

Chapter 1. Introduction

The archaeological study of rock art can contribute to our understanding of past human behaviour and the ways in which previous cultural systems functioned. Unlike archaeological evidence, which is usually discarded fragments of human activities, rock art is both an image of, and a constructing force behind, human culture (Domingo Sanz *et al.* 2008:15). Rock art provides a visual record of past environments, animals, aesthetics and symbolism, human responses to climate change and a range of material culture e.g. body decorations, weapons and other implements, which are not commonly preserved in other types of archaeological evidence. This is due to the acidic nature of Australian soils that dominate the northwest Kimberley, where organic materials deteriorate quickly and are thus not able to survive in the archaeological record. Rock art is filled with significance and encodes many levels of information about the identity of the artists and their sociocultural context. It even allows us rare glimpses into the daily life of the artists through depictions of hunting, fighting, birthing and ceremonial scenes.

Within Australia, the study of rock art is helping to address some of the fundamental problems in archaeology, including the colonisation of the continent, emergence of language and changes in social organisation and land use (Morwood and Smith 1994:30, see also David 1994; Davidson and Noble 1992; Roberts *et al.* 1990; Rosenfeld 1993; Smith 1992b). Exactly how rock art expresses change in human behaviour forms part of my research topic. Specifically, this thesis is an archaeological investigation of the relationships between continuity¹ and change in the art assemblage of Wunambal Gaambera country, in the northwest Kimberley region of Western Australia.

¹ By 'continuity', I refer to the repeated presence of particular cultural conventions across space and/or through time (David 1994:12).

1.1. Research Context

This section provides the contextual framework for this thesis. It outlines the current understanding of human occupation and rock art production in the Kimberley, and identifies the hypotheses that have come out of previous research.

1.1.1. Human occupation in the Kimberley

To date, few archaeological studies have been undertaken in the Kimberley, but those that have indicate a complex cultural sequence with identifiable changes in population levels, land use and the stone tool assemblage (see, for example, Balme 2000; Blundell 1975; Crawford 1969; Dortch 1977; O'Connor 1990, 1999).

Morwood and Hobbs (1997:197) reasoned that some of this complexity relates to climatic fluctuations and *in situ* cultural developments.

Currently, the oldest evidence for human occupation in the Kimberley comes from Carpenter's Gap 1 and Riwi in the southern Kimberley, with non-basal dates of around 45,000 BP (O'Connor 1996; Balme 2000). Human use of the Kimberley is considered to have intensified by around 30,000, with sites such as Widgingarri, Widgingarri 2 and Koolan shelter along the southern Kimberley coast, and Drysdale 3 in the northern inland being occupied for the first time a little later (25,850±300 BP) (Morwood 2012:29; Morwood and Hobbs 2000:36). These dates attest to human occupation of the Kimberley region during the Pleistocene. Published dates for the occupation of the Kimberley are presented in Morwood and Hobbs (2000:36, Figure 30), including dates by Crawford (1969), Dortch (1977), Dortch and Roberts (1996), Morwood and Hobbs (1997), O'Connor (1995, 1996), and Veitch (1996).

1.1.2. Early evidence for the systematic use of ochre in northern Australia

The archaeological evidence from northern Australia indicates that symbolic behaviour overlaps with the oldest evidence for human occupation. This includes a painted limestone slab from Carpenter's Gap 1 (O'Connor and Fankhauser 2001) and

use-striated ochre 'crayons' from Malakunanja II and Nauwalabila I shelters in Arnhem Land (Jones and Johnson 1985; Roberts *et al.* 1990; Roberts *et al.* 1994).

In the Kimberley, the earliest evidence for symbolic behaviour and the systematic use of ochre comes from Carpenter's Gap Shelter 1 in the Napier Ranges. The Carpenter's Gap 1 deposit yielded a slab of the limestone roof coated with a red substance dated to a minimum of 42,700 BP (O'Connor and Fankhauser 2001:293). The authors used energy dispersive X-ray analysis to determine the elemental composition of the red substance on the limestone slab and concluded that it was consistent with that of ochre, although as the ochre was not in the form of a recognisable motif, it falls into the non-iconic category. From this dated slab we know that ochre has been in use in the Kimberley for at least 40,000 years, as early as the earliest evidence for occupation; and that symbolic behaviour was practised in the Pleistocene (O'Connor and Fankhauser 2001:296). Though alone, the ochre slab is not indicative of rock art production. A robust interpretation of Pleistocene rock art would require a recognisable motif, as ochre was not exclusively used to produce rock art (Aubert 2012:574).

Early use of ochre is also demonstrated in western Arnhem Land by the appearance of use-striated ochre 'crayons' from Malakunanja II and Nauwalabila I shelters (Jones and Johnson 1985:219). These 'crayons' are bracketed by 61,000±13,000 and 45,000±9,000 year-old thermo-luminescence (TL) dates from Malakunanja II (Roberts *et al.* 1990:153), and also at Nauwalabila I in close association with a 53,400±5400 year-old TL date (Jones and Johnson 1985; Roberts *et al.* 1994). Whilst we do not know what these 'crayons' were used for, they still attest to the early use of ochre in northern Australia by around 50,000 years ago.

1.1.3. Earliest evidence for rock art production in northern Australia

From the above evidence we have indications of considerable antiquity for the systematic use of ochre in northern Australia (around 50,000 years), but the earliest

secure evidence for rock art production is an excavated slab with an indeterminate black pigment motif dated to about 28,000 BP (David *et al.* 2013a). This buried charcoal painting from Nawarla Gabarnmang in Arnhem Land has a radiocarbon determination of $22,965 \pm 218$ BP (26,913-28,348 BP calibrated) (David *et al.* 2013b:8). The age of the artwork was determined indirectly by chrono-stratigraphic association, and by obtaining a radiocarbon age on ash adhered to the painted stone's back surface (David *et al.* 2013a:2496-7). The art could not be dated 'directly' by Accelerator Mass Spectrometry (AMS) radiocarbon dating as the sample taken was too small to return a reliable result ($<0.1\text{mgC}$) (David *et al.* 2013a:2496). Though the radiocarbon determination of this indeterminate black pigment motif does indicate that the production of rock art is of Pleistocene antiquity within northern Australia, it does not provide a minimum age for the production of figurative art.

Further afield, new evidence from Sulawesi shows that figurative art was already part of the cultural repertoire of the first modern human populations to reach the Indonesian region more than 40,000 years ago (Aubert *et al.* 2014:226). This has 'implications for our understanding of the time-depth of early symbolic traditions in the region, about which little is currently known' (Aubert *et al.* 2014:225). Twelve hand stencils and two zoomorphic figures, from seven cave sites in the Maros karsts of Sulawesi have provided minimum ages ranging from 17,400 to 39,900 years ago (Aubert *et al.* 2014:225). Minimum ages were obtained using uranium-series dating of coralloid speleothems that formed directly on top of clearly discernible motifs (Aubert *et al.* 2014:224). Specifically,

The earliest dated image from Maros, with a minimum age of 39.9 kyr, is now the oldest known hand stencil in the world. In addition, a painting of a babirusa ('pig-deer') made at least 35.4 kyr ago is among the earliest dated figurative depictions worldwide, if not the earliest one (Aubert et al. 2014:223).

These minimum ages are compatible with the oldest European art, where in northern Spain uranium-series dating demonstrates that the tradition of decorating caves extends back at least to the Early Aurignacian period, with minimum ages of 40,800 years for a red disk, 37,300 years for a hand stencil, and 35,600 years for a claviform-like symbol (Pike *et al.* 2012).

The 'pig-deer' from Sulawesi is depicted in profile as irregularly infilled outlines, which on initial inspection, appears very similar to the earliest figurative art phase in the Kimberley – the Irregular Infill Animal Period. These similarities may be a significant factor when considering the geographical proximity of the Kimberley to island Southeast Asia and may be relevant to future research into the evolution of symbolic behaviour of modern human arrival into Australia. Unfortunately, a major problem with use of the Kimberley rock art as a source of information about the past is the lack of secure dating. There are still very few absolute dates available to anchor the rock art sequence. Therefore, while we know that there was 'symbolic differentiation of populations early in the process of colonisation', we do not know if this included figurative art (Balme *et al.* 2009:64).

1.1.4. The Kimberley rock art sequence

The Kimberley region is home to one of the largest concentrations of rock art in the world. The geology of the region, mainly strongly bedded quartzarenites, has ensured the long term preservation of the rock art assemblage. As a result, the Kimberley rock art sequence is likely to prove one of the longest and most complex anywhere in the world (Ross *et al.* 2011:4).

Like western Arnhem Land, the art assemblage of the Kimberley has an emphasis on figurative motifs with a 'degree of detail not evident in Aboriginal rock art in most other regions, and with clear visual clues for recognition of depicted subjects' (Morwood 2012:31). Overall, the art assemblage of the Kimberley shows that there have been major changes in stylistic conventions, subject matter (e.g. fauna, material culture, and weaponry), and context of production and function through time (e.g. Crawford 1968, 1977; Schulz 1956; Walsh 2000; Welch 1993b). For this reason, the assemblage provides an opportunity for investigating changes in human behaviour and society otherwise unavailable in archaeology (Morwood 2002:260). This is as 'the activities, accoutrements, weapons and animals vividly depicted in early rock paintings contrast markedly with the sparse evidence of bones, plant remains and stone artefacts recovered from archaeological excavations' (Morwood 2012:34).

Within the Kimberley, stylistic sequences, placing the art in a relative temporal framework, have been developed by enthusiast rock art researchers Grahame Walsh (1994, 2000) and David Welch (1993a, 1993b). These sequences, which are discussed in further detail in Chapter 3, have been inferred from studies of superimpositions and differential weathering. Outlined below is Walsh's sequence, as it is the most widely recognised and comprehensive sequence developed for the region to date.

At the broadest level Walsh (1994, 2000) divided the entire Kimberley rock art sequence into three phases or 'Epochs', and six rock art periods (Figure 1.1)²:

1. The first phase, the 'Archaic Epoch', includes the Irregular Infill Animal Period (a, b, c).
2. The second phase, the 'Erudite Epoch', includes the Gwion Period, formally known as the Bradshaw Period (d, e) and the Wararrajai Gwion Period, formally known as the Clothes Peg Figure Period (f).
3. The third phase, the 'Aborigine Epoch', includes the Painted Hand Period (g, h), formally known as the Clawed Hand Period, and the Wanjina Period, previously spelt Wandjina (i).

² A new nomenclature system has been applied within this thesis. A full explanation of the new system is provided in 1.2.5. Existing Kimberley nomenclature systems.

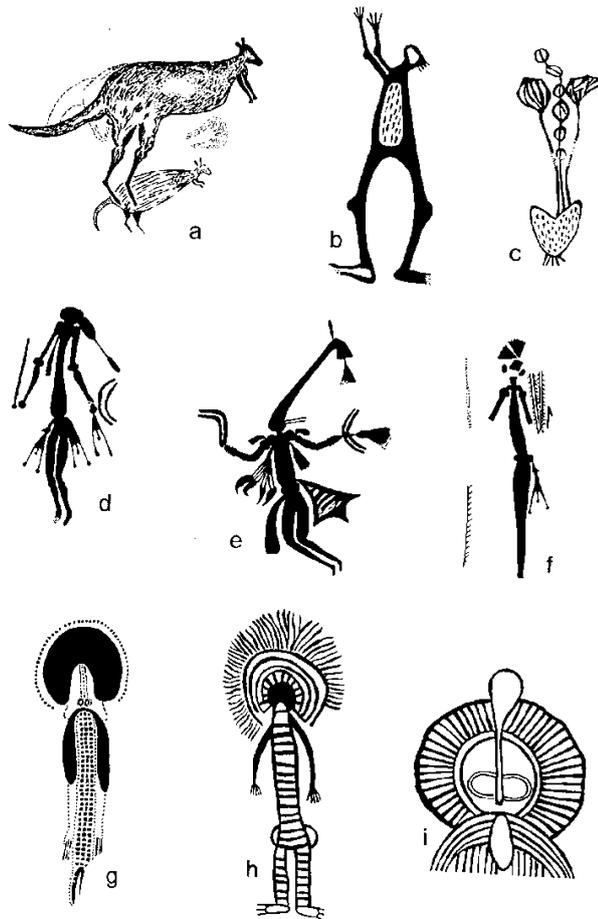


Figure 1.1 Rock art styles in the Kimberley (from Morwood 2002:53, Figure 2.14)

In order of appearance: Irregular Infill Animal Period: a) Macropod, b) Anthropomorphic figure, c) Yams. Gwion Period: d) Mambi Gwion, e) Yowna Gwion. Wararrajai Gwion Period: f) Wararrajai Gwion Figure. Painted Hand Period: g) Horseshoe Head Figure, h) Ceremonial Figure. Wanjinna Period: i) Classic Wanjinna.

The foundation of Walsh's three phase chronology was his belief that change in the assemblage was abrupt, and that each phase was separated by periods of discontinuity. He argued that there is no indication of any form of transition or development between the three phases, stating in particular that the second phase appears to have begun abruptly and ended just as abruptly (Walsh 1994:51). He stated that '[t]here is no evidence for any continuity in style, technique, or expertise with the following Clawed [Painted] Hand Period, which appears simply to "happen"' (Walsh 1994:51). Such an argument has implications for the cultural context of the art, as any disruption in the rock art record would presumably be associated with disruption in the cultural sequence. Testing this hypothesis is at the core of this research.

Walsh proposed that the discontinuity between the second and third phases equates with the archaeological discontinuity at O'Connor's Widgingarri Shelter 1 site in the southern Kimberley; and that the second phase ended roughly 18,000 years ago when he believed the Kimberley region was largely abandoned, due to severe aridity caused by the Last Glacial Maximum (LGM) (Walsh 1994:70,72). The Gwion Period is attributed to the Pleistocene based on one *questionable* OSL minimum age of $16,400 \pm 1,800$ years, from a mud-dauber wasp nest overlying a Gwion Period anthropomorphic figure. The validity of this date has recently been questioned by Aubert (see Aubert 2012), although Roberts stands by the minimum age estimate (see David *et al.* 2013b).

In relation to the Gwion painting tradition, Walsh (1994) alluded to a non-Aboriginal origin for the stylistic period. He claimed that 'features such as exquisite form' was 'alone sufficient to warrant considering this culture as quite different from others reflected in later Kimberley arts periods' (Walsh 1994:74). Alongside these claims, with his use of the term 'Erudite' to describe the period in which the Gwion painting tradition resides, and 'Aborigine' to describe the period in which the Painted Hand and Wanjina painting tradition resides, Walsh expressed a diffusionist perspective and 'deep-seated colonialist perceptions of Aboriginal people' (McNiven and Russell 1997:802). Although these claims were met with a general lack of acceptance in the Australian archaeological community, particularly the Australian Archaeological Association (see Walsh 2000:440), they were widely supported in the media with emphasis on claims of *mysterious races*. Whilst Walsh did not explicitly state that the Gwion painting tradition *was* of non-Aboriginal origin, in refuelling the diffusionist debate he 'played into the hands of political conservatives and again placed Aboriginal people in the position of having to demonstrate cultural authenticity and legitimacy' (McNiven and Russell 1997:807).

The implications of such views for our understanding of human prehistory in the Kimberley exemplify the importance of observing changes in archaeological assemblages, including rock art. Understanding how change is represented in the art

assemblage, e.g. abrupt or transitional, is a pivotal question in archaeology and provides significant information on the cultural context of production and the artists who created the assemblage. Put simply, abrupt change is likely to result from diffusion from a different cultural population, whereas, gradual change is likely to result from a slow introduction of ideas resulting from *in situ* changes occurring within the Kimberley. These ideas are expanded on in section 1.3.3 of this chapter. The examination of *how* change is represented in the art assemblage of the northwest Kimberley is central to this thesis.

Once the process of describing stylistic change is complete, the observed patterns can be used in conjunction with other contextual evidence (e.g. changes in past environments, resource use and Aboriginal population size) to formulate hypotheses about the *actions* of the artists and the reasons such patterns were produced in particular contexts (Conkey 1989b:120). This is significant as it is the interrelationships between art and the contexts of its production which informs us about past human behaviour, rather than the content of the art itself.

However, the major problem with the northwest Kimberley is that there are very few absolute dates available to anchor the rock art sequence and to situate the changes against contextual archaeological evidence. We do not know how long the production of figurative art has been in place in the Kimberley, and the timing of stylistic changes. For this reason, establishing a chronological framework for the rock art sequence is considered a priority for archaeological research in the Kimberley. Once the relative chronology has been established, the patterns of variability, similarities and difference through time and across space can be examined, and the reasons such patterns were produced in particular contexts can be considered. Until such time, that the relative stylistic sequences become temporal chronologies, only hypotheses can be formulated about the relationship between the art assemblage and our understanding of past human behaviour and the ways in which previous cultural systems functioned.

1.2. Research Focus

This section defines the focus of this thesis and identifies the main research questions posed.

1.2.1. The *Change and Continuity* Research Project

Research for this thesis was undertaken as part of the overarching Australian Research Council (ARC) Linkage Project (DP 0877463) titled '*Change and Continuity: chronology, archaeology and art in the northwest Kimberley, Australia*'. The Chief Investigators of this project are Associate Professor June Ross (University of New England) and Dr Kirra Westaway (Macquarie University), and the late Professor Michael Morwood (University of Wollongong). Additional research team members are Dr Mark Moore (University of New England, ARC Research Fellow), Dr Simone Haberle (Australian National University) and Dr Maxime Aubert (Griffith University). The Industry Partners supporting this research are Kandiwal Aboriginal Corporation, Kimberley Foundation of Australia, Slingair and Heliwork Pty Ltd, and the Department of Environment and Conservation, Western Australia.

The *Change and Continuity* project aimed to develop a broader understanding of the past lives of the Aboriginal people in the northwest Kimberley. In particular, the project focused on documenting, analysing, dating and explaining the changes evident in the rock art assemblage of northwest Kimberley (Ross *et al.* 2011:1). Specifically, the broad aims of the project were to:

- Document and date major changes in human occupation of the Kimberley, and to
- Explain specific changes in human occupation of the region in terms of climate change, *in situ* social processes, 'outside' contact or other possible determinants.

The thesis research aims and questions, formulated below, are framed within these parameters.

1.2.2. Research aims

The broad aims of this thesis are to identify the form and pace of stylistic change in anthropomorphic figures in the rock art assemblage and to examine how this can contribute to our understanding of past shifts in cultural, technological, social and economic activities throughout the northwest Kimberley. Specifically, this thesis uses environmental and social evidence to contextualise the rock art in its broader archaeological setting. The stylistic variation in the rock art assemblage observed over time in the selection of attributes and spatial patterning is analysed, together with further archaeological data, to show how the inhabitants of the Kimberley inscribed the land with rock art at different times for different purposes. The anthropomorphic figures of the northwest Kimberley are an ideal dataset to study stylistic change, as they are depicted in the four main stylistic periods.

1.2.3. Research questions

The following questions are addressed in this thesis:

1. What are the core characteristics of anthropomorphic figures in each of the stylistic periods in the northwest Kimberley?
2. Is there evidence in the art assemblage to support notions of an abrupt discontinuity of art between the Wararrajai Gwion and Painted Hand periods?
3. Is there sufficient chronological evidence to support a pre-Last Glacial Maximum age range for the Gwion Period?
4. If stylistic change in the art assemblage is considered gradual – what factors are driving these changes?
5. What can we learn about environmental, social and economic change from a study of the rock art assemblage, and its social and environmental contexts?

Although the stylistic periods have been identified and discussed by both Walsh (1994, 2000) and Welch (1993a, 1993b, 1993c, 1996, 1999), a comprehensive archaeological analysis of the art assemblage has not yet been undertaken, nor has a

comprehensive description of each style been published. Thus, this thesis will not only refine previous studies, but will add new understandings of past cultural systems in the northwest Kimberley, their development, changes, and function/s.

1.2.4. Key assumptions and limitations

There are five main points I wish to make here. First, this thesis relates specifically to Wunambal Gaambera country, in the northwest Kimberley. Therefore, the results of the analyses undertaken, and the conclusions drawn, are relevant *only* to the study area, and are not intended to be extrapolated to the broader Kimberley region.

Second, my approach is an archaeological one. Where ethnographic information is not available, I do not attempt to guess at the original meaning/s of the paintings. Instead, I aim to adopt an archaeological perspective to assess art assemblage. While it is internationally accepted that the original intent and meaning of past art traditions (particularly when they are prehistoric) are inaccessible; contextual analyses can facilitate an understanding of the function of past art systems and gain insight into past human behaviour (Domingo Sanz *et al.* 2008:15; Sundstrom 2012:325).

Third, this thesis focuses on anthropomorphic figures. As such, this research does not address the other subject matter recorded within the study area, e.g. zoomorphic motifs, prints or the associated rock art traditions. The art assemblage of the northwest Kimberley is varied and other aspects of the assemblage are in need of further study, however this is beyond the scope of the study.

Fourth, the multidisciplinary nature of this thesis means that I cannot provide an independent and exhaustive examination of the contextual climatological, environmental, demographic, temporal, and archaeological evidence presented. Ideally, more comprehensive and robust contextual studies need to be undertaken within the study area, which include clear chronological markers in order to generate a more integrated model for prehistoric settlement and subsistence patterning for the northwest Kimberly region.

Finally, this thesis provides two potential temporal scenarios for the art assemblage; a ‘short’ and a ‘long’ chronology. This was done, as at present, I consider that there is not enough evidence to unambiguously support Pleistocene antiquity of the art assemblage. I do not exclude the possibility of a ‘long’ chronological scenario only that more robust evidence, from multiple sources, needs to be established before this scenario can be confirmed. Until such time, the ‘short’ chronology is considered a viable alternative.

1.2.5. Existing Kimberley nomenclature systems

There have been many different terms used to describe Kimberley rock art motifs since the first publications in the early twentieth century. The variation in terminology is partly due to ‘differing names for similar figures in the various Indigenous language groups, but also to a profusion of English descriptive terms applied by rock art researchers where specific Indigenous names were not identified’ (Donaldson 2012:12, see also Donaldson 2014).

In particular, the term ‘Bradshaw’ was coined by members of the Frobenius expedition in 1938 in the absence of any specific Aboriginal name, and was used to describe the early human figures of the Kimberley region named after the explorer/pastoralist who first described them in 1892, Joseph Bradshaw (Donaldson 2014:31, see also Bradshaw 1892). The term ‘Bradshaw’ is now considered inappropriate or insensitive by indigenous people and many researchers, as it is seen by some ‘as a “colonial” misappropriation of Aboriginal culture’ (Donaldson 2014:32, see also Doring 2000).

For this reason, the terminology used within this thesis differs from that of previous researchers, including Walsh and Welch, as the *Change and Continuity* project has been provided with a set of new terms considered culturally appropriate by the traditional owners of our study area, the Wunambal Gaambera Aboriginal Corporation (Table 1.1). I recognise that I am dealing with Aboriginal cultural

material and consider that it is appropriate to adopt names that the traditional owners are comfortable with. From this point forward, I will be applying the new nomenclature unless directly quoting from other researchers.

Table 1.1 Existing nomenclature systems in the northwest Kimberley

Wunambal Gaambera Aboriginal Corporation	Grahame Walsh (1994, 2000)	David Welch (1993a, 1993b)
Irregular Infill Animal Period	Irregular Infill Animal Period	-
Gwion Period	Bradshaw Period	-
Mambi Gwion	Tassel Bradshaw	Tasselled figures
Yowna Gwion	Sash Bradshaw	Bent knee figures
Dynamic Gwion	Elegant Action Figure	-
Wararrajai Gwion Period	Clothes Peg Figure Period	Figures with straight parts and missing pigment
Painted Hand Period	Clawed Hand Period	-
Wanjina Period ³	Wandjina Period	Wandjina Period

These terms were determined after consultation with Lily and Jack Karadada and Sylvester Mangolomara and endorsed by the late Albert Puemora (traditional owner for the Lawley River and Brremangurey areas), the four Traditional Owners for the *Change and Continuity* project's study area. Wunambal Gaambera elders identified some of the accoutrements worn by figures and those terms were used in place of previous terminologies adopted by Walsh and Welch. The distinctive tassels hanging from the waist of some Tassel Bradshaws are *mambi*, made of bush string or human hair adorned with feathers. The three-pronged 'sash' of Sash Bradshaws is *yowna*, a small bag made from kangaroo skin. The figures called Clothes Peg Figures by Walsh (1994, 2000) were identified by Lily Karadada as Wararrajai, 'a bush spirit figure that helps people locate sugarbag, bush honey, in native beehives' (Donaldson 2012:13).

³I have used the accepted modern spelling of Wanjina, but retain the older form, Wandjina, where it is a direct quote from a published source.

It is important to note that the terms identified by the traditional owners, are only meant to be used within the country in which they were identified – Wunambal Gaambera. They are not intended to be put to general use across the Kimberley. It is important to realise that, apart from Wanjina, these terms were never used by traditional Aborigines for the images seen on the rocks; all the small red human figures were, and still are, referred to simply as Gwions with no distinction between the four types named here. There is no recognition by Aboriginal people that there is a relative chronology for these figures and all appear to be regarded as of equal status. These new terms are, therefore, essentially Aboriginal words for English constructs.

1.3. Research Framework

The following provides an outline of the research framework adopted for this thesis. I begin by providing an overview of the ways style has been defined and applied within archaeological studies with particular reference to rock art. I then outline the way style has been adopted for this research. My approach has been strongly influenced by the works of Meg Conkey (1990), Polly Wiessner (1990) and Martin Wobst (1977) and involves a two-tiered approach – etic and emic. I discuss the important role the contextual study of rock art plays in situating the art assemblage in its context. I then outline the importance of understanding stylistic change and how it can be used to explain changes in past human behaviour.

1.3.1. Style, context, and their application in rock art research

By definition, archaeologists are analysts, trying to ‘make sense’ of cultural materials and cultural representations that are not always enmeshed in their former context. As analysts, we use style as a ‘tool’ to help us make sense out of the materials and out of the past (Conkey and Hastorf 1990:3). Style has become one of the most valuable tools for archaeologists to develop understandings of past human behaviour and cultural change. This is especially the case in rock art research.

Throughout the archaeological literature there are differing perspectives on the concept of style; its meaning, what constitutes a 'style', how style should be applied in archaeological analyses, and how it can inform us about the past (see Bednarik 1995; Conkey 1990; Conkey and Hastorf 1990; Clegg 1978, 1987; Maynard 1976; Morwood 1979; Officer 1992; Pigeaud 2007; Plog 1980, 1983; Sackett 1977, 1982, 1990; Wiessner 1983, 1984, 1989, 1990; and Wobst 1977). In spite of this dialogue, there remains no unified theory of style. As a concept it remains elusive and ambiguous (Shanks and Tilley 1992:146). A brief overview of some of the main concepts of style applied to rock art research is provided below. It is not the intent here to provide an exhaustive overview of the history of the concept of style, but to outline the way in which style will be used within this thesis.

As Conkey and Hastorf (1990:2) have pointed out, the definition of style proposed by art historian Meyer Schapiro (1953) has marked the use of this concept in archaeology and especially prehistoric art (Abadía and González Morales 2007:115). According to Schapiro (1953:287), 'style is, 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'. Schapiro's definition of style as a form of communication inside and between groups has been retained by archaeologists, for example, Wobst (1977).

Wobst (1977:321) equated style with 'that part of the formal variability in material culture that can be related to the participation of artifacts in the processes of information exchange'. According to Wobst, style is *actively* employed and reflects intentional choices made by individuals and/or groups to communicate particular messages. Differences in style can thus be used to communicate messages about group affiliation and identity. As outlined by Clive Gamble (1982:99):

Wobst (1977) has discussed the low cost involved in sending and decoding messages where all that is needed to maintain a communication system is adherence to a small set of stylistic rules. This is especially useful when contact is being maintained with a socially distant population.

According to James Sackett (1977, 1982, 1990) style involves choice between functionally equivalent alternatives. He stated that 'style resides in the specific context-determined variants ('choices') assumed by functional form'. Sackett also defined two forms of style: isochrestic and iconological. Isochrestic style considers that the decisions of individuals are shaped by the traditions within which they have been enculturated (Sackett 1977:371). In this sense, style is used unconsciously, passively and without meaning. Iconological style is emblemic; it is consciously and actively used and encodes meaningful messages of social identity.

Taking a more sociocultural approach, Conkey (1978), following Gombrich (1960), regarded style as 'the projection of similar thoughts, feelings, and orientational constructs of those taking part in the sociocultural context of production' (Shanks and Tilley 1992:150). Overall it can be understood that style can have multiple functions, is subject to various processes of change, and can be considered active (e.g. emblemic and assertive) or passive (e.g. isochrestic). The word 'style', like the rest of language works by *difference* (Conkey 1990:7).

Wiessner (1983, 1984, 1989, 1990), known for her research on variation in projectile points among San people of the Kalahari Desert, viewed style as a form of non-verbal communication about relative identity at both an individual and a group level. Wiessner (1989:57) turned to social psychology in an attempt to uncover a link between basic human cognitive processes and *stylistic behaviour*. She argued that such a nexus exists and proposed that there is a single underlying behavioural basis to style, in the 'fundamental human cognitive process of identification via comparison' (Wiessner 1989:58). Style thus becomes a means by which people 'negotiate and communicate personal and social identity *vis-à-vis* others' (Wiessner 1989:59).

Wiessner defined two forms of style: emblemic style and assertive style. Assertive style is the formal variation in material culture which is personally based and carries information supporting individual identity and may be employed either consciously

or unconsciously (Wiessner 1983:258). This form of stylistic variation corresponds closely to the social interaction view of style in archaeology (see Deetz 1965; Plog 1980). Emblematic style is the formal variation in material culture that carries information about group affiliation or identity. This form of style transmits a clear message to a defined target population about conscious affiliation or identity, such as an emblem or a flag (Wiessner 1983:257).

Wiessner's two-fold definition was based on the premise that variation in material culture can include stylistic messaging that stems from several behavioural sources (see Wobst 1977:325). Further, that our understanding of stylistic variation depends heavily on understanding the behaviour that generates it (Wiessner 1983:256). Style is an inherently purposeful behaviour, which, whether consciously chosen or not, entails the choice of particular distinctive options of form from the range of alternatives available (Burke 1999:25-6). We need to understand more about the principles that underlay stylistic behaviour; to understand its context (Renfrew and Bahn 2004:54; Wiessner 1983:253). It is only with context that we can 'go beyond the mere appearance of things, and on to a level of analysis that seeks in some way to *understand* the pattern of events' and the reasons why such events might occur (Renfrew and Bahn 2004:469).

Generally speaking, context refers to 'the circumstances in which a particular event occurred' (Bednarik *et al.* 2010:5). It can be inferred archaeologically from information about sites, landscapes, movements, activities, technologies, group dynamics, and other patterning (Conkey 1997:361). Researchers have investigated context in different ways over the years. First, researchers investigated the immediate and proximal settings of rock art. This focused on internal analysis: the close inspection of motifs in association with each other; and site-level analysis: the use/s of the site. Second, the occurrence of rock art as spatial 'marks' within the context of cultural landscapes was investigated (e.g. Brady 2005, 2008; Morwood 1979). Most recently, context has been used to assess the relationships among and between rock art assemblages (Conkey 1997:346-7).

The many scales or levels at which context has been investigated or understood can be related to notable shifts in our understanding of the term. The shifting understanding of the term and how researchers have applied it to art analysis is linked to developments in archaeological theory since the mid twentieth century. Ultimately, the use of context as a theoretical framework is a departure from earlier (pre 1960s) structuralist principals (see Conkey 1989a, 1992, 2001 for reviews), which neglected three key areas of archaeological inquiry: time, context and ecology (Ross 1997:24).

Originally developed in linguistics, structuralist analysis took a particular shape and influence in the 1960s and was first employed in rock art research by Andre Leroi-Gourhan (1965) to Palaeolithic cave art in western Europe (Whitley 2001:835). A structuralist approach to rock art assumes that:

...the imagery made was generated from a set of underlying cultural premises that are structured like language; that is, one could expect to find an underlying set of rules for the making and placing of specific images on rock surfaces, especially if one had a large enough sample of imagery with which to work (Conkey 2001:274).

Classic Structuralism proposes that the individual units of any system have meaning only by virtue of their relation to one another. Consequently, structuralism was not concerned with elucidating meaning, context, temporality, or intentions (Conkey 2001:274-5). This method was in line with the normative theory approach, which characterised the majority of archaeological research up until the 1960s. During this period, the ‘problem of why changes in stylistic attributes might occur was never directly addressed’ (Shanks and Tilley 1992:138).

During the 1960s and 70s, with the advent of New Archaeology, a general reassessment of archaeological theory and research methodology took place (Morwood and Smith 1994:21). Archaeologists began to emphasise contextual analyses to explain past change, to look at the internal dynamics of a society, and additionally, what external influences were driving changes. This investigative shift was driven by criticism of previous normative approaches, ‘the adoption of systems

theory from the natural and physical sciences, and a primary interest in social processes and adaptation' (Officer 1993:16).

Culture was viewed as a *system*, defined by Clarke (1978:495) as 'an intercommunicating network of attributes or entities forming a complex whole'. Cultural systems were likened to natural systems in ecology, which tend toward a state of balance. Hence, when cultural systems are affected by some form of external change, such as climate change 'the whole system will, after a period of fluctuation, tend to reach a new state of overall balance through modifications in the relations between the subsystems' (Johnson 2000:68-9). In other words:

...general systems theory forces us to look at aspects of a cultural system's technology, social organization, and ideology as components through which measureable quantities of matter and energy pass in specific patterns of flow. Moreover, general systems theory forces us to assume that a cultural system will remain in steady-state until such a time that changes of significant magnitude take place in the cultural systems' inputs and/or outputs (Glassow 1972:301).

The strength of the systems approach is that it avoided monocausal explanations for change, explanations that tried to single out one cause for an event or pattern, and in doing so, demonstrated the importance of a multifaceted contextual approach (Johnson 2000:71; Tomášková 1997:265). Although such approaches began to address the role of local environmental factors to socio-cultural change in a more sophisticated fashion (e.g. Jones 1968), internal social processes were still largely ignored (David 1994). Such approaches 'usually treated social strategies as outcomes of "external" environmental circumstances (epiphenomena)' (David 1994:6).

In archaeological research, context is essential for understanding the nature of the particular prehistoric society in question. An archaeologist views context as the methodological and interpretive basis for understanding the past: 'The contextual approach is based upon the conviction that archaeologists need to examine all possible aspects of an archaeological culture in order to understand the significance of each part of it' (Trigger 1989:349). By applying a multidisciplinary approach, archaeologists are better able to understand how differing internal and external

factors may be influencing the overall patterns within the archaeological record (see, for example, Morwood 1979; Smith 1994; Taçon 2001). As Taçon stated (2001:117):

[c]omposite approaches to model building and interpretation, that draw on a range of disciplines, are now seen to be the necessary next step that follows observation, description and the establishment of typologies if we are to get at more than one level or form of meaning.

Using a single line of evidence is now seen as insufficient for interpreting and understanding past human societies.

Within the study of rock art, context goes beyond the ways in which researchers observe patterns in an art system, assess how the system operated by investigating ‘how signs interact with the world *outside* of their internal system’ to determine what external forces (e.g. environmental, economic, social, and/or demographic) are influencing the actions of the artists (Bryson 1983:xii). As Conkey (1990:10) has argued, archaeological analyses of style should take an understanding of context as their premise, as context is a creator of style. By stressing the role of context as a creator of style, Conkey and others have fastened attention onto a specific range of questions. Conkey considered these to be questions of pattern generation: *Why that style in that place? Why that style at that time?* (Conkey 1993:106).

It is questions such as these that I seek to answer within this thesis. It is for this reason that I have applied a two-tiered approach to style, in order to go ‘behind and beyond’ the artistic system (Burke 1999:27). My first approach is to use style in a passive way, as an analytical tool to ‘observe’ the rock art assemblage from an external viewpoint. This is an etic approach. It is what Conkey (1990:15) referred to as pattern recognition, the process of describing observable patterns of artefact variability and relating them to group relations. The second approach is emic, moving from style to stylistic behaviour, which is considered as active. This is what Conkey (1990:15) referred to as pattern generation; it aims at questioning how the observable patterning might be generated (Burke 1999:27). Such a two-tiered approach to the study of style was advocated by Wiessner (1990:110).

My first task is to establish a morphological description of the rock art assemblage. This corresponds to a sort of ‘formal statement of the particular ways in which different artifacts are similar to each other’ (Davis 1986:124); in this case, the stylistic attributes of rock art motifs. An attribute is classed as a ‘distinctive feature of an artefact, a characteristic that cannot be divided into smaller constituent units’, for example, the position of human legs: standing plan, standing spread-legged, sitting cross-legged, sitting legs out-stretched etc. (Thomas 1991:187).

Through a stylistic analysis of attributes, ‘patterns of variance, similarities and difference in space and over time within and between art bodies, can be isolated and extracted. These patterns in turn, can be seen as an expression of change’ (Forbes 1982:13). Evidence of change in stylistic attributes is crucial for the archaeological study of rock art. However, a purely stylistic approach is insufficient to address sources of variation, rates or kinds of change, meaning and/or function (Conkey and Hastorf 1990:2). The limitation of a purely stylistic approach is that it is restricted to the service of chronology and does not consider context sufficiently (Rosenfeld and Smith 1997:407). This is exemplified in early approaches to style, when attributes were used as a means of classifying groups of similar art assemblages as ethnic or geographic groups on an extremely large scale. Such approaches were based on the notion that style ‘is specific to a particular place and time: since different people in different places produce art in different ways, then style can be used as a chronological or geographical marker’ (Rosenfeld and Smith 1997:407). This type of approach ‘viewed the limits to variation as extremely broad, and particular styles became labels for otherwise undefined groups of people, such as the Beaker folk and the Lapita culture’ (Burke 1999:26). Criticism of such approaches inspired research aimed to ‘narrow down the focus of style in order to concentrate on the nuances of stylistic differentiation that are possible *within* a single group’ (Burke 1999:26). Viewing style simply as a chronological or geographical marker fails to comprehensively recognise the internal complexities of style, stylistic drift and clinal variation.

My second approach is to use style in an active way; as a means to access the internal view of the participant. To do this, I am subscribing to the view that style is inherently a purposeful behaviour. The artists were living people, they thought up, made, used, re-used and often discarded the archaeological materials we examine today (Conkey and Hastorf 1990:3). For these artists, there were ‘styles of making, of using, of knowing, and ever-changing contexts that these styles derived from and defined (Conkey and Hastorf 1990:3). Hence, ‘[s]tyle is not just “something that informs,” although the term is sometimes reduced to this etic position, but also “something that mediates,” a behaviour that was intentionally created and manipulated by the participants...’ (Burke 1999:34). This is an emic approach.

Once the process of describing observable patterns of motif variability is complete, the observed patterns can be used in conjunction with other contextual evidence to formulate hypotheses about the *actions* of the artists and the reasons such patterns were produced in particular contexts (Conkey 1989b:120). This is done by using the contextual framework in Figure 1.2, previously applied by Ross (1997). As Ross (1997:27) pointed out,

While it is understood that the selection of certain organising principles “were made by some individual or group acting in a certain way for a certain purpose, and with certain habits, knowledge, and values...this possibility cannot be confirmed from within the stylistic description itself” (Davis 1990:27 emphasis in the original). There is a need to develop an understanding of stylistic behaviour and to compare this to other ecological and archaeological evidence in order to formulate hypotheses about past human behaviour.

This framework analyses the relationships between aspects of the art assemblage, such as spatial and temporal distribution of the art, the art assemblage itself and the site context and ecology. It is the interrelationships between art and the contexts of its production which informs, rather than the content of the art itself.

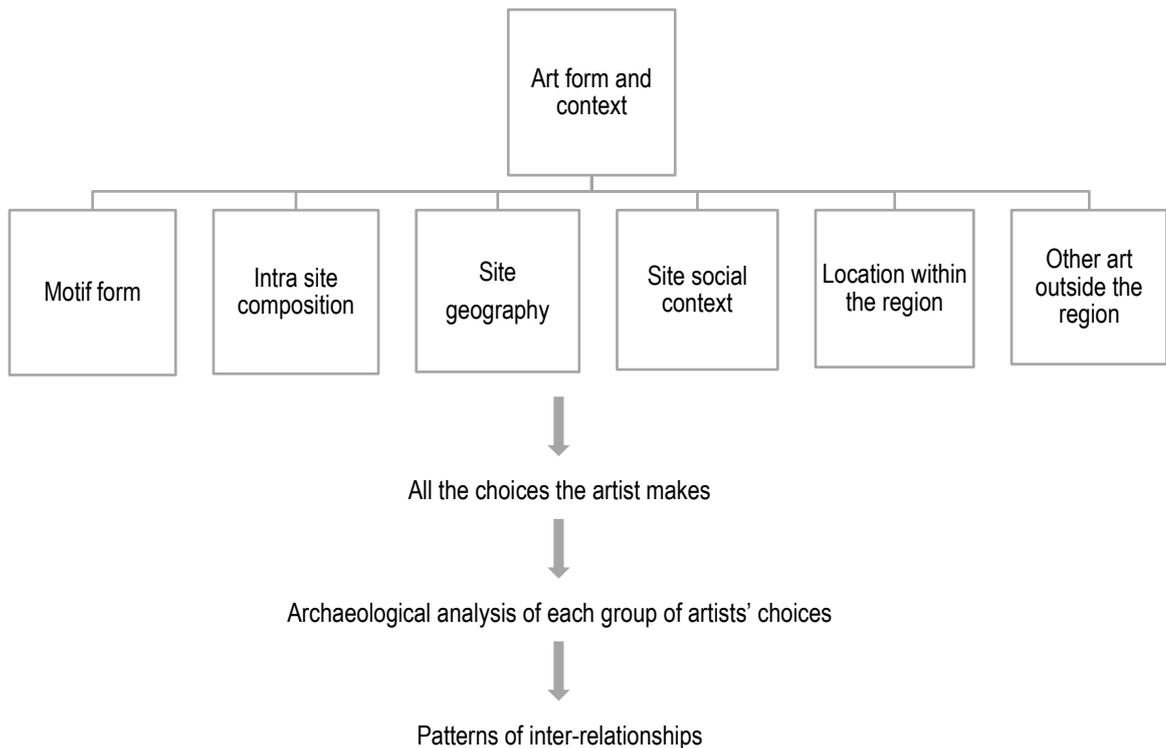


Figure 1.2 Analysis of art within the contextual framework (after Ross 1997:25)

This is where my research benefits from the contextual information provided by other forms of analysis undertaken as a part of the broader *Change and Continuity* project. My research is correlated with results from several lines of converging evidence, including archaeological excavation, terrain and site mapping, pigment characterisation and sourcing of ochre and other raw materials (Ross *et al.* 2011). In addition, rock art dating techniques, including Uranium Series, Optically Stimulated Luminance (OSL), and radiocarbon analyses utilised in the *Change and Continuity* project have established a range of minimum dates for the rock art. By incorporating the results of these studies, I am better able to understand processes underlying or generating style: how and when they came into existence, and how they were used (Conkey and Hastorf 1990:13), and the significance of changes in the rock art assemblage through time and across space. This is important as an understanding of *stylistic behaviour* and variation depends heavily on understanding the behaviour that generates it (Wiessner 1983:256). There is a need to develop an understanding of stylistic behaviour and to compare this to other ecological and archaeological

evidence in order to formulate hypotheses about past human behaviour (see Figure 1.3) (Ross 1997:27).

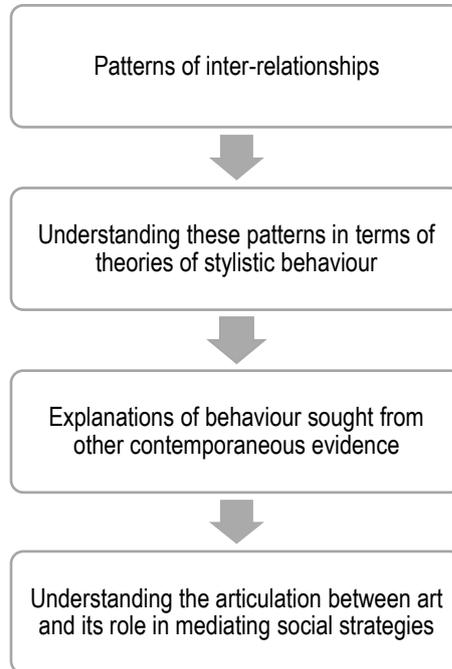


Figure 1.3 Framework for interpretation (after Ross 1997:27, Figure 2.3)

1.3.2. The contextual study of rock art assemblages

Within the study of rock art, contextual approaches start with the classification of the rock art assemblage in question. An important approach to classifying rock art assemblages has been through the development of relative stylistic sequences; a sequence that determines the relative age of a feature or event in relation to the age of other features or events. Many rock art studies have applied superimposition analysis and evidence of differential weathering to formulate relative chronologies for regional rock art assemblages (e.g. within Australia, Brandl 1982; Chaloupka 1984; Mulvaney 2010). Although these methods have been widely applied, it is generally accepted that they have their limitations.

Superimposition analysis is based on the knowledge that the stratification of art layers can provide a relative dateable context; that is, a painting occurring over, or

through, another was executed later in time. Morwood (1980:106-7) has cautioned that superimposition analysis is suitable for isolating well marked trends in the art given a sufficient sample size, but should not be used to discern more subtle changes, and, noting these limitations, recommended that superimposition should be used in conjunction with other methods if reliable results are to be obtained. For example, absolute dating; spatial patterning; portrayals of datable subject matter e.g. extinct animal species or tools, weapons and technologies with independently defined chronological ranges; and associated excavated archaeological materials below rock art panels (but this can be misleading due to the multiple uses of ochre other than pigment) (e.g. Morwood and Hobbs 1995).

Further, if all chronological phases or styles are not incorporated into superimposed panels, then it is impossible to determine whether styles coexisted rather than replaced each other through time (Layton 1977:40-1; 1992:219). Also, without confirmation by repeated instances of superimposition, any stylistic sequence must remain hypothetical unless confirmed by some form of accepted dating technique (Walsh 2000:vii). It is only in cases where one stylistic attribute has superseded another entirely that results can be securely established (Morwood 1980:107). Even then, positioning of the motif may be influenced by factors other than chronology. Although a consistent pattern of superimposition may indicate relative chronology, it could also be 'functional' (Morwood 1980:98). The presence of superimposition does not provide any indication of the time depth between painting episodes; the association of two overlapping motifs may have been a deliberate action of the artists, and undertaken contemporaneously. There can be both symbolic and neuropsychological reasons for this kind of locational association (see, for example, Lewis-Williams 1974; Whitley 2005:54-5). As Lewis (1997:4) has suggested, superimposition of different styles may reflect the work of different artists, different functions of the art within society, different social groups, or depictions of different classes of 'ancestral beings' in the artist's cosmology.

The use of differential weathering as a relative dating technique has also been questioned by Brandl (1982:171) and Wright (1968:63). They warn that weathering

rates are dependent upon a number of non-temporal factors, for example, differential erosion rates of pigments, hardness of the rock, exposure and mineral staining (Crawford 1977; Morwood 1980:98). It is important to acknowledge such limitations, but they do not invalidate the use of superimposition analysis or differential weathering as indicators of relative age. They do, however, suggest that they be applied with some caution and supporting evidence, where possible. The best relative sequences result when multiple independent lines of chronological evidence are developed and applied (Whitley 2005:54, 61).

Once the relative chronology has been established, the patterns of variability, similarities and difference through time and across space can be examined, and the reasons such patterns were produced in particular contexts can be considered.

1.3.3. The relevance of change in rock art styles

Archaeologists use the presence and absence of change in the material cultural remains to interpret past human behaviour. As the production of rock art is a cultural practice, any change evident in the rock art assemblage could relate to changes occurring within other conventions of the associated cultural system, outside the physical limitations of rock art e.g. stone tool industry, resource use, ideology, etc. (Officer 1993:28). This exemplifies the important role change plays in the analysis of data. What is more important however, are the observations of how such change occurs within the record e.g. abrupt or transitional. The way change is represented provides significant information on the cultural context of production.

Evidence of abrupt stylistic change in superimposed attributes within a rock art assemblage supports notions of cultural discontinuity. Historically, explanations of abrupt change within a rock art assemblage have centred around two themes: migration of peoples, or of diffusion – the spread of ideas through contact between groups (Johnson 2000:18; Shanks and Tilley 1992:138). Migration and diffusion are themes deeply rooted in culture-historical thought and were common explanations for variation in the archaeological record worldwide until the latter part of the

twentieth century (e.g. Davidson 1937). Diffusionist explanations of the rock art of the Kimberley have questioned the Aboriginality of the paintings (e.g. Elkin 1930, Capell 1939, Lommel 1970, Love 1930, Mathew 1894, McCarthy 1958, Schulz 1956, and Worms 1955). This will be discussed in more detail in Chapter 3.

Alternatively, if there is evidence for transitional change, where art changes gradually from one form to another, the idea of cultural discontinuity is not merited. Changes in the cultural context of production may be occurring through the emergence of new ideas and potentially new cultures, however, the preceding and succeeding art periods remain linked. Continuity can be observed through the persistence of some stylistic attributes over time, or through the gradual rate of cultural change, as a 'slow shifting of norms' (Ford and Willey 1949:39).

This research aims to identify exactly how change is manifested in the rock art assemblage of the northwest Kimberley, and provide explanations for the changes observed. How this will be achieved is outlined below.

1.4. Thesis Structure

This thesis consists of ten chapters, of which this Introduction is the first.

Chapter 2 identifies and defines the study area and the geographical context in which the research was undertaken. This chapter discusses aspects of the topography, geology, climate, flora and fauna that I consider relevant to the archaeology of the region.

Chapter 3 provides an outline of previous rock art studies that have been undertaken in the northwest Kimberley. A discussion on how stylistic change has previously been interpreted within the Kimberley rock art sequence is also provided, in order to situate this thesis in its broader archaeological context. A brief outline of the published dates for rock art production in the Kimberley is provided. Finally, the

significance of previous research to the thesis is presented. The purpose here is to analyse the hypotheses presented and to examine how a formal analysis of the rock art assemblage from the northwest Kimberley can further our understanding of change in past Aboriginal societies from the region through time.

Chapter 4 outlines the methodological approaches employed for the collection and analysis of data used within this thesis.

Chapter 5 presents the results of a series of quantitative analyses, which were undertaken on three levels: site analysis, motif analysis, and anthropomorphic figure analysis. This chapter also presents the results of multivariate statistical analyses undertaken. Correspondence analysis was employed to investigate whether or not there is evidence for gradual stylistic change within the art assemblage.

Evidence for gradual stylistic change is expanded upon in Chapter 6. The aim of this chapter is to establish a morphological description of the rock art assemblage and to summarise the ways in which the rock art sequence changed through time, and what stylistic evidence is available to support the notion of gradual change.

Chapter 7 discusses the contextual evidence available for the northwest Kimberley, which may have had influence over the development of the art assemblage. Specifically, the varying temporal, environmental, climatological, archaeological, and demographic evidence is reviewed in order to later identify the events which may have been influencing the actions of the artists, and initiating the shifts in stylistic behaviour.

Chapter 8 and Chapter 9 bring together the results of the analyses and the multiple strands of contextual evidence presented, speculating on the possible cultural differences that may have contributed to some of the variation identified. Due to the ambiguity of current temporal frameworks for the art assemblage, I present the two options. Chapter 8 presents a 'short' chronology, assuming the rock art sequence

dates to the terminal Pleistocene, based on radiocarbon dating. Conversely, Chapter 9 presents a 'long' chronology of about 25,000 years based on luminescence dating.

Chapter 10 outlines the conclusions drawn from the research and situates them in the current framework of Australian rock art studies. The implications of this research are discussed and the issues which remain unresolved are outlined.

Chapter 2. Research Setting

This chapter defines and describes the study area and the physical aspects of the landscape in which the research was undertaken. The focus is on aspects of the environment that I consider relevant to the archaeology of the region, such as, climate, geology, landforms, flora and fauna.

2.1. The Kimberley

The Kimberley is located in the northwest corner of Western Australia and covers a total area of approximately 420,000 km². To the south it is bounded by the Great Sandy and Tanami Deserts, to the east the Northern Territory border, to the north the Timor Sea and to the west the Indian Ocean. The Kimberley is a rich and diverse environment, and has been home to Aboriginal people for thousands of years. In fact, given the proximity to Southeast Asia and the relatively short water crossing at times of lowered sea level, the region was a likely beach-head for the initial peopling of Australia (Birdsell 1977). The region has already provided some of the earliest evidence for human presence on the continent – with non-basal dates of around 45,000 BP for Carpenter’s Gap 1 and Riwi in the southern Kimberley (O’Connor 1996; Balme 2000).

2.2. The study area

This research was undertaken within Wunambal Gaambera country in the northwest region of the Kimberley.

2.2.1. Wunambal Gaambera country

Wunambal Gaambera country incorporates around 25,000 km² of land and 200 km of coastline (Figure 2.1). The area extends from Prince Frederick Harbour in the southwest to Napier Broome Bay in the northeast, including parts of King Edward River, the Anjo and Bougainville Peninsulas, the Mitchell and Gardner Plateaus, the Mitchell and lower Roe Rivers, the Bonaparte Archipelago and the Admiralty Gulf Aboriginal Reserve. Wunambal Gaambera country also incorporates the seas of the Bonaparte Archipelago and the Admiralty Gulf and numerous islands, e.g. Bigge Island (Karadada *et al.* 2011:10).

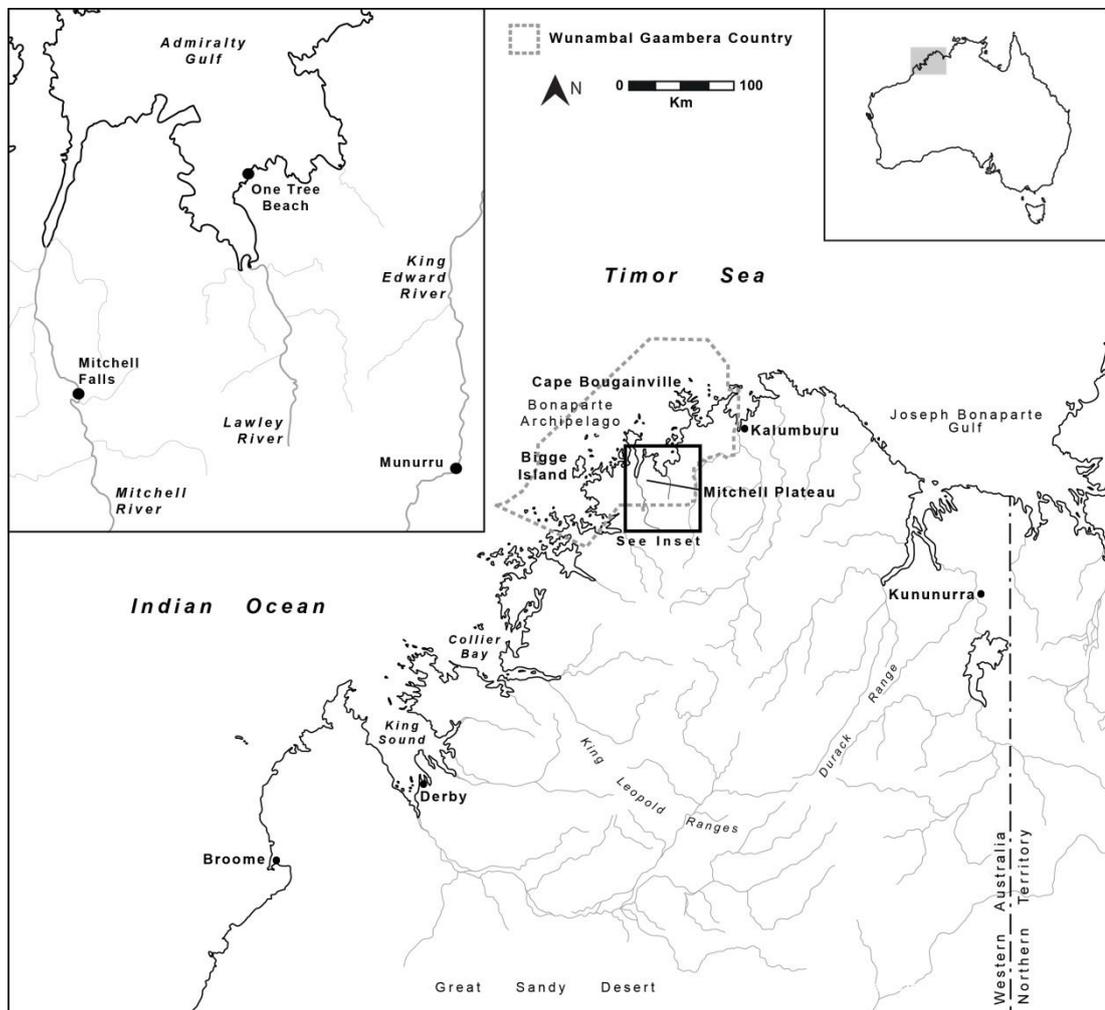


Figure 2.1 Wunambal Gaambera country, the northwest Kimberley

Wunambal Gaambera country is the living home (*Uunguu*) for the Wunambal and Gaambera people⁴. *Lalai*, for Wunambal and Gaambera people, is the story and belief of ‘how and when Wunambal Gaambera country was created by our ancestors, and why it is the only place in the world we can call home – our Uunguu’ (Karadada *et al.* 2011:8). The Wunambal Gaambera people believe that:

*...all the land, sea, heavens and all things in Wunambal Gaambera Country (plants, animals and ourselves) were put here by our **Wanjina** and **Wunggurr** (Dreaming Snake) creator ancestors. In the Lalai, they put the Law for us Wunambal and Gaambera people to live together, to live with our neighbours and to look after Country. They created our Wunambal and Gaambera languages and the Law for each family group to look after **graa** (our traditional part of Wunambal Gaambera Country) (Karadada *et al.* 2011:8).*

Wunambal and Gaambera are the languages traditionally spoken by Wunambal Gaambera people. Wunambal is spoken in the region between the Prince Regent River and the lower portion of the King Edward River, and includes the Bonaparte Archipelago and the Mitchell Plateau (*Ngauwudu*). Gaambera is spoken in the northern region of Wunambal Gaambera country, and includes Cape Bougainville (Karadada *et al.* 2011:11).

2.2.2. The present climate

The Kimberley region is dominated by a tropical seasonal (monsoonal) climate, with a ‘wet’ season from November to March and a ‘dry’ season from April to October, with two short transitional periods. It is dominated by the Indo-Australian Summer Monsoon (IASM), part of an extensive monsoon system ranging across the Maritime Continent and the Indo-Pacific Warm Pool and extending southwards into northern Australia (Denniston *et al.* 2013b:155; Wyrwoll *et al.* 2012). According to Wyrwoll *et al.* (2012:24), it is customary to describe the IASM as being characterised by ‘burst’ (active) and ‘break’ (inactive) events, referring to the seasonal cycle of monsoon rainfall.

⁴ The Wunambal and Gaambera people refer to themselves collectively as the Wunambal Gaambera people (Karadada *et al.* 2011:9).

Mean monthly minimum and maximum temperatures range from around 24.6°C to 37.1°C in November and from 14.1°C to 32°C in July (Table 2.1). However, local influences such as topographic relief, vegetation and oceanic effects contribute to some variation. A rainfall gradient exists from a mean annual high of around 1,400 mm on the *Ngauwudu* area to just over 1,000 mm further inland (Karadada *et al.* 2011:15). At Kalumburu the mean annual rainfall is 1,209 mm. Around ninety percent of rainfall occurs during the ‘wet’ season, when tropical cyclones and low pressure systems, which originate over the Timor and Arafura Seas, dominate (BOM 1996; Mucina *et al.* 2013:89). The study area is well drained by a system of rivers, creeks and secondary waterways, the most significant of which are the King Edward, Lawley and Mitchell rivers.

Table 2.1 Mean monthly maximum and minimum temperatures (°C) and rainfall (mm) for Kalumburu Mission (BOM 2005). Temperature and rainfall records are from 1941-2005

Mean	‘Wet’ season					‘Dry’ season							Annual
	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	
Max. Temp.	37.1	35.8	34.2	33.6	34.3	34.5	33.3	31.8	32.0	33.4	35.2	36.6	34.3
Min. Temp.	24.6	25.0	24.6	24.4	23.9	21.4	18.0	15.2	14.1	15.6	19.0	22.6	20.7
Rainfall	80.4	191.6	309.6	291.4	212.2	60.7	17.0	5.4	6.9	0.4	4.0	27.7	1,209.3

The differences between the ‘wet’ and ‘dry’ seasons are considered extreme. During the ‘wet’ (summer monsoon) season, heavy downpours result in large scale flooding along and beyond the rivers and their tributaries (Daniel and Mucina 2013:11; Mucina *et al.* 2013:89). During the ‘dry’ season, these rivers transform into a series of isolated waterholes as ground water dries up rapidly, leaving only the deeper shaded rock holes to provide water (Mucina *et al.* 2013:89). Such seasonal variability would have had implications for Aboriginal occupation patterns. First, the heavy downpours, winds and cyclones common during the ‘wet’ season would have been a major factor in determining occupation sites, as adequate shelter would have been a requisite (O’Connor 1999:15). Second, while surface water is abundantly available

during the ‘wet’ season, its limited availability during the ‘dry’ season would have placed constraints on the long-term occupation of some areas (O'Connor 1999:15).

Wunambal Gaambera people recognise four main seasons: *Wunju* (‘wet’ season), *Bandemanya* (early ‘dry’ season), *Yurrama* (cold dry season), and *Yuwala* (build up) (Karadada *et al.* 2011:15) (Figure 2.2). The delineation of seasons assists in obtaining food, planning and participation in ceremonies (Crawford 1982:17). The onset and duration of each of these seasons varies year on year.

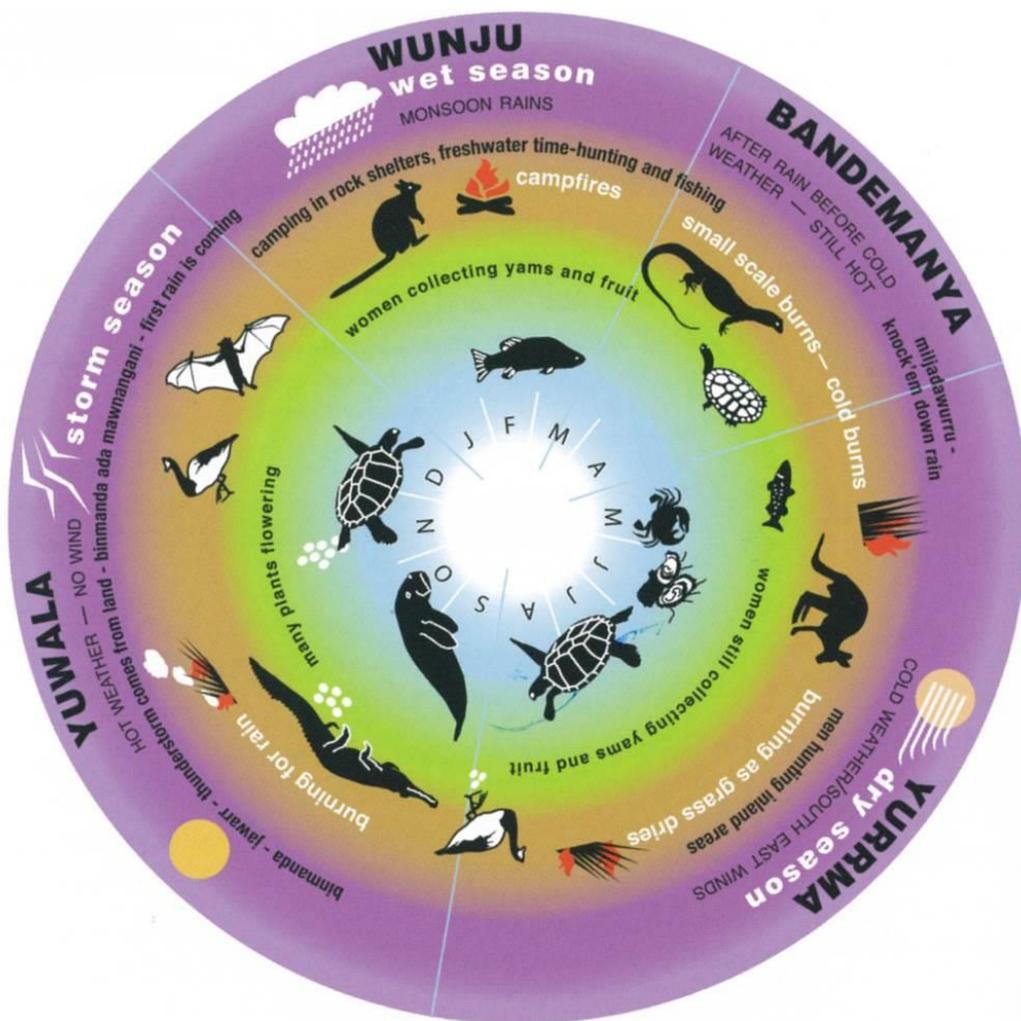


Figure 2.2 Unguu seasonal calendar showing many food resources available in Wunambal Gaambera Country and major climatic indicators (from Karadada *et al.* 2011:14, Figure 3)

2.2.3. Geology

The Kimberley is composed of five broad geological classes: sedimentary rocks; granites; mafic and felsic volcanics; granulite-facies metamorphics; and mafic-ultramafic intrusive, dolerites and gabbros (Figure 2.3). The sedimentary rocks, which cover most of the Kimberley, are dominated by the Kimberley Group (1,834±3 Ma to 1,790±4 Ma old) (Schmidt and Williams 2008). The Kimberley Group comprises (from the oldest unit to youngest upwards) the King Leopold Sandstone, the Carson Volcanics, the Warton Sandstone, the Elgee Siltstone, and the Pentecost Sandstone (Daniel and Mucina 2013:12) (Figure 2.4).

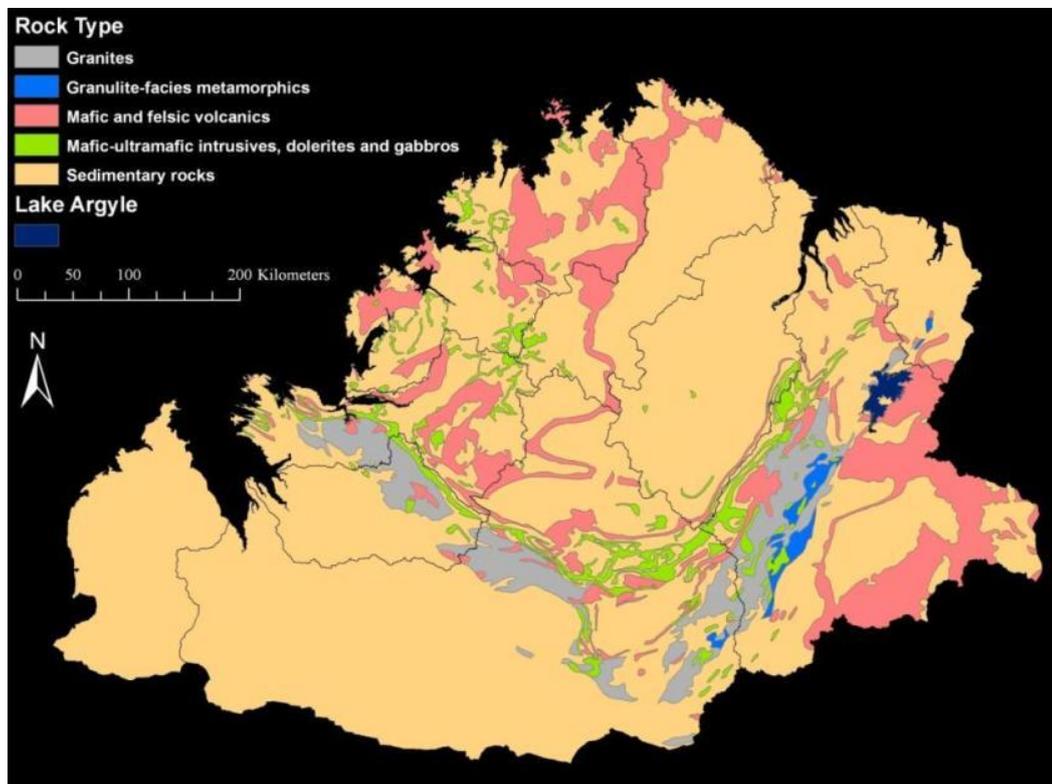


Figure 2.3 Geology of the Kimberley region (from Scown 2010:46, Figure 3.2)

STRATIGRAPHIC UNITS (Approximate maximum thickness)		AGE CONSTRAINTS (Ma)		
		Magmatic zircon	Youngest detrital zircon	Diagenetic xenotime
KIMBERLEY GROUP	Pentecost Sandstone	1790 ± 4 (Hart Dolerite)	1800 ?	1704 ± 14
	Elgee Siltstone			
	Warton Sandstone		1786 ± 14	1704 ± 7
	Carson Volcanics			
	King Leopold Sandstone Emu Point Member			
SPEEWAH GROUP	Bedford Sandstone			
	Luman Siltstone			
	Lansdowne Arkose			
	Valentine Siltstone	1834 ± 3		
	Tunganary Formation			
	O'Donnell Formation			
HOOPER AND LAMBOO COMPLEXES (1890–1840 Ma)				

Figure 2.4 Generalised stratigraphic column for the Kimberley and Speewah groups, with published U–Pb zircon ages (in Ma) (from Schmidt and Williams 2008:269, Fig. 2)

The northwest Kimberley is mainly composed of silicified lower Proterozoic King Leopold Sandstone, a massive, strongly bedded quartzarenite (Moore 2014). The King Leopold succession is unmetamorphosed and essentially undeformed, an important distinction, as the harder strata are not quartzite; rather, they are highly silicified sandstone or quartzarenite (Huntley *et al.* 2015; Schmidt and Williams 2008). It is classified as white, pale pink and pale purple, texturally mature, fine- to coarse-grained, often with local bands of granules and small pebbles (Schmidt and Williams 2008:269). King Leopold Sandstone is commonly eroded along joint planes, hence resisting significant erosion, resulting in rectilinear sandstone blocks separated by steep sided gullies, or rugged ridges interspersed with valleys of gentler relief, which provide many overhangs and rock shelters suitable for occupation and art sites (Daniel and Mucina 2013:12; Donaldson 2007:5; Veitch 1996:66).

King Leopold Sandstone provides excellent surfaces for rock painting as it is extremely stable and resistant to weathering. This ensures the long-term survival of

rock paintings in a way not possible in most other parts of Australia, e.g. Cape York Peninsula, where rock art surfaces are more friable and active (Morwood *et al.* 1994:79; Ross *et al.* 2011:4). King Leopold Sandstone's stability and resistance to weathering is highlighted by its age, which is up to 1.8 Ga (Schmidt and Williams 2008:268). In fact, it is considered one of the hardest and most erosion-resistant quartzarenite's on Earth (Mucina *et al.* 2013:89). For this reason, the Kimberley rock art sequence could likely prove one of the oldest sequences in the world.

2.2.4. Landforms

Wunambal Gaambera country is environmentally diverse, containing a broad range of landforms, including *Ngauwudu* (the Mitchell Plateau), steep escarpments and broken country, prominent sandstone outcrops, pristine rivers and waterfalls, and a ragged coastline with numerous inlets and bays.

Ngauwudu is a dissected laterite⁵ plateau. It lies 120 km southwest of Kalumburu and is bounded to the west by Mitchell River, to the east by the Lawley River, to the south by Camp Creek and to the north by the Admiralty Gulf. *Ngauwudu* consists of extensive flat-topped mesas and plateau country, fringed by escarpments and rounded hills. It rises up to 370 m above sea level, and slopes gently northwards to the coast (Tyler 2011:16). To the east of *Ngauwudu*, the topography of the study area is relatively flat, punctuated with low rocky outliers and vast rocky shelves of King Leopold Sandstone (Figure 2.5). Many of the sandstone outcrops that occur in the northwest Kimberley landscape contain rock art.

⁵ Laterite is a residual rock, which is formed at or near the Earth's surface through the weathering of pre-existing rocks by the action of rainwater. On *Ngauwudu* it likely formed when Australia had a more tropical climate and higher rainfall 70 to 50 million years ago (Tyler 1996:16).



Figure 2.5 View of the typical northwest Kimberley landscape containing prominent sandstone outcrops. The eastern fringes of the Mitchell Plateau can be seen in the top left, distinguished by the horizontal volcanic strata

The study area contains three major rivers, the Mitchell, Lawley, King Edward and their tributaries (see Figure 2.1). The King Edward River flows in a northerly direction almost parallel with the Kalumburu Road and eventually discharges into Deep Bay then Napier Broome Bay and finally the Indian Ocean. The river contains numerous permanent water holes. Along the course of the river is *Munurru* (King Edward River Crossing), the vehicular entrance to Wunambal country. *Munurru* is sandstone country, with a large number of outcrops bordering the King Edward River.

The Mitchell River flows northwards for 117 km before entering the Admiralty Gulf in the Indian Ocean. The river traverses the Mitchell Plateau before dropping 80 m in the three-tiered Mitchell Falls, where it spills into a short gorge before opening out into a broad rocky valley (Figure 2.6). The Mitchell Falls is a place of cultural and

spiritual significance for Wunambal people. Further downstream, three smaller waterfalls drop the river another 20 m, before the final stretch of the river turns into a mangrove-lined tidal estuary.



Figure 2.6 The Mitchell River and Mitchell Falls

The Lawley River flows northward from the south-eastern edge of the Mitchell Plateau for 40 km. Small falls and rapids mark the river's drop into a tidal estuary, which extends a further 8 km through mudflats lined with mangroves before debouching into Admiralty Gulf. The Mitchell and Lawley Rivers are separated by the Mitchell Plateau. Permanent flow of good quality water occurs along the main channel of both rivers. This is sustained in the 'dry' season by groundwater depletion (Allen 1971:5).

The coastline is deeply indented with numerous bays and inlets. The coast is generally of low relief, except for the western side of Admiralty Gulf, where inlets and bays are backed by steep cliffs. The shoreline is dominated by rugged, rocky outcrops that form headlands. Numerous small sandy beaches have formed between

these headlands, such as, *Yoowandaa* (One Tree Beach) on the eastern side of Admiralty Gulf (Allen 1971:5; Ross *et al.* 2011:39). Extensive littoral, mudflats occur in sheltered bays, particularly in the estuaries of the Mitchell and Lawley Rivers (Figure 2.7). These mudflats are inundated by the incoming tide (Allen 1971:5). Tides in the area are semi-diurnal with amplitudes of up to 10 m (Wells 1981:95).



Figure 2.7 Example of littoral mudflats at the mouth of the Lawley River, Admiralty Gulf (photo by June Ross)

2.2.5. Resources

Flora

The study area falls within the Gardiner Botanical District (GBD). Within the GBD, the vegetation is predominately savanna woodland (*wumanggar*), with varying degrees of tree or shrub cover determined largely by rainfall and geology (Wheeler *et al.* 1992). Areas with a mean annual rainfall above 700 mm are mostly covered by

wumanggar, with trees forming a light canopy; whereas areas with a mean annual rainfall below 400 mm generally support savanna grasslands with an absence of large trees (Wheeler *et al.* 1992). Between these two mean annual rainfall amounts exists a general gradient from grass savanna to savanna woodland (Scown 2010:51-2).

The tree layer in the GBD is generally dominated by *Eucalyptus* species; however, the ground cover can vary markedly. Within sandstone areas, *Sorghum* and *Plectrarchne* species comprise the grass layer, whereas on basalt areas the grass layer is dominated by *Sehima*, *Chrysopogon*, *Themeda*, and *Heteropogon* species (Wheeler *et al.* 1992:xiv). Woodland occurs on areas of laterite with high rainfall, and is dominated by *Eucalyptus* species, but also includes species of *Cycas*, *Livistona*, *Terminalia* and *Gardenia*. Riverine woodland occurs along certain reaches of the river networks and consists of *Terminalia*, *Ficus*, *Melaleuca*, *Acacia*, *Eucalyptus* and *Pandanus* species (Wheeler *et al.* 1992:xiv). Other vegetation types, such as rainforest (*wulo*) have more localised distributions dependent upon local soil, orientation and rainfall. Pockets of rainforest, or broadleaf vine thicket, grow in fire shadows along permanent watercourses, for example, Little Mertens Creek, near the Mitchell Falls on *Ngauwudu* (McConnell and O'Connor 1997:20; Wheeler *et al.* 1992:xiv). Mangrove (*darrngarla*) communities occur in sheltered inlets along the coast as fringing riverside vegetation. Fourteen species of mangrove have been observed within the region, their relative presence related to their tolerance of aeration and salinity (Wells 1981:95). Overall, the GBD is biologically diverse and species rich; a total of 1,627 vegetation species have been recorded in the region, of which over 100 do not occur anywhere else (WGAC 2010:19; Wheeler *et al.* 1992:xv).

Plant resources were a staple component of the Aboriginal diet and were also utilised for shelter, carrying vessels, making weapons, and for medicinal purposes (Crawford 1982; WGAC 2010:25). For instance, *Ngauwudu* contains dense coverings of 'Fan Palm' (*Livistona eastonii*) on the areas with laterite capping (Veitch 1996:66). The 'Fan Palm' is very common in the *Ngauwudu* area, often the dominant plant type in the mid layer of savannas and open forests. The inner growing stem can be eaten

(Karadada *et al.* 2011:48). The lower leaves are sharply pulled down to reveal the white pith (cabbage), which is also eaten. The young leaves are used to make baskets and string for dilly bags. In the past, 'wet' season shelters were made out of the stems and leaves to provide protection from the rain and winds (Karadada *et al.* 2011:48-9). Additionally, *Wulo* (the rainforest) contains a number of food and medicine plants utilised by the Wunambal Gaambera people. The main resources collected in *Wulo* are *gunu* (round yam), *garnmarngu* (long yam) and fruit like *gurangi* (black plum) (WGAC 2010:15). Other plants species collected have been outlined by WGAC (2010:19):

We collect and eat fruits such as langanda (bush almond), gurangi (black plum), gulay, jiliwa (river fig) as well as yams like gunu (round yam) and garnmarngu (long yam). We collect yarn.gun (waterlily) and aanuu (water chestnut) from billabongs and swamp areas. We get gun.gurru (cycad sp.) to make flour and eat the pith of dangana (livistona palm). There are many more plant foods we eat.

Additionally, plant resources, particularly yams, are featured in the art assemblage of the northwest Kimberley (see Welch 2003).

Fauna

In addition to plant species, Wunambal Gaambera country contains a rich and diverse faunal species assemblage. From the early 1970s a number of faunal surveys of this part of the Kimberley were undertaken, and as a result a wide range of terrestrial vertebrate fauna, avifauna, marine fauna and invertebrate species have been recorded. For instance, a total of 219 species of birds, 39 species of mammals, 86 species of amphibians and reptiles, 21 freshwater fish species, and 146 species of molluscs have been recorded (Hutchins 1981:232; Johnstone and Smith 1981:174; Kitchener *et al.* 1981:123,157; Smith and Johnstone 1981:211; Wells 1981:249). This diversity is, in part, due to the varying physiography of the area coupled with a protracted 'wet' season.

Wunambal Gaambera names and uses of 345 animals were documented in Karadada *et al.* (2011). Of these, a total of 123 (54.4%) were identified as food animals, and 42 (18.6%) were also of cultural significance (Karadada *et al.* 2011:166). The economic

and social importance of the faunal species assemblage is echoed in the rock art of the northwest Kimberley, where zoomorphic figures are a prominent feature.

Depictions of animals in our study area include a range of birds, macropod species, crocodiles, dingoes, echidnas, emus, fish, dugong, flying foxes, lizards, possums, snakes, thylacines and turtles.

2.3. Summary

In summary, the study area is the *Uunguu*, or living home of the Wunambal Gaambera people. Today, the region is dominated by a tropical monsoonal climate with highly seasonal rainfall patterns. The delineation of the four main seasons, the ‘wet’ season, early ‘dry’ season, cold dry season, and build up, assists the Wunambal Gaambera people in obtaining food, planning and participation in ceremonies. It is evident that the diverse geomorphological conditions and geology have had a marked influence on the range of flora and fauna present, making it species-rich and economically secure. The King Leopold Sandstone, which dominates the region, provides excellent surfaces for rock painting as it is extremely stable and resistant to weathering.

Chapter 3. Research Background

The aim of this chapter is to provide an understanding of the previous research relevant to this thesis, and to situate this study in its broader archaeological context. It is divided into four main sections. First, I provide a discussion on previous research that has been undertaken on the rock art assemblage of the Kimberley. Here, I outline the relative stylistic sequences that have been developed for the art assemblage. Second, a discussion on how stylistic change has previously been interpreted within the Kimberley rock art sequence is provided, which sets up the context of the research undertaken within this thesis. Following this, I present an overview of the ways in which changes in rock art assemblages have been studied elsewhere within Australia, including Arnhem Land and South East Cape York. Third, I provide a discussion of the published dates for rock art production in the Kimberley. Finally, I discuss the significance of previous research to the thesis. The purpose here is to analyse the hypotheses presented and to examine how a formal analysis of the rock art assemblage from the northwest Kimberley can further our understanding of change in Aboriginal society through time.

3.1. Previous rock art research within the Kimberley

3.1.1. The established rock art sequence

Within the Kimberley, stylistic sequences, placing the art in a relative temporal framework, have been developed by enthusiast rock art researchers Grahame Walsh (1994, 2000) and David Welch (1993a, 1993b). While each has their limitations, they clearly demonstrate that the rock art assemblage of the Kimberley has changed greatly over time.

3.1.2. Grahame Walsh

Based on over 30 years of research, Walsh (1994, 2000) developed a comprehensive relative stylistic sequence for the Kimberley rock art assemblage based on years of systematic recording, observed evidence of well-preserved superimpositions, differential weathering and stylistic change. At the broadest level the entire Kimberley rock art sequence was divided into three phases or ‘Epochs’, separated by major breaks in style, theme and technique, and six rock art Periods:

1. **‘Archaic Epoch’**

The earliest phase comprises stencils, handprints and imprints of grass and other objects, pecked cupules which form the Pecked Cupule Period, and large naturalistic of humans, yams and animals, including extinct species of the Irregular Infill Animal Period.

2. **‘Erudite Epoch’**

The second phase comprises the Gwion Period, divided into the Mambi Gwion and Yowna Gwion Sub-Groups, and Wararrajai Gwion Figure Period, the latter argued to be a development from the Gwion painting tradition. This phase is characterised by depictions of humans with associated ceremonial accoutrements and material culture.

3. **‘Aboriginal Epoch’**

The third and final phase comprises the Painted Hand Period, and the ethnographically observed Wanjina Period featuring large anthropomorphic figures lacking mouths and usually depicted on a background of white pigment (Walsh 1994:19). This Epoch was named the ‘Aboriginal Epoch’ as there are ‘[i]dentifiable transitions, techniques and themes that can be identified through the Aborigine Epoch which link it via definable stages to contemporary Aboriginal culture’, hence Walsh’s use of the term (Walsh 2000:207).

The further division of Walsh’s relative stylistic sequence classified all rock art into a seven-level classification system, as follows:

1. Epoch e.g. Erudite Epoch
2. Period e.g. Gwion Period

3. Group e.g. Mambi Gwion Period
4. Sub-Group e.g. Bland Gwion Sub-Group
5. Phase e.g. Monochrome
6. Feature e.g. Ankle Wing Feature
7. Application e.g. Painted (Walsh 2000:vii).

The first classification level is 'Epoch', which Walsh defined as collectives of artistic, stylistic and thematic commonalities. The second level 'Period' refers to recurring 'classic' representative forms, which are based on similar artistic, stylistic and thematic aspects. Within each 'Period', finer stylistic clusters are defined as 'Groups', the third classification level. Within defined 'Groups' discrete assemblages incorporating characteristics of a primary 'Group', but differing by way of certain additional distinctive but recurring attributes, warranting identification of a definable 'Sub-Group', are classified in a fourth level. The fifth classification level 'Phase' is colour-based (i.e. monochrome, bichrome, polychrome). The sixth is 'Feature', referring to a stylistic attribute (e.g. 'Ankle Wing'), appearing as a wide-ranging option rather than a group-specific characteristic. The seventh and final level is reserved for 'Application', which is always defined by its method (e.g. drawn, painted) (Walsh 2000:vii-viii).

At a broad level, Walsh's stylistic sequence is generally accepted; each of the proposed rock art periods can be easily identified and superimpositions confirm their relative position to each other. Below, I provide a description of his six identified rock art periods. It should be mentioned, that I only outline the first three levels of Walsh's seven-level structure. For more information on the identified Sub-Groups in each Group, refer to Walsh's original work (Walsh 1994, 2000).

Irregular Infill Animal Period

Hand stencils, hand prints and imprints of grass and other objects, and pecked cupules form the Pecked Cupule Period. The Irregular Infill Animal Period is the least represented period within the art assemblage. It consists of large naturalistic paintings of anthropomorphic figures, yams and animals (mainly macropods) (Figure 3.1). Artists within this period used long, flowing brushstrokes to create motif

outlines, applying solid infill to head, tail and limb areas, while whole body cavities were rendered with a stippled irregular infill (Walsh 2000:114). The anthropomorphic figures are rare within this period, and are of ‘basic and undecorated form’ (Walsh 2000:130). Walsh (2000:130) argued that ‘...a comparison of their inconsequential numbers to those of flora and fauna images suggest that rock art had a very different role in this period from that of the subsequent Erudite Epoch’.

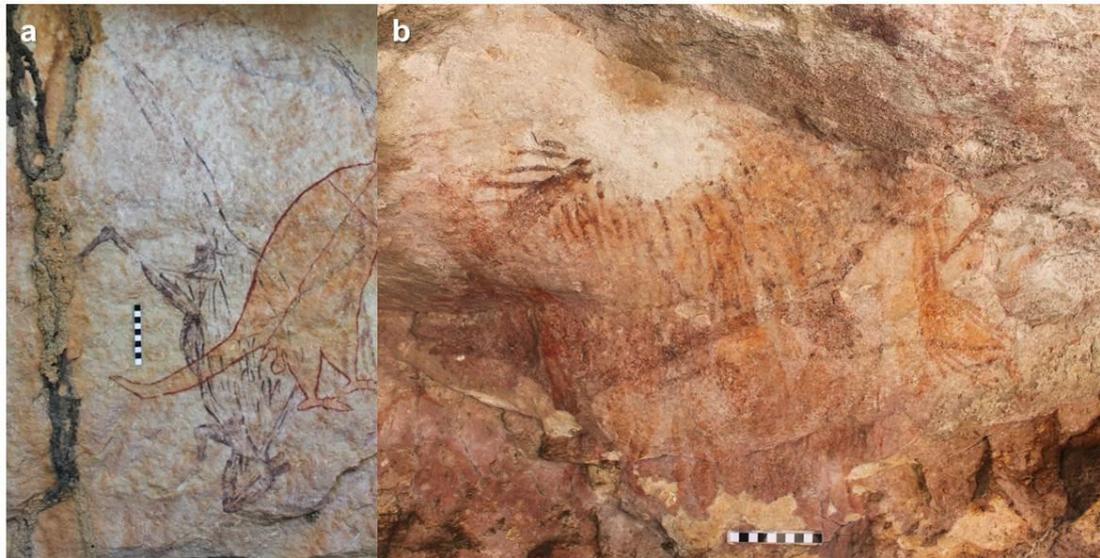


Figure 3.1 Irregular Infill Animal Period

- a) Macropod with head facing down (MP02-1-3163), scale is 10 cm
- b) Echidna (OTB01-44-2198), scale is 10 cm

Gwion Period

The Gwion Period, formerly known as the Bradshaw Period, is characterised by depictions of anthropomorphic figures with great attention to anatomical detail, accoutrements and composition. These paintings are: naturalistic⁶, generally monochrome, are associated with elaborate dress decoration and material culture including boomerangs, and are often composed on individual panels. The Gwion Period has been divided into two main groups: Mambi Gwion (Tassel Bradshaw) and

⁶ I define ‘naturalistic’ as the depiction of realistic objects, with the least possible distortion or interpretation. While the Gwion Period is still a stylised form of art, it is the least stylised of the identified stylistic periods.

Yowna Gwion (Sash Bradshaw). Various other minor Gwion groups and sub-groups were identified, including the Dynamic Gwions (Elegant Action Figures).

The Gwion Period commences with the Mambi Gwion Group (Figure 3.2). As described by Walsh (2000:136).

Tassel Bradshaws might be considered somewhat static in stance, but they display the greatest diversity in accoutrements. These include arm bands, elbow bands, chest bands, bangles, anklets and a variety of shoulder and armpit suspended cords and tassels, including variations of the triple tassel. Headdress forms are more naturalistic than some of the huge and elaborately decorated examples appearing in the later Sash Bradshaws.

Early ‘classic’ Mambi Gwions, often include a number of interesting traits. Some of these include distinctive broad shoulders, with a headdress draped over the shoulder, and having ‘held’ objects positioned beside the forearm rather than in the hand.

There is evidence of bichrome and possible polychrome examples within the Mambi Gwion Group (Walsh 2000:136).

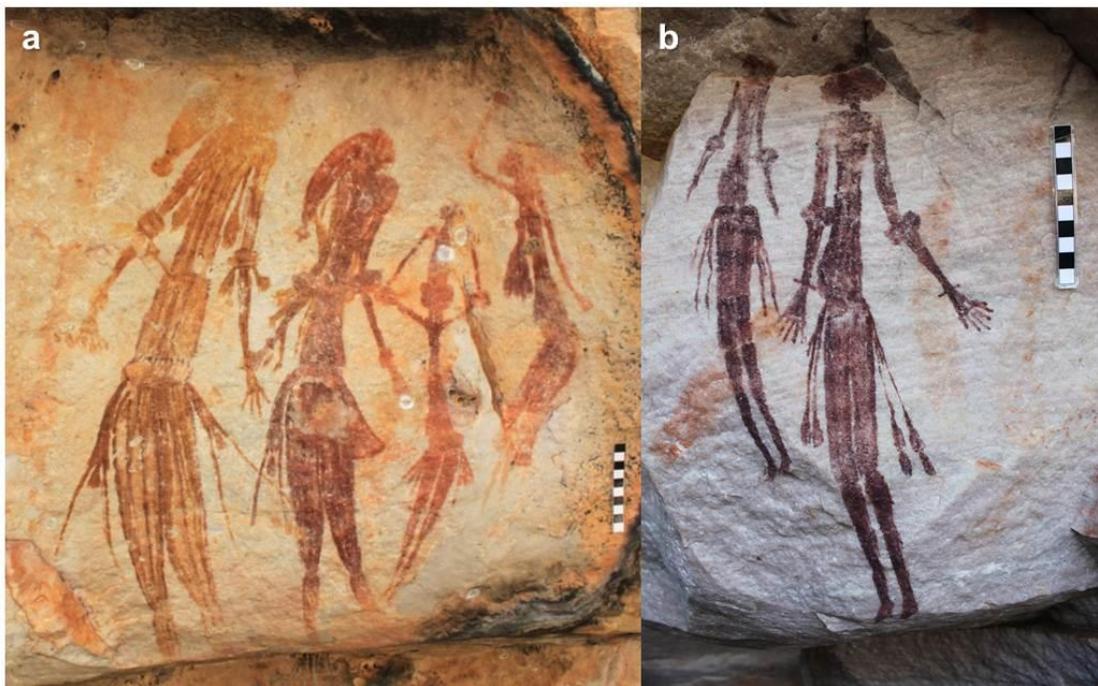


Figure 3.2 Mambi Gwion Period

- a) Anthropomorphic figures (KERC16-1), scale is 10 cm
- b) Anthropomorphic figures (OTB01-37), scale is 10 cm

The Yowna Gwion Group (Figure 3.3) evolved out of the earlier Mambi Gwion Group. Walsh (2000:138) considers that there is no indication that these two Groups were contemporaneous. Dress and accoutrements change dramatically, all forms of elbow bands disappear, the diverse range of armbands is replaced by the distinctive tuft armband, and the triple tassel is replaced by the three point sash (Walsh 2000:138). Hands are defined as circular knobs. 'A noticeable difference is that artefacts are now clearly 'held' in the small round hand, not aligned beside the forearm' (Walsh 2000:138). A commonly observed stance is to have 'both arms rigidly thrust ahead of the body, at an angle of 30° to 40°, sometimes slightly upraised from the elbow, and almost invariably holding one or more boomerangs erect and forward while trailing a whisk from below the hand' (Walsh 2000:141). According to Walsh (2000:141) Yowna Gwions appear to be 'involved in some form of ceremony or dancing'. Bichrome examples survive.

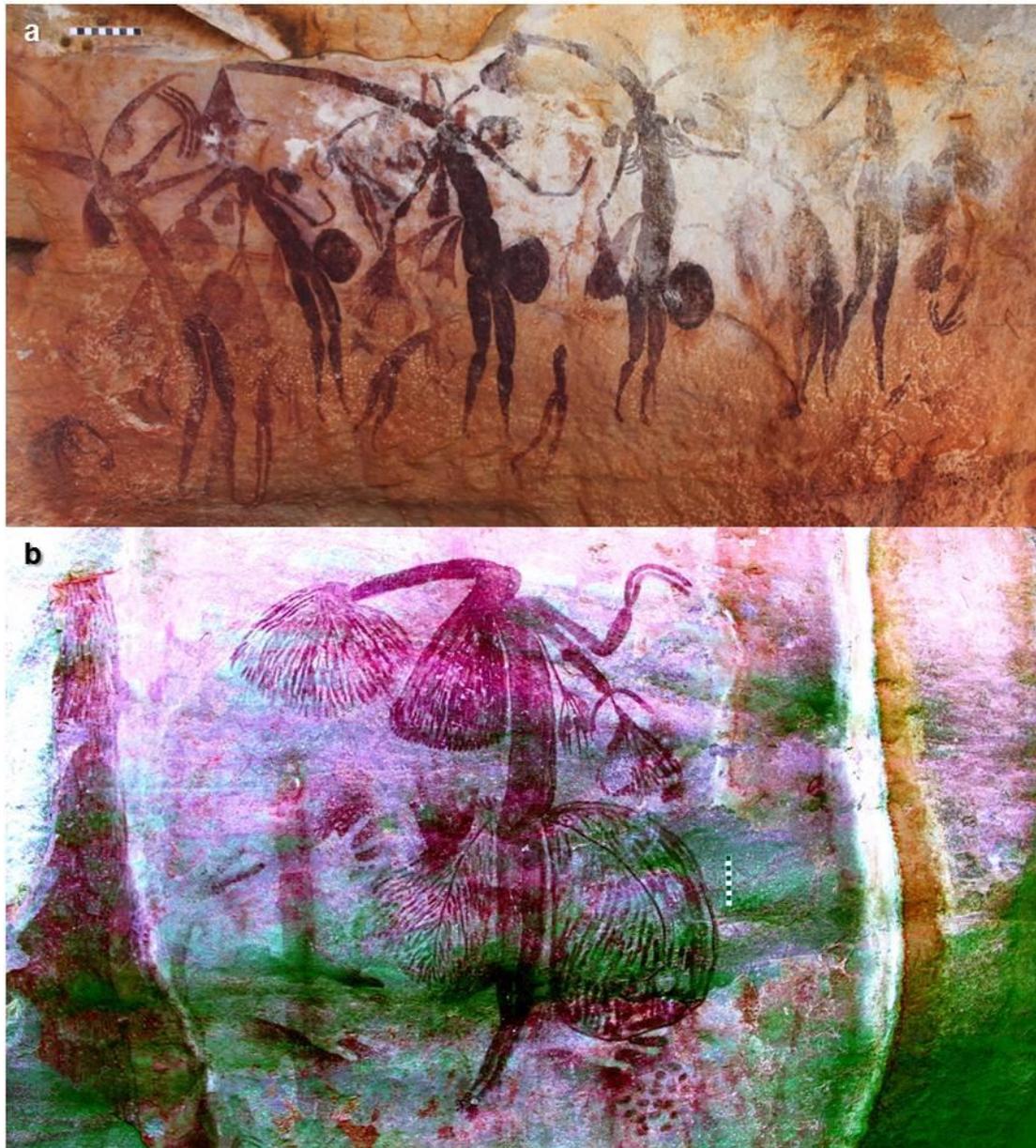


Figure 3.3 Yowna Gwion Period

- a) Anthropomorphic figures (OTB02-1), scale is 10 cm
- b) Anthropomorphic figure (MM19-2-7361), photograph digitally enhanced with D-stretch, scale is 10 cm

Dynamic Gwions (Elegant Action Figures) are portrayed with little or no decoration, carry spears and boomerangs and also depict scenes of everyday life (Figure 3.4). They are animated to suggest movement and action, for example, a striding walk, or high speed running (Walsh 2000:152). There is a noticeable trend towards depicting group scenes rather than individuals, occasional family camp scenes with women and

children, numerous action scenes, and hunting scenes (Walsh 1994:50; Walsh and Morwood 1999:49).



Figure 3.4 Dynamic Gwion Period

- a) Anthropomorphic figures (CC13-11-3849), scale is 10 cm
- b) Anthropomorphic figures and macropod in camp scene, (UL22-7-4777), photograph digitally enhanced with D-stretch, scale is 10 cm

Wararrajai Gwion Period

Walsh argued that the Wararrajai Gwion Period (Figure 3.5), formerly known as the Clothes Peg Figure Period, is a development from the Gwion painting tradition. As the Gwion Period transforms into the Wararrajai Gwion Period, three main changes occur. First, there is a reduction in the naturalistic representation of the human form

as it becomes more stylised. Second, there is a marked decrease in the presence and complexity of associated ceremonial accoutrements. Finally, there are distinctive changes in the depiction of associated weaponry. These include an increase in weapon frequency, the appearance of new weapon types (e.g. the ‘Hooked Stick’) and the development of projectile technology. According to Walsh (2000:169):

The Clothes Peg Figure (CPF) Period is a transformation from the Bradshaw Period, possibly happening over a relatively brief time frame and appearing to involve the same culture. While there are many identifiable similarities shared by the two periods, these figures are accompanied by sufficient clearly different features to identify the CPF art as a discrete period....The CPF Period heralds not only markedly different depictions of human form and associated colour use, but notable changes in many elements of dress, weaponry and most particularly headdress. Multi-Barb Spears become a common weapon, frequently accompanied by a Spearthrower, and boomerangs are still frequently carried.

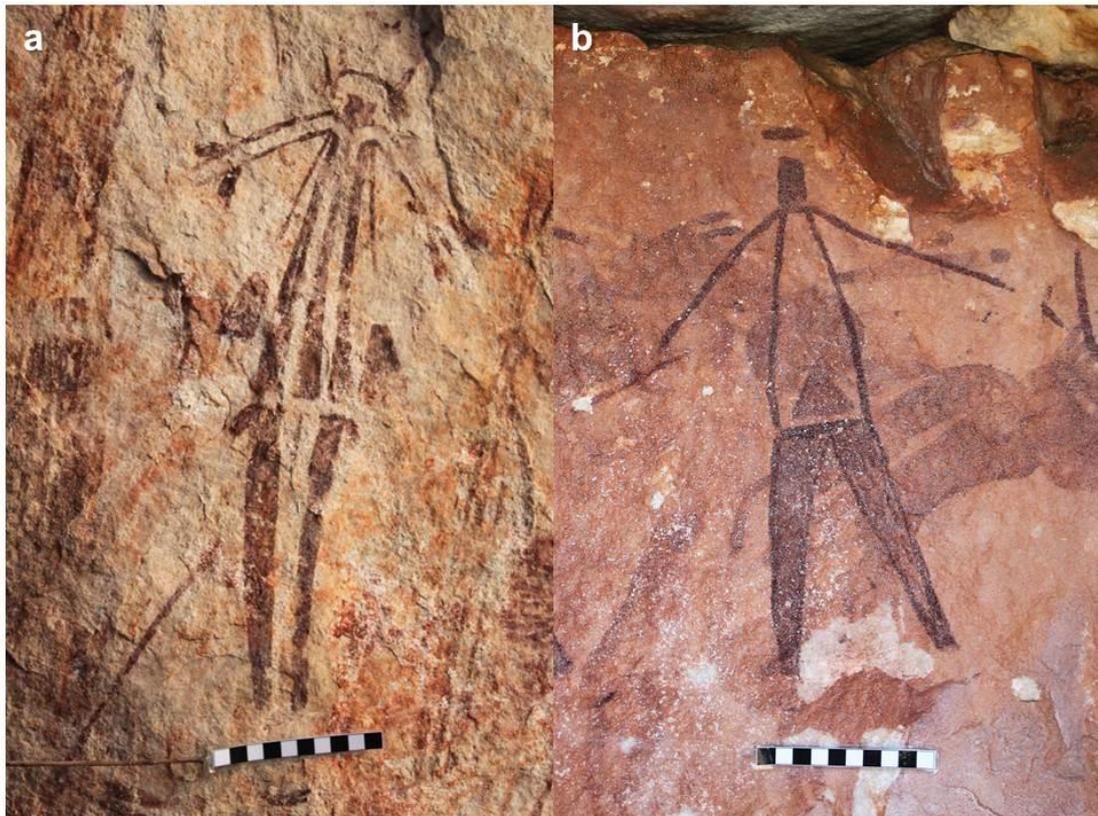


Figure 3.5 Wararrajai Gwion Period

- a) Anthropomorphic figure (SBY01-3-2458), scale is 10 cm
- b) Anthropomorphic figure (OTB01-24-1001), scale is 10 cm

Painted Hand Period

The Painted Hand Period, formally known as the Clawed Hand Period, was named after one of the most consistently recurring (but not the earliest) motifs: painted variations of decorated hands, with long, claw-like ‘fingernails’, referred to as the Clawed Hand Motif (Walsh 2000:207). This period consists primarily of zoomorphic and anthropomorphic figures (Figure 3.6). The most favoured zoomorphic subject is the macropod (Walsh 1994:51). Anthropomorphic figures often have three fingers, hanging arms, feet splayed in either direction, straight crutch line separating the legs, and/or compartmentalised bodies. This period sees the introduction of sexual themes in the art, with examples of genital depiction becoming common (Walsh 2000:208-9, see also Holt 2014). Depictions of weapons are rare in the Painted Hand Period. ‘A distinctive compartment body detail is developed on anthropomorphous and zoomorphic motifs, which has serviced bichrome (and probably polychrome) forms, seeming to have had yellow and white as dominant infill colours’ (Walsh 2000:209).

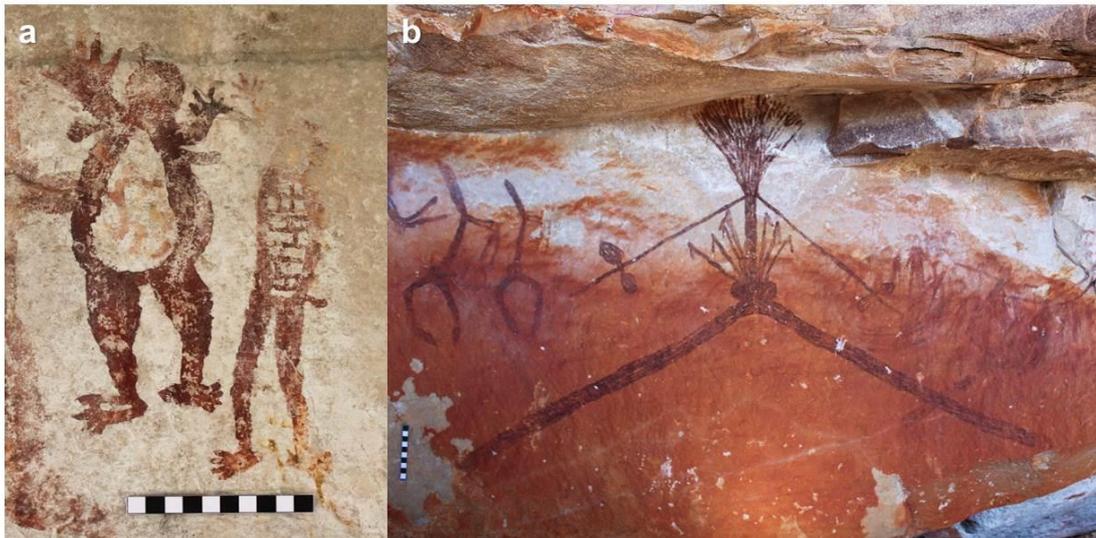


Figure 3.6 Painted Hand Period

- a) Anthropomorphic figures (UMR01B-10-5266,5267), scale is 10 cm
- b) Anthropomorphic figure (MM15-1-7270), scale is 10 cm

Wanjina Period

The Wanjina Period developed from the Painted Hand Period and is characterised by large, full frontal anthropomorphic figures. ‘Classic’ anthropomorphic figures within

this period generally have prepared backgrounds, large upper bodies that are patterned, horseshoe-shaped headdresses, and heads that show prominent eyes and nose but typically no mouths (Akerman 2014) (Figure 3.7). The smallest portrayals are of the head only. Other motifs associated with the Wanjina Period include a variety of animals and plants, particularly yams (O'Connor *et al.* 2013:542). In relation to the paintings of animals:

Animals accompanying these motifs are characterised by a particular form of twisted perspective, in which heads are shown with the eyes close together, separated by a line running to the nose, and the ears positioned twisted through 90° in relation to the orientation of the eyes. Limbs are stiff and straight, while the anus is prominently depicted, also through the use of twisted perspective (Layton 1985:445)

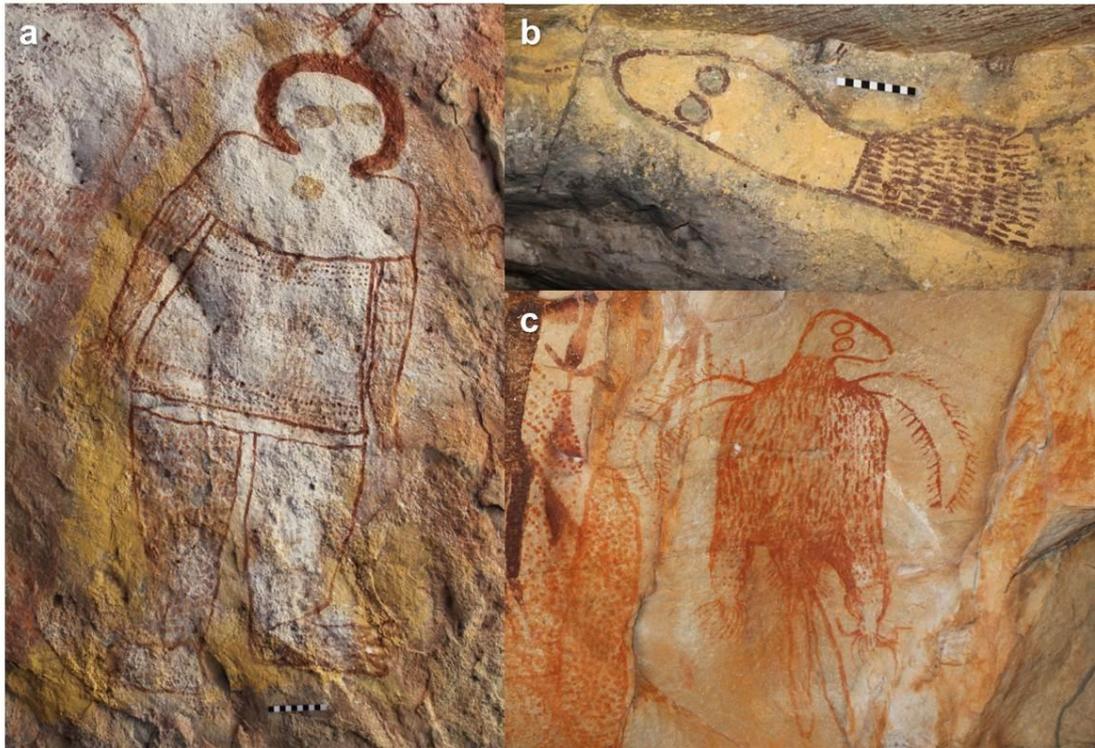


Figure 3.7 Wanjina Period

- a) 'Classic' Wanjina Period anthropomorphic figure (CC04-19-3676), scale is 10 cm
- b) Zoomorphic figure (snake/*Ungud*) (KCC01B-12-2722), scale is 10 cm
- c) Zoomorphic figure (bird) (LRM02B-1-5879)

There is detailed ethnographic information on the ideological, social and economic significance of the Wanjina Period (see for example Akerman 2014; Blundell 1974,

1975, 1980, 1982; Crawford 1968, 1969; Elkin 1930, 1948; Kaberry 1938; Layton 1985, 2012; Lommel 1997; Love 1936; Petrie 1954; Playford 1960; Utemara and Vinnicombe 1992; Vinnicombe 1997; Worms 1955).

‘Classic’ Wanjina paintings are ‘visual representations of beings that are orally presented in the complex myths of the local Aborigines’ (Blundell 1982:4), meaning that they are not considered ‘paintings’ in the western sense. Instead they represent whose creative acts laid the foundation for Kimberley society, offering tangible expression to the transformations undergone by ancestral figures (Morphy 2012:301). Specifically, they are ‘visible manifestations of supernatural beings who created topographical and other features of their country before transforming themselves into paintings at these sites’ (Blundell and Woolagoodja 2012:474). Thus, the Wanjina Period paintings are an integral part of the religious belief system of the traditional owners of the Kimberley. Aspects of the Wanjina mythology are associated with fertility and the coming of the wet season (Morphy 2012:301, see also Akerman 2014). Wanjina creative beings have control over the monsoonal cycle and the associated rain, which provide the key to regeneration and thus survival in the Kimberley (Ross 2013:162).

Paintings were retouched (repainted) to ensure the coming of the monsoon and the regeneration of all life (Blundell 1974). Keeping the images ‘bright’ by repainting is seen as a means of ensuring the retention of the Wanjinas powers (Ross 2013:163).

Furthermore, retouching of paintings of female Wandjinas causes an increase in human babies, as, according to some myths, does the retouching of Ungud paintings. Retouching of the various totemic animals and plants further ensures that they will reproduce and flourish throughout all clan territories of the West Kimberleys (Blundell 1974:222).

Repainting events in the Kimberley have been recorded as recently as the last few decades (Mowaljarlai *et al.* 1988).

The paintings are not the only manifestations of Wanjina mythology. A ‘range of topographical features are attributed to the Wanjina, as well as features, such as the

clouds, that are visible in the sky' (Blundell and Woolagoodja 2012:475). In addition, many distinctive landmarks and geographical features across the region such as rock formations, hills and rock shelters that are identified as locations where the exploits of particular Wanjinas took place in the past (Crawford 1968:38-61). Within Wunambal Gaambera country, 'Lalai' is the story and belief of how and when the country was created and why it is the only place in the world Wunambal Gaambera people can call home – 'Uunguu' (Karadada *et al.* 2011:8).

*Wunambal Gaambera people believe all the land, sea, heavens and all things in Wunambal Gaambera Country (plants, animals and ourselves) were put here by our **Wanjina** and **Wunggurr** (Dreaming Snake) creator ancestors. In the Lalai, they put the Law for Wunambal and Gaambera people to live together, to live with neighbours and to look after Country. They created the Wunambal and Gaambera languages and the Law for each family group to look after **graa** (our traditional part of Wunambal Gaambera Country) (Karadada *et al.* 2011:8).*

In order to understand the role of the rock art in the Wanjina Period in Aboriginal societies in the area, it is necessary to look at certain aspects of traditional social organisation, territorially and settlement patterns (Blundell 1974:215). The Wanjina Period artistic tradition forms part of a complex social system that reinforces the inter-dependence of three Kimberley linguistic groups, the Worora, Ngarinjin and Wunambal Gaambera (Blundell 1982:14, see also Layton 1985:443). These three groups are 'linguistically related and inter-marrying groups which share basic features of economy, social and territorial organisation, cosmology and mythology' (Blundell 1982:4).

The Worora, Ngarinjin and Wunambal Gaambera are characterised by 'exogamous, totemic, patrilineal clans which "own" defined areas of land' (Blundell 1974:213). Each clan is totemically associated with a discrete and named area of land, called by Wunambal speakers the *gira*, Worora speakers the *dambina*, the *dambun* by Ngarinjin speakers, and estates by Australian ethnographers (Blundell 1974:215, 1980:106).

Because clans are totemically linked to a named estate, the number of estates in a region will also correspond to the

number of clans and bands. Core members of a band have primary rights of access to their own clan estate, and these rights extend to members of the band that forms around them. Core members, along with their dependents in the band, may visit and forage in the estates of other clans where secondary rights of access arise through ties of kinship (Blundell 1980:109).

A typical clan consisted of a core of related male clan members and their wives and children, residing in the *gira* of the male members clan. Men were allowed ‘to “visit” and exploit resources in other clan territories, particularly those of their wives and their mothers’ (Blundell 1974:221). The relationship between clan, band and estate in the west Kimberley is illustrated in Figure 3.8.

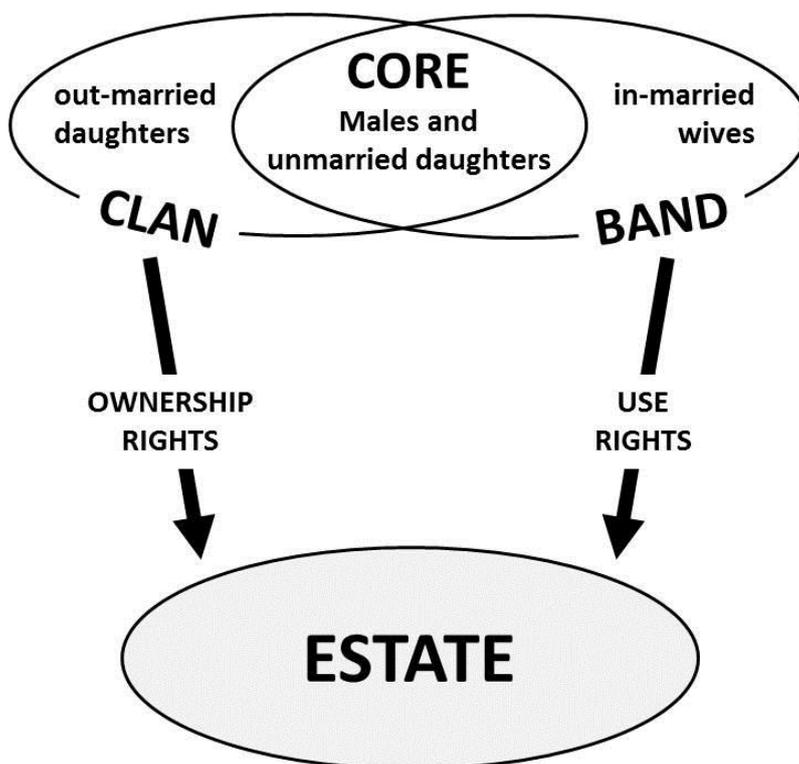


Figure 3.8 The relationship between clan, band and estate in the west Kimberley (after Blundell 1980:110, Fig. 2)

The geographical focal points of these *gira* are the rock shelters where Wanjina Period paintings constitute ‘the “shadows” of animals, plants and anthropomorphic beings called *Wandjina*’ (Blundell 1980:106). ‘Classic’ Wanjina Period paintings define a totemic point for a clan members ritual obligations and for the expression of

their socially constituted identity (Rosenfeld 1997:293). In addition, the ‘animals and plants depicted in the painted galleries are the totems of that particular clan, and their replenishment in the natural world is the specific responsibility of this or that particular clan’ (Blundell 1974:221). Due to the allotment of responsibility for the natural species to the various clans, the Worora, Ngarinjin and Wunambal Gaambara represent a system of clan inter-dependence.

Not only are women exchanged in marriage among the clans, thus broadening the resource base for all exploitative groups, but in a symbolic sense the very resources themselves are exchanged by assigning their increase rites to separate clans’ (Blundell 1974:222).

This network of communication between clans is a tightly structured, linear and directional system known as the *wunan* (Rosenfeld 1997:293).

In its most abstract meaning, the wunan is a cognitive model with a binary structure, which orders both humans and nature...The wunan has several important aspects. Among these is the idea that individuals belong to social groups which are ordered relative to one another and are interrelated by reciprocity and exchange (Blundell 1980:111).

3.1.3. David Welch

Welch developed an alternative relative stylistic sequence based on evidence of weathering, superimpositions, content and spatial arrangement of the paintings. Unlike Walsh, the unifying principle for Welch’s periods is material culture, similar to Brandl (1982) and Lewis (1988) in Arnhem Land.

Initially in his sequence, Welch divided the art into three broad chronological periods: monochrome, bichrome, and polychrome (Welch 1990). The ‘monochrome’ and ‘bichrome’ periods comprise the Gwion Period previously identified by Walsh. The older ‘monochrome’ period consisted of naturalistic human forms. Further research found that, within this period, there exist at least two major, chronologically different groups of paintings: Tasselled figures and Bent-knee figures (Welch 1993a:24). The later ‘bichrome’ period involved a stylistic change to human figures

in stylised form where often, the body was depicted in sections with straight parts and in a frontal stance. Gaps often occurred where pigment was missing (Welch 1993a:24). In the last period, the ‘polychrome’ art period, Wandjina’s and associated themes were common, and paintings were generally multi-coloured (Welch 1990:121).

More recent insights resulting from further research led Welch to revise his sequence and divide the sequence into five chronological periods, he termed:

- The tradition of tasselled figures
- The tradition of bent-knee figures
- The tradition of figures with straight parts and missing pigment
- The Wandjina Period
- The Contact Period

And two general periods, he termed:

- The Archaic period
- A diverse range of coexisting painting traditions including painted hands with long fingernails (Welch 1993b) (Figure 3.9). This general period includes painted hand with long fingernail motifs, crocodiles with segmented bodies (Welch 1993c).

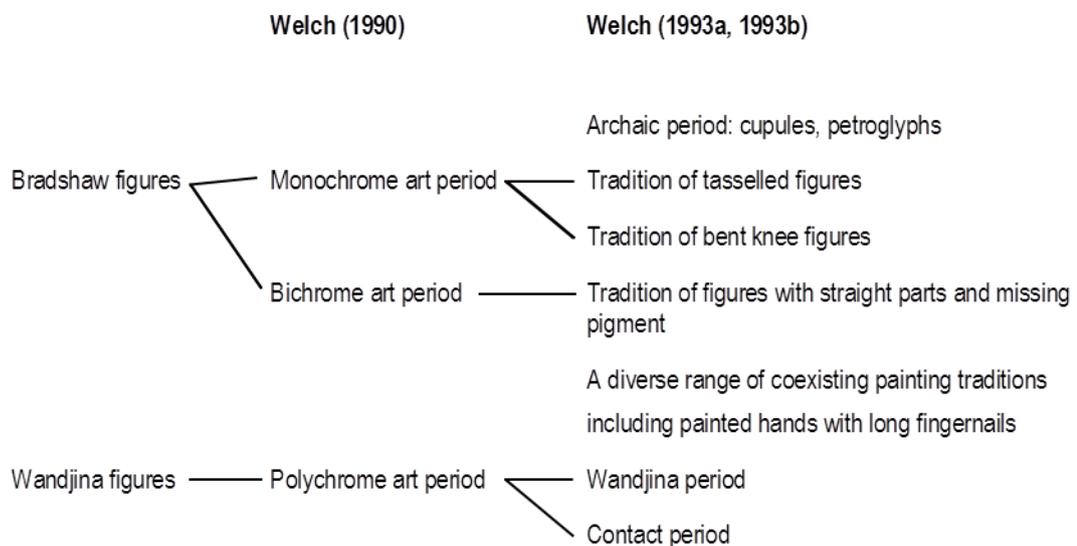


Figure 3.9 Stylistic divisions of Kimberley rock art (after Welch 1993b:15, Table 1)

The alignment between Welch's and Walsh's relative stylistic sequences and the nomenclature system applied within this thesis can be seen in Table 1.1.

The tradition of tasselled figures

The tradition of tasselled figures is characterised by anthropomorphic figures painted in a broadly naturalistic form with tassels hanging from their bodies. They commonly have 'tapering headdresses, elbow ornaments, bracelets, a simple belt or waistband such as could have been made from string or hair around their waists, and generally depicted with straight legs' (Welch 1993a:24). A large paunch is featured on some tasselled figures in profile view, below which appears to be a belt from which tassels hang (Welch 1993a:26). These include all the figures referred to in this thesis as Mambi Gwion figures.

The tradition of bent-knee figures

The tradition of bent-knee figures is characterised by anthropomorphic figures painted with legs bent at the knees, headdresses with knobbed ends, boomerangs, arm epaulets and a waist appendage like a skirt (Welch 1993b:13). Rather than tassels from the waist, the bent-knee figures have wider waist decorations, with one type triangular in shape. Due to associated ambiguities of the waist appendages, Welch named these figures after a feature common to the majority of examples, the bent knees. These include the figures referred to in this thesis as Yowna Gwion figures, and also Dynamic Gwion, termed by Welch 'Dynamic Figures'.

The tradition of figures with straight parts and missing pigment

The tradition of figures with straight parts and missing pigment is equivalent to the Wararrajai Gwion Period. In 1990, Welch used the term 'bichrome' figures to describe these paintings.

The term 'bichrome' figure was used to describe paintings which comprise only weathered red 'ochre'...The missing sections are therefore likely to have been painted in pigments

which have weathered away without a trace, such as charcoal or kaolin (Welch 1990:111-12).

Later, due to a large number being recorded with more than two colours, they were renamed the 'tradition of figures with straight parts and missing pigment' (Welch 1993a, 1993b). In 1996, Welch referred to these figures as 'Straight part figures (with missing pigment)' (Welch 1996). They are characterised by anthropomorphic figures painted mainly in a full frontal stance, with straighter lines and more rectangular-shaped bodies than the earlier bent-knee figures (Welch 1990:120). They vary greatly in size, have noticeable gaps where unstable pigments have eroded from the rock surface, and often carry multi-barbed spears, boomerangs and a 'hooked stick' (Welch 1990:121).

'Wandjina' Period

According to Welch (1990:110), 'Wandjina' Period paintings are often made up of several paints of different colours, depicting large anthropomorphs, zoomorphs and the 'Wandjina' figures. 'Wandjina Figures are characterised by having a head with two eyes, but no mouth. The smallest forms are portrayals of the head only...[t]he more complex forms include full body portrayals in bright colours of white, red, orange, yellow, and the eyes a charcoal black or grey' (Welch 1993c:109-11). Smaller paintings of plants (yams or berries), animals, beehives and other motifs are often associated with 'Wandjina' figures. This period was previously referred to as the 'polychrome' art period (Welch 1990).

The Contact Period

The Contact Period refers to art of contact with people from outside Australia, with paintings during this time showing material culture of visitors: for example: boats with sails and people smoking pipes.

General periods

The first general period named the Archaic Period includes pecked cupules on vertical rock faces. The second general period Welch identified as a diverse painting

tradition, which includes painted hands with long fingernails. This period corresponds to the Painted Hand Period. He was uncertain about the placement of this painting tradition, suggesting it may be linked to the tradition of figures with straight parts and missing pigment (Welch 1993c:104). Welch avoided putting it into a separate period and so defined it as a general rather than distinct stylistic period.

3.1.4. Summary of the established rock art sequences

Generally speaking, the relative stylistic sequences provided by Walsh and Welch are in broad agreement. They divide the art assemblage into comparable stylistic periods, in a similar relative temporal order. The division of the Gwion Period into three recognisable sub-groups, i.e. Mambi Gwion, Yowna Gwion, and Dynamic Gwion, is recognised by each researcher. The main disagreement lies in the relative chronological placement of the Painted Hand Period. Walsh (1994, 2000) considered that this period introduces the final phase, the ‘Aborigine Epoch’, whereas, Welch (1993c:104) suggested that this period may be linked to the tradition of figures with straight parts and missing pigment.

Although these relative stylistic sequences provide a good basis for understanding the overall development of the art sequence, the need for further research to clarify the sequences is widely recognised. Morwood (2002:175) in particular, was of the opinion that more contextual information on the changes in past environments, resource use and Aboriginal population size is needed to better understand changes in material culture, technology and ideology.

3.2. Previous hypotheses on the reasons for change in the rock art assemblage of the Kimberley

Following, is a discussion of the previous hypotheses proposed as explanations for observed changes in the Kimberley rock art assemblage and their implications for the Kimberley cultural sequence. Overall, there is a dichotomy between arguments for abrupt change versus gradual change.

3.2.1. Abrupt change and diffusionist explanations in Kimberley rock art research

A relative stylistic sequence for the art assemblage has been developed by Walsh, the order of which is not being contested here. The foundation of Walsh's three phase sequence was his belief that change in the assemblage is abrupt, and that each phase is separated by a period of discontinuity (Figure 3.10). Walsh proposed that there is a clear stylistic discontinuity at two points.

The tripartite division of the primary Kimberley cultural sequence is based on broad cultural Epochs, which are defined by collectives of artistic, stylistic and thematic commonalities. Their terminology indicates the representative factor inferred for the epoch's art. Epochs are separated by clear division of major change, which appear to have been accompanied by periods of discontinuity (Walsh 2000:viii).

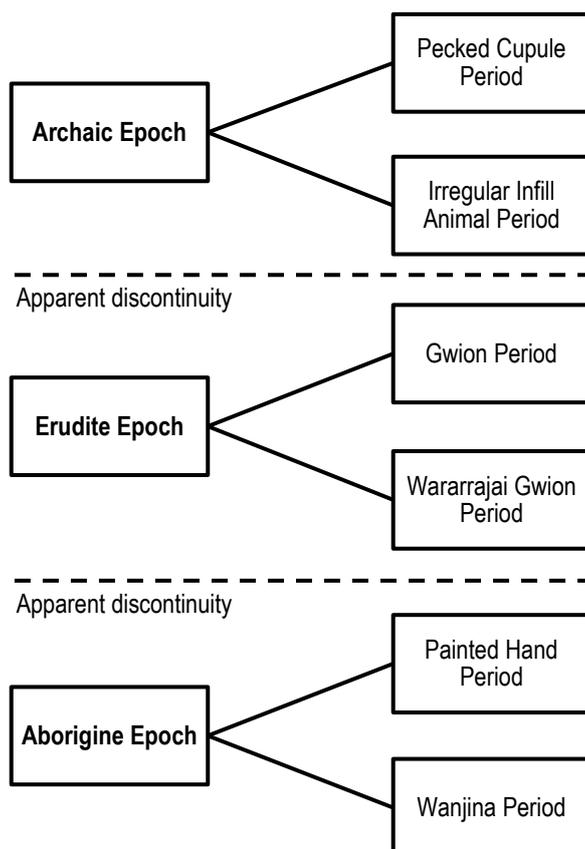


Figure 3.10 Walsh's tripartite division of the primary Kimberley cultural sequence (after Walsh 2000:viii, Figure 3)

According to Walsh, differential deterioration of the underlying art forms suggests that the ‘two main periods of discontinuity have involved a considerable length of time’ (Walsh 1994:21). He argued that there is no indication of any form of transition or development between the three Epochs:

The Erudite Epoch, characterised by Bradshaws and Clothes Peg Figures, appears to have begun abruptly, with no obvious antecedents in the preceding art periods. It appears to have ended just as abruptly. There is no evidence for any continuity in style, technique, or expertise with the following Clawed Hand Period, which appears simply to ‘happen’ (Walsh 1994:51).

Such an argument has implications for the cultural context of the art, as any disruption present in the rock art record would be associated with disruption in the cultural sequence. In relation to the posited discontinuity between the Archaic Epoch and the Erudite Epoch, Walsh claimed that ‘at this time there is no logical explanation for this apparent period of artistic discontinuity, which one would assume accompanies a cultural discontinuity’ (Walsh 2000:135).

According to Walsh (1994:51), evidence suggests that the Painted Hand Period (‘Aborigine Epoch’) culture ‘arrived’ in the wake of a lengthy duration of discontinuity following the Wararrjai Gwion Period (‘Erudite Epoch’).

Noteworthy examples of rock art supporting this hypothesis include a number of Clothes Peg Figures displaying retouch and modification stylistically attributable to the Clawed Hand Period of art...The Clawed Hand Period contrasts with the Clothes Peg Figure Period in many ways. Distinguishing elements of the Clothes Peg Figure artistic tradition, such as fine, precise linework, attention to detail, and stark schematised anthropomorphous forms, have completely vanished. These refinements are replaced with broad linework, frequently of poor quality, with detail appearing to be centred mainly on a range of complex geometric infills rather than motif form (Walsh 1994:51).

Walsh (1994:70-2) proposed that this period of apparent rock art discontinuity equates with the archaeological discontinuity at Widgingarri Shelter 1 in the southern Kimberley excavated by O’Connor (1996, 1999). Widgingarri Shelter 1 is a mainland rock shelter located within the Prince Regent Plateau sub-province of the

Gardner Botanical District (O'Connor 1999:17) (Figure 3.11). According to O'Connor, the Widgingarri Shelter 1 site has an occupation sequence dating from ca. 28,000 BP. However, occupation was not continuous. The shelter was used throughout the early part of the LGM, and then abandoned approximately 19,000 years ago at a time when the site was located several hundred kilometres from the coast. Reoccupation occurred between 7,000 and 8,000 years ago when the sea came close to its present position (O'Connor 1999:51).

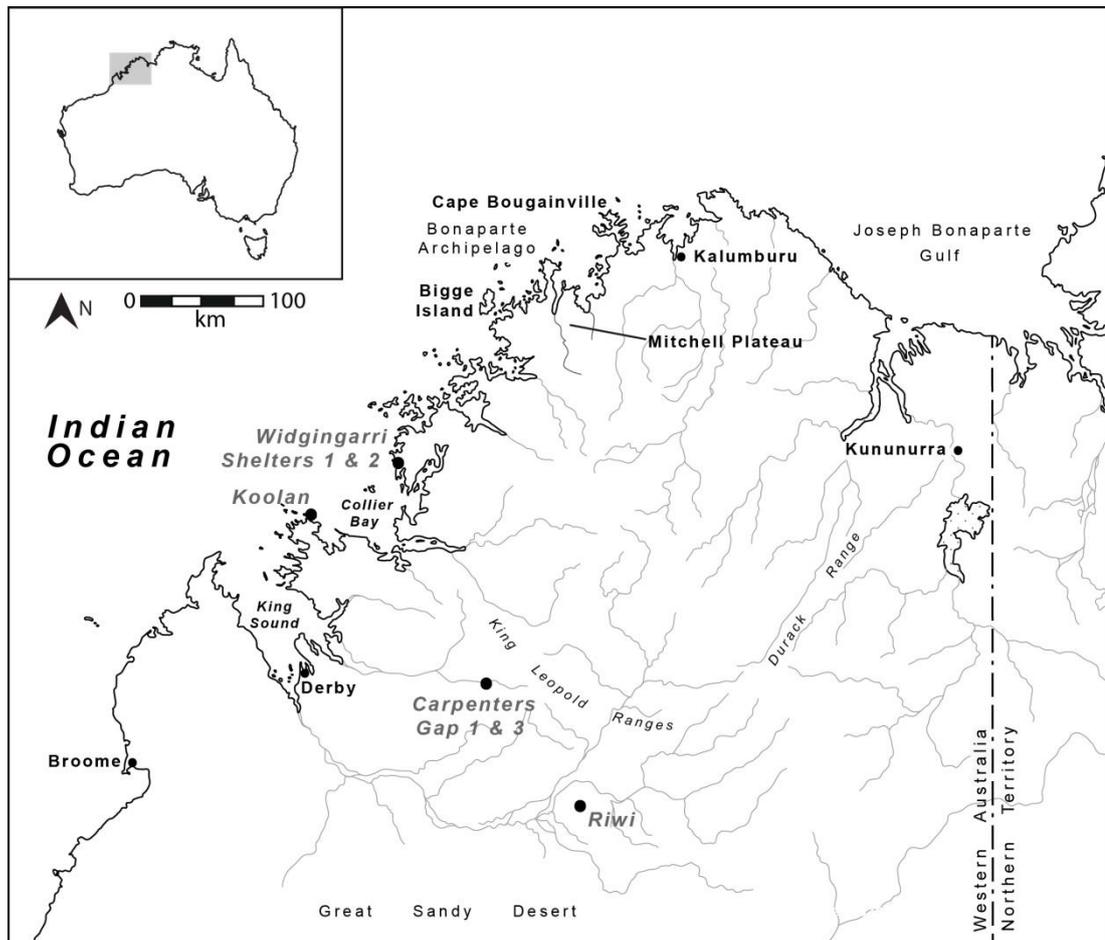


Figure 3.11 Location of excavation sites in the southern Kimberley

Walsh (1994:70,72) proposed that the Erudite Epoch ended roughly 18,000 years ago when he believes the Kimberley region was largely abandoned, due to increased aridity caused by the LGM. The Gwion Period is dated to this time based on one Optically Stimulated Luminescence (OSL) date of quartz grains from a mud-wasp's nest overlying a Gwion Period anthropomorphic figure that produced a minimum age

of $16,400 \pm 1,800$ years (Roberts *et al.* 1997:697). Walsh (1994:72) indirectly dated the origin of the 'Aborigine Epoch' to approximately 8,000 years ago, when the Widgingarri Shelter 1 site was reoccupied. He considered that the most logical explanation for the lengthy abandonment of the Widgingarri site is major environmental change.

Increased aridity would have resulted in major changes and associated habitability in such a marginal environment. Loss of resources must have forced major relocation of human populations, with conflict resulting from territorial protection and acquisition adding to the social traumas of the region (Walsh 1994:72).

Walsh (1994:72) went on to claim that:

Perhaps the Kimberley rock art may represent a graphic record of the passing of the Bradshaw culture. The apparent passive scenes of the Bradshaw art are followed by increasingly defiant stances in the Clothes Peg Figure art, culminating in a few surviving aggressive group combat scenes in the late Clothes Peg Figure art.

Such an argument is based on evidence for the increasingly challenging appearance of individual figures within the Wararrajai Gwion Period. He considered this as evidence of aggression. According to Walsh, the intent of human figures depicted holding weapons can be defined by the alignment of the body and the weapons they hold. He described the most common challenging appearance as figures in erect, full frontal view alignment (facing the viewer), holding spears, often with one arm raised to hold a spear or spearthrower. Their feet are firmly placed, with legs either slightly spread or closely aligned in rigid form (Walsh 2000:191). In relation to spears, upward facing spears were considered 'passive' and downward facing spears were considered 'aggressive'. However, only a single downward facing spear could be held in the 'aggressive' challenging stance, as it is in a 'launchable' alignment (Walsh 2000:193). According to Walsh (2000:192), such reoccurring alignments were considered important as they differ greatly from the passive body language of the previous Gwion Period. It is this change, and a corresponding decline in the complexity of (what is seen as) ceremonial accoutrements and the appearance of new projectile technology (including the 'hooked stick', which may be a spearthrower,

and also a two-part multi-barbed spear), which led Walsh to believe that there was an increasing tension and aggression in the associated culture.

In relation to the Gwion painting tradition, Walsh (1994:74) considered that ‘features such as exquisite form, composition and application of the art are alone sufficient to warrant considering this culture as quite different from others reflected in later Kimberley arts periods’. By claiming this, Walsh alluded to a non-Aboriginal origin for the Gwion painting tradition, particularly with his use of the term ‘Erudite’ to describe the period in which the Gwion painting tradition resides, and ‘Aborigine’ to describe the period in which the Painted Hand and Wanjina painting tradition resides. Once the Painted Hand Period commenced, ‘identifiable transitions, techniques and themes can be identified through the Aborigine Epoch which link it via definable stages to contemporary Aboriginal culture (Walsh 2000:207).

There has long been a trend in Australian archaeology of invoking successive migrations to the continent as the explanation for changes in the archaeological record, for example, Joseph Birdsell (1967) and Alan Thorne (1971, 1976, 1977) (Hiscock 2008:92-3). Such claims reflect diffusionist thought, common until the latter part of the twentieth century. Diffusionist explanations have been applied to the Kimberley rock art sequence by numerous researchers at least as early as the 1820s (e.g. Worms 1955; Walsh 1994, 2000, see McNiven 2011; McNiven and Russell 1997 for a review), drawing inspiration from the general European view of ‘savages’ as completely uninventive. ‘Such elegant and sophisticated pictures as the Gwion must thus have been painted by another race’ (Barry and White 2004:42-3). During the 1930s, before the Gwion painting tradition was well known, it was considered that:

Either foreigners impressed by Australian art seen at other places decided to paint portrayals of themselves upon a suitable rocky surface, or the natives, impressed by the appearances of foreigners seen in the region or along the coast, attempted to portray them as accurately as possible (Davidson 1936:134).

As outlined by McNiven and Russell (1997:802), two 19th-century diffusionist theories accounted for this:

An advanced predecessor theory held that superior traits had entered Australia through migration of an advanced race which either died out or degenerated into a more primitive (Aboriginal) people. An advanced successor theory proposed that superior traits had diffused into Aboriginal society either with advanced immigrants or through contact with advanced visitors.

In particular, Father Ernest A. Worms (Catholic priest and Pallottine missionary), who undertook two expeditions into the Kimberley in 1953 and 1954 with the purpose of studying the ‘prehistoric rock miniatures’ of the region recorded numerous Gwion paintings and was impressed by the ‘advanced’ style of these ‘masterpieces’ (Worms 1955:558). Worms considered that the origin of ‘Bradshaw’ figures from the Kimberley region had been created by an ancient and dark pygmoid race that had attained a higher artistic standard than the present residents and were now only to be found in Tasmania (Worms 1955:562-6). Such sentiments toward Kimberley rock art were repeated by Andreas Lommel (member of the 1938 Frobenius Expedition – he returned to the Kimberley, Gibb River Station, in 1955 to continue his research begun as part of the expedition), who has expounded this view in an extreme form – hunter art originated in western Europe and spread (Crawford 1972:301). Lommel maintained that Wandjina figures were ‘probably due to a Melanesian influence’ (Lommel 1966:125), possibly from the ‘Sepik River’ (Lommel 1970:221).

Diffusionism was the theory of the day and some of Walsh’s interpretations echoed such nineteenth century (and later) scholarship and the ‘deep-seated colonialist perceptions of Aboriginal people’ (McNiven and Russell 1997:802, 806, see also Hiscock 2008:102-10; Taçon 2001:114). Walsh did, however, consider alternatives to the diffusionist explanation. He reasoned that:

If climatic changes were sufficient to show noticeably in even the archaeological deposits of the Kimberley, it is difficult to argue that there would not have been a major reduction in the local population. This would have resulted from:

- *Diminishing resources on a regional basis.*
- *Increased inter-group conflict resulting from the increasing necessity to protect and, where possible,*

expand territorial lands to maintain sufficient resources for group survival.

- *Territorial expansion by stronger groups, forcing subjugated groups to move progressively further away. (Walsh 2000:24).*

Walsh allowed that conflict need not necessarily involve a migration or invasion, but ‘an unavoidable quest for group survival from within. This need not have resulted in physical extinction of the society, but perhaps a breakdown sufficient to create cultural extinction and the end of an era’ (Walsh 1994:72). He claims that:

It is not necessary to evoke the intrusion of different racial groups to explain aspects of the Kimberley cultural sequence – nor is it necessary to argue for a direct line of descent to counter such arguments (Walsh 2000:37).

Ultimately, the diffusionist model, as applied to the Kimberley rock art sequence does not stand up to close scrutiny. A diffusionist argument needs a plausible diffusion source (i.e. South East Asian rock-art of comparable form and age), and a plausible link between the two occurrences must be established. This evidence is noticeably absent (Barry and White 2004:44; McNiven and Russell 1997:807). Research by Barry (1997) and Barry and White (2004) has shown that Gwion figures do not, as suggested by diffusionist models, resemble overseas figures more than Australian figures. Their work examined 2,230 human images from seventeen areas outside Australia (e.g. Algeria, Ethiopia, Italy, South Africa, Spain, Turkey) and three areas within Australia (Arnhem Land, the Pilbara, and the Tombs), to determine whether or not Gwion figures resemble those from overseas more or less than those within the continent. Their analysis, which included a correspondence analysis of 79 stylistic attributes, indicated that Gwion figures ‘resemble Australian figures so strongly that an origin within the Australian continent is indicated’ (Barry and White 2004:44). This research has shown that stylistic analysis fails to establish a case for the exotic origin of Gwion images. Welch (1996, 1999) has also argued that there is no aspect of these images that cannot be explained in light of Australian Aboriginal culture. Specifically, Welch demonstrated that items of material culture depicted in Gwion paintings ‘can be closely matched with recent examples of Aboriginal ceremonial paraphernalia in the Kimberley and elsewhere in Australia, particularly Arnhem Land’ (Welch 1996:104). Although I consider that there is a

direct relationship between current and previous inhabitants of the Kimberley region, I am apprehensive about Welch's method of corresponding ethnographic material to paintings with a significant time depth as it is highly unlikely that cultural expressions remained static.

However, the Kimberley region has involved prehistoric foreign contact (see Akerman 2015; O'Connor and Arrow 2008; Ross and Travers 2013). In particular, contact with Macassan trepang fisherman from South East Asia is well documented from the seventeenth century (Crawford 1969:103; Macknight 1976; Morwood and Hobbs 1997:198), and the dingo arrived approximately 3,000-4,000 years ago, indicating external contact at this time (Morwood 2002:22,24).

Past research has established that the cultural sequence of the Kimberley region has a complex history. As Morwood and Hobbs (2000:35) has argued, 'the Kimberley served as a point of contact for continued Asian influences, including technological, linguistic and genetic impacts'. However, 'there is no real reason to invoke non-Aboriginal artists to explain the Bradshaw paintings and certainly no reason to assume this' (Morwood 1996:47). Balme *et al.* (2009:64) have stressed that 'genetic change does not cause behavioural change'. Hence, even if foreign origins could be documented, 'the question remains as to why such foreign "traits" became part of the new system' (Glassow 1972:293). It will be necessary to explain 'why knowledge of the behaviour of foreign peoples was accepted...In the end, citation of diffusion or migration is largely irrelevant to the explanation of cultural change' (Glassow 1972:294).

The advent of New Archaeology during 1960s and 70s made such shortcomings of migration and diffusionist explanations apparent (Renfrew and Bahn 2004:471, see also Ross 2013:164). Diffusionist explanations ignored the possibility of independent invention, original innovation and the catalyst of internal forces (David and Chant 1995:361). As archaeologists began to focus on contextual analyses to explain past change, a notable shift from 'an emphasis on cultural diffusion as the explanation for chronological changes in Australian Aboriginal art (e.g. McCarthy 1958), to

investigations which seek to understand the integrating function of art in Aboriginal society' occurred (Morwood and Smith 1994:21). Investigation into the integrative function of art included, investigating:

...how a range of social and economic information is encoded in art and its distributional characteristics; and how it may reflect fundamental changes in social organisation, group interaction and the pattern of land use. Such investigations require information on the cultural and natural contexts of rock art production, whereas previous studies had tended to be more focused on rock art in isolation (Morwood and Smith 1994:21).

Changes in the archaeological record need not be due to the arrival of new waves of people, but adaptation of people to their social and material environment over long spans of time.

Cultural as well as biological variation in humans throughout Australian pre-history can also be explained in terms of the dynamic adjustment of people from a single founding population to the changing contexts in which they lived rather than as a result of passively receiving genetic and social influences from outside Australia (Hiscock 2008:101).

While debate continues about the extent of foreign influence on Aboriginal culture, most rock art researchers now accept that the diverse rock art assemblages located across Australia were made by Indigenous Australians and developed *in situ* (Mulvaney and Kamminga 1999:261; Taçon 2001:114). This can be expressed archaeologically, through gradual change in stylistic attributes.

Archaeological evidence from the southern and western Kimberley

As outlined above, Walsh (1994, 2000) has postulated that a hiatus in occupation is evident in the Kimberley, in response to increased aridity brought about by conditions of the LGM, e.g. climatic deterioration coupled with continentality (Hiscock 2008:60; Morwood 2012; O'Connor 1996:47). Here, I outline the archaeological evidence for a hiatus of occupation in the southern and western Kimberley, and the contrasting evidence for a continuity of occupation throughout

the LGM, in relation to sites excavated by Jane Balme (Riwi) and Sue O'Connor (Carpenter's Gap 1, Carpenter's Gap 3, Koolan and Widgingarri 1 and 2) (see Figure 3.11).

O'Connor (1990:349) has argued that the dates from the Koolan excavation illustrate its abandonment by 23,000 BP followed by its reoccupation at 10,850±160 BP. The excavations at Widgingarri shelters replicate this trend, but abandonment occurs later and closer to the height of the LGM (between 19,000 and 7,700 BP) (O'Connor 1996:26; 1999:60). O'Connor interpreted the abandonment as the result of increased aridity and its effect on local surface-water availability in close proximity to the shelters, as during the LGM these sites would have been within the continent's much-expanded arid zone (O'Connor and Veth 2006:35). Additionally, at Riwi, a date of about 5,000 years BP directly overlying a date of 30,000 years BP is indicative of a period of possible abandonment over the LGM (Balme 2000:2-4).

However, the size of the abandoned area is unclear as evidence of abandonment of the entire region is equivocal as only a few sites have been excavated, and only parts of those regions may have been unused during the LGM (Hiscock 2008:60). As Balme (2000:4) suggested, it is possible that deposits elsewhere in the sites might represent the key missing period. For instance, at Carpenter's Gap 1 very limited use of the site continued throughout the LGM indicating that (semi)-permanent waters were retained in the deep gorges of the Napier Range (Morwood 2012:29).

Archaeological evidence for continuity through arid conditions

It is understood that the southern region of the Kimberley experienced increasingly arid conditions during the LGM, including increased windiness, mobile sand dunes, less vegetation cover, and for many areas a decrease in surface water availability (Hiscock and Wallis 2004). In fact, sand dunes that are now present on the south side of the Napier Range at Carpenter's Gap 1 attest 'to the major phase of dune building and sediment mobility that occurred during this time' (O'Connor and Veth 2006:37). Direct evidence of such arid conditions during the late Pleistocene in the southern

Kimberley come from macrobotanical records at Carpenter's Gap 1 (McConnell and O'Connor 1997), and faunal records from Widgingarri shelter (O'Connor 1999).

Evidence for environmental changes through the late Pleistocene and the Holocene in the southern Kimberley has been inferred from the macrobotanical remains recovered from Carpenter's Gap 1 (McConnell and O'Connor 1997:28). Here macrobotanical remains are well preserved in deposits and reveal a four phase sequence, with evidence for arid conditions during the LGM. However, discard of stone artefacts and other cultural materials from 30,000 BP to 11,000 BP also demonstrates sparse occupation during and immediately following the LGM, in spite of arid conditions (O'Connor and Veth 2006:35).

Specifically, Phase 3 (25,000-11,000 BP) of the Carpenter's Gap 1 deposit contains the presence of *Chenopodiaceae*, *Amaranthaceae*, *Cyperaceae* and perennial grasses in the site record. According to McConnell and O'Connor (1997:29), this is the best current evidence for an arid phase in the southern Kimberley.

The region may be reconstructed as a shrubland-grassland mosaic extending across a landscape with increasingly saline and calcareous soils, associated with Chenopodiaceae. Available moisture in the form of precipitation and streams had decreased, as noted by the decline of rainforest tree taxa; however, sufficient moisture was still available to support perennial grasses and shrubs (McConnell and O'Connor 1997:29).

In addition to the macrobotanical record at Carpenter's Gap 1 attesting to an increase in arid conditions, faunal analysis from Widgingarri provides evidence for arid species, such as bilby (*Macrotis sp.*) in spits immediately predating the height of the LGM (Prince 1991).

Overall, the Carpenter's Gap 1 macrobotanical record provides evidence for a continuous cultural presence in the southern Kimberley for the past 40,000 years. Some indications of long-term shifts in flora can be identified from the archaeological record. For example, through time, grass cover increased and the fruiting tree species decreased, 'as the area becomes increasingly more arid after

about 35,000 years ago, and spinifex and grasses dominate the records between about 30,000 and about 15,000 years ago' (O'Connor 2007:67). The evidence in the rock shelter of shifts in environment suggest that alternate plant food procuring strategies occurred as a response to environmental changes, and 'that the Aboriginal inhabitants did not abandon this region during the Last Glacial Maximum, but adapted their survival strategies to cope with a changing environment' (McConnell and O'Connor 1997:29).

Other evidence for continued occupation of the Kimberley during the LGM is found on the Ord River, in the east Kimberley. Excavations at Miriwun and Monsmont Shelters reveal that the sites were first occupied during the LGM and continued in use at the end of the Pleistocene, when conditions began to improve around 12,000 years ago, (Dortch 1977). These excavations attest to use of riverine resources at the height of the LGM and afterwards during the late Holocene (Veth 1995:743). The Ord River would have been a likely catchment to retain permanent water.

Overall, during the LGM, occupation of the southern Kimberley region is likely to have fluctuated in response to long and short-term water resource availability. Human populations may no longer have been sustained in some areas, resulting in depopulation or abandonment (Anderson *et al.* 2007:14). Abandonment, however, would be best phrased as relocation. Presumably, people relocated to zones of refuge if this was an option, in a manner similar to that proposed by Hiscock (1988) for at Lawn Hill Gorge in north-western Queensland. Zones of refuge are generally defined as 'areas providing reliable networks of (more) permanent waters' (Veth 1995:734). The now-submerged Pleistocene coastline, may have served as a major fall-back area, which during the LGM was approximately 200 km farther west than at present (Morwood 2012:29). Unfortunately the post-glacial rise in sea level has made archaeological records in this zone unrecoverable. However, advances in remote sensing and diving technologies may in the future enable exploration of these former terrestrial landscapes submerged by sea-level rise related to the LGM.

Evidence that people occupied the now-drowned coastal shelf includes fragments of *Dentalium* sp. shell beads found in the upper Pleistocene levels of the Riwi deposit (Balme 2000:4). *Dentalium* is a marine species and Riwi is now some 300 km from the coast and at the time of the beads' deposition about 30,000 years ago, sea levels were lower than today (Balme 2000:4, see also Balme and Morse 2006). Balme (2000:4) points out that '[a]lthough it is possible that people travelled long distances in the Pleistocene it seems more likely, as O'Connor (1999:121) has suggested, that the beads were traded'.

Contact with the coast is also evident in fragments of baler shell (*Melo* sp.) and pearl shell (*Pinctada* sp.) at Widgingarri Shelter 1. The baler shell was found in deposits dated to 28,000 BP, while pearl shell was dated to 19,000 BP (timed to the LGM), when the site was some 200 km inland (O'Connor 1999:121).

Re-examination of some of the sites in which a hiatus seems evident is currently underway. Our understanding of human occupancy of the Kimberley during the Pleistocene will benefit from current research being undertaken in the southern Kimberley. The ARC Linkage project *Lifeways of the First Australians*, led by O'Connor and Balme continues research at Carpenter's Gap and Riwi. The aim of this project is to investigate the archaeology of the Oscar Napier Ranges to produce a more holistic picture of the lifeways of the Indigenous people of this region during the Pleistocene.

Going back to the art assemblage, even though 'abandonment' did occur at particular sites, the act of abandonment or relocation does not reasonably result in a complete behavioural or cultural change, as:

the reason a regional abandonment is undertaken by hunter-gatherers is ostensibly so they can then continue practising their usual adaptations elsewhere without dramatically altering them, as might be necessary if they did not relocate (Eren 2012:20).

For this reason, I do not consider the changes evident in the rock art assemblage, between the Wararrajai Gwion and the Painted Hand Periods as evidence of 'a

graphic record of the passing of the Bradshaw culture' (Walsh 1994:72). Below, I discuss the notion that change in the art assemblage was gradual.

3.2.2. Gradual change, a model for cultural continuity

Whilst Walsh argued that there is no continuity of art from one Epoch to the next, other authors such as Crawford (1977) and Welch (1993c) disagreed. This is an important dichotomy within the literature and will be dealt with in more detail here.

Within the northwest Kimberley, evidence of transitional change between the Gwion and Wandjina cultural traditions would imply some type of cultural continuity within the region. As 'continuities of style conventions within a body of rock-pictures imply an ideology of continuity of traditions at some level of cultural identity; discontinuities of style imply an ideology of breaks in identity traditions' (Rosenfeld 2000:56). Numerous researchers have argued for such continuity (e.g. Crawford 1968, 1977; Morwood and Hobbs 1997; Lewis 1997; Welch 1996, 1999 and Ross 2013). Crawford (1968, 1977) was one of the earliest researchers to investigate an evolutionary relationship from the Gwion Period to the Painted Hand and Wandjina Periods. In 1977 he stated that:

If we compare the classic Bradshaw and Wandjina figures, there is nothing in common stylistically. However, if we widen the definition so that we are talking about a Bradshaw style and Wandjina style, the ranges approach common ground and this suggests an evolutionary sequence. The evidence is, at the moment, insufficient but the implication is the evolutionary sequence may eventually be confirmed (Crawford 1977:357).

Welch (1999:289) agreed that the rock art of the Kimberley provides evidence of gradual changes in the culture of the Aborigines of that region over time. Based on pigment choice and stylistic attributes, Welch illustrated that 'there is a continuity into the later Wandjina period with recent examples of Straight Part Figures still retaining white and yellow pigments and there are paintings showing the gradual development of the Wandjina head shape' (Welch 1999:308). Welch argued that much of the material culture associated with previous Kimberley inhabitants, that of

the early 'Tasselled' and 'Bent Knee' figures, can be closely matched with recent examples of Aboriginal ceremonial material culture in the Kimberley and elsewhere in Australia, particularly Arnhem Land (e.g. feather tasselled belts and arm bands, tapering headdresses, and fly whisks) (Welch 1996:105; 1999:298,302). He concluded that the material culture exhibits strong continuity.

I believe such a link does exist between the early Bradshaw paintings and contemporary Aboriginal culture in at least three ways. Firstly, for many paintings, there is a continuity of a high level of artistic skill from the earliest to the latest art. For example, during the more recent Wandjina Period this takes the form of large oval and rounded shapes painted on irregular rock surfaces. Secondly, one can see the development from one art style to the next, with the most recent Wandjina figures evolving from elements of tasselled and straight part figures through a pre-Wandjina phase. Thirdly, there is the enormous amount of material cultural items seen associated with the early human figures, and here can be found the strongest link between the culture of those early artists and Aboriginal people today (Welch 1996:105).

I consider Welch's method of corresponding ethnographic material to paintings with a significant time depth as problematic. It is highly unlikely that cultural expressions remained static.

In 1990, Welch produced a Venn diagram to illustrate his notion of gradual cultural change; the probable co-existence and overlap between what he considered at the time to be the three main periods of Kimberley rock art (Figure 3.12). The Venn diagram illustrates a simple set of relationships. The area where the two circles overlaps is called the intersection. The intersection is not empty; it is where stylistic attributes from the overlapping art periods are considered to coexist, alluding to cultural continuity throughout the sequence.

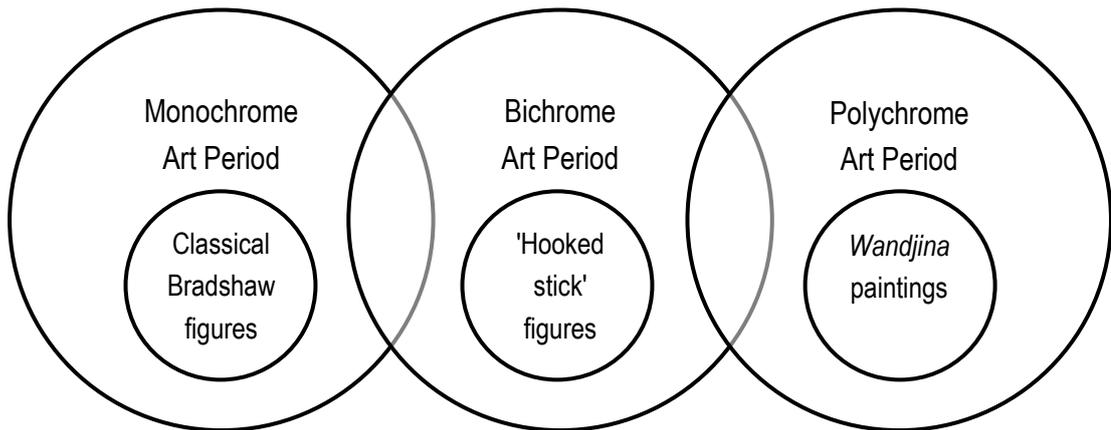


Figure 3.12 Venn diagram of all Kimberley rock art (after Welch 1990:121, Fig. 32)

More recently, Ross (2013:164) argued that:

the early date obtained for the incipient Wandjina form (Morwood et al. 2010:4-5) together with later research on late-Holocene stylistic change in the Kimberley (Crawford, 1977; Ross, 2010) indicates that the change from Gwion Gwion to Wandjina style is a gradual one. The factors driving stylistic change are likely to be more multifaceted than a diffusionist explanation would suggest.

Morwood and Hobbs (1997:197) reasoned that some of the complexity in the prehistoric sequence, including changes in land use, projectile technology and rock art, relates to climatic fluctuations and *in situ* cultural developments (Morwood and Hobbs 1997:197). Lewis (1997) used the relative sequence of weaponry depicted within the art to indicate cultural continuity between the two periods. For example, the 'Curved Tip Boomerangs occur in the "later" Clothes Peg Figure Period and the "later" Clawed Hand Period, and composite spears occurred and were used up to the ethnographic present' (Lewis 1997:6).

In 1972, Crawford claimed that there was growing evidence that the Kimberley 'was an area of changing culture before the Aboriginal culture itself was overrun by white Australians' (Crawford 1972:304). This was an important point to make and moved away from Old Archaeology notions of culture as static. This underlined the complexity of Aboriginal cultures, allowing us to view change as constant and occurring from within a cultural system, and not resulting entirely from external

influences. It is here that studies of rock art can provide insights in ways other archaeological evidence cannot and have not.

Cultural change evident in the rock art assemblage of northwest Kimberley is not unique. Similar stylistic transitions have occurred across the Australian continent. During the mid to late Holocene, widespread stylistic assemblages give way to more diverse rock art with spatially restricted areas of stylistic unity (Rosenfeld 1997:290). Elsewhere in Australia, such changes have been attributed to internal development. Specifically, environmental changes and adaptive strategies within Arnhem Land, social and demographic changes within South East Cape York, interaction and economic exchange within Northwest Central Queensland, and human-environmental interaction within Central Australia (Ross 2013).

3.2.3. Previous explanations for stylistic changes evident in regional rock art sequences of Australia

Within Australia, there are well documented rock art assemblages that reveal ongoing temporal change throughout the continent. I have chosen to focus my discussion on the two regional art traditions of Arnhem Land and South East Cape York. These regions are located in the tropical north of Australia, with similar environments and climates to that of the northwest Kimberley. Both of these regions have well documented rock art sequences, with regional art traditions in the Pleistocene with marked changes in the late-Holocene.

Previous research into these sequences has involved contextual and multi-disciplinary approaches, aimed at investigating the possible factors that have driven the marked changes apparent in the mid-to-late-Holocene. Such approaches have incorporated stylistic analysis, as the growing understanding of the ways in which style can be used in flagging identity, means that rock art provides a fitting archaeological assemblage for investigating late-Holocene change within Australia (Ross 2013:161). Importantly, explanations for change in rock art have been

dependent on theoretical perspectives most prevalent at the time that research was undertaken (Ross 2013:161).

Arnhem Land

In Arnhem Land, change in the rock art assemblage has been ascribed to environmental changes and adaptive strategies (see Chaloupka 1984, 1985, 1993; Lewis 1988; Taçon and Brockwell 1995; Taçon and Chippindale 1994, 2008; Taçon 1987). About the same time as the Wanjina Period emerged in the Kimberley rock art sequence, the ‘Complete Figure Style’⁷ art emerged in Arnhem Land (Taçon and Chippindale 1994:218; Taçon 1989a:141). The ‘Complete Figure Style’ comprises the recent rock art of Arnhem Land, including ‘x-ray art and all works contemporary with it’ (Taçon 1989a:133-4). This change is considered to correspond with sea level rise following the LGM that reduced the available land mass and transformed saline waters to fresh.

Aboriginal responses to changes in environmental conditions over the last one thousand years are evident in the archaeological, geomorphological and rock art records (Schrire 1982; Jones 1985; Taçon 1987). Archaeological and geomorphological investigations indicate that saline rivers and mangrove swamps were transformed into freshwater rivers, billabongs and floodplains from around 3,000 to 1,000 years ago, and that these changes greatly increased food resources, including fish, available to Aboriginal populations (Taçon 1987:39-40; Taçon and Chippindale 1994:218). Jones (1985:293) argued that with the transformation of the wetland landscape and the appearance of freshwater swamps that ‘the population density increased dramatically and the Aboriginal economy was reorganised to take advantage of the new food resources’. Increased rates of stone tool discard in excavated deposits support this hypothesis (Jones 1985:291). This is accompanied by a ‘shift in religious orientation and the general belief system of Western Arnhem Land people, with the Rainbow Serpent receiving greater importance’ (Taçon 1989b:330). This shift ultimately resulted in ‘increased social disclosure’, and the

⁷ There has been much debate about the terms used to describe the rock art of Arnhem Land. Here, I apply terminology defined by Taçon (1989a).

mosaic of bounded clan territories that were evident by the time of European contact emerged (Taçon 1989b:330).

Overall, alterations noted in the archaeological record such as the introduction of a new art style are viewed as ‘adaptive strategies aimed at ameliorating changing ecological conditions’ (Ross 2013:165).

South East Cape York

In contrast, in the South East Cape York, late-Holocene changes in the rock art assemblage have been attributed to social and demographic changes (David and Chant 1995; David and Lourandos 1998, 1999). No evidence was found ‘to support a claim that environmental amelioration or increased biomass played a major role in the emergence of regionalisation in the late-Holocene in South East Cape York (cf. Morwood and Hobbs 1995; Morwood 1995)’ (Ross 2013:165-6).

South East Cape York is located in tropical north Queensland, on the eastern side of the Australian continent. During the late-Holocene, a distinctive new art style, known as Quinkan art, was produced. This art style differs greatly from the earlier, wide spread, more or less homogeneous engraved non-figurative and track assemblage dating from at least the terminal Pleistocene (Cole *et al.* 1995). This major change that takes place in the art assemblage correlates with systemic changes in the cultural practices that took place during the mid to late Holocene within the region (David and Lourandos 1999:107).

The mid to late Holocene was a period of unprecedented change in the South East Cape York, involving ‘the appearance of new artefact forms, new manufacturing technologies, increased paintings activities, and changes in resource management strategies, food processing procedures and settlement-subsistence systems’ (David and Chant 1995:513). Such changes involved increases in the numbers of sites occupied and in deposition rates within sites, as well as an increase in the range of site types. As Ross (2013:166) outlined:

David and Chant (1995) argued that population growth, identified by the increase in site numbers, the increase in different site types, and the boost in rates of sedimentation and artefact discard resulted in an introduction or intensification in the demarcation of territorial boundaries. This in turn, necessitated more structured networks to facilitate interaction between neighbouring groups via the establishment of recognised formal procedures. The emergence of a distinctive regional rock art style in South East Cape York is seen to be an expression of this process.

Although the particular forms that these changes took must have been undertaken in the context of natural environmental conditions, David and Chant (1995:516) argued that ‘social conditions during the mid-Holocene were already leading to major demographic alterations, and that this was a social dynamic not directly attributable to environmental amelioration’ (David and Chant 1995:516). David and Lourandos (1998:194) echoed this opinion; they considered that it is the ‘sociocultural context that primarily influences and shapes decisions taken’.

Additional regions

While I will not discuss them in detail, other regions across Australia also have regional art traditions that show marked changes in the mid-to-late-Holocene. These include: northwest Central Queensland, where change in the rock art assemblage has been credited to facilitating predictable interaction and economic exchange (see Davidson *et al.* 2005; Ross *et al.* 2008; Ross 2013); and Central Australia, where change in the rock art assemblage has been ascribed to human-environmental interaction (see Gunn 1995, 2000; Ross 2005; Ross and Abbott 2004; Ross and Davidson 2006; Smith 1993, 1996, 2006; Smith and Ross 2008a, 2008b). What becomes evident through these regional studies is that changes in rock art assemblages frequently occur:

when the relationship between people and place was under pressure, whether the pressure came from... rising sea levels, population increase or the introduction of more intense interaction in the form of trade networks, or a combination of these factors (Ross 2013:169).

This highlights the need to understand the multiple contexts of rock art production, which is central to this doctoral research.

3.3. Establishing the temporal context of the art assemblage

A major problem with use of stylistic rock art sequence of the Kimberley as a source of information about the past, is dating. There are still very few absolute dates available to anchor the rock art sequence and to situate the changes against the excavated and environmental evidence of the past (Morwood *et al.* 1994; Watchman *et al.* 1997; Roberts *et al.* 1997; also see recent review by Aubert [2012]). For archaeologists, time is a conceptual tool that ‘provides a framework or context within which the traces of the past may be situated and ordered’ (Shanks and Tilley 1987:119). Without absolute dates, the timing of the introduction of social and economic practices evident in the art and the associated archaeology cannot be confidently correlated or set into a temporal framework. We can only speculate that will need to be re-assessed as new data becomes available. I will now discuss the dating of the Kimberley rock art sequence outlined in Chapter 1 in depth.

3.3.1. Previous dating of the Kimberley rock art sequence

With one exception, of the dates that are available all are of Holocene age (Morwood and Hobbs 2000). Claims for a Pleistocene age for the Kimberley rock art sequence come from two Optically Stimulated Luminescence (OSL) dates. Roberts *et al.* (1997) undertook OSL dating of quartz grains from a mud-dauber wasp nest overlying a Gwion Period anthropomorphic figure (that overlies a hand stencil and underlies and Painted Hand Period zoomorph), which produced a minimum age of 16,400±1,800 years (KER4) (Figure 3.13), and OSL dating from quartz grains extracted from the core of the nest (not directly associated with the motif), which produced a minimum age of 17,500±1,800 (KER5). The anthropomorphic figure is described as a mulberry coloured human figure with:

an elongated torso, hanging arms, and a narrow head from whose apex radiates a semi-circular tufted head-dress; the

painting looks archaic, and may be related to the Bradshaw style (Roberts et al. 1997:697).

Additional photographs of the anthropomorphic figure and the dated sample are provided in Jacobs and Roberts (2007:218, Figure 5) and Aubert (2012:576, Figure 1).



Figure 3.13 OSL dating of quartz grains from a mud-dauber wasp nest (circled) overlying the Gwion Period anthropomorphic figure produced a minimum age of $16,400 \pm 1,800$ years (KERCO8-1-4051), scale is 10 cm

This minimum age estimate is of considerable importance to our understanding of rock art production in the Kimberley as it implies Pleistocene antiquity. However, Aubert (2012), in a recent review of the rock art dating in the Kimberley, disputed the validity of this date (see also, Bednarik 2014). Aubert (2012:576) claimed that ‘[w]hether or not the Kimberley has Pleistocene aged rock art remains debatable and requires additional dated motifs’. His concerns were based on the premise that the relationship between KERCO4 and the painting appears unclear, due to the nest being located at the margin of the paint; that ‘mud-dauber wasps prefer to build nests near existing nests and on the stumps of abandoned nests, rather than on a bare rock

surface (Naumann 1983; Waterhouse 1991)'; and that the method applied is 'best suited to large nests where grains can be extracted from the nest core' (Aubert 2012:575).

However, Roberts stands by the minimum age estimate as outlined by David *et al.* (2013b:7):

In recent correspondence, subsequent to the publication of Aubert (2012), Roberts has provided the following comments and clarifications, which are reproduced here verbatim:

...I stand by the OSL ages for KERC5 and KERC4 as accurate estimates of the time of construction of those nests. As part of KERC4 appears to overlie the painting, then the OSL age of that nest provides a minimum age for the painting. I consider the most reliable estimate of minimum age to be $16,400 \pm 1800$ years, as this was obtained using an early form of the regenerative-dose procedure that has since been shown to be more accurate than its additive-dose counterpart (see Jacobs and Roberts, 2007).

If these OSL dates for KERC4 and KERC5 are accurate, they indicate that the anthropomorphic figure and hand stencil were painted around or before that time (David *et al.* 2013b:7). In contrast to this evidence, dating of mineral skins over or under Gwion Period motifs includes some inconsistent Holocene ages leading geochronologist Alan Watchman to conclude that the Gwion Period was likely to be mid-Holocene in age.

Watchman *et al.* (1997:18) obtained AMS ^{14}C radiocarbon age estimates from mineral encrustations (calcium oxalate crusts) and silica skins associated with paintings on the lower Drysdale River of the Irregular Infill Animal Period and Gwion Period, the two earliest painting styles identified in the relative sequence. As the pigments used for the paintings did not contain any organic binders they could not be directly radiocarbon dated. Samples for dating were instead obtained from 'carbon-bearing substance lying as close to the paint layers as possible to obtain age estimates for the paintings' (Watchman *et al.* 1997:24).

Results produced two minimum age estimates of $1,490\pm 50$ (538-623 AD calibrated) and $1,490\pm 290$ (240-852 AD calibrated) for the encrustations overlying a Mambi Gwion anthropomorphic figure. Conversely, a maximum age estimate of $1,430\pm 180$ (432-779 AD calibrated) was also produced for a Mambi Gwion anthropomorphic figure. Additionally, an older minimum age estimate of $3,880\pm 110$ BP (2,559-2,149 B.C. calibrated) was produced for the encrustations overlying a 'Cane'⁸ Gwion anthropomorphic figure. Furthermore, the Irregular Infill Animal Period zoomorphic figure provided a minimum age estimate of $3,140\pm 350$ (1,875-930 B.C. calibrated) (Watchman *et al.* 1997:25; Watchman 2000a:41).

Preliminary results of this study indicate that the Gwion Period is at least 4,000 years old (with the exception of the one maximum age estimate of $1,430\pm 180$), and by implication, the Irregular Infill Animal Period, generally considered to predate the Gwion Period, must be older (Watchman *et al.* 1997:25). It is important to note here that these minimum age estimates date the mineral encrustations overlying the paintings and may underestimate the actual age of the underlying paintings (Watchman *et al.* 1997:25). Specifically, if there has been a time lag between the painting episode and the formation of the mineral encrustation, the relationship between the dates obtained and the production of the painting may not be closely related. This is expressed in these results by the more recent minimum age estimate of the Irregular Infill Animal Period in comparison to the older Gwion Period age. Therefore, although these results indicate minimum Holocene ages for the Irregular Infill Animal Period and Gwion Period, they cannot directly negate the option that the art may be of Pleistocene antiquity, or at the very least terminal Pleistocene/early Holocene.

While the Painted Hand Period has not been directly dated, Morwood (2012:34) considers that an age range of 10,500 to 4,500 BP is a reasonable first estimate. This age range has been put forward as some 'late' Painted Hand Period motifs include depictions of spears with stone points that were introduced to the Kimberley in the

⁸ A definition of a 'Cane' Gwion anthropomorphic figure was not provided by the author.

mid-Holocene after 5,000 BP (Walsh 2000:305). See Dortch (1977), Moore (2013b), O'Connor (1996), Veitch (1996), and Walsh and Morwood (1999) for a discussion on the appearance of stone point technology. Walsh has not published an image of a Painted Hand Period anthropomorphic figure associated with a stone-tipped spear; this spear type has only been published alone (e.g. Walsh 2000:305, Figure 495 'B'), or associated with Wanjina Period zoomorphs (Figure 3.14).

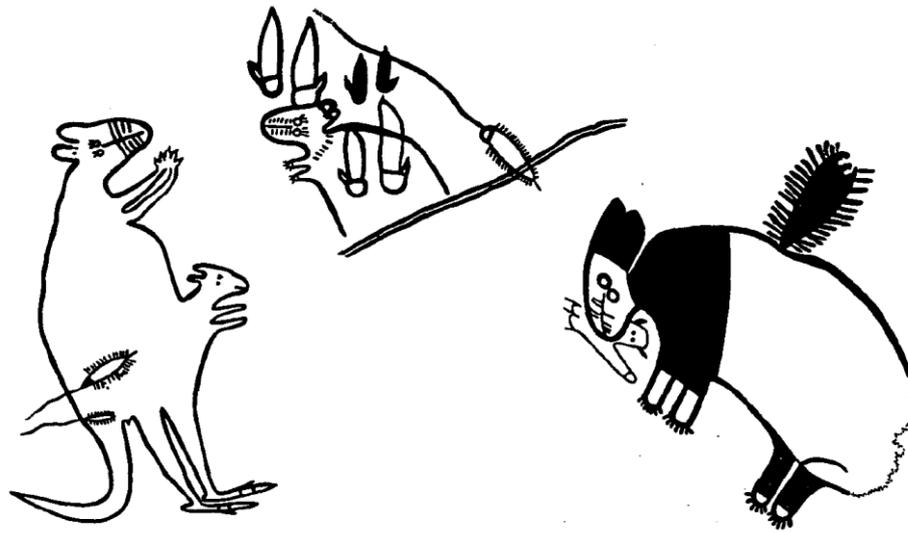


Figure 3.14 Wanjina Period zoomorphs associated with spears with stone points (from Walsh and Morwood 1999:54, Figure 13)

It has also been argued that the absence of these stone points in Gwion Period motifs indicates that Gwion Period is older than the introduction of this technology in the region (Crawford 1968). This is a tenuous argument, but still may be a fair indication of the antiquity of the Gwion Period (Crawford 1977:358).

The most recent stylistic period within the Kimberley, the Wanjina Period, is the most securely dated. An AMS radiocarbon age of $3,780 \pm 60$ years BP (2,457-2,033 BCE calibrated⁹) for a simple Wanjina head made from beeswax pellets provides a minimum age for the start of the Wanjina Period (Morwood *et al.* 2010:5, Table 1). Morwood *et al.* (2010:6) concluded that:

⁹ Radiocarbon age was calibrated with IntCal 04 provided by the Oxford Radiocarbon Accelerator Unit (Morwood *et al.* 2010:7).

Classic Wandjina-style paintings appeared more recently, however, with ages for the black pigments in such paintings ranging from 1210±140 BP to modern. In fact, heavily repainted examples only date to the last 375±35 years — the age of the lowermost of thirty-eight layers of paint in a Wandjina-style snake depiction.

In association, Roberts *et al.* (1997) dated organics embedded within mud-dauber wasp nests overlying a Wanjina Period motif, and obtained a minimum age estimate of 990±60 BP for the oldest sample (David *et al.* 2013b:6). Production of Wanjina Period paintings is known to have continued until recent times (e.g. Blundell 1975).

The older age estimates (3,780±60 years BP) obtained for this recent period imply that the earlier periods, e.g. the Gwion, Wararrajai Gwion and Painted Hand Periods, must be of greater antiquity or overlap in time. However, more research is required to determine a more precise age range for the earlier stylistic periods, and importantly their duration. As dating techniques are refined and the results replicated using multiple techniques (where viable to collect) on high quality and well understood samples, higher resolution understandings of the temporal framework of stylistic changes will emerge.

3.4. Significance of previous research to the thesis

The current literature pertaining to the Kimberley rock art sequence suggests that there have been major changes in stylistic conventions, subject matter (e.g. fauna, material culture, and weaponry), and context of production and function through time. Two sequences, placing the rock art assemblage in a relative temporal framework have been developed, dividing the art assemblage into comparable stylistic periods, in a similar relative temporal order (see Walsh 1994, 2000; Welch 1993a, 1993b). While the unifying principles of these sequences and the nomenclature systems differ (see Table 1.1), they each recognise five main stylistic periods: the Irregular Infill Animal, Gwion, Wararrajai Gwion, Painted Hand, and Wanjina Periods.

The main disagreement between Walsh and Welch lies in the relative chronological placement of the Painted Hand Period. Walsh (1994, 2000) considered that the Painted Hand Period ‘arrived’ in the wake of a lengthy duration of discontinuity following the Wararrajai Gwion Period. His argument has implications for the cultural context of the art, as any disruption in the rock art record would be associated with a disruption in the cultural sequence. Conversely, Welch (1993c:104) suggested that the Painted Hand Period may be linked to Wararrajai Gwion Period, implying cultural continuity. This is an important dichotomy within the literature that is addressed within this thesis. Specifically, I identify the ways in which the anthropomorphic figures of the northwest Kimberley changed through time and question whether there is evidence in the art assemblage to support notions of an abrupt discontinuity of art between the Wararrajai Gwion and Painted Hand Periods.

What is lacking from previous studies of the Kimberley rock art assemblage is an understanding of the contextual basis of stylistic changes. To understand the significance of changes in rock art over time, they need to be informed by the context of multiple lines of archaeological and environmental records. Morwood (2002:175) in particular, was of the opinion that more contextual information on the changes in past environments, resource use and Aboriginal population size is needed to better understand changes in material culture, technology and ideology. The contextual approach applied within this thesis aims to re-evaluate the diffusionist arguments for changes in the Kimberley rock art sequence and seeks to investigate the possibility of an evolutionary relationship. The temporal framework established within this chapter, supplemented by results of the *Change and Continuity* dating program, will help to situate stylistic changes against the excavated and environmental evidence of the past, in order to contribute to our understanding of past shifts in cultural, technological, social and economic activities throughout the northwest Kimberley.