

## Chapter 6

### *Change Through Time*

#### 6.1 Introduction

One of the greatest difficulties in analysing any assemblage of prehistoric rock art is to identify the changes in art styles through time, and to place them in a relative sequence so that contemporaneous aspects of the art assemblage and other archaeological evidence can be compared in a meaningful manner. In this chapter, I will analyse and assess multiple lines of chronological evidence (Chippindale & Taçon 1998; Morwood 1980; Wylie 1989) pertaining to rock art in central Australia including: broad-scale geological changes; association with excavated material; the subject range depicted; the relative patination of engraved motifs, superimposition of motifs and techniques; and the relationship between motifs or groups of motifs and their context and modes of production. This analysis will allow me to propose stylistic groupings and place them into a relative chronological sequence.

Shanks and Tilley (1987:119) stated that 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'. Aboriginal people in central Australia today are much more likely to frame their understanding of the past, and order their world, using concepts such as kinship, totemism and the *Alcheringa* rather than use linear and directional time concepts (Stanner 1987:225; see also Bradley 1998:87). Ethnographic accounts document Aboriginal informants assigning the origin and antiquity of engraved rock art to the *Alcheringa* or remote past. In the few instances where the artist and the time of production of rock art motifs is known, it is the relationship of the informant to the artist, and the totemic affiliation between the artist and the location which are of significance, rather than the specific time of painting or stencilling (see Gunn 1995d:13). It is therefore not surprising that establishing a chronological framework or absolute dates for rock art has not been an Aboriginal priority in central Australia.

Further, the maintenance of traditional beliefs as an integral part of contemporary Aboriginal life in central Australia has constrained archaeological exploration of

direct dating because all of the more reliable dating techniques involve the removal of small samples of material from the motif or the surrounding area for laboratory analysis (Dorn 2001; Rowe 2001; Ward & Tuniz 2000). This practice could be problematic for Aboriginal Custodians where sites are recognised as sacred. These problems may be overcome when the size of the required sample is reduced and the prospects and benefits of dating projects becomes evident to both Aboriginal and government site managers (see Chapter 9). Microerosional analysis, an *in situ* method of dating based on examination of the profile of individual engraved motifs, has not received widespread acceptance amongst rock art researchers and has proven unsuitable for analysis on sandstone (Bednarik 1992; 1995a; 1995b).

The absence of a direct dating component in this research should not be viewed as a flaw. Rosenfeld (2000:56) has argued that 'what is of primary relevance about dating in archaeology is not the age as such, but the temporal positioning of the thing dated in relation to other material. Determining age-estimates in years is one of several ways of expressing this temporal relationship'. She goes on to argue that 'degrees of contemporaneity expressed in terms of stylistic coherence or variance are generally archaeologically more informative than mere expressions of age in years' (Rosenfeld 2000:56). Potential problems in formulating relative rock art sequences based on stylistic similarities have become evident since the more widespread use of radiocarbon dating techniques (Bednarik 1995b; Clottes 1997,1998; Dorn 2001 and see discussion below). Even where direct dating of a representative number of motifs is undertaken, dates only pertain to those particular motifs unless the sample dated can be related to the broader body of rock art by stylistic measures. That is, even with the considerable advances in dating techniques, the formulation of rock art chronologies still depends on stylistic analyses (Keyser 2001:129; Rosenfeld 2000:57) and will continue to do so until every motif can be dated. This research is based on the description of more than 20,000 motifs.

## **6.2 Previous chronologies in central Australia**

A number of previous researchers have outlined chronological differences in the central Australian rock art assemblage (e.g. Gunn 2002a; Kimber 1991; Layton 1992; Rosenfeld 2002; Rosenfeld & Smith 2002). Layton (1992:221) drew conclusions

about the relative sequence of central Australian rock art from his Australia wide survey that looked at the *uniformity* of motif size, shape and range. Cluster and spatial analyses were undertaken on presence/absence data from three localities in the study area although only one data set (Forbes 1982) provided a comprehensive recording of the rock art. Layton (1992:236) concluded that the earlier rock art in the Central Desert consisted of predominantly engraved geometric motifs produced in similar consistent proportions at sites associated with water sources likely to be utilised during droughts (see also Edwards 1966). He contrasted the distribution and motif range of the engravings with the 'modern' painted assemblage documented in ethnographic accounts (Chapter 3) and argued that this more recent assemblage, while utilising the same general motif vocabulary, is more likely to appear in rockshelters where one particular motif predominates at each location. Layton's conclusions however, appear to be drawn from an interpretation of the ethnographic literature rather than from specific analyses of recorded sites.

Gunn (2000a) has produced a summary of his extensive site documentation in central Australia that supports and expands upon Layton's conclusions about chronological changes in the central Australian assemblage. Following Spencer and Gillen (1899), Gunn divided the more recent painted rock art into two contrasting assemblages based on *function*; the first assemblage is characterised by large, visually dominant, bichrome motifs, which are associated with sacred sites and relate to the ethnographically recorded Dreaming Ancestors. The second assemblage consists of secular paintings or 'casual art', which must be pointed out at individual sites by Aboriginal Custodians as they are not readily identifiable by any particular formal qualities.

Like Gunn, Rosenfeld (1997:296) also recognised two differing but coeval assemblages amongst the most recent pigment motifs but suggested that the art reflects two very different aspects of *territorial affiliation*. The first, a localised assemblage comprising elaborate motif structures, appears to be expressive of the formal relationship between people and the locale, while the second assemblage, consisting mainly of track lines and hand stencils, found in association with camping sites, relates to people's rights to habitual foraging ranges.

At a more fine-grained level, Gunn (2002a) has proposed a five-phase relative chronology of central Australian rock art focussed on seven *techniques* (Table 6.1). Although he does not attempt to equate the phases in the chronology with calendar years, Gunn flags the possibility that engraved rock art in central Australia may have had its origin around 30,000 BP when people first colonised the region (Smith 1996; Thorley 1998a) although the rationale for the selection of rock art as a form of visual expression over other art forms such as body painting or artefact decoration amongst the colonising population is not addressed (Rosenfeld personal communication). Although Gunn is yet to publish a summary of data from his individual reports to support his chronology, what is significant is that he contended that the number of techniques utilised has increased through time until the most recent phase when all techniques were being used to produce rock art. In making this claim, he acknowledged the possibility that taphonomic processes could well have obliterated earlier pigment art.

Table 6.1 Gunn's (2002a) proposed central Australian rock art chronology

Chronological phase	Draw	Print	Paint	Stencil	Peck	Abrade	Pound
Phase 1 recent	X	X	X	o	o	o	X
Phase 2	X	X	o	o	X	X	
Phase 3		o	X	X	X		
Phase 4		?	?	X	X		
Phase 5 earliest			?	?	X		

X=major component, o=minor component.

Rosenfeld and Smith (2002) have proposed a range of chronological parameters for changes in the rock art in central Australia. A number of radiocarbon dates were obtained from excavations at Puritjarra in the west of the study area, targeted at addressing chronological issues pertaining to the art assemblage (Smith *et al.* 1998). A date of 13,570 ± 100 BP was obtained immediately under a slab of roof-fall providing the oldest possible date for the motifs engraved on the upper, freshly exposed rock surface (Smith 1996:67). As the plain pecked circles on the slab are covered in a patinated skin, more likely to form in moist climatic conditions, Rosenfeld and Smith (2002:117) contend that the motifs were probably produced before 7500 BP in the early Holocene when conditions were thought to match these requirements.

A marked increase in the amount of ochre in deposits *adjacent to the rear wall* of the shelter was evident from levels dating to 13,000 BP. While the authors argued that painting at the site is therefore likely to have had its origin around this time, they conceded that the pigment motifs evident today are likely to have been produced in the last millennium, as most earlier motifs would have gradually eroded away. Rosenfeld and Smith (2002) have identified discrete painting episodes at Puritjarra but demonstrate that the relationship of these episodes to the production of similar motifs at other sites recorded in the region is problematic as overlapping sequences are neither common nor uniform. This warns against attempting to establish a regional sequence at such a fine-grained level where superimposition is inconsistent or minimal in many assemblages.

Patination and superimposition were used to refine the relationships between other aspects of the assemblage at Puritjarra. A series of abraded grooves on the roof fall are unpatinated so must post-date the engravings which they overlie. Rosenfeld and Smith (2002:121) reviewed the evidence from other parts of the region and *speculated* that the production of abraded grooves may represent a discrete phase of activity associated with a cult that spread across central Australia in the mid Holocene. An analysis of superimposed motifs showed that handstencils continued to be produced throughout the last thousand years. Drawings, in contrast, constitute the most recent additions to the site and are attributed to the post-contact period. Analysis of the rock art at this site, did not provide the means for the authors to designate the site to a particular territorial affiliation (see above), but rather, the authors argued that recent shifts in the rock art at the site may 'reflect changes in either the totemic referent of the site or the identity of the people occupying it' (2002:121).

Although there are a number of reports (e.g. Gunn 1995a, 1995b, 1995c; Kimber 1991; Rosenfeld & Mumford 1993; Rosenfeld & Smith 2002) that identify chronological change at specific central Australian rock art complexes and additional reports that look at relative sequences within a localised geographic area (e.g. Frederick 1997, Rosenfeld 1990, Smith & Rosenfeld 1992), none of the authors has attempted to extrapolate from these, to propose a comprehensive and substantiated regional relative chronology.

### 6.3 Previous methods of establishing regional chronologies in Australia

The formulation of regional rock art chronological sequences in Australia have not been without problems, some of which are inherent in all rock art analyses and some which are specific to individual regional assemblages. In the following section, I have outlined those that pertain to issues relevant to the central Australian assemblage and the methods adopted in this thesis.

Analysis of the superimposition of artistic variables has been widely used as a means to formulate relative rock art chronologies (e.g. Breuil 1952; Leroi-Gourhan 1968; and within Australia, Brandl 1973; Chaloupka 1984; Walsh 2000). It is now widely accepted that the use of superimposition has limitations where the sample size is small or where assemblages do not demonstrate marked trends. It must also be remembered that even when trends are clearly identified, it may be that the positioning of motifs is a product of factors other than chronology. For example, the association between two overlapping motifs may be intentional with both motifs produced at the same time.

One of the early attempts to detail a regional rock art sequence in Australia was undertaken by Leslie Maynard (1976:166-173) using the rock art at Laura in southern Cape York as her case study. Rather than analysing the relationship of all superimposed motif classes, Maynard grouped the Laura art assemblage into four form/colour categories in an attempt to limit the range of possibilities in the superimposition analysis. Her analysis showed that the four 'stylistic' categories did not fall consistently over or under one another so she extended her analysis by testing a small sample of paired sequences without obtaining clear results. Maynard concluded that there is no real change over time and that the rock art assemblage could more usefully be considered as one unit in the art history of Australia. While Maynard's conclusions may well be correct, the use of just four stylistic categories may have obscured the finer grained patterning in the assemblage (*cf.* Cole 1998 below).

Morwood (1980) adopted a two-stage approach to developing a relative chronology for the rock art in the central Queensland Highlands. Rather than selecting groups for

superimposition subjectively, Morwood undertook a preliminary step where he tested the spatial distribution of the assemblage. His premise was that the spatial distribution of artistic variables should reflect their chronological distribution, that is, contemporaneous motifs, colours or techniques will be clustered within and between sites representing a slice in time. Principal Components Analysis (PCA) demonstrated that both colour and technique clustered into two major groups, as did a combined colour/technique PCA analysis. Morwood tested the two groups identified in the spatial analysis against comprehensive superimposition data taken from *a single site* and found that the results confirmed and quantified his subjective assessment of colour usage, formed during field recording when he suspected that white motifs were the most recently produced and engraving the earliest. In using two complementary analytical methods, he was able to obtain a range of results and explanations, which enabled him to propose a broad, three-phase relative chronology combining technique and colour.

Morwood (1980:106) cautioned that superimposition analysis is suitable for isolating well marked trends in the art given 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. Furthermore, if superimposed styles, colours or techniques do not occur in the same overlying sequence on all occasions, the development of a sequential relative chronology cannot be securely established. Finally, if all chronological phases or styles are not incorporated into superimposed panels, then it is impossible to determine if styles coexisted rather than replaced each other through time (Layton 1977:40-1; 1992:219). The latter problem is particularly relevant to assemblages like those in central Australia, where relatively few superimpositions are recorded.

McDonald (1994), in recognising these limitations to superimposition analyses, developed a three-stage method of determining a relative sequence for the rock art of the Sydney Basin and proposed chronological parameters for the results formulated from comparisons with dated excavated materials from the art sites. A fine-scale analysis based on the presence or absence of the superimposition of colour/technique categories found that the art was relatively diverse, but by considerably *reducing* the

number of colour/technique categories, McDonald was able to identify three broad trends or phases. Motifs involved in superimposition were then tested against the three phases using chi-squared statistical analyses and were found to group in a non-random way. The identification of the groupings or phases was supported, in part, by the results of Correspondence Analysis. McDonald's example warns against attempting superimposition analysis on a fine-grained level unless the sample size is extremely large.

Cole (1998:131-4) also adopted a multi-strand approach in developing a relative sequence in a later study of Cape York rock art, and was able to support her proposed phases with a range of 'direct' radiocarbon dates. Like McDonald, she too was forced to group finer-grained data into broad groups for superimposition analysis. Cole ascribed a superimposition level to each layer of the art assemblage (up to 5) according to the relevant position in the overlay, across a group of sample sites. Cole then recognised that attributing motifs to particular layers and then analysing them against each other was problematic as there is no way of assessing if the corresponding layers at different sites (or even between panels at the same site) represent the same time periods without direct dating of each layer. In an attempt to overcome this difficulty, Cole limited her analysis to the top and bottom layers of superimposition irrespective of the number of layers, which allowed her to identify a two phase relative sequence in technique, colour and motif classes with some degree of confidence.

An alternative method of addressing superimposition, a Harris matrix, initially developed for studying complex sediment stratigraphy in European urban archaeological sites, has been used successfully in the study of complex superimposition in rock art assemblages in Arnhem Land (Chippindale & Taçon 1993) where there are marked stylistic changes. The relatively few examples of multiple superimpositioning of motifs in the central Australian assemblage renders this analytical approach unfeasible.

#### **6.4 Rationale and outline of methodology used to establish a relative chronology of rock art in central Australia**

Given that the superimposition sample in central Australia is relatively small (2382 motifs in database of 21,084 motifs) and spatially spread, and that many (23) motif classes were not recorded in superimposed positions at all, I have limited the use of superimposition analysis and sought additional methods to identify temporal change. (Superimposition analysis of motif classes and colours did not provide consistent patterns of overlay). Analysis will be undertaken to test the overlay of *techniques* as observations in the field suggest that superimpositioning of some techniques appears to be relatively consistent. As there are only three recorded instances (all at Kuyunba) where engraved techniques are overlaid with pigment art, an innovative method will be adopted to *establish the chronological relationship* between motifs produced in these different manners. The conventional approach, to separate analysis of engravings and pigment art, underpins many studies of rock art in the arid zone (e.g. Edwards 1966; Franklin 1992; Galt-Smith 1997; Maynard 1979). This has resulted in engraved assemblages that could potentially span 30,000 years, being studied as a single assemblage with little regard for chronological boundaries.

The analytical separation of central Australian rock art into engraved and pigment assemblages has been directed by the obvious technical differences and justified by three main strands of evidence: ethnographic, taphonomic and researchers' impressions of content of the assemblage and the context of production. Ethnographic accounts outlined in Chapter 3 lend weight to the separation. When questioned, Aboriginal Custodians have attributed the origin of engravings to the *Alcheringa* (Dreaming), that is, to time immemorial, rather than to any direct ancestors. This has been construed to suggest a considerable time depth for engravings (*cf.* Kimber 1991). In contrast, some rock paintings are known by Custodians to have been made by Aboriginal people and anthropologists have witnessed instances of the ongoing production of painted rock art (e.g. Gould 1969:147; Mountford 1948:87-88). Furthermore, the rapid build-up of motifs and the obliteration, erosion and fading of others (Mountford 1968:69, 1971:175-179) attests to the dynamic nature of paints made from natural pigments and argues against any great antiquity for motifs produced with this material.

Additional taphonomic processes appear to support the chronological separation of the two modes of production. The identification of patinated skins (Rosenfeld & Smith 2002), which may take millennia to form over motifs, have been used to substantiate claims that engraved motifs are likely to be old, whereas the actively eroding sandstone surfaces of the rockshelters where most pigment art is found suggests that paintings stencils and drawings now evident, are likely to have been produced relatively recently (see below). Nonetheless, while much pigment art might be relatively recent and some engravings as old as the Pleistocene, there is strong taphonomic and archaeological evidence throughout the study area to suggest that production of engravings has persisted into the recent past (Rosenfeld 2002; see Section 6.5 below for detailed discussion on taphonomic processes).

On initial visual appraisal, there are observable differences between the paintings and engravings both in motif range and the context in which they were produced (Chapter 5). Most of the pigment rock art is found in rockshelters or in alcoves formed in gaps and gorges and motif numbers range from a single motif to several hundred per site. In contrast, engraved rock art is more often found in open situations in gorges or on rocky outliers and the motif numbers can run to thousands. Yet there are also *many elements that overlap*. Rosenfeld (1991:141-2) in recognising the considerable overlap in motif range in the region flagged the potential of analysis across techniques stating that 'technology remains very secondary', to stylistic regularities, composition and context 'in the identification of an artistic tradition' (see also McDonald 1998:323; Maynard 1976:79). I have undertaken a *stylistic analysis* across a sample of motifs produced in both the pigment and the engraved assemblages in Section 6.9 in order to ascertain which techniques were contemporaneous.

But before such an analysis is undertaken additional broad-scale chronological information will be presented from a variety of other data. Analysis of the rate of rock surface exfoliation within rock shelters, the accessibility of the motif location and other geological factors provide chronological parameters for the production of rock art (Section 6.5).

On a finer scale, I have analysed the relative patination of motifs on both a regional and site complex level and results will be compared to ascertain if the regional patterns are consistent across the study area in Section 6.6. I have compared the relationship between the patinated classes to the application methods used to produce engravings and the relative superimposition of motif classes. In addition, I analysed the superimposition of techniques in order to establish the sequential relationship of techniques across the assemblage. I will carry out an analysis of the patinated classes at a single unique site at Art Complex A (ASID 292) where the assigning of patination classes could be undertaken with a far greater degree of confidence than elsewhere and results will be compared to those obtained for the region in Section 6.7. I will identify chronological markers from the subject matter depicted in the rock art assemblage (Section 6.8).

Finally, I will undertake stylistic analyses across technique in Section 6.9 and results will be discussed in relation to all previous findings in Sections 6.10, 6.11) before hypotheses on the temporal ordering of central Australian assemblage are formulated in Section 6.14.

## 6.5 Weathering

Broad-scale chronological information can be gained by investigating weathering processes. Mabbutt (1977:34-35) described the typical weathering process responsible for the formation of rockshelters in central Australia that occurs when the hardened outer crust of iron and manganese oxides is breached, exposing the leached under-layer. The weakened under-layer is then subject to granular disintegration and sheet flaking in the newly created protected and relatively humid environment. Continued weathering tends to be upwards and inwards on the surfaces on which rock art is most commonly produced with exfoliating grains contributing to floor deposits within the shelter. The relationship between the shelter deposit and the surface where rock art is produced provides a means of estimating a maximum date for the rock art on these surfaces. That is, *the art is unlikely to be older than the surface deposits within that shelter* provided that the build-up of deposit cannot be attributed directly to wind blown or water born accretions (Thorley 1998a:288) and the exfoliation is relatively even across the shelter surface.

However, the few radiocarbon dates from the surface layers of two rock art sites demonstrate that depositional rates have fluctuated throughout the region (and within sites) so that extrapolation from one site to predict a general depositional estimate would be problematic. For example, at Puritjarra where there is a range of painted and stencilled art along the shelter walls, layer 1a with a depth of 44 to 52 cm. has been dated at  $570\pm 50$  BP (Smith 1988:108) although the deposit is likely to have been built up with additional windblown sediment. At Kulpi Mara to the east of the George Gill Range where stencils and paintings are also found, the surface layer with a depth of 6-12 cm is dated to  $2500\pm 60$ BP (Thorley 1998a:231) although Thorley (1998a:286) states that surface artefacts are probably less than 500 years old. Although these results are too coarse grained to be definitive, they raise the possibility that the art on actively exfoliating shelter walls may be very recent (Thorley 1998a:309). This is likely to be the case in most of the rock art sites in the George Gill and Dulcie Ranges where the leached Mereenie sandstone in which many of the shelters have formed, show extensive signs of erosion. Thin flakes of shelter wall with portions of stencilled and drawn motifs were recorded lying on the deposit at several site complexes (Watarrka/Bagot Central and Watarrka/NE Plateau, Plate 6.1). Artists have shown a marked preference for the clean white surfaces in these shelters, probably because motifs contrast clearly against such a background, but in so doing, have unknowingly jeopardised the long term survival of this art. The rock surfaces of shelters formed in the Hermannsburg sandstone and quartzite are more stable and therefore pigment art on these surfaces may be amongst the older motifs produced using these techniques (e.g. Puritjarra, Emily Gap). However, the weathering patterns that occur in many central Australian rockshelters indicates that the production of much of the pigment art evident in rockshelters today was produced in the recent past, perhaps as recently as the last few hundred years (see also Rosenfeld 2002:63-64).

Access to rock art sites may also change through time. Motifs were recorded high on sheer cliff faces at Puritjarra and at N'Dhala Side Gorge in places that are impossible to reach today suggesting that they were produced when access to these rock faces was available along rocky ledges, which have since eroded or fallen away. Motifs in such inaccessible locations are therefore likely to be of considerable antiquity (see also Basedow 1914:198; Edwards 1968:653; Terry 1974:166). A single intaglio motif (possibly a lizard but recorded as indeterminate) was recorded at Puritjarra more

than 4 metres above the current ground level and at N'Dhala Gorge a quadruped, bird, anthropomorph and two oval motifs were documented even higher on a sheer cliff face (Figure 6.1). It may well be that the depiction of animals in a representational form was more common in the older engraved assemblage.

The positioning of rock art motifs in relation to fractured or slumped rock surfaces can also provide information on relative age. The fact that no motifs have been truncated when the large slab which makes up the main engraved faces at Ewaninga fractured into the four remaining separate pieces, suggests that the engravings post-date the fracturing of this slab (Plate 6.2). However, there is evidence that there was further movement of the rocks on this outlier after at least some of the engravings were made. An engraved face under the main slabs has motifs pecked into a crevice where space is so restricted that it would now be impossible to produce these engravings. Based on the similarity in the style of the motifs above and below the slabs, it is likely that both faces were engraved around the same time and that the second rock movement occurred at a later date. A panel of abraded grooves found in a narrow vertical cleft formed to the side of the main slabs was only partly visible with the majority discovered by extending an arm into the recess. This means that the grooves must have been abraded when the rock face was more exposed providing room for the artist's hand, perhaps prior to either one or both the rock movements. As yet, there is no means of estimating the timing of the rock movements. Engraved motifs in similarly restricted spaces have also been recorded at Rainbow Valley, Roma Main Gorge and N'Dhala Side Gorge.

Fracturing of the flat sandstone slabs above the waterhole at Wallace Rockhole has resulted in considerable rock movement with newly exposed surfaces evident across the site. A comparison between the motifs on patinated surfaces and those on freshly exposed surfaces gives an indication of the sequential use of motif classes. Circle, concentric circles >3, radiating circle, birdtrack silhouette and macro track/silhouette motifs are common on the older horizontal surfaces while meandering lines are found on each of the more recently exposed vertical steps. An area of unpatinated horizontal surface, which forms part of the largest engraved face, is pecked with meandering lines, circle/external line motifs and a range of birdtrack/linear and macro track/simple motifs (Plate 6.3). As the latter range of motifs is also found scattered

across the patinated area of this face, it may be that these motifs were later additions to the original circle and concentric circles suite (*cf.* Rosenfeld & Mumford 1993:24). Clearly, engravings have been produced at this location over a considerable period of time.

Keyser (2001:128; see also Edwards 1968:37) points out that the aggregation or erosion of soil deposits below rock art panels can provide clues to the age of the art. A small finely pecked, elongated/one lateral motif is now only 20mm above the sandy deposit at Puritjarra. It would be extremely difficult for an artist to produce this pecked motif without bending an elbow, and this would not have been possible with the deposit level at the current height indicating that the motif is likely to have been engraved when the deposit was considerably lower, perhaps thousands of years ago (see also Rosenfeld 2002:65). The dynamic nature of deposits at rock art sites situated in gorge locations where the velocity of water during floods scours and shifts large volumes of sand, is demonstrated in photographs of Emily Gap taken almost fifty years apart (Groom 1946:89; Spencer & Gillen 1899:171) which show the painted panels above the heads of the subjects in the photos and beyond the reach of any potential artist. Today, the sand has banked up against the gorge walls and the major panels are again at ground level and easily accessible although a range of other motifs remain out of reach. Alterations to the height of the deposit at gorge/gully/gap sites can occur in a matter of hours so that movement in the levels of deposit in these cases are unreliable chronological markers.

The analysis of the geological and geomorphological processes at rock art sites have provided a range of broad-scale parameters against which the taphonomic processes pertaining to the production and conservation of rock art can be better understood. Motifs painted, drawn, printed or stencilled on the walls of actively exfoliating rockshelters have probably been produced in the last few hundred years. In contrast, geological changes that have made the location of intaglio and animal motifs inaccessible today, indicate that these motifs are likely to have been produced many thousands of years ago. Patinated motifs truncated by rock surface fractures and the subsequent engraving of freshly exposed surfaces demonstrates that engraved rock art has been produced over a considerable period of time, perhaps thousands of years with some site-specific changes in motif assemblages.

## 6.6 Patination in the engraved assemblage

Problems and limitations associated with the identification and use of patination analysis in determining the relative ages of engraved motifs were outlined in Chapter 4. Results of the comparison between fresh and patinated motifs show that 1330 motifs in 86 motif classes are classified as fresh; 1714 motifs are classified as patinated in 82 classes. Both older and more recent assemblages contain a wide diversity of motif classes. A comparative analysis of the two groups shows that both assemblages contain a similar range of motifs (78 motif classes in common) with concentric oval, curved rake, bird and rake the only classes unique to the patinated assemblage and bisected circle/external line, boomerang, circle/joined lines, hand, rectilinear grid, series of vertical lines, snake and spoked concentric circle classes unique to the fresh assemblage. Before too much emphasis is placed on these results, it must be remembered that *only a small proportion* of the engraved assemblage was assigned to a fresh or patinated class (22%). However, comparison between those motifs assigned a patination class has shown that a *basic engraved motif vocabulary continued through time in central Australia*.

There are marked differences in the range of techniques used in the fresh and patinated assemblages with *all eight engraving techniques* represented amongst the more recent fresh engravings. A number of the motifs unique to the fresh assemblage are produced using pounded or scratched techniques. Clearly, the diversity in technique was concomitant with the introduction of a small number of motif classes new to the engraved assemblage but present in the pigment assemblage.

Issues of preservation could account for some of the differences between the two assemblages. Superficial techniques such as bruising, pounding and scratching all produce motifs which rely on the contrast in colour between the disturbed surface and the substrate rather than a clear three dimensional differentiation, and suitable climatic conditions which facilitate fungal growths and the development of silica skins can result in these shallow motifs becoming obscured within a very short period of time. Rosenfeld (1991) recorded a pair of snakes lightly pounded into the cliff face (Plate 6.4) adjacent to the largest painted site at Watarrka/Lilla. Less than a decade later, the

cliff face where these had been recorded was covered in a black fungal layer and only the merest trace of the snake motifs was evident during recording for this thesis. It may well be that motifs produced using shallow engraving techniques have been obliterated by the repatination of the rock surface.

These conclusions are drawn from all engraved assemblages across the region, but they do not take into account spatial differences in the selection of motif range over time. Therefore, the differences between fresh motifs and all other engraved motifs (patinated class, plus motifs not assigned to a patinated class) *at the major engraved complexes were analysed separately*. This provided a means to include *all* engraved motifs to determine if the inferences drawn above provide an accurate description of the changes in the rock art *at each* complex through time, and to isolate site-specific trends between the most recent rock art and the assemblage that had preceded its production.

At N'Dhala Gorge, 354 motifs or 13% of the engraved assemblage, was recorded as fresh and when relative proportions between fresh and non-fresh motif classes are calculated, circle and pit motifs (fresh 4, other 55, n=59) are proportionally more common in the older assemblage as are many of the other circle and oval classes. Other motifs with disproportionate representation in non-fresh classes include complex poles, complex motifs, ferns, meandering lines and most classes of macro tracks and trails (*cf.* Forbes 1982:76-78). Twenty four of the motif classes in the non-fresh assemblage are not represented in the fresh class, while only two motif classes were unique to the fresh assemblage (snake, circle/joined lines) demonstrating that a more restricted range of motifs was used in the later rock art and that a considerable number of motif classes dropped out of production in the recent past at this location.

A similar reduction in the number of motif classes utilised to produce the later assemblage was also documented at the Dulcie Range engraved site to the north of N'Dhala Gorge, where only ten motif classes made up the fresh assemblage. Circle and pit and all other circle motifs dropped out of use although both birdtrack and macro track motifs continued to be produced but in lower proportions (*cf.* Gunn 1997a:30). What is significant at this site is, that only 7% of the assemblage was classified as fresh so that the addition of new engravings at this site was undertaken

less often in recent times. This is also the case at Wallace Rockhole where only 8% of the engraved assemblage was classified as fresh and the number of motif classes was 34 fewer than in the non-fresh range (*cf.* Rosenfeld & Mumford 1993:24-31). Birdtrack class motifs continue to be produced but macro tracks and trails are less common in the later assemblage although the range of macro track classes utilised remains relatively constant. Circle, circle and pit and all concentric circle classes constitute a small proportion of the fresh assemblage (10%) but a much greater proportion of the earlier rock art (36%).

At Rainbow Valley, 11% of the engraved motifs were recorded as fresh. Circle classes, which are common in the older assemblage, are absent from the more recent rock art. Birdtrack and trail motifs make up a more substantial proportion of the earlier assemblage (21%) than they do in the newer or fresh assemblage (14%) and include a range of trails uncommon in the later rock art. Macro track classes form a higher proportion of the fresh motifs (59%) than they do in the older assemblage (38%) although there is a trend to produce the macro track motifs in a more simplified manner in the fresh motifs. In summary, there has been a trend from an assemblage dominated numerically by circle and birdtrack motifs to one where macropod tracks predominate (*cf.* Kimber 1991:87). Less than half the motif range (30 of 67 classes) continued to be produced in the most recent rock art at Rainbow Valley.

The strongest contrast between the motif class range in the earlier and more recent assemblages at Roma Main Gorge is the dominance of circle and pit and other circle and oval motif classes including spirals, as well as meandering lines, lines, complex poles, ferns and arcs in the older rock art and the absence or relatively scarcity of these motifs in the recently produced engravings. The fresh motifs at this complex constitute only 5% of the total assemblage so that the limited number of motif classes represented is predictable (36 of 82 classes). A single example of a topview quadruped is the only motif unique to the fresh class at this site.

Analysis of the motifs classified as fresh in the engraved assemblages at individual complexes has demonstrated that a relatively low number of motifs in a small range of motif classes were produced at most major engraved rock art sites. The introduction of new motif classes indicated in the comparison between patinated and fresh motifs

earlier in this section, is not supported by the analysis of fresh motifs against *all other engraved motifs* at individual major engraving sites. Rather, many of the newly introduced engraved motif classes have been produced in locations *outside* the major engraved sites in rockshelters or in smaller open engraved rock art sites.

*What is evident is that a core group of motifs continued to be produced through time.* More specifically, bird and macro track and trail class motifs continued to be engraved at all sites until the recent past but the proportions varied from site to site through time. Circle and pit, circle, and oval class motifs followed a more uniform pattern and were produced less often in the more recent assemblages at all sites.

A range of engraved motifs located within three rock art sites (Puritjarra, Watarrka/Wanga, Watarrka/NE Plateau) in the west and southwest of the study area are likely to be considerably older, and may be many thousands of years old (Rosenfeld & Smith 2002; Smith 1996; Section 6.2 for Puritjarra dates). Blocks of roof-fall have been engraved with circles or other circle class motifs at Puritjarra (100%), Watarrka/Wanga (89%) and Watarrka NE/Plateau (86%) and all motifs are patinated and covered with a glossy skin (Plate 6.5). Birdtrack or arc motifs make up the greatest proportion of the remaining engraved rock art at the two latter sites. The protection afforded by the rockshelters would have ensured that the rock art remained sheltered from the extremes of the desert climate over an extended period of time. It can be inferred from the similarity in context, motif range and patination as well as the relatively close geographic proximity of the sites to each other, that these three assemblages are likely to form part of a single rock art system. However, it is not possible to determine if these motifs predate other patinated engravings recorded elsewhere in central Australia as *there are no non-intrusive dating methods available that can differentiate between old and very old engravings.*

#### Patination and application method

Although there are some marked preferences shown in the choice of application method for the production of engravings through time, the use of a wide variety of methods has continued from the earliest to the most recent rock art assemblages (Table 6.2).

Table 6.2 Application method used to produce patinated and fresh motifs

Application method	Patinated	Fresh	Fresh % of assemblage	TOTAL
Deep even	341	36	10	377
Deep irregular	509	29	5	538
Even	175	135	44	310
Fine	129	58	31	187
Irregular shallow	203	451	69	654
Shallow	24	102	81	126
Shallow fine infill	150	337	69	487
Sparse	118	100	46	218
Thick	38	26	41	64
Not recorded	16	25	N/A	41
TOTAL	1703	1299	N/A	3002*

\*total number of motifs recorded when these two categories are compared.

Earlier patinated engravings are most often created using deep methods of application: deep even 90%; deep irregular 95% of the motifs for which a patinated class was allocated in these application method classes. Recent fresh engravings are more likely to be created using shallow methods: irregular shallow 69%; shallow 81%; shallow/fine/infill 69% of the motifs for which a patinated class was allocated in these application method classes.

#### Patination and superimposition

The problems encountered with the use of superimposition analysis in previous studies have been discussed above and the following comparative analyses are therefore aimed at establishing general regional trends rather than a fine-grained sequence.

The superimposition sample size in this research is small with only 867 cases of superimposed motifs being classified into the under or over classes despite more than 21,000 motifs being entered onto the database. The overlap class included 1515 additional superimposed motifs where the superimposition could not be clearly established. No patterning in the relationship between superimposed motifs was identified so that no intentional composition or association of particular motif classes could be established.

Little can be inferred from the relative position of the motif classes that were recorded in the same sequential order in all documented cases (Table 6.3) as the numbers of motifs involved in each sequence are extremely low. The exceptions are concentric ovals and bird motifs where the sample size is more substantial so that these motifs could be attributed to the older assemblage with some confidence.

Table 6.3 Motifs that are superimposed in the same order in all documented cases

Motif	Number of times motif is over	Motif	Number of times motif is under
Anthropomorph/headdress	6	Amorphous grid	5
Birdtrack/silhouette/spur	3	Concentric ovals	45
Birdtrail/transverse	2	Concentric U shape	1
Circle/joined lines	2	Curved rake	2
Cluster of dots	3	Inverted concen/Ushape	1
Continuous circle	2	Macro/paws/tail/trail	1
Hydra shape	6	Oval/crosshatch	3
Macro track/silhouette	1	Rectalineal/bar/fringe	2
Macro track/transverse	2	Bird	13
Macro track/heel/toe	2	Y shape	1
Other object	3		
Oval/fern	1		
Thick outline circle	2		
Macro/trail 16	5		

Tables 6.4 and 6.5 demonstrate that when patinated classes are compared with superimposed classes, the sample size is too small to be meaningful. This sampling problem is the same as that faced by McDonald where fine-grained analysis had to be abandoned in favour of larger grouped classes. Rather than adopt McDonald's solution, and perhaps encounter the converse problems faced by Maynard where no differences could be discerned when motifs were lumped together, I will look for stylistic and contextual patterning in other categories recorded for each motif to assess relative age in a later section of this chapter.

Table 6.4. Fresh motifs superimposed over other motifs

Fresh Motifs	Abraded	Pecked	Scratched	TOTAL
Birdtrack/linear/spur		1	1	2
Birdtrack/linear		1		1
Birdtrail/simple		1		1

Rock art, ritual and relationships

Circle		3		3
Concentric circle + pit		1		1
Concentric circle>3		1		1
Hand	1			1
Horizontal lines			1	1
Line		1		1
Lizard		2		2
Macro track/simple		11		11
Macro trail/simple		1		1
Macro/simple/random		2		2
Macro track/toe		1		1
Meandering line		3		3
Multitrident		2		2
Oval		1		1
Pecked area		1		1
Rectilinear grid			2	2
Snake		1		1
Spoked circle		1		1
Tracks/other		1		1
Trail of dots		2		2

Table 6.5 Patinated motifs under other motifs

<b>Patinated motifs under</b>	<b>Abraded</b>	<b>Intaglio</b>	<b>Pebraded</b>	<b>Pecked</b>	<b>TOTAL</b>
Amorphous shape			1		1
Bird	1	1	1		3
Birdtrack/linear/spur				1	1
Birdtrack/linear				4	4
Birdtrack/silhouette				4	4
Birdtrail/silhouette			1		1
Birdtrail/simple				3	3
Circle				11	11
Circle pit				9	9
Complex				1	1
Concentric ovals			1		1
Concentric circle + pit			1	3	4
Concentric circle<4				3	3
Concentric circle>3				6	6
Line				1	1
Linked circles				1	1
Macro track/simple				3	3
Macro trail/simple			1		1
Macro track/heel			1	6	7
Macro/simple/random			1	8	9
Macro/toe				1	1
Meandering line				1	1
Organic circle				3	3
Organic oval				4	4
Oval				5	5
Parallel lines		1			1
Spiral				1	1
Topview quadruped		1			1
Macro/trail 14			1		1
U shape				1	1

Superimposition and technique

A number of trends can be identified when the superimposition of techniques is analysed (Table 6.6).

Table 6.6 The relationship of superimposed techniques (where **over** reads **down** the table and *under across*)

Technique	Paint	Draw	Print	Sten	Peck	Pebra	Abra	Scrat	Incis	Intag	TOTAL
Painted	223	68	21	15	1			12			340 under
Drawn	14	7	3					7			31
Printed	12	5	6	1				1			25
Stencilled	53	49	22	48			1	15			188
Pecked	3				278		21		4		307
Pebraded				1	5	1	1				7
Abraded		1			16						17
Scratched		1									1
Incised		1		1							2
Intaglio					8						8
Pounded								1			1
TOTAL	305over	132	52	66	308	1	23	36	4	0	927

Drawing appears to be the most recent addition to the pigment art assemblage as this technique has been produced over painting (68), stencilling (49) and printing (5).

The superimposition evidence also demonstrates that painting and printing (but not stencilling) continued to be produced *after* the introduction of drawing so that these three techniques must have been used concurrently in the production of the most recent rock art, at some sites at least. In turn, a second trend to replace stencilling (1) with printing (22) is indicated.

The pattern of superimposition between engraved techniques is more complex and the incidence of superimposition in some techniques less common, although some clear trends can be discerned. Given that intaglio motifs were only recorded under other techniques (n=8), it is likely that this technique originated in the older engraved

assemblage. Conversely, scratched motifs are only recorded as over other techniques with one exception where a scratched motif was recorded under a drawn motif. As discussed previously, drawn motifs are likely to be associated with the most recent phase of art production so it is likely that the scratched technique might also form part of this recent assemblage. The relationship between pecked motifs and techniques used to produce pigment motifs is unclear as they have rarely been recorded superimposed but in the four instances where pecked motifs are superimposed with painted motifs, they have occurred both under (3) and over (1). While this sample is too small to draw reliable inferences, it appears likely, based on this evidence, that the production of pecking and painting were coeval, at least for a period of time. The coeval production of painting, other pigment art and engraving will be further investigated in Section 6.9.

When results of the superimposition analyses are considered with results of the patination analyses, the argument for a recent origin for scratching is strengthened as all scratched motifs are recorded as fresh. Further, the scratched motif range has also been produced in the drawn assemblage and both techniques are found in similar contexts associated with pigment art (Chapter 5).

#### Superimposition on grindstones and ground patches

Engraved and drawn motifs were also recorded on grindstones and ground patches both under and over the ground areas. Grinding patches have been abraded over sections of pecked motifs including circles, ovals, bird track/linear, lizard, bird and complex pole at Roma Main Gorge, Rainbow Valley and Art Complex/A. The haphazard placement of the grinding patches in relation to the engravings suggests that no intentional association between the abraded areas and the underlying motifs was intended but rather the converse, that those particular engravings may not have held significance for those doing the seed grinding. There is evidence that engravings continued to be made well after the production of seed grinding patches as multiple cases of motifs such as birdtrack/silhouette and macro track/simple were recorded pecked *into* grinding patches. It may be then, that the superimposition of a functional entity over engraved motifs, rather than signalling the obsolescence of aspects of the engraved assemblage, is another example of what is common practice at many art sites where multiple layers of motifs are produced over previous rock art.

Further evidence for the continued production of engraving after the widespread adoption of seed grinding about 1000 years ago was found when a small grindstone with a birdtrack/silhouette was recorded on the valley floor at Wallace Rockhole. A charcoal fern motif was recorded on the grinding face of a grindstone at Watarrka/NE Plateau.

### 6.7 A Case Study, ASID 292

One unusual site, ASID 292 at Art Complex A, provides a *unique opportunity* to analyse relative patination across a substantial engraved assemblage where there are fewer of the difficulties associated with analyses of this type. While the location and reproduction of motifs at this site is restricted, permission was given by Custodians to discuss the site in general terms. The four horizontal rock slabs on which the engravings at ASID 292 have been produced are protected from the most extreme weathering conditions by the overhanging cliff line that forms a low rockshelter over the slabs. Therefore, the site fulfils the criteria where comparisons between states of patination can be made with confidence as the engraved surfaces are made up of the same base rock, they are orientated the same way and have been subjected to the same microclimate. The distinction between patinated and unpatinated motifs remains very clear and all motifs could be assigned to one class or another with confidence as the patinated motifs retain a definite shiny glass-like skin that is absent from the more recent engravings. This art site provides an ideal location from which a description of the chronological composition of the engraved assemblage can be formulated, and against which other complexes where patination classes are less definitive, can be compared.

Analysis of the engraved motifs (n=1346) showed that there are almost twice as many unpatinated motifs (n=882) as patinated motifs (n=464), which could indicate that engraving activities at the site intensified in more recent times. Alternatively, as no chronological boundaries can be assigned to each phase at this stage, the increase in motif numbers could simply be a reflection of a longer time period represented by the unpatinated motifs. It is also evident that the richness of motif classes increased through time with 51 motif classes represented in the unpatinated assemblage and

only 43 amongst the patinated engravings. Eleven motif classes are unique to the unpatinated assemblage with only three recorded exclusively in the patinated engravings. Birdtrack/lin/spur, concentric circle + pit, concentric circles<4, spiral, cluster of dots, sinuous line, lizard, human track, plus tail, rectilinear grid and radiating circle are only found in the unpatinated assemblage while a single figurative abraded bird motif is unique to the patinated assemblage as are larger concentric circles >3 and circle/external lines.

There is additional evidence of change through time in the composition of the motif classes that occur in both the patinated and unpatinated assemblages. Although macro track classes increased in total numbers in the unpatinated engravings (patinated n=251, unpatinated n=390), the total percentage that these classes contributed to the unpatinated assemblage *decreased* (54% and 44% respectively). A large, visually dominant motif in the patinated motifs, macro/heel 14, dropped from 10% in the patinated assemblage to 5% in the newer engravings but nevertheless continued to be produced through time. Small circle and pits also followed this trend with n=20 in the patinated engraving but only n=5 in the unpatinated motifs. In the birdtrack and trail motif classes, the opposite trend is evident where these tracks constitute 16% of the patinated assemblage but *increase* to constitute 28% of the unpatinated more recent motifs. The exception to this trend is bird track/silhouette/spur, which is more common in the older engravings.

Significantly, there is also evidence for continuity of motif vocabulary through time with 40 motif classes recorded in both patinated and unpatinated assemblages.

Patinated motifs constitute a higher proportion of large (n=15, 3% patinated, n=8, 1% unpatinated) and medium (n=25, 5% patinated, n=32, 4% unpatinated) sized motifs but as not all motif classes were measured, and the difference in size between patinated states is not minimal, little can be inferred from these results. I would speculate that earlier artists, faced with a blank rock surface, may not have felt constrained to limit the size of the motifs they produced, whilst later artists working on a surface already covered with hundreds of motifs, may have felt more constrained. A trend from larger to smaller is not supported by the results of the

analysis of the category, trail lengths, where no significant difference in lengths between the older and more recent engravings was recorded.

A changing trend in the way in which the engravings were produced (application method category) can also be identified. The majority of the patinated motifs (n=322, 69%) are classified as deep/even, or deep/irregular and although these methods of application continue to be used to produce the unpatinated motifs, a much wider range of application methods is adopted with the majority (n=543, 62%) classified as shallow, irregular/shallow, shallow/solid/infill or sparse.

In summary, the production of engravings at ASID 292;

- became more intense over time
- artists used a wider range of motif classes in the later assemblage
- macro tracks and trails had been dominant motif classes in the earlier assemblage but decreased proportionally amongst the unpatinated engravings
- bird tracks and bird trails became more common in the later assemblage
- circle and pit motifs became less common in the later assemblage
- 40 motif classes continued to be used in both assemblages
- patinated motifs were more often larger
- patinated motifs were more likely to be deeply pecked than the more recent engravings while unpatinated motifs were produced using a wider range of shallow application methods.

Although the rock faces at ASID 292 are densely engraved, only 198 instances of superimposition were recorded (over n=67, under n=56, overlap n=75). No additional chronological differentiations could be added to the patterns already discerned for the site, using the presence or absence of patination although a number of the superimpositions where unpatinated motifs cover unpatinated motifs, or patinated motifs cover patinated motifs, demonstrate that the engravings may have been produced over considerably more time than a coarse grained two-stage patination analysis implies.

In order to identify any consistent patterns of association between motif classes, I excluded the overlapping class so that only two superimposed classes remained: patinated under (n=45) and unpatinated over (n=64). The numbers of motifs in each class involved in superimposition are low so that it would be unwise to draw too many inferences from individual examples. On a more general level, 86% (n=55) of the assemblage consists of tracks and trails in the over class, and only 60% in the under class. Circle and pit motifs on the other hand, are almost always under other motifs rather than over. These figures accord with the general percentages of these motif groups in the patinated data. Analysis of superimposition has provided very little additional information to the chronological sequence at ASID 292.

When the summary of the analysis of motifs at ASID 292 is compared to the results of individual engraved rock art sites throughout the region described above, a number of clear *consistencies* are evident:

- i) a core of motif classes continued to be produced through time, although there is some variation between the motif classes making up the assemblage composition between complexes.
- ii) circle and pit and circle type classes occur as a higher proportion of the earlier assemblage.
- iii) application methods in the earlier assemblages are more often deeply pecked while in the later assemblages irregular shallow and shallow/fine/infill predominate.
- iv) the proportional changes in the relative frequencies in the production of macro and bird tracks and trails is less consistent with some sites differing from the pattern identified at ASID 292. While these might reflect differing preferences for these motif classes in particular areas of the region, the limited allocation of patinated classes across the engraved assemblage may be biasing the results.

The most marked *inconsistency* between the patinated assemblage at the case study site and the other engraved complexes relates to the differences in the range of motif classes in the earlier and later assemblages:

- v) at ASID 292, the fresh assemblage is richer while in other engraved rock art complexes the converse is found.

As outlined previously in this chapter, these differences are likely to be the result, in part, of the differences in sample size between the classes evident in the individual site analyses, which resulted from the difficulty in assigning patination classes to much of the assemblage with any degree of confidence and the varying time spans represented by the somewhat dichotomous patinated classes within each assemblage that occurred as a consequence. It therefore seems more prudent to argue that the increase in motif classes identified at ASID 292 between the patinated and the fresh assemblages, is likely to represent a more realistic indication of the way in which motifs accumulated to form the engraved assemblage evident today, than the opposing conclusions drawn from analysis at the other complexes with smaller percentages of fresh motifs recorded.

## 6.8 Subject matter

The depiction of a range of subject matter has been employed to indicate the relative age of rock art assemblages throughout Australia. The identification of animal species has been particularly useful with extinct animals (Basedow 1914; Chaloupka 1993; Clegg 1978), introduced animals (Mountford & Edwards 1962; Ross 1997) or those associated with particular environmental changes (Taçon 1988) used as chronological markers. However, in central Australia, depictions of animal species outside the drawn assemblage (see below), except in the form of tracks, is limited and the identification of motifs to species level is problematic in many cases so that few definitive chronological markers can be identified. A single set of what appear to be engraved dingo or dog tracks were recorded in the main gorge at Rainbow Valley and a short vertical trail of painted dingo tracks was found at Kuyunba on an isolated rocky outlier. An unusual set of four dark red, stencilled dingo's paws (Plate 6.6) was recorded in a rockshelter at Wataraka/NE Plateau (see also Smith & Rosenfeld 1992:34) amongst an extensive range of other stencilled items. Accepting that there is pronounced variation in the visual depiction of animal tracks in all forms of central Australian Aboriginal art (Kimber personal communication), identification of all but the stencilled dingo tracks is tentative, but if my classification is correct, it would

support the argument based on taphonomic evidence, that at least some parts of the engraved, painted and stencilled assemblage post-date the arrival of dingoes. I would expect that dingo/dog tracks feature more prominently in the rock art assemblage as dogs were (and are) a feature of the myths associated with the Totemic Dreamings (e.g. Spencer & Gillen 1927:90-91, 335) and ethnographic accounts record that dogs were the constant companions of Aboriginal groups, cleaning up camp areas and warming people on freezing winter nights (Gould 1980).

Changes in the range of tools, weapons and clothing associated with anthropomorphic figures have also been used to develop relative chronologies in the Kimberley and Western Arnhem Land (Lewis 1988; Walsh & Morwood 1999; Welch 1997). Items of material culture depicted in art such as stone spear points, barbed spears and boomerangs have been dated by comparison with excavated or with ethnographically known examples. There are eleven anthropomorphic figures in the engraved assemblage holding what appear to be weapons or items of material culture although the graphic detail is not refined enough to determine the exact array of weapons depicted (Figure 6.2). These are found at N'Dhala Gorge in the east and Rainbow Valley in the southeast of the study area. The three figures from Rainbow Valley have been produced by bruising the rock surface so that the outline definition is slightly blurred (Figure 6.2, F & G). An object held by one figure, appears to be a boomerang similar to those described and illustrated by Spencer and Gillen (1927: 530-534) early last century and found stencilled on shelter walls throughout the study area. A semicircular object held by another of the figures could not be identified as it is unlike any known Aboriginal artefact in use at contact. The spears depicted are both short and long shafted (see Spencer & Gillen 1927:521-524). The array of weapons at N'Dhala Gorge is more varied and could possibly include shields and spear-throwers. Figure 6.2 A, located on a low boulder on the camping flat at the entrance to N'Dhala Gorge, is unique in that it is sparsely pecked and has been abraded and rubbed over with ochre. Eight of the motifs are grouped into pairs and all motifs have been produced on vertical or near vertical rock faces. Similar engraved motifs have been recorded from Therreyererte further to the south (*Therirrerte*, Gunn 1993a) but again, details of the weapons are not clear enough to contribute to the development of a central Australian chronology.

Additional items of material culture, classified as stencilled objects could not be identified as tools or weapons with certainty, so add little chronological detail. The only definitive classification was a stencilled line at Watarrka/NE Plateau, which appears to have been produced using a metal rod, which supports the claim that stencilling continued into the recent past. Post-contact items such as a metal knife have been recorded by Gunn (1995d) in the Palmer River area further supporting a recent origin for some parts of the stencilled assemblage.

The inclusion of animals associated with the European exploration and settlement of central Australia amongst the drawn assemblage, provides evidence that drawing remained a part of the ongoing production of rock art even after the arrival of Europeans in the 1860's and 70's. A drawn, charcoal, horse and rider (Plate 6.7) and a string of camels tied together with nose lines were recorded in an isolated site at Watarrka/NE Ridge. Further south along the ridge, two drawn horses roughly outlined in red paint were produced in a low shelter, which overlooks the track used by Aboriginal groups, and more latterly by stockmen, to cross the George Gill Range from Petermann Pound to the spring at Wanmara and the sand dune desert beyond (Bruce Breaden personal communication). The painted outline demonstrates that artists continued to use wet pigment to produce motifs after contact with Europeans had disrupted many other aspects of their former lifestyle. Furthermore, quondong seeds (*Santalum acuminatum*) and emu egg shell (*Dromaius novaehollandiae*) were recorded on the surface of the deposit at this site demonstrating that traditional foraging also continued into the post-contact period.

A frieze of roughly drawn figures depicted wearing clothes, was recorded at Watarrka/ NE Plateau although details of the clothing are difficult to discern (Plate 6.8). It appears that at least one of the figures is wearing a skirt, providing a singular example of the documentation by Aboriginal artists of the presence of European women in the region, or at least, the arrival of European items of clothing. Groups or friezes of drawn charcoal animals classified as quadrupeds in the database were also recorded at Palm Valley and three additional sites along the Plateau at Watarrka. The quadrupeds are thought to represent cattle or horses common in the region by the end of the nineteenth century. During that period, the rugged George Gill Range was used by Aboriginal people as a refuge from punitive mounted police expeditions intent on

rounding up those responsible for raids on cattle herds to the east on Tempe Downs (Mulvaney *et al.* 2000) while the flats adjacent to the Palm Valley site, known as 'the horse paddock' were used by the Lutheran missionaries to run the horses necessary for the operation of the Hermannsburg mission station (Conrad Ratara personal communication).

In summary, the study of subject matter in the central Australian rock art assemblage has produced few definitive chronological markers but has demonstrated that techniques such as *drawing, stencilling and painting continued into the post-contact period.*

### **6.9 Analysis of stylistic similarities and differences across technique**

The chronological analyses, thus far, have demonstrated that there is a core motif vocabulary shared between the older and the newer engravings; that is, the same core range of motifs was produced at different times. Further, my analyses (Chapter 5) have shown that the engraved and pigment assemblages also share a motif vocabulary. I have also demonstrated that some of the surviving drawings, stencils, paintings, prints, scratchings and poundings were produced relatively recently, possibly as long as 500 years ago but probably in the past few hundred years. The aim of this section is to develop a better understanding of the chronological relationship between the engraved and pigment assemblages.

In order to investigate the possibility that some of the pigment and engraved motifs formed part of the same contemporaneous assemblage, a stylistic analysis was undertaken on a sample drawn from the 90 motif classes (82% of the total motif classes) produced in both technique ranges (Chapter 5). As it cannot be assumed, based on the similarity of motif classes alone, that the motifs occurring across technique form part of the same assemblage, a comparison between the form of the motif and the context in which it was produced was undertaken in order to establish claims for the coeval production of a number of techniques.

Clear results were difficult to obtain from the analysis of classes that included large numbers of motifs such as circles, concentric circles<4, concentric circles>3, macro

track/simple and birdtrack/linear. This was because similarities and differences were obscured, first, by the diversity of forms and contexts in which these motifs were produced and, second, by the tendency for motifs produced in particular techniques to be classified into preferential classes. Therefore the following stylistic analysis is limited to five selected distinctive motifs where results showed marked patterning.

Macro/trail 12 motifs (Plate 6.9) are similar in form, in the way they are produced and in the context in which they are found across all techniques, therefore, it is likely that all macro/trail 12 motifs form part of the same rock art stylistic tradition (Table 6.7).

Table 6.7 Macro/trail 12: n=130 motifs

Technique	Pecked, abraded, pebraded, bruised and painted
Length	Similar form: 80% of engraved motifs and 74 % of painted motifs are <500mm long
Direction	Similar form: 93% of trails in all techniques classified as meandering
Application method	Similar application methods with 88% of painted motifs recorded in the rough class and 31% of the pecked class recorded in the irregular shallow class
Patination	74% of the pecked motifs assigned to a patination class were recorded in the fresh class
Location	Engraved motifs found in middle gorge and painted in rockshelters
Motif location	Motifs produced across a variety of surfaces in a single trail in all techniques

Macro/trail 12 motifs were classified as patinated and fresh which suggests that these trails were produced over a considerable period of time. As painted macro/trail 12 motifs have been recorded at sites where shelter walls are exfoliating rapidly, which shows that this motif class was produced up until relatively recently, perhaps the last few hundred years.

Meandering lines (Plate 6.10) have a number of similarities across techniques in form, context and distribution (Table 6.8).

Table 6.8 Meandering lines: n= 540

Technique	Pecked, intaglio, pounded, pebraded, painted and drawn
Length	Painted, pounded, intaglio and pebraded motifs all <1000mm while pecked (25%) and drawn (14%) were >1000mm

Patination	Similar percentage of motifs classified as patinated and fresh
Visual dominance	Only 4% of motifs classified as visually dominant
Location	Widespread throughout the region in all techniques with pecked pounded and pebraded motifs also found in rockshelters where the painted and drawn motifs are found
Motif location	Motifs grouped on single panels within sites in painted and pecked assemblage

Pecked meandering lines are well represented in both the patinated and fresh classes, which indicates that these pecked motifs continued to be produced into recent times.

Spoked circles (Plate 6.11) have a number of similarities across different techniques although there are differences in size range between pecked and drawn motifs, and the way in which motifs are composed on a panel between the pecked and painted assemblage (Table 6.9).

Table 6.9 Spoked circles: n=55

Technique	Pecked, bruised, painted and drawn
Size	Medium sized motifs most common in most techniques (62%) except drawn where the motif was recorded in the small class. Large motifs unique to pecked class
Patination	Only a single pecked example recorded as patinated
Visual dominance	Pecked and painted techniques have motifs classified as visually dominant.
Orientation of rock surface	Painted motifs and some engraved motifs on vertical surfaces but the majority of pecked motifs on sloping surfaces
Location	Motifs across all techniques have the same limited spatial distribution (see Chapter 7)
Motif location	Painted motifs occur as a single example at each site while pecked motifs cluster on some panels

There is only one motif classified as patinated which indicates that the majority of these motifs may have been produced in the recent past, perhaps the last 500 years. It is likely that all spoked circles form part of the same contemporaneous rock art tradition.

Complex poles (Plate 6.12) have some similarities across techniques in size range and composition of rock art panels although there are differences in the application methods between techniques (Table 6.10).

Table 6.10 Complex poles: n=98

Technique	Pecked, pebraded, painted and drawn
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Size	98% of pecked motifs and 82% of painted motifs medium or large
Application method	Pecked drawn and painted motifs classified in the fine or even class although 35% of painted and drawn motifs are classified in the rough class
Patination	Only a single pecked example recorded as fresh
Visual dominance	35% of complex poles repeated across a single face or panel in both the painted and pecked assemblage have been classified as visually dominant
Location	Engraved motifs found in middle gorge and painted and drawn in rockshelters
Motif location	Multiple painted and pecked motifs grouped on a single face or panel in three locations

There is only one complex pole classified as fresh in the category which records the state of patination and painted examples are located on stable rock surfaces so that it is likely that these painted motifs may form part of the earlier surviving painted assemblage.

The bird motifs (Table 6.11) produced in the three engraving techniques contrast most markedly with drawn birds in size.

Table 6.11 Bird: n=15

Technique	Intaglio, abraded, pebraded and drawn
Size	33% of engraved motifs in large class in contrast to drawn motifs where 86% are classified in the small class
Patination	All intaglio, pebraded and abraded motifs classified as patinated
Ceremonial rubbing	All abraded and pebraded motifs have been rubbed over
Outline	Abraded and pebraded birds produced in outline while drawn and intaglio birds are infilled
Visual dominance	Intaglio and abraded motifs appear in visually dominant position
Location	Intaglio birds appear as a single example at each location
Motif location	Intaglio, abraded and drawn birds on vertical or sloping faces while pebraded bird was classified on a horizontal face

There are other differences between the form and context in which birds in each of these techniques is produced so that it seems most unlikely that drawn birds and birds produced in engraved techniques form part of the same contemporaneous rock art tradition. This conclusion is supported by the data on patination in which all engraved motifs are classified as patinated suggesting they may be of considerable age. The advanced state of weathering, including fractures across slabs on which intaglio birds are found, indicates that these motifs may be amongst the oldest recorded in the central Australian assemblage (Plate 6.13), while analysis earlier in this chapter has demonstrated that drawn motifs are likely to be amongst the most recent produced in the region.

Thus, stylistic analysis confirms that not all motifs classified into a motif class belong to the same contemporaneous rock art assemblage. The extensive motif vocabulary shared between the engraved and pigment assemblages does not necessarily indicate that *all* engravings and all pigment art belong to the same rock art traditions. Rather, my analysis has shown a complex relationship between motifs produced in each technique.

Motifs such as macro/track 12, meandering line and spoked circle are likely to have formed part of the same rock art traditions and have been produced more or less contemporaneously with the choice of technique probably dependent on factors such as the geology of the location, the availability of ochre, the preference of the artist or the convention of the group to which the producer belonged.

Although there are some similarities in size and composition between those complex poles that are painted and those that are pecked, there are also some differences so that the chronological relationship between motifs produced in different techniques is difficult to establish. Complex poles were likely to have been produced over a considerable period of time.

The analysis of bird motif demonstrates that older motifs dropped out of production, in this case, perhaps thousands of years ago. Bird motifs were recorded again in the most recent drawn assemblage. It is unlikely that bird motifs produced perhaps thousands of years apart in different forms, sizes and techniques, formed part of the same rock art tradition.

In summary, there is a considerable overlap in motif vocabulary across techniques. Various lines of evidence in the preceding sections have supported the hypothesis that the surviving pigment art must be relatively recent and is likely to have been produced in the last 500 years or less and much of it more recently than that. If then, there is a similarity between the form of motifs and context in which they were produced within a motif class which constitutes part of both the pigment assemblage and engraved assemblage, I contend that this portion of the engraved assemblage *may also be of relatively recent origin.*

### 6.10 Excavated evidence

The relationship between rock art and excavated deposits at any art site is notoriously difficult to determine (e.g. McDonald 1994, Thorley 1998a) so that few definitive chronological conclusions can be drawn unless excavated pieces of ochre of a reasonable size or ochre showing signs of usewear, can be matched to motifs produced on the shelter walls, or alternatively, if examples of painted or engraved rock art are located within dated deposit.

Engraved slabs have been recovered from two excavated deposits in central Australia; the first from Keringke south east of Alice Springs (*Kurringa*, Stockton 1971:57-58) and the second from and Intirtekwerle in the same area (*James Range East*, Gould 1978, 1980). At Keringke, the deposit from trench (K) in which a sandstone slab with remnants of a pecked solid circle was recovered, was not dated, but a *single* radiocarbon date from a second trench nearby (R) returned a date of 920±130 BP (see Smith 1988:270-71). However, the relationship between the dated charcoal and the deposit in trench K is difficult to establish. The engraved slab was recovered between 30-35cm below the surface in trench K, while the dated charcoal was obtained from a spit 50-60cm below the surface in trench R, although Stockton stated that artefact changes are similar across the lower spits in both trenches despite the differences in depth at site K, differences which Stockton attributed to the fact that site K has been subjected to erosion and re-silting. Stockton noted that there is little geological difference between spits so that no comparisons between the sediment texture and colour in the spits can be made across the two excavations so that it is impossible to draw any supportable conclusions on the age of the engraving.

The dating of the engraved slabs recovered during excavation at Intirtekwerle is more straightforward as the slabs were recovered in the upper deposit not subject to ongoing debate over chronological interpretation (*cf.* Smith 1988:202-234; Thorley 1998a:326-328). The engravings of 'emu tracks' (birdtrack/linear) were recorded on the upper faces of two boulders in the rock-fall layer closest to the surface of the deposit which represents the latest phase of occupation. Gould (1980:185) estimates that the two engraved boulders were 'engraved sometime after the upper rockfall

event but before the upper surface of these rocks were covered by sediments, thus placing them deposits accumulated sometime between 2000 years ago and 1700AD'. A further trench was excavated adjacent to the trench in which the engravings were located (Smith 1986,1988:212) and additional radiocarbon dates were processed. The results for the layer in which the engravings were located were consistent with Gould's chronology at Intirtekwerle (but see Smith 1988; Thorley 1998a for discussion on remaining stratigraphy). These results confirm that the production of engravings in this area at least, persisted into the late Holocene.

Thorley & Gunn (1996:11) have argued that the presence of red and yellow ochre within the upper layers of excavated deposit from a shelter in the Storm Creek area, to the east of the George Gill Range, and its absence from levels predating 400BP indicates that the substantial number of handstencils and paintings at this site, are likely to have been produced since this time. While this seems highly likely, ochre was widely used in central Australia at the time of contact, especially for body painting and the decoration of weapons and tools (e.g. Spencer & Gillen 1927:521-534), so that it cannot be assumed that all ochre recovered from excavated deposits is associated with rock art (see also McDonald 1994:143-146).

Chronological interpretations at a further thirteen excavated sites in central Australia where rock art is present or located nearby, indicate that the most intensive use of these sites has generally been within the last 1500 years (Gould 1978; Greathouse 1985; Napton & Greathouse 1985; Smith 1988; Stockton 1971) although Thorley interprets the dates slightly differently and places the timing of the increase in the Hugh River catchment a little earlier at around 2,000BP (Thorley 1998a:330). An analysis of the range of dates at each site and the techniques used to produce art at these complexes did not produce any clear chronological patterns or relationships. This is, in part, due to the fact that painted, stencilled and pecked art were produced at each complex so that it was not possible to isolate individual techniques and attempt to relate them to particular time periods or other site activities. However, excavation at Kuyunba (illustrated by Spencer & Gillen 1899:632, fig. 92), a site where painting, handstencils, drawings, abraded grooves and abraded patches were recorded, produced a basal radiocarbon date of  $320 \pm 55$ BP which lends support to the contention

that all these techniques continued to be used to produce rock art into the recent past (Site 107, Greathouse 1985:196-198, Kweyunpe 2, Smith 1980:250).

Radiocarbon dates from excavations in the valley floor at two major engraving sites, Rainbow Valley and Therreyererte indicate that the periods of major occupation were relatively recent. Increase in occupation at both complexes was measured by an increase in artefact density, and other types of material such as bone, charcoal and ochre. The timing of the change at Therreyererte is bracketed by two radiocarbon dates to between 400 and 1830 years BP with Smith extrapolating from these to suggest that the change took place at around 570BP (Smith 1988:290).

Smith obtained *a single* radiocarbon date of  $980\pm 80$  BP from the excavation at Rainbow Valley (*Urre*) from which he extrapolated to suggest that the major increase in occupation occurred between 980-1300BP (Smith 1988:240). These assumptions must be considered against two potential chronological problems: first extrapolation from a single excavation date must be considered tentative. Second, excavated evidence of human occupation may occur below the radiocarbon dates at both sites so that the timing of the introduction of engraving to the region remains unclear.

Morwood (personal communication) points out that the excavation at Therreyererte did not reach bedrock and that the initial occupation of this site could be considerably older than that suggested by Smith excavated dates. Following on from that, Morwood argues that the origin of engraving at this site could also be considerably older, a claim he supports from a visual appraisal of the patinated state of some motifs at this location. However, the universal problem of differentiating between old and very old motifs based on visual appraisal of patinated states alone, means that the temporal sequence in which engraved motifs were produced at these sites cannot be established without direct dating.

While it is likely, based on evidence from other areas of Australia, that some engravings at these two locations predate the excavated evidence for increased use of the site, several lines of evidence suggest to me that the majority of engraving were probably produced in the last 1400 years. First, the sheer volume of engraving at Rainbow Valley and Therreyererte would have necessitated either production of motifs by large groups of people aggregated at the site or conversely, production of

motifs by a smaller number of people meeting more frequently. The archaeological signature of either of these alternatives could have produced an excavated assemblage similar to those excavated by Smith. It seems probably that the production of a considerable body of rock art would be associated with a similar increase in subsistence activities as recorded in the excavated deposits at these sites by Smith. Second, the presence of motif classes demonstrating stylistic similarities across engraving and pigment techniques (Section 6.9), particularly spoked circles, complex poles, macro/trail 12, concentric circles, radiating circles and radiating fans suggests that this portion of the engraved assemblage may be relatively recent. If we accept that these two lines of evidence support the hypothesis that the majority of the engravings at Rainbow Valley and Therreyererte were produced in the last 1400 years, it is also likely that similar large engraved rock art assemblages produced in similar contexts with similar associated archaeological material throughout the region may also have been produced in the same period. Confirmation of this hypothesis awaits direct dating.

### **6.11 Ethnographic evidence**

A summary of Aboriginal perceptions of the origin and timing of engravings and paintings was outlined in Chapter 3 but several points need to be reiterated here. Ethnographic reports document interpretations of a portion of the engraved assemblage at many rock art sites, lending support to claims for the relatively recent production or reincorporation of parts of the engraved assemblage. As part of the extensive documentation of sacred rock art sites undertaken by Gunn in central Australia over the past decade (see Chapter 3), the sacred stories relating to engraved sites and the interpretation of particular motifs have been outlined by the Traditional Aboriginal Custodians. Although the details of these stories and motifs are restricted, it is evident that certain motifs, including engraved motifs hold particular significance over and above the general rock art assemblage. These motifs are likely to either constitute part of the most recent engraved assemblage or represent those reincorporated into the most recent belief systems.

Superimposition analysis and the inclusion of post-contact motifs in the drawn assemblage (see above) indicate that drawing was used into the recent past. A close

reading of the ethnographic evidence, however, points to an origin for this technique, *prior to* European contact. In 1872, before contact with Europeans impacted on Aboriginal people in central Australia in any significant way, the explorer Giles (1995:39) recorded drawn hand outlines at the Tarn of Auber, which he attributed to the efforts of Aboriginal children: ‘...upon the walls of this, natives had painted strange devices of snakes, principally in white; the children had scratched imperfect shapes of hands with bits of charcoal’. Further, Basedow (1904:39) documented charcoal drawings in the Musgrave Range to the south of the study area, while on a prospecting expedition in this remote region in 1903. The isolation of the locations where the drawings were noted and the dating of these sightings early in the history of European exploration and settlement of central Australia, lends support to the contention that drawing was an established method used in the production of rock art *prior to* the disruption of Aboriginal traditional life.

Some ethnographers (Gould 1969; Meggitt 1962; Mountford 1955, 1971) witnessed the production of painted and pounded rock art in areas surrounding the current research area indicating that these techniques were still in use until the recent past (Chapter 3).

## **6.12 Chronology of associated rock art traditions**

One of the questions that has not been adequately addressed in the Australian rock art literature is the relationship between, what I have called associated rock art traditions (Rosenfeld’s gestural marks [1999], Chapter 4) and other components of the rock art assemblage. Now that some temporal ordering of the rock art assemblage has been drafted, I will compare the patination and superimposition of associated rock art traditions in order to establish the chronological relationship between these and the main body of the rock art assemblage and compare these results to the patterning within complexes established for each tradition in the previous chapter.

### Abraded grooves

Abraded grooves were found at 59 sites demonstrating that their production in central Australia is widespread. An analysis of the patination of the grooves at each site showed that, where there were extensive panels of abraded grooves or discrete panels

within the same site, differences in the degree of patination and groove profile, demonstrates that the grooves have been produced over a considerable period of time using a variety of implements (see also Kimber 1991:87). The patination of many of the grooves at open sites and the degree to which the grooves, compacted by the friction caused by the abrading action, have resisted the ongoing weathering within shelters, argues for a considerable time depth for this practice. While many of the grooves within rockshelters are not patinated, they nevertheless do not have the same freshness as other more recently produced engravings so that results from the analysis of the patination suggest that the production of abraded grooves may not have continued into the recent past.

There is some evidence that abraded grooves at certain sites were produced, or at least reworked, *after* the pecked motifs were engraved. At Puritjarra, the abraded grooves do not have the same glossy red brown patina that has formed on the circular motifs on the same rock surface (see also Rosenfeld & Smith 2002:116) which indicates that they may be considerably younger than the engravings at this site. The evidence at Wallace Rockhole is more equivocal. The major engraved rock slabs at this complex have also been the focus for the production of abraded grooves and an analysis of the superimposition between the two shows that most grooves were abraded into the underlying motifs. However, several motifs including a concentric circle <4, a macro track/simple and a circle motif, have been pecked *into* abraded grooves so that these motifs must post-date the grooves (*cf.* Rosenfeld & Mumford 1993:25, Plate 6.14). Similarly, at Ewaninga abraded grooves were recorded both over and under pecked motifs. At the apex of the main outlier on a horizontal panel of abraded grooves, a suite of pits has been pecked into the surface, one of which clearly cuts into an abraded groove, while at the outlier nearby, a groove was cut into an organic circle. The same lack of consistency in the superimposition of abraded grooves and pecked motifs was documented at Kuyunba where an abraded groove cut into a patinated circle while another groove was dissected by a meandering line. It can be inferred from these analyses that the production of abraded grooves at some complexes began prior to, continued along with, and then persisted after the production of the engraved assemblage. The production of abraded grooves at Kuyunba is coeval with the production of engravings.

The relationship between abraded grooves and pigment motifs is also equivocal as there are limited cases of superimposition between the two elements. The instances where superimposition does occur demonstrates that abraded grooves continued to be produced concomitant with stencils and paintings; at one site (Watarrka/NE Ridge), three red handstencils have been sprayed over abraded grooves while at the second (Watarrka/Atalpi), an abraded groove has been cut into a brown handstencil while a painted macro/trail 12 motif passes over the same panel of abraded grooves. At a third site (Watarrka/Wanga), black splatter produced during stencilling is evident within the abraded groove and, in another reversal, a red handstencil has been cut by an abraded groove at a fourth site (Watarrka/NE Plateau).

The spatial relationship between abraded grooves and sites where pigment art predominates correlates strongly with grooves recorded at 34 such sites (see Table 5.50, chapter 5). In addition, the five sites where grooves were recorded as the only rock art, were all in close proximity to stencilled or painted assemblages rather than engraved sites. Such a strong association argues for the coeval production of abraded grooves and pigment motifs. This argument is supported by evidence of the colouring of some abraded grooves with ochre at Puritjarra, Kuyunba, Watarrka/Atalpi and Watarrka/NE Plateau and re-marking of others with charcoal at the latter site. It would appear that the grooves, even if they ceased to be produced in the last few hundred years, continued to be relevant to the artists producing pigment art.

Archaeological and ethnographic evidence indicate that abraded grooves have been produced over a considerable period of time. Abraded grooves were found on a shelter wall under excavated deposits at Devon Downs in South Australia (Hale & Tindale 1930). A reanalysis of the geomorphology at this site by Smith (1982:111) brackets the panel on which the abraded grooves were produced, between 2980±90 and 3460±100 BP. At Ingaladdi to the north, Edwards (1968:667) records that D. J. Mulvaney recovered a slab with abraded grooves and tracks within excavated deposits dated between 4920±100 and 6800± 270. Ethnographic accounts (Arndt 1962:170-171), on the other hand, indicate a more recent production and document informants recalling that abraded grooves were made as part of a rain making ceremony where 'each man present cut a groove in the rock to make the Old Man bleed and bring rain'. Taçon (1992:13) was also told by informants that abraded grooves were produced into

the 20<sup>th</sup> century at Roma Main Gorge as a tally or record of ceremonies performed there.

In summary, abraded grooves are likely to have first appeared in association with the now patinated engraved assemblage but have continued to be produced into the recent past.

### Pecked pits

The chronological relationship between pecked pits and the rest of the rock art assemblage is unclear. Both fresh and patinated pits have been recorded on the same panel at Wallace Rockhole, Anna's Reservoir, the Dulcie Range, Rainbow Valley and N'Dhala Gorge, but at all other locations pecked pits were recorded in the patinated class.

A large boulder in the camping area at the entrance to N'Dhala Gorge has a number of pits amongst a panel of pits that appear to have been reworked (Plate 6.15) while one or two pits amongst panels at Roma Gorge East, Roma Main Gorge and Anna's Reservoir have been abraded to form deep pits considerably larger than the other pits on the panel (Plate 6.15). The reworking or continued abrading of pits indicates that this tradition continued to be part of Aboriginal rock art production into the recent past. The presence of a glassy black patina covering panels of pits at Roma Main Gorge provides some evidence that the origin of this practice might be as old or older than much of the engraved assemblage as few of the adjacent pecked motifs were covered with the same distinctive patina (Plate 6.16).

In northern Australia, pecked pits (cupules) have been attributed to an early phase of the rock art assemblage (Chaloupka 1993; Flood 1997; Taçon *et al.* 1997; Walsh 1994; Welsh 1993) however, recent dating undertaken on pecked pits suggests that they may not have been introduced until the mid to late Holocene. Accelerator mass spectrometry radiocarbon determinations for oxalate crusts overlying pecked pits in the Keep River district to the north of central Australia have provided minimum age estimates of at least 2,130 years old and possibly 5,840 years old (Watchman *et al.* 2000:6). The absence of conformable age sequences, where ages of the excavated layers within the oxalate crusts do not become progressive older, is problematic. This discrepancy is deemed acceptable by the authors, especially as the minimum

dates fall within the time period obtained for an excavated fallen slab engraved with pits, recovered from one of the same sites from which the *in situ* pits were dated. This slab was covered by deposit dated to about 3000 years ago (Roberts *et al.* 1998; *cf.* Fullagar *et al.* 1996).

A single example of the superimposition of a panel of pits and abraded grooves was recorded at Ewaninga where one pit was clearly pecked into an abraded groove so that the pit must have been produced after the groove had been abraded although little can be inferred from such a unique sample. At the Dulcie Range site, a pit was pecked into a birdtrack/linear so it is evident that pits continued to be added to this site after engraving had been established.

Ethnographic evidence supports the contention that pits continued to be produced into the recent past (see also Flood 1997:145-6). Mountford (1976:213) documented the production of pits (or potholes) in the Western Desert as part of a cockatoo increase ceremony in the Musgrave Ranges, immediately to the south of the study area. He witnessed Aboriginal men pounding a boulder with a small stone. The boulder was said to represent the body of the Cockatoo Ancestor. The pounding action released the sacred spirit of cockatoos contained within the boulder in the form of dust that flew into the air and fertilised living cockatoos causing them to lay more eggs. Mountford, in a footnote, stated that 'Although these pot-holes are well known at other totemic places in central Australia and possibly elsewhere this is the first time the writer has been able to find out definitely their function and their means of production' (Mountford 1976:213).

In summary, patination data and ethnographic evidence together, indicate that the production of pits may span the entire period of rock art production in central Australia. It is not possible to determine if the production of pits is part of a continuous practice over an extended period of time or if there have been hiatuses and re-establishment of this practice.

#### Abraded areas

Abraded areas were recorded *over* pecked, intaglio, pebraded and painted motifs at 19 rock art sites including the Dulcie Ranges and Anna's Reservoir where the abraded

area extended over vertical panels of pits. At Watarrka/Atalpi the abraded area extends over a pecked circle and two abraded grooves pecked into a boulder on the shelter floor. These cases demonstrate that the abrading of rock faces post-dates the production of other associated rock art traditions. The white chalky appearance of the abraded faces at Buka and over some areas at Orange Creek, which indicate a recent abrasion of the surface, add strength to the claim that this practice continued into the last few hundred years. A number of distinctive motifs infilled with abrading were recorded as abraded motifs although they could well form part of the same artistic practice as that associated with abraded areas.

#### Random pecking/pounding

The majority of random pecking was recorded as fresh with patinated pecking restricted to Rainbow Valley, Ewaninga and Puritjarra where it is associated with patinated engravings or non-fresh motifs. Superimposed random pecking was rarely recorded (Roma Main Gorge over a circle, Puritjarra over a circle), and when it did occur, the random pecking post-dated the motifs. This practice, therefore, may be an older tradition, which has re-emerged in the recent past.

#### Battered edges

All roughly battered edges were recorded as fresh, which indicates that this is a recently introduced practice, whereas flaked edges had a patinated appearance (e.g. Puritjarra and Watarrka/Penny Springs, Plate 6.17). Flaking of rock edges may be an earlier form of this practice, or alternatively, it may be that edges were flaked for the utilitarian purpose of obtaining stone tools.

The similarity in form, patination and context in the production of battered edges and random pecking and pounding suggests that these activities may be forms of the same recent practice where the producer interacts with the rock surface in a repetitive and prescribed manner.

### **6.13 Relevant chronological issues**

There are several issues relevant to the development of a chronology of the rock art of central Australia that have been the centre of much debate in the archaeological literature over the past decade (e.g. Bednarik 1995b; Clottes 1998; Conkey & Hastorf 1990; Lorblanchet & Bahn 1993; Rosenfeld 2000; Rosenfeld & Smith 1997). I will address these issues briefly here before summarising the temporal relationship between aspects of the assemblage.

Rock art chronologies, both within Australia and in other parts of the world, have traditionally been presented in sequential phases, periods or traditions, where each stylistic phase of rock art is seen to evolve, continue for a period of time and then be replaced by a different subsequent stylistic phase (e.g. Cole 1998; Leroi-Gourhan 1965; Morwood 1979; Muzzolini 2001; Walsh 2000) in much the same way as art historians have perceived the development and subsequent demise of styles in art, sculpture and architecture (Davis 1990). Put simply, style is seen as formal variation and is recognised by analysis of form, motif vocabulary, colour and technique with additional consideration given to spatial distribution. Ordering was achieved by grouping perceived similarities and style was viewed as a chronological marker *reflecting* cultural ethnicity. Style was understood to be geographically and temporally limited and thus provided one of the few tools that rock art researchers could use to order rock art assemblages (Conkey 1990:3, see also 1990:5-17 for a historical overview of the uses of the concept of style).

More recent studies based on ethnographic observations (e.g. Hodder 1982; Smith 1994; Weissner 1983; Wobst 1977) have demonstrated that style is also a concept *used by* people manufacturing objects (Hodder 1982; Weissner 1983), producing rock art or art objects (Smith 1994) or choosing the clothing they wear (Wobst 1977) to communicate information to others in order to mediate social interactions and relationships. The manipulation of style is a process used by people as one means to assist in the facilitation of desired social outcomes. So in exploring the patterns (styles) we observe as archaeologists we can investigate the types of behaviour that the producers or the manufacturers were using (stylistic behaviour) to produce the objects or rock art we study. Different patterns or styles will result from different stylistic behaviour so that styles observed by archaeologists can be *interpreted* from theoretical perspectives developed from ethnographic studies that relate particular

patterns to particular social situations, relationships or interactions (e.g. Gamble 1982; Ross 1997; Smith 1989). In order to best understand the archaeological record, in this case rock art, style can be used in both ways (see Conkey 1990:3).

An acceptance that particular stylistic behaviour will produce identifiable patterns both in rock art and the context in which it was produced, has led researchers to review and refine chronologies. It has become evident that more than one style can be produced at the *same time* under different social circumstances, a likelihood flagged by Ucko & Rosenfeld (1967) almost 35 years ago (see also Conkey 1992:8). Indeed, Rosenfeld (2002), Layton (1992) and Gunn (2000a) (as outlined above) have all argued for the production of different styles at one time in the painted assemblage in central Australia, although they do not reach consensus about the possible function of each style.

In previous research, I identified two contemporaneous patterns in the painted rock art assemblage in northwest central Queensland (Ross 1997), which illustrate the ways in which parallel styles might function within a single assemblage. Distinctive and visually dominant anthropomorphic figures were produced in a bounded geographic area alongside reliable waterholes while another range of geometric motifs was not geographically constrained and was found in a wider variety of contexts. The form and context of the painted anthropomorphs was interpreted as having been produced as a result of emblematic stylistic behaviour adopted in order to mediate the behaviour of outsiders coming into the area. I argued that outsiders travelled into the area would have followed Dreaming Tracks from one reliable waterhole to the next to trade items in return for valuable dolerite stone axe material from quarries within the region. At the same time, the production and display of the anthropomorph motifs added to the cohesiveness of those in whose territory the quarries were located. The homogeneity and wide distribution of the geometric motifs was interpreted as resulting from stylistic behaviour, which served to mediate easy social interaction with particular neighbouring groups who shared ceremonial and exogamous relationships with the central group. Recognising the coeval production of styles in rock art assemblages, Rosenfeld and Smith (1997) contend that it is likely that contemporaneous stylistic variation was an inherent part of past artistic systems.

New advances in rock art dating techniques (Dorn 2001; Rowe 2001; Ward & Tuniz 2000) have provided an additional challenge to the concept that style is temporally constrained (Francis 2001:226 for American examples). One recent European case warns that style alone can be an unreliable measure of age. Jean Clottes' original estimation of the dating of the Chauvet Cave paintings, in the Ardeche region of France, based on a stylistic comparisons with other art from caves such as Lascaux in the Dordogne region of France, was that they were produced between 17,000 and 21,000 years ago (Clottes 1995). Subsequent radiocarbon dating of charcoal in the paint and from the floor below the paintings revealed that the paintings had been produced much earlier, around 32,000 years ago (Clottes *et al.* 1995). Stylistic comparison with sculptured animals from that period in the Swabian sites of southwest Germany (Hahn 1896) and, to a lesser extent, to the engraved blocks from the sites around La Ferrassie in the Dordogne region of France (Delluc & Delluc 1978) demonstrates stylistic similarities not previously acknowledged. Apparent anomalies in the results from 'direct' dating of charcoal motifs from Cosquer Cave in France (Clottes 1998:115-116) also raised the possibility that more or less identical animals had been drawn almost 8000 years apart. Even though it is very likely that the different radiocarbon ages obtained for samples on juxtapositioned bison motifs can be attributed to the use of charcoal of different ages, such tales caution against assumptions that motifs could not be replicated at a later date.

Given the complexity of the temporal ordering of stylistic variation outlined above it is likely that a modular linear model where one single style replaces the previous one, only to be replaced by a subsequent one, may be far too simplistic. It is evident that styles can persist, occur contemporaneously, reappear at a later date or become reincorporated into a later society.

### **Chronology of central Australian rock art assemblage**

The discussion in the previous section has flagged the possibility that the relationship between aspects of the rock art assemblage in central Australia may be extremely complex.

### Earliest rock art

With the evidence to hand, the timing of the origin of the production of rock art in central Australia can only be hypothesised. The timing of the initial use of the two sites with earliest evidence for occupation in the central Australian arid zone, Puritjarra (Smith 1988, 1996) and Kulpi Mara (Thorley 1998a, 1998b) is placed around 32-30,000 BP. The slow accumulation of deposits until the terminal Pleistocene may reflect isolated episodes of human occupation (Smith 1988) or perhaps complete abandonment during the glacial maximum (Thorley 1998b:43). Either way it is unlikely that the sparse population indicated by the archaeological record would have participated in the structured corporate interactions usually associated with the production of rock art. Rosenfeld (1993:79) assessed the data for the emergence of rock art in Australia and argued:

...[E]vidence for the use of a referential system of symbols to mark the landscape according to a corporate system of meaning appears to have its origins during the period of rapidly changing environmental conditions in the terminal Pleistocene...The integration of features of the landscape into a corporate symbolic system is entirely consistent with a model of tightened social and territorial organisation at the close of the Pleistocene. Corporate territorial expression through the indelible marking of place with a stylistic graphic system may have been a powerful means of asserting corporate rights and relationships. Earlier individualised symbolic expression ...may reflect less constrained social systems within which individual and interpersonal relations provided the principal means of social action among more circumscribed populations.

The terminal Pleistocene archaeological record indicates an increase in occupation at Puritjarra and Kulpi Mara at this time. This period also saw the first human occupation at Puntutjarpa (Gould 1968), a site to the southwest of Puritjarra. Concomitant with evidence of higher levels of occupation, ochre granules adjacent to the back wall of the Puritjarra shelter also increased, which Rosenfeld and Smith (2002:117) suggest may indicate that rock painting was introduced to the site at this time. However, taking taphonomic processes into consideration, it is probable that the oldest rock art evident today will be found amongst the engraved assemblage.

The analysis in this chapter has described the assemblage of patinated engraved motifs and has also identified a range of weathering factors, which indicate that many of these motifs are of considerable antiquity. Placing these motifs into a chronological framework remains problematic as, without direct dating, there is no means to separate the old motifs from the very old. If we accept that the engraved boulders protected in the rockshelter at Puritjarra were produced in the early Holocene as Rosenfeld and Smith (2002) have argued (and seems plausible), it is likely that similar protected boulders covered in patinated circle class motifs at Watarrka/NE Plateau and Watarrka/Wanga are also likely to date from this period. Analysis showed that deeply pecked circle class motifs including concentric circles and circle and pit motifs, were consistently more common in the older assemblages. The non-random distribution of these motif classes close to waterholes in topographic areas where they would be highly visible (Chapter 5) would have ensured that the circles were seen, even by highly mobile groups visiting the water source on an opportunistic basis. Circle classes were not produced singly but *repeated on the same face or in the same general area*. It is likely that circle class motifs are amongst the oldest in the central Australian assemblage. Repeated macro and birdtrack motifs are a major component of the older assemblage but tracks are more often structured as individual motifs or in pairs than in long meandering trails common in the later assemblage.

In contrast, patination, superimposition and weathering analyses have identified a range of figurative intaglio or linear outline motifs that occur as unique or rare examples at each location. Intaglio motifs include bird, quadruped, macropod and lizard motifs. There is only one example of a freshly engraved intaglio motif (a much larger lizard at ASID 292) suggesting that these motifs were part of an assemblage that functioned in a different manner to the geometric component of the older assemblage, but then dropped out of use.

While painting, stencilling and other techniques subject to taphonomic deterioration may have been part of the older assemblage, none would remain visible today.

Analysis of the patination and superimposition of associated rock art traditions indicates that the production of pecked pits and abraded grooves began in association with the older engraved assemblages. Clusters of circle and pit motifs, common in the

older assemblage, are often found in association with pecked pits, strengthening the contention that pecked pits were amongst the earliest forms of rock art in central Australia.

#### Increase in production of rock art

The archaeological record of the late Holocene contrasts sharply with that of the late Pleistocene with marked increase in the density and richness of excavated assemblages and an increase in the rate of sediment deposition beginning around 3000 years ago but reaching most intense levels from 1500 years ago and continuing until around 500 years ago (Smith 1988; Thorley 1998b:44). I have argued that this was likely to be the period when the most intensive production of engraving occurred at the larger engraved complexes. The rich archaeological record at these complexes indicates that the production of rock art is likely to have been one of a range of subsistence, social and ritual activities undertaken at each location (Chapter 8). David (2002) has assessed the excavated data from central Australia (e.g. Napton & Greathouse 1985; Smith 1988; and detailed in this thesis) and collated archaeological evidence from other widespread areas of Australia to put forward a comprehensive, if somewhat speculative argument, that this period is likely to have seen the emergence of the pan-Australian belief system known today as the Dreaming (Chapter 1).

Motif classes produced during this time included *the same core vocabulary* identified in the earlier assemblage so that the older motifs were reproduced and incorporated into the new assemblage. The proportion of particular motif classes that persisted at each complex varied between the older and newer engravings so that the composition of motifs in the assemblage at individual sites varied through time. Equally, some motif classes became more prominent including complex poles, spoked wheels, radiating fans, radiating circles, ferns, arcs and meandering lines. Extensive trails of macro, bird and other animal tracks also became a feature of many complexes.

Motifs were engraved throughout the gorges, and in some complexes, out onto the flats used as camping areas and into adjacent gorges. Motifs produced at this time were placed all over the site including elevated ledges no casual visitor would be likely to see. Tracks extended over multiple rock faces up cliff faces and over flat

rocky shelves. Motifs were often densely and repeatedly engraved on large horizontal slabs where groups of people could have sat together to participate and watch the production of the engravings.

Abraded grooves, pecked pits and flaked edges are associated with engravings at this time.

#### New techniques evident in rock art

During the last 500 years or so, the production of engravings continued but in reduced numbers and again, the same core motif vocabulary persisted. In addition a range of motifs including elongated/two laterals, oval/fern, elongated/one lateral, snake, anthropomorph/headdress and anthropomorph/weapons were introduced or became more prominent, probably as recently as three or four hundred years ago. Although the analysis did not isolate this group of motifs as consistently large, visually dominant and on vertical surfaces or highly visible sloping surfaces, a number of the engraved motifs in these classes from this period did appear to fulfil these criteria on subjective appraisal. Motifs from these classes at Ewaninga and Wallace Rockhole were produced in locations that are separated from the main engraved assemblage. At Ewaninga, one group of motifs are located in a secluded alcove while a similar motif is located in a small niche below the main engraved slabs. At Wallace Rockhole, the motifs are located on an elevated slab at the top of the slope at the head of the valley. While the form of the motifs can be seen from the valley floor, details can only be viewed by climbing up the scree slope. In contrast, motifs from these classes have been engraved onto highly visible faces at N'Dhala Gorge and Rainbow Valley. Large anthropomorph/headdress and oval/fern motifs at N'Dhala Gorge were engraved onto boulders in prominent positions at the head, centre and end of the gorge and at Rainbow Valley anthropomorph/weapons have been engraved onto sloping rocks immediately above the main waterhole. At Roma Gorge a large highly visible vertical panel in the centre of the gorge, was engraved more recently with a large circle external lines motif and a number of boomerang motifs (Figure 6.17). Importantly, it is these fresh motifs that continue to hold particular significance for Aboriginal Custodians today and some are identified as the focus of the site indicating that this group of motifs may have been engraved or reincorporated as part of the most recent activities involving the production of rock art at these locations.

In addition to more traditional engraving techniques, motifs were produced by bruising, pounding, scratching and incising although fewer motifs were produced using an intaglio technique. In contrast to the older assemblage, motifs were more often produced using shallow application methods. The majority of newer motifs are distributed in what appears to be a random manner throughout engraved sites but scratched and incised motifs were most commonly found in rockshelters.

The paintings recorded for this thesis are likely to have originated during this period although it is probable paintings occurred before this time but have weathered away. The striking similarity between a number of distinctive motifs and the contexts in which they were produced in the painted and engraved assemblage, demonstrates that parts of the painted and engraved assemblage may represent the same types of stylistic behaviour. The similarity identified in some aspects of the assemblages produced in both techniques may represent a continuation of this behaviour or a contemporaneous alternative. Painted spoked circle, meandering line, concentric circle, fern, radiating fan and radiating circle motifs are also common in the engraved assemblage but the most striking similarity is in the trails of macro and birdtrack motifs. Trails in both techniques meander over a variety of surfaces and many are applied in a rough and irregular manner. Birdtracks are likely to form shorter vertical tracks and some cluster into groups.

The recent painted assemblage is structured in a similar manner at a number of complexes. Each complex has one rockshelter, usually, but not always, one of the largest shelters in the complex (Chapter 5), that contains a larger assemblage of paintings than other painted shelters at the complex. Amongst these paintings there are one or two motifs that dominate the assemblage both visually and numerically. For example, at Rainbow Valley radiating fans and concentric circles dominate the rockshelter adjacent to the waterhole while at Roma Gorge D, ovals and human trails are prominent in the rockshelter overlooking the small side gorge. At Watarrka/NE Plateau complex poles cover the entire length of the panel, at Trepina Gorge striped motifs and radiating circles are repeated along the gorge walls and at Kuyunba elongated ovals and inverted U shapes stand out on the wall of the shelter. Additional painted motifs at the sites are usually drawn from the core motif vocabulary so that

when viewed as an entire site assemblage there are also many similar motifs shared between complexes.

At many complexes, there are also a number of rockshelters that contain less than 10 painted, drawn, printed or stencilled motifs. Some shelters contain just one or two motifs and all appear to have been produced in the recent past. At Penny Springs and Arltunga/Rockshelter a single painted motif has created a dramatic effect but at many sites at Watarrka/NE Ridge, Dulcie Range and Kuyunba the assemblage consisted of a few handstencils and drawings.

Many rockshelter sites are dominated by handstencils or handprints with hundreds recorded on the walls at Puritjarra, Watarrka/Atalpi and sites in the Dulcie Range. Some handstencils were produced early in the period represented in the pigment assemblage but others are amongst the most recently produced motifs at sites. Handprints and charcoal hand outlines have been recently introduced into the assemblage but the similarity in the context of the production of these motifs suggests that they may have served the same function as handstencils.

Drawing is clearly the latest technique introduced into the central Australian rock art assemblage and it has continued to be the preferred technique for the production of much of the rock art into the post-contact period. Significantly, drawn motifs are produced in the same sites as other pigment motifs. The range of motifs utilised in the drawn assemblage is similar to that produced in the painted and engraved assemblage including concentric circles, rectilinear grid, circles/joined lines, snake and barred ovals. Alongside the persistent range of motifs are a number of motif classes that appear for the first time including vertical lines/random, horizontal/vert/lines and a number of post contact motifs of humans, camels and horses.

The marking of shelter walls with vertical lines/random motifs drawn in charcoal shares many of the same qualities that are evident in the associated rock art traditions. The concern of the artist does not appear to be with the completed form of the motif as no attempt is made to produce a recognisable shape but rather a series of repeated charcoal lines are drawn very roughly on the wall and it is easy to see how earlier

researchers dismissed these markings as graffiti. Similarly, horizontal/vert/line motifs often extend across whole sections of the site in a relatively haphazard manner. It seems probable that the concern of the person producing the lines was with interacting with the surface of the site, or marking the site in some way, rather than with the shape of the resulting mark. I would argue on the grounds of the morphology and structure of these motifs that they too could be included as the most recently introduced associated rock art tradition. Other associated rock art traditions commonly used during this period including battered edges, random pecking/pounding and abraded areas share the same relatively random approach, repetitive form and lack of concern for shape.

The relationship of associated rock art traditions with the central Australian assemblage has continued from the earliest engraved assemblage to the recent past. Abraded grooves and pecked pits probably have a similar temporal span as the rock art assemblage in central Australia, extending to the last phase of production last century. In contrast, the production of abraded areas appears to be restricted to the most recent phase of rock art production although distinctive motifs were abraded prior to this. Isolated examples of patinated battered edges and random pecking demonstrate that these practices had their origins early in the history of rock art production but both practices became more widely utilised in the most recent phase of rock art production while drawn vertical lines/random and horizontal/vert/lines are likely to be a recent form of associated rock art traditions.

Abraded grooves are associated with both engraved and pigment art but the production of pecked pits is restricted to rock art sites where engraved assemblages are found. Abraded areas are found at both engraved and pigment sites but are more common at engraved sites (*cf.* Gunn 2002a:45). Battered edges are found in associated with painted and engraved assemblages while random pecking is only associated with engraved assemblages.

### **6.15 Summary and conclusions**

The *persistence* of a core vocabulary of motifs from the earliest rock art assemblage through to the drawn assemblage produced in the last few hundred years characterises

the rock art assemblage in central Australia. The focus on the relationships between the rock art, the structure of the assemblage and the geographic and cultural context of production adopted in this thesis has provided the means to differentiate aspects of the assemblage and identify more subtle variation in the assemblage through time. It is these variations or patterns that can be used to hypothesise about stylistic behaviour and the activities that led to the production of rock art.

A similar range of motifs have been selected through time and across technique over thousands of years. Motifs were *repeated* frequently at complexes throughout the entire period of rock art production but the composition of earlier and later assemblages varied from complex to complex. What appears to be a homogeneous assemblage on first appraisal has been shown to demonstrate site-specific chronological preferences within a framework of invariance.

A small range of figurative motifs produced as single or rare examples at particular complexes dropped out of assemblage. The majority of motifs produced throughout the period of rock art production were geometric motifs. Drawn post-contact motifs again incorporated some figurative motifs with animals and people depicted.

Early engraved motifs were frequently located in middle gorge areas around water sources or in rockshelters but the later engraved motifs were more widely distributed throughout complexes. No clustering was identified in the most recent engravings, rather they appeared to be placed randomly throughout gorge assemblages.

The similarities between the later engraved and painted assemblages indicates that these assemblages were contemporaneous and it may be that the selection of technique was dependent on the locality or the availability of ochre. Groups of distinctive engraved motifs have been produced at some complexes, while at others, groups of distinctive painted motifs have been produced in larger shelters. Handstencils and handprints are found in small numbers at some sites but are also found in sites with assemblages running into the hundreds.

Associated rock art traditions, which all involve a similar repetitive stylised behaviour, have been associated with all aspects of the rock art assemblage from the earliest art to the most recently produced assemblage.

In the following chapter, I will look at the spatial distribution of the structure and chronological features identified above.