. Shell middens with mangrove mudflat species, commencing some 7 000 B.P., confirm this environmental change and also indicate the advent of the following Freshwater Period, with the appearance of freshwater **Velesunio** mussels in their upper level. This period is reflected in rock art by paintings of magpie geese, water lilies, and hunters with “goose” spears



and goose-wing “fans”. The acrophone **didjeridu** was introduced or invented during this period. The contact paintings document the use of the coast by Macassan fishermen and later document the settlement of the region by Europeans.

The rock art of the Arnhem Land Plateau represents not only the world’s longest continuing tradition of this art form, but it also documents, in its detailed narrative compositions, the longest record of human endeavour. The rock paintings of all the periods allow us not only to reconstruct the economy, social structure and the cosmogony of the early Australians of this region, but also reveal the aesthetic dimensions of their human experience. The proposed logical sequence of periods and styles may be used in considering rock art sequences in other Australian regions and other continents, when similar artistic modes of expression and subjects suggest universal motifs, some already evident: running figures, animal-headed beings and animal-headed Rainbow Snakes.

A chronological sequence similar to the Arnhem Land Plateau’s rock art may now also be proposed for the rock art of Kimberley. There the Bradshaw figures with their elaborate head-dresses, “skirts”, tassels, armlets and weaponry, are of the same period and contemporaneous with the **dynamic figures**, whilst the large multi-coloured **Wandjinas** and accompanying subjects are of the same period as the **X-ray** style. In between these two styles the stylisation and schematisation of the human form and the subsequent return to naturalistic representation can all be recognised.

It is also probable that similar forms of expression may be found in the rock art of Teluk Berau (McCluer Gulf) in Irian Jaya, for during the last glacial maxima, groups from both New Guinea and Arnhem Land would have reoccupied the emergent Sahul and come into prolonged contact. Roder (1959) illustrates the rock art of that region, and depicts a zoomorph holding a boomerang as well as several angled stencils which may have been acutely angled boomerangs, whilst the **X-ray** convention is used in the representations of many animal species. The study of the rock art of Teluk Berau is of primary importance, as during that period it was part of Australia and Australian prehistory, only as far away from the Arnhem Land Plateau as that is from Kimberley.

The achievements of the Aboriginal artists as evidenced in rock art support the conclusion expressed by Golson (1972) in his assessment of the research carried out elsewhere in South-east Asia that the region, of which Australia’s north was always a part, has moved from the background to the forefront in world cultural development.

## REFERENCES

- Alexander, J. and D. G. Coursey 1969. The origins of yam cultivation. In P. J. Ucko and G. W. Dimbleby (eds) **The domestication and Exploitation of Plants and Animals**. Duckworth, London.
- Allen, H. R. 1977. **Archaeology of the East Alligator Rivers Region, Western Arnhem Land**. Revised version of a seminar given to Dept. Anthropology, University of Auckland. Manuscript lodged at AIAS, Canberra.
- Anati, E. 1974. Post-palaeolithic stylistic changes in rock art as illustrated by the Valcamonica cycle. In Peter J. Ucko (ed): **Form in indigenous art**. AIAS, Canberra.
- Arndt, W. 1962 The Nargorkun Narlinji cult, *Oceania*, 32 : 298-320.
- Birdsell J. B. 1958 Some population problems involving Pleistocene man. **Cold spring Harbor Symposium on Quantitative Biology**. 22: 47-67.
- 1977 The recalibration of a paradigm for the first peopling of Greater Australia. In **Sunda and Sahul: prehistoric studies in Southeast Asia, Melanesia and Australia**, Allen, J., Golson, J. and Jones R., eds. London: Academic Press.
- Blainey, G. 1975 **Triumph of the nomads**. Melbourne: Macmillan.
- Bowdler, S. 1977 Coastal colonisation of Australia. In Allen, J., Golson, J. and Jones, R. (eds) **Sunda and Sahul: Prehistoric Studies in Southeast Asia, Melanesia and Australia**, pp. 206-246. Lond: Academic Press.
- Bowler, J. M., G. S. Hope, J. N. Jennings, G. Singh and D. Walker 1976. Late Quaternary climates of Australia and New Guinea. **Quaternary Research** 6: 359-94.
- Brandl, E. J. 1968 Aboriginal rock designs in beeswax and description of cave painting sites in Western Arnhem Land. **Archaeology and Physical Anthropology in Oceania**, 3 : 19-29.
- 1970 "Aboriginal Sites and Relics at Deaf Adder Creek, N.T." report to the Director of Social Welfare, N.T. Administration, Darwin.

- 1973 **Australian Aboriginal paintings in western and central Arnhem Land.** Australian Institute of Aboriginal Studies.
- Calaby, J. H. 1976 Some biogeographic factors relevant to the Pleistocene movement of man in Australasia. In R. L. Kirk and A. G. Thorne (eds): **The Origins of the Australians.** pp 23-28. A.I.A.S., Canberra.
- Chaloupka, G. 1977 Aspects of the chronology and schematisation of the prehistoric sites on the Arnhem Land Plateau. In Ucko, Peter J. (ed.) **Form in Indigenous Art: Schematisation in the Art of Aboriginal Australia and Prehistoric Europe.** pp 243-59. Canberra: Aust. Inst. of Aboriginal Studies.
- Chappel, J. and B. G. Thom. 1977 Sea levels and coasts. In Allen, J. Golson, J., and Jones. R. (eds) **Sunda and Sahul: Prehistoric Studies in Southeast Asia, Melanesia and Australia.** pp. 275-291.
- Clarke, M. F., R. J. Wason and A. J. Williams 1979 Point Stuart chenier and Holocene sea levels in Northern Australia, **Search**, 3:90-93.
- Colani, M. 1927 **L'Age de la pierre dans la province de Hoa-Binh. Tonkin.** Hanoi.
- Crawford, I. M. 1968 **The Art of the Wandjina.** Melbourne, Oxford University Press.
- Dashwood, C. J. 1897 Government Resident report on the Northern Territory.
- Edwards, R. 1974 **The Art of the Alligator Rivers Region.** Alligator Rivers Region Environmental Fact Finding Study. Government Printer, Canberra.
- Elkin, A.P. 1952 Cave paintings in southern Arnhem Land. **Oceania**, 22 : 245-255.
- Galloway, R. W. 1976 Geology of the Alligator Rivers Area. In Story et al., **Lands of the Alligator Rivers Area, Northern Territory. Land Research Series No. 38** CSIRO.
- Golson, J. 1971 Australia Aboriginal Food plants: some ecological and culture-historical implications. In D. J. Mulvaney and J. Golson (eds) **Aboriginal Man and Environment in Australia**, pp. 196-238. ANU Press. Canberra.
- 1972 The remarkable history of Indo-Pacific man: missing chapters from every world prehistory, **The Journal of Pacific History**, 7:5-25.
- Haudricourt, A.G. 1964 Nature et culture dans la civilisation de l'igname: origins des clones et des clans, **L'Homme** 4:93-104.

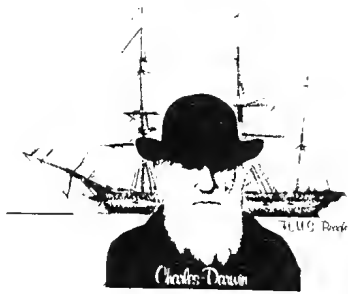
- Hughes, P. J. and R. J. Lampert 1980 Pleistocene occupation of the arid zone in Southeast Australia, **Australian Archaeology**, 10: 39-51.
- Jelinek, J. 1977 Nangalore: A gallery of rock paintings in Western Arnhem Land. **Anthropologie**. 15(1) : 3-26.
- 1978 Obiri — a rock art gallery in Arnhem Land in **Anthropologie**, 16(1) : 35-65.
- Jones, R. 1973 Emerging picture of Pleistocene Australians. **Nature** 246:278-81.
- Jones, R., and Bowler, J. 1980 Struggle for the Savanna: Northern Australia in ecological and prehistoric perspective. In Jones, R. (ed.) **Northern Australia: options and implications**. pp 3-31. Research school of Pacific Studies, A.N.U., Canberra.
- Kamminga, A. J., and Allen, H. 1973 **Report of the Archaeological Survey**. Alligator Rivers Region Environmental Fact-Finding Study. Government Printer, Canberra.
- Lampert, R. J. & P. J. Hughes 1980 Pleistocene Archaeology in the Flinders Range, **Australian Archaeology**, 10:11-20.
- Leichhardt, F.W.L. 1847 **Journal of all overland expedition in Australia, from Moreton Bay to Port Essington**, London, Boone.
- McCarthy, F. D. and F. M. Setzler 1960 The Archaeology of Arnhem Land, in C. P. Mountford (ed), **Records of the American — Australian Scientific Expedition to Arnhem Land**, Vol. 2:215-95.
- Macintosh, N. W. G. 1951 Archaeology of Tandandjal cave, south-west Arnhem Land. **Oceania**, 21, 178-204.
- Macintosh, N. W. G. 1952 Paintings in Beswick Creek cave, Northern Territory. **Oceania**, 22 : 256-274.
- Maddock, K. J. 1970 Imagery and social structure of two Dalabon rock art sites. **Anthropological Forum**, 2 : 444-463.
- Maynard, L. 1980 A Pleistocene date from an occupation deposit in the Pilbara region, Western Australia, **Australian Archaeology**, 10: 3-8.
- Meehan, B. 1977 Man does not live by calories alone: The role of shellfish in a coastal cuisine, in Allen J., Golson J. and R. Jones (eds) **Sunda and Sahul**, Academic Press.
- Mulvaney, D. J. 1975 **The Prehistory of Australia**. Second edition. Penguin Books: Melbourne.
- Murray, P. 1978 Late Cenozoic Monotreme Anteaters. **The Australian Zoologist** 20 (1): 29-55.

- Mountford, C. P. 1956 Art, myth and symbolism. **Records of the American-Australian Scientific Expedition to Arnhem Land**. Vol 1, Melbourne University Press.
- 1958 Aboriginal cave paintings at Slesisbeck, Northern Australia. **South Australia Museum, Records** 13(2) : 147-155.
- Nix, H. A. and J. D. Kalma 1972 Climate as dominant control in the biogeography of Northern Australia and New Guinea. In **Bridge and barrier: The natural and cultural history of Torres Strait**, D. Walker (ed), pp. 61-91. Australian National University Press, Canberra.
- Novotny, S. 1975 Rock paintings of the Gumardir River, Arnhem Land, Australia, **Annals of the Naprstek Museum**, 63-10.
- Ripoll Perello, E. 1968 Cuestiones en torno a'la cronologia del arte rupestre post-paleolitico en la Peninsula Iberica, in Ripoll Perello, E. (ed) **Simposio de arte Rupestre**, Barcelona.
- Roder, J. 1959 **Felsbilder and Vorgeschichte des MacCleur — Golfes West Neu Guinea**. L. G. Wittich Verlag, Darmstadt.
- Schapiro, M. 1953 Style. in **Anthropology today**. A. L. Kroeber ed. pp. 287-312 The University of Chicago Press.
- Schulz, A.S. 1971 **Felsbilder in Nord Australian**. Fanz Verlag, Weisbaden.
- Shaweross, W. 1975 Thirty thousand years and more. **Hemisphere**, 19 : 26-31.
- Smith, B. 1979 **Mexico, a history in art**. Gemini Smith, Brattleboro.
- Spencer, W. B. 1914 **The Native Tribes of the Northern Territory of Australia**, Macmillan, London.
- 1928 **Wanderings in the wild Australia**, Macmillan, London, 2v.
- Tresize, P. 1971 **Rock art of south-east Cape York**. Australian Institute of Aboriginal Studies: Canberra.
- Urry, James 1978 "Old questions: New answers? Some thoughts on the origin and antiquity of man in Australia", **Aboriginal History**, 1-2, pp 149-164.
- Verstappen, H. Th. 1975 On Palaeo climates and landform development in Malesia in **Modern Quaternary Research in Southeast Asia** Bastra Gent-Jan and Willem Arnold Casparie (eds) A. A. Balkema, Rotterdam.
- Watchman, A. L. 1979 Summary and interpretation of petrological, geochemical and mineralogical studies. In P. J. Hughes, A. L. Watchman and D. Gillespie **The Deterioration, Conservation and Management of Rock Art Sites in the Kakadu National Park, N.T.** Research School of Pacific Studies, A.N.U. Canberra.

- Watchman, A. L. 1982 **Chemistry, Mineralogy, and Petrology of rock samples from Aboriginal rock art sites in the Kakadu National Park, N.T.** Unpublished report.
- White C. 1967a **Plateau and Plain: Prehistoric Investigation in Arnhem Land**, Unpub. Ph. D. Thesis, A.N.U. Canberra.
- 1967b The prehistory of the Kakadu people, **Mankind**, 6 : 426-3. 1967b.
- White, C. 1967c Early stone axes in Arnhem Land, **Antiquity**, 41 : 149-52.
- White, C. and N. Peterson. 1969 Ethnographic interpretation of the prehistory of Western Arnhem Land. **Southwestern Journal Anthropology**, 25 : 45-67.
- White, C. 1971 Man and environment in Northwest Arnhem Land. D. J. Mulvaney and J. Golson (eds) **Aboriginal man and environment in Australia**, A.N.U., Canberra.







MAIN  
J4

11 1128 1  
1-C-2017 4