WHAT BIRD IS THAT?
Identifying a Probable Painting of *Genyornis newtoni* in Western Arnhem Land

R.G. Gunn¹, L.C. Douglas¹ and R.L. Whear²

Abstract
A large painting of an unusual emu-like bird was recorded in western Arnhem Land. The painting and its setting are described in relation to reported megafauna depictions in the region. Concordance with palaeontological evidence suggests that the painting was of *Genyornis newtoni*, one of the giant ‘thunder birds’ which some palaeontologists claim became extinct around 45,000 years ago. This image raises four particular questions: Is the painting 45,000+ years old? Did *Genyornis* survive in Western Arnhem Land until much more recently than the palaeontological record demonstrates? Did the collective memory of the painters retain the precise details of the extinct animal for many thousands of years? Or, is it an image of some imaginary bird/creation ancestor? It is concluded that the painting is most likely a representation of *Genyornis newtoni* but there is insufficient evidence to indicate any age for the painting.

Introduction
In 2008, as part of the ongoing Jawoyn Cultural Heritage Programme, Ray Whear and Chris Morgan from the Jawoyn Association located an art site complex in western Arnhem Land with a range of interesting features (Gunn and Whear 2007; Gunn et al. 2010). Subsequent assessment by the authors in 2009 recognised one of the rockshelters as containing a possible representation of the extinct flightless bird *Genyornis newtoni* (Figure 1). A photograph of the image was sent to palaeontologist Peter Murray, who confirmed that it did indeed have the attributes of *Genyornis*. Extinct fauna, such as the thylacine (Tasmanian Tiger), have been reported in Arnhem Land rock art since the early 1970s (e.g. Brandl 1972). In the early 1980s the probable presence of extinct megafauna depictions in the region was highlighted and it was proposed that the rock art ‘provides a unique opportunity to search for palaeontological and archaeological evidence of the association of man and megafauna’ (Murray and Chaloupka 1984:106). In 1984, the oldest date for ochre in an archaeological deposit in the Kakadu region was just 20,000 years (Jones and Johnson 1985), and a maximum age for the depicted images was assumed to be less than 20,000 years (Murray and Chaloupka 1984:105). As *Genyornis* is considered by some to have become extinct around 45,000 BP (but see debate below), the current image may add considerably to the potential time-depth of Arnhem Land rock art.

Given the possible implications of the site, the Jawoyn Association provided a press release to the media (Masters 2010; Smith 2010). The site was recorded in greater detail in May–June 2010 to provide an initial description of the motif and a

---
¹ 329 Mt Dryden Road, Lake Lonsdale, VIC 3381, Australia gunnb@activ8.net.au
² Jawoyn Association Aboriginal Corporation, PO Box 371, Katherine, NT 0851, Australia ray.whear@jawoyn.org
discussion on the potential implications for both palaeontology and the archaeology of rock art. Further archaeological work at the site is planned in the near future.

The Problem of Interpreting Species in Rock Art

For the archaeologist, formal rock art studies tend to be undertaken through either subject or structural analysis (Morwood 2002:148ff). Of these, ‘subject analysis is the most common means … to reconstruct the cultural and natural contexts of the rock artists’ (Morwood 2002:148). Morwood (2002) provided four limitations on this process:

- it only applies to figurative art;
- the conventions used by the artist may be unknown to the researcher and hence may make identification difficult;
- the range of subjects depicted is selective, not random or absolute; and
- the skill of the artists can vary and anatomical errors may occur.

In addition, while the identification of a particular bird or animal does not ascribe or infer any particular meaning to the motif, it is also acknowledged that many proficient artists, in all world cultures, have produced images of creatures that are ‘unreal’, often having combined characteristics of various animals (such as depictions of the ‘Rainbow Snake’ which can contain elements of snakes, fish, crocodiles, emu and kangaroo, see Munro et al. 2010). To further complicate the issue of identification, post-production factors, such as weathering and superimposition over hundreds or thousands of years, can lead to misleading distortions.

In a self-deprecating paper, Macintosh (1977) compared his earlier attempt to interpret rock art from his own medical perspective (Macintosh 1952) with explanations given to Elkin (1952) by knowledgeable informants. He conceded that it was fool-hardy for any outsider to attempt to interpret Aboriginal rock art without the assistance of someone with appropriate cultural knowledge. He also concluded that there were four levels to interpretation:

- identification of the figure (motif type);
- awareness of the social context of the shelter and motifs;
- elaboration of the broader significance of the motifs; and
- the ‘inner meaning’.

He suggested that schematisation existed at each of these levels and that the ‘key’ to unlocking this was clear to the Aboriginal artist but not to outside researchers. This paper had, rightly, a profound impact on rock art recording over the following 30 years.

However, Macintosh’s attempt was made in the late 1940s when little was known about the variety and styles of Aboriginal rock art throughout Australia, and when recordings of Aboriginal interpretations of rock art were almost non-existent. In the past 50 years the situation has changed substantially, with a small number of in-depth regional studies, such as those of Chaloupka (1993) in Arnhem Land and Walsh (2000) in the Kimberley, providing enough detail such that even outsiders can now recognise regional styles and local forms of schematisation.

While this rarely assists in the interpretation of social meanings, it greatly increases the reliability of our interpretations at the first level: that of identifying what the image probably represents. Similarly more recent, informed studies have assisted in recognising the range of variation in depiction of certain motif types (e.g. Arndt 1962a, 1962b; Elkin 1952; Gunn 1992; Maddock 1970; Merlan 1989; Mulvaney 1996; Tacon 1992). On a species level, few would have problems with recognising the representation of a macropod. Further afield, there has been little reluctance in accepting paintings of extinct or locally extinct fauna in either Europe or northern Africa (e.g. Ambrose 2006; Bahn and Vertut 1988; Holl 2002; Lhote 1973), although the acceptance of some of the proposed ages has been more controversial (see Balter 2008).

Further, while there has been considerable consternation regarding the interpretation of traditional Aboriginal subjects, the same concern has not been raised for Aboriginal depictions of so-called contact art (Chaloupka 1993; Flood 1997; Macknight and Gray 1970; May et al. 2010; Tacon et al. 2010). For example, maritime historians have little trouble interpreting the type and country of origin of non-Aboriginal watercraft (e.g. Burningham 1994). While Akerman (1998) noted that the interpretation of extinct fauna from rock art was fraught with problems, Clegg and Ghantous (2003) considered that the identification of contact animals was largely through intuition and experience, suggesting that while some animals are readily accepted (i.e. interpreted), others are less so.

The problems inherent in identifying an object or species are fundamental to the acceptance or rejection of the identification. Let us present a cautionary tale from fine art studies. The small Renaissance oil painting catalogued as the Mona Lisa by Leonardo da Vinci, is arguably the most famous single piece of artwork from the Western art tradition, for its innovation, influence and mystique (McMullen 1975). Despite coming from an historical period around 500 years ago of which we have considerable written information, and although ‘we are relatively well informed about the genesis of the Mona Lisa’ (Zöllner 2007:154), the identity of the person portrayed cannot be proven and the date of its execution remains speculative. Despite intense and extensive scholarship over the past 50 years, the number of potential sitters and the time period of its production have been narrowed down but neither have been accepted unanimously (Clark 1973; Kemp 2006; Marani 2000; Zöllner 2007). In fact there is some doubt that the painting is by da Vinci – there is at least one other candidate (Kemp and Cotte 2010; McMullen 1975:6; but see Marani 2000:183, 340). In another example, a newly-discovered drawing by da Vinci was subject to an exhaustive artistic and forensic study in order to assess its authenticity (Kemp and Cotte 2010). Researchers examined the support, technique, materials, stylistic attributes, documentation, comparative analysis and later restorations and concluded that, on the basis of ‘the accumulation of interlocking reasons’ (Kemp and Cotte 2010:187), the drawing could be accepted as being by da Vinci. Whether or not it is authentic is irrelevant to the present discussion, as it is the methods used to assess the drawing and the qualifications of their conclusion that is significant in the study of the Genyornis painting (cf. Grann 2010).
In the study of fine art:

In general, scholars are trained to be skeptics [sic] ... Part of our business is to ask questions and raise doubts. Consensus is rarely arrived at, and often it takes a generation or more (Wallace, an authority on Michelangelo's artwork, quoted in Esterow 2010). For the purposes of this paper then, and in the words of the vernacular, 'if it looks like a duck, waddles like a duck, and quacks like a duck', we accept that we have reason enough to term it a 'duck' (and note Dobrez 2011). The interpretation of what the 'duck' signifies, however, is a far more complex issue that will not be attempted here.

Natural Environment

The painting in question is located in the central Arnhem Land plateau, in the headwaters of the Katherine River (Figure 2). It is on the northern wall of a shallow rockshelter (Figure 3) that sits within a larger cluster of broken sandstone stacks (Jawoyn site No. ARN-0124).

The Arnhem Land plateau consists of sharply dissected and horizontally-bedded Proterozoic quartz sandstone units of the Katherine River Group and Kurrundie Sandstone (Ferenczi and Sweet 2005:2; Nott 2003) – the orthoquartzites of Hughes and Watchman (1983). This is a very stable rock, being cemented by silica, and contrasts with the quartz sandstone of the northern outliers of the plateau which are cemented by kaolin (Hughes and Watchman 1983:74). However, in both areas silicification has in many places casehardened and stabilised the exposed surfaces (Needham 1992). The sheer cliffs and gorge walls have been formed by the erosion of the underlying softer sediments and the retreating collapse of the exposed faces. The region is tectonically stable and the surface sandstone has become deeply weathered.

While one-third of the northern plateau consists of practically bare rock (Christian and Aldrick 1977:16), field observations suggest that rock outcrops decrease in size and frequency towards the south, with exposures being largely related to the western escarpment and the major drainage lines of the central plateau area, and only minor exposures in the southeast corner.

The prevailing sparse savannah woodland on the plateau in which the rockshelter is situated is eucalypt-dominated, with a characteristic understorey of numerous leguminous and myrtaceous shrubs, and extensive spinifex and wiry grasses at ground level (Ferenczi and Sweet 2005:2). Elsewhere vegetation varies greatly with the environment, ranging from wetlands and riverine species, to tropical rainforest taxa in the deeper sheltered gullies.

Today, the region in which the site occurs is within the tropical monsoonal climate zone of northern Australia. This has a well-defined wet season with an average annual rainfall of around 1560mm, occurring between November and April, and a contrasting dry season between May and October. Temperatures are generally warm-to-hot with an average maximum temperature range from 38°C in the dry season and 32°C in the wet season. The average minimum temperature is 19°C in the dry season and 24°C in the wet season (Bureau of Meteorology 2010). These temperatures indicate that the area is not subject to the dramatic extremes experienced in other areas of Australia that can have a significant impact on rock preservation.

This climate, however, only applies to the past 500 years. Previously, there were major changes ranging from high aridity in the late Pleistocene (80,000-8000 BP), to warmer and wetter in the early-to-mid-Holocene (8000-4000 BP, with c.1.5 times present precipitation), followed by a sharp drop in rainfall to around present levels (4000-2000 BP), and then a period of high variability up until around 500 years ago (Allen and Barton 1989; Bourke et al. 2007; Kershaw 1986).

Watchman (2004) found oxalate crusts over petroglyphs in nearby Kakadu National Park to be >8000 years old and has suggested that the processes leading to crust formation probably started in the late Pleistocene or early Holocene when climatic conditions changed from cool and dry to warm and wet (Watchman 1991; see also Kershaw 1986). This higher rainfall probably resulted in a period of increased cliff failure and block collapse of the sandstone (cf. Twidale and Campbell 2005). However, shelters within a few kilometres of the site under discussion have remained.
What Bird is That?

Figure 4 Reconstructed skeleton and profile of *Genyornis* (from Murray and Vickers-Rich 2004).

relatively stable and were initially occupied over 45,000 years ago (Geneste et al. 2010). In Western Australia, the Warton sandstone that houses much of the Kimberley rock art is a similarly very stable white quartzose sandstone, with optical stimulated luminescence (OSL) dating of wasp nests indicating the rockshelter surfaces have been stable for >30,000 years (Yoshida et al. 2003). Higher rainfall in the mid-Holocene would have presented the period of greatest threat to rock art.

Cultural Environment

The site is a shallow rockshelter within the traditional lands of the Jawoyn people, whose lands incorporate the central, western and southern portions of the Arnhem Land plateau (Gunn and Weharr 2007). The shelter is one of nine art sites in a small complex (ARN-0124), in close proximity to two larger complexes (ARN-107 and 113). The other sites within this complex show the full range of Arnhem Land rock art from handprints to contact motifs, indicating occupation during all recognised art periods (cf. Chaloupka 1993).

The rock art of the Jawoyn region has a close relationship with that of the more studied art of the northern plateau (e.g. Brandl 1973; Chaloupka 1984, 1993; Chippindale and Taçon 1998; Lewis 1988; May and Domingo Sanz 2010; Taçon 1987, 1989, 1993; Taçon et al. 2004). This northern art occurs on the same sandstone type as the Jawoyn plateau art and contains many of the same rock art styles, particularly those from the earlier periods (Chaloupka 1993; Gunn and Weharr 2007). Although direct dating of the artwork puts the more recent works at less than 4000 years (Nelson 2000), there is no firm chronology for the wealth of earlier artwork other than educated guesses (see Chippindale and Taçon 1998 for a summary). Principal amongst these is the indirect evidence of apparent images of several other extinct fauna. Depictions exist throughout the plateau of an animal that closely resembles photographs and museum specimens of thylacines (e.g. Brandl 1972; Chaloupka 1993; cf. Beresford and Bailey 1981). As the thylacine has been extinct on the mainland for at least 3000 years (Beresford and Bailey 1981), this suggests that the paintings of these images are greater than 3000 years old. Many of these images are in a very good state of preservation and some overlie well-preserved artwork that appears considerably older than that of the thylacine images. This keystone forms the basis for much of the proposed dating of the early art on and around the plateau (Chippindale and Taçon 1998).

*Genyornis newtoni*

*Genyornis newtoni* was a large flightless bird endemic to Australia (Murray and Vickers-Rich 2004; Trusler et al. 2010). It stood around 2m tall and weighed around 230kg (Figure 4). It had a wedge-shaped head, exceptionally deep lower jaw, very short stubby wings, and massive hind legs with robust toes. Comparison of the attributes of the most recent palaeontological reconstructions with those in the painting suggests a close correlation (see below). All of the dromornithids, of which *Genyornis newtoni* is one of the smallest and the most recent survivor, had distinctive strong and manipulatory beaks, which in tandem with their large body mass suggests they were essentially herbivorous, with a feeding process and diet comparable to cockatoos (Murray and Vickers-Rich 2004:256). Its primary habitat was extensive shrubland (Murray and Vickers-Rich 2004:288) and the principle cause of its extinction was probably the marked reduction in this vegetation habitat dominated by fire-sensitive scleromorphic woodlands (Murray and Vickers-Rich 2004:317). This habitat had begun to decline during the Pliocene but its decline was greatly accelerated to a precarious level coincident with the assumed arrival of humans onto the continent around 50,000–55,000 BP (Bird et al. 2002; Murray and Vickers-Rich 2004:297-307; Price and Webb 2006:968; Prideaux et al. 2007a, 2007b).

Fossil remains, including eggshell and two sets of possible fossilised footprints and tracks, have been found in southeastern Australia (Rich and Gill 1976; Rich and Green 1974). Present distributions are confined to this area of the continent, although, in line with the well-known axiom, absence of evidence cannot be taken as evidence of absence unless strong additional evidence to the contrary is available. During the late Pleistocene the vegetation of the Arnhem Land plateau contained remnant pockets of scleromorphic woodlands providing a suitable habitat for *Genyornis* (Murray and Vickers-Rich 2004:298). The preservation of bone in the acidic sands of Arnhem Land is notoriously poor, with little being preserved prior to 4000 BP (Allen and Barton 1989:30; Jones and Johnstone 1985:222) and hence, for taphonomic reasons, the likelihood of finding fossil remains of any Pleistocene fauna in Arnhem Land is extremely remote.

Interpretation of the fossil evidence suggests that *Genyornis newtoni* became extinct around 45–55,000 years ago (Bird et al. 2003; Miller et al. 1999; Roberts and Brook 2010; and note Baynes 1995 cited in Miller et al. 1999), although the Cuddie Springs date of c.30,000 BP (Field and Boles 1998) remains anomalous. On the basis of DNA studies in Alaska, mammoths and horses appear to have survived longer than the recovered fossil record indicates (Haile et al. 2009). Hence it is possible that *Genyornis*, as well as other Australian megafauna, may have survived in particular refugia considerably later than our fossil record implies (Vickers-Rich, pers. comm., 2010). As qualified by Murray and Vickers-Rich (2004:288), ‘the consensus is that they were entirely gone by about 25,000 years ago’. However, survival will have required refugia big enough to have supported populations large enough to remain biologically viable for several thousand years.

If these propositions are accepted then art has survived in these shelters for many thousands of years. However, is it possible for pigment art to survive for the proposed 45,000 years?
Figure 5 Digital tracing of the art panel.

Table 1 Motif list for the ‘Genyornis’ panel. A=uppermost (most recent); G = underlayer (oldest); L=linear; S=solid; O=outline; I=infill; Hst=handstencil; st=stencil (plus combinations of these); mf=middle finger length.

<table>
<thead>
<tr>
<th>Layer</th>
<th>Motif No.</th>
<th>Technique</th>
<th>Colour</th>
<th>Form</th>
<th>Motif Type</th>
<th>Size (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>7</td>
<td>paint</td>
<td>yellow</td>
<td>L</td>
<td>simple design</td>
<td>–</td>
</tr>
<tr>
<td>A</td>
<td>11</td>
<td>paint</td>
<td>yellow</td>
<td>L</td>
<td>simple design</td>
<td>–</td>
</tr>
<tr>
<td>A</td>
<td>21</td>
<td>paint</td>
<td>yellow</td>
<td>SL</td>
<td>flying fox</td>
<td>21</td>
</tr>
<tr>
<td>A</td>
<td>13</td>
<td>paint</td>
<td>yellow</td>
<td>SL</td>
<td>flying fox</td>
<td>20</td>
</tr>
<tr>
<td>A</td>
<td>14</td>
<td>paint</td>
<td>yellow</td>
<td>L</td>
<td>simple design</td>
<td>–</td>
</tr>
<tr>
<td>B1</td>
<td>15</td>
<td>draw</td>
<td>red</td>
<td>OI</td>
<td>grid</td>
<td>17</td>
</tr>
<tr>
<td>B2</td>
<td>1</td>
<td>paint</td>
<td>red</td>
<td>OI</td>
<td>macropod</td>
<td>102</td>
</tr>
<tr>
<td>C</td>
<td>2</td>
<td>paint</td>
<td>red</td>
<td>OI</td>
<td>macropod+joey</td>
<td>87</td>
</tr>
<tr>
<td>C</td>
<td>3</td>
<td>paint</td>
<td>red</td>
<td>L</td>
<td>fragment</td>
<td>–</td>
</tr>
<tr>
<td>C</td>
<td>10</td>
<td>paint</td>
<td>red</td>
<td>OI</td>
<td>bird</td>
<td>150</td>
</tr>
<tr>
<td>D</td>
<td>4</td>
<td>paint</td>
<td>red</td>
<td>fragment</td>
<td>bird</td>
<td>–</td>
</tr>
<tr>
<td>D</td>
<td>9</td>
<td>paint</td>
<td>red</td>
<td>L</td>
<td>spear</td>
<td>–</td>
</tr>
<tr>
<td>E</td>
<td>6</td>
<td>paint</td>
<td>red</td>
<td>S</td>
<td>anthropomorph</td>
<td>&gt;160</td>
</tr>
<tr>
<td>F</td>
<td>5</td>
<td>paint</td>
<td>red</td>
<td>OI</td>
<td>Genyornis</td>
<td>166</td>
</tr>
<tr>
<td>G</td>
<td>8</td>
<td>stencil</td>
<td>red</td>
<td>Hst</td>
<td>right hand</td>
<td>mf 7</td>
</tr>
<tr>
<td>G</td>
<td>16</td>
<td>stencil</td>
<td>red</td>
<td>Hst</td>
<td>unknown</td>
<td>–</td>
</tr>
<tr>
<td>G</td>
<td>17</td>
<td>stencil</td>
<td>red</td>
<td>Hst</td>
<td>right hand</td>
<td>mf 7</td>
</tr>
<tr>
<td>G</td>
<td>18</td>
<td>stencil</td>
<td>red</td>
<td>Hst</td>
<td>left hand</td>
<td>mf 8</td>
</tr>
<tr>
<td>G</td>
<td>19</td>
<td>stencil</td>
<td>red</td>
<td>Hst</td>
<td>unknown</td>
<td>–</td>
</tr>
<tr>
<td>G</td>
<td>20</td>
<td>stencil</td>
<td>red</td>
<td>Hst</td>
<td>left hand</td>
<td>mf 8</td>
</tr>
<tr>
<td>G</td>
<td>21</td>
<td>stencil</td>
<td>red</td>
<td>Hst</td>
<td>right hand</td>
<td>mf 7</td>
</tr>
<tr>
<td>G</td>
<td>22</td>
<td>stencil</td>
<td>red</td>
<td>unknown</td>
<td>fragment</td>
<td>–</td>
</tr>
<tr>
<td>G</td>
<td>23</td>
<td>stencil</td>
<td>red</td>
<td>Hst</td>
<td>unknown</td>
<td>–</td>
</tr>
<tr>
<td>G</td>
<td>24</td>
<td>stencil</td>
<td>red</td>
<td>Hst</td>
<td>unknown</td>
<td>–</td>
</tr>
<tr>
<td>G</td>
<td>25</td>
<td>stencil</td>
<td>red</td>
<td>Hst</td>
<td>left hand</td>
<td>mf 5</td>
</tr>
<tr>
<td>G</td>
<td>26</td>
<td>stencil</td>
<td>red</td>
<td>Hst</td>
<td>left hand</td>
<td>mf 5</td>
</tr>
<tr>
<td>G</td>
<td>27</td>
<td>stencil</td>
<td>red</td>
<td>Hst</td>
<td>left hand</td>
<td>mf 5</td>
</tr>
<tr>
<td>G</td>
<td>28</td>
<td>stencil</td>
<td>red</td>
<td>object st</td>
<td>unknown</td>
<td>17</td>
</tr>
</tbody>
</table>
To date the oldest dated pigment on a rock surface in Australia is >28,000 BP (Campbell et al. 1996), with the oldest painted motifs reportedly dated to >17,000 BP (Roberts et al. 1997; but note arguments against this date in Bednarik 2010:99). Hence, while it appears that pigment may survive 25,000 years, the possibility of poorly-protected pigment surviving 45,000 years has still to be demonstrated.

**Recording**

The site and art panel was extensively photographed with a Nikon D90 camera using a variety of lens and lighting combinations. To produce a detailed recording of the motif, a 36Mb digital photograph was imported into Adobe Photoshop© (36cm x 24cm @ 300dpi) and, using layers, was traced with the pencil tool (3 pixel diameter), followed with the paint-bucket tool when enclosed areas were defined. One layer concentrated on the outline and areas of heavier pigment, while a second concentrated on the areas of lighter pigment wash. Additional separate layers were used for the earlier stencils and later pigment layers (cf. Gunn et al. 2010; although in this case, the D-stretch programme proved of little use clarifying the motif shape or superimpositioning of the panel motifs).

**The Painting**

The ‘*Genyornis*’ image is the largest and most central of 28 paintings and stencils across the panel (Figure 5). What remains of the painting exists as a red ochre stain (cf. Hughes and Watchman 1983:44). The image was initially painted with an outline and a pigment wash (Figure 6). Subsequently, but of an unknown time-depth, the outline was (partially?) repainted with a heavier line. The pigment varies in intensity across the figure owing to wash and over-painting but for the most part the outline is distinct. Two areas, however, are indistinct: the left (back) leg and the bottom section of the neck. The former is due to the deleterious effects of salt and granular exfoliation, while the latter is due to (salt-induced?) leaf exfoliation. The motif is 1.66m long and 1.07m wide, and the base of the toe is 1.7m above the ground. The full extent of the figure is readily reached from a large roof-fall block below the panel.

The ‘*Genyornis*’ stands with its head outstretched to the right, tending to follow the form of the rock surface, although not constrained by it. Based on superimposition and preservation, no other artwork on the panel appears to be contemporary with the figure. It is not clearly depicted in either a dead or lively pose (cf. Murray and Chaloupka 1984:111). While the image appears over-weighted towards the head, this is exactly what would be expected in a near-wingless, terrestrially-mobile bird, where the body mass is centred over the massive musculature of the hind limbs (Murray and Vickers-Rich 2004:184). The particular pose represented is clearly deliberate as the panel would have been large enough to have the figure positioned upright had this been required. It appears that the figure is portrayed in a stylised pose in which particular traits are over-emphasised (cf. Brandl 1980:8). Of these the head shape (including blunt beak), long neck, stubby legs, tail-less rump and large heavy feet are the dominant features. To stress this interpretation, the figure is painted in twisted perspective, with the feet portrayed in plan view to better show the three-toed structure, while the body and legs are in profile (with the left leg overlapping the right).

Although large and apparently naturalistic, the painting is not a classic of Chaloupka’s ‘Large Naturalistic figures’ phase as it lacks the rapidly and surely painted ‘free-flowing’ outline and the overall weightlessness of the animals (see Murray and Chaloupka 1984 for full definition). In contrast, the outline of the ‘*Genyornis*’ is heavily applied and, overall, the figure has a decidedly stolid, weighty and monumental appearance. However, in line with another of the characteristics of the phase, the legs and neck are decorated with a striped infill while the bulk of the outlined body is filled with an ochre wash (and with a centre-line that parallels a schematic path of the alimentary canal; although there are insufficient indicators to suggest incipient x-ray features). The head is well-defined and
Figure 7 Shadow movement across the ‘Genyornis’ art panel, mid-June 2010.

Figure 8 Areas of water-wash and exfoliation on the ‘Genyornis’ art panel.
somewhat triangular in shape, but with a distinctive broad and rounded beak, in contrast to the sharp pointed beak depicted on emus. What appears to be a representation of an eye on the original and in photographs is in fact an area of exfoliation over which the painting was applied. It is unlikely that this was an intentional use of the rock surface, as the painting is not correctly positioned to take full benefit of the mark. The thighs and legs are stocky while the feet are massive and with rounded toes rather than sharp pointed claws. The rump is short and blunt and there is no indication of feathers, such as are depicted in apparently similar-aged paintings of emu (cf. Chaloupka 1993:109). This might indicate a ‘plucked’ bird or a featherless (burnt) carcass following cooking (cf. Murray and Vickers-Rich 2004:205). Alternatively, it might simply indicate the compactness of the feathers (as in the related magpie goose) in contrast to the loose feathers of an emu (cf. Trusler et al. 2010).

The art panel contains 27 other motifs (Figure 5). Sequentially, the ‘Genyornis’ post-dates a series of faint red handstencils including a ‘3mf’ handstencil (motif 20). It was subsequently superimposed by at least four other motifs (paintings in red and yellow, and a red ochre drawing, see Table 1). The spear that overlies the ‘Genyornis’ figure appears to be somewhat later and whether it was placed in reference to the ‘Genyornis’ is unknown. Some of the more recent paintings, including an overlying large and solid male figure, have deteriorated significantly more than the ‘Genyornis’ image. Although the reason for such overlying figures to be less well-preserved is unknown, it is not an uncommon pattern across the plateau. It is possible that it results from different climatic conditions at the times the different layers were painted, with the underlying paintings being produced during a significantly drier period (such as during the late Pleistocene).

‘3mf’ handstencils have previously been considered contemporary with the Dynamic style (Chaloupka 1984, 1993; although this is currently under review). Most recent guesses have proposed that the Dynamic style is around 10,000 years old (Chippindale and Taçon 1998) which, if approximately correct, makes the ‘Genyornis’ painting less than 10,000 years old. However, as no dates can be convincingly ascribed to any Arnhem Land styles/traditions prior to c.5000 BP, this is of little help in either supporting or refuting the age of the ‘Genyornis’ figure. The superimposition does indicate that the ‘Genyornis’ is not amongst the earliest pigment art on the plateau.

**Shelter**

The shelter is within a small residual stack of a white, well-sorted, medium-grained, quartz sandstone (Marlgowa Sandstone, the upper sandstone in the Kombolgie Formation, Katherine River Group: Ferenczi and Sweet 2005:43; see also Hughes and Watchman 1983). The shelter was formed by the collapse of a large block from the northern face of the stack, presumably due to stress release from erosional undercutting (Figure 6). The overhang housing the ‘Genyornis’ figure is some 5m long and 3m high, with a maximum overhang of 1.5m. The panel faces slightly east of north.

Such a shallow shelter would seem to offer little protection for the artwork within. A plot of the shadow movement in mid-June, however, reveals that all but the lower toes of the ‘Genyornis’ are in shade from 10am (Figure 7). At other times of the year the shade would be greater, suggesting that the ‘Genyornis’ is protected from solar extremes, which can be a major factor in pigment deterioration and rock disintegration throughout the year (Thorn and Dean 1995). The panel has been subject to water-wash (Figure 8) which doubtless accounts for the change of colour and partial erasure of those motifs on the left side of the panel (cf. Chaloupka 1978; Hughes and Watchman 1983).

**Assessment**

Palaeontologist Peter Murray examined a photograph of the motif in question and agreed that it had eight diagnostic features consistent with *Genyornis*. These were:

- a deep convex bill, very unlike any casuariiformes;
- a globular cranium;
- relatively thick neck;
- indication of a crop (emus and cassowaries lack crops);
- unusual posture of the wing (unlike the pendulous wing posture of emus);
- the proportions of the pelvic limb showing long tibiotarsi and stout tarsometatarsi;
- the short, broad toes terminating in blunt, robust claws; and
- a dorsal profile exactly paralleling that of reconstructed dromornithids and quite unlike an emu or a cassowary, in which the vertex of the back is more anterior (Peter Murray, pers. comm., 2010).

These concurrences are also borne out through reference to the fossil fragments and reconstructed images in *Magnificent Mihirungs*, the authoritative study on extinct Australian Dromornithidae (Murray and Vickers-Rich 2004) (cf. Figure 9).

Previously, Murray and Chaloupka (1984:106) had argued that ‘the recognition of a species depends on a combination of a few distinctive features rather than overall attention to detail’, although in certain cases ‘a single well-represented feature [could be] deemed sufficient to distinguish [an] animal from all forms of taxa in the artists graphic vocabulary’. Consequently, Murray (pers. comm., 2010), considered ‘that this is as fine a depiction of a living *Genyornis* as we are ever likely to see’ and, hence, from a palaeontological perspective, the painting is highly likely to be a representation of *Genyornis newtoni*.

Clegg (1978) elucidates the problems of diagnosing the subject of prehistoric pictures (pictures without the interpretation of the
Hall et al. (1951) reported petroglyphs of the tracks of a ‘giant emu’ from Pimba in South Australia, which was followed by a comment from Tindale (1951:381) as to the ‘distinct possibility’ that in Australia man may have been a contemporary of giant extinct birds such as Genyornis newtoni. Tindale then draws, somewhat extremely, on late nineteenth century Aboriginal mythology for support in the interpretation of the petroglyphs.

Paintings of extinct fauna in Arnhem Land have long been recognised, particularly with representations of the thylacine (Thylacinus cynocephalus: Brandl 1972; Chaloupka 1975, 1993; Lewis 1977, 1988), thought to have become extinct parallel with the arrival of the dingo around 4000 years ago. Other mainland extinct fauna reported from Arnhem Land rock art include:

- Tasmanian Devil (Sarcophilus harrisii: Callaby and Lewis 1977; Chaloupka 1993; Lewis 1988);
- Thylacoleo, the marsupial lion (Thylacoleo carnifex: Murray and Chaloupka 1984);
- Sthenurus, a giant macropod (Sthenurus stirlingi: Murray and Chaloupka 1984);
- Zaglossus, a giant echidna (Zaglossus sp.: Murray and Chaloupka 1984); and
- Palorchestes, a marsupial tapir (Palorchestes australi: Chaloupka 1984, 1993; Murray and Chaloupka 1984; Lewis 1986).

The Tasmanian Devil became extinct on the mainland only some 400 years ago (Archer and Baynes 1972; Guiler 1982), while Zaglossus became extinct in Australia around 18,000 years ago (Murray 1978). Palorchestes and Sthenurus were extinct by 25,000 years ago (concordant with Murray and Vickers-Rich’s 2004 ‘consensus’ minimum age for Genyornis).

A possible image of Sthenurus has also been reported from Arnhem Land, but its identification remains dubious (Chaloupka 1984, 1993; Murray and Chaloupka 1984). The report of an image of Thylacoleo is similarly unconvincing, although the reporting of two possible examples in the Kimberley region (Akerman 1998, 2009; Akerman and Willing 2009) gives some support to the possibility of the species within Arnhem Land rock art. Of interest is Akerman’s (1998) description of one of the Thylacoleo paintings being on a very exposed rock wall and yet appearing to correlate with Walsh’s Irregular Infill period, which pre-dates the better known Gwion (or Bradshaw) paintings (Walsh 2000) and has been tentatively dated to >17,000 BP (Roberts et al. 1997). Lewis (1984:60) also reported on the survival of ‘old’ red Mimi art on faces fully exposed to annual monsoonal rains. Like Lewis (1984, 1997), Akerman also equates the early art of the Kimberley with that found in Arnhem Land. Thylacoleo, like Genyornis, is believed to have become extinct around 45,000 years ago (Roberts et al. 2001; Prideaux et al. 2007a) and hence an image of the animal further supports either the possibility of 45,000 year old paintings or of the notion that the proposed extinction date may be less than is generally accepted.

Collective Memory

The question of the human capability to retain the precise details of the extinct animal for many thousands of years is considered highly unlikely. This is because humans have a propensity to modify copied visual examples (cf. Clegg 1979:27-30), provide
varying interpretations from witnesses of the same incident (e.g. Mannan and Weishmann 2003), and incorrectly relay verbal information.

While notions of a 'giant emu' in the most general terms may have persisted into the ethnographic present (Dawson 1881:92–93), we cannot accept that such detailed knowledge of the bird's anatomy would be reliably transmitted either orally or visually.

Conclusion

Regarding the questions that began this paper, as we do not have a living example of a Genyornis newtoni for direct comparison and as the red pigment stain cannot be directly dated, we cannot present certain and indisputable proof that this is a painting of Genyornis newtoni. However, we have taken the first steps in a similar approach to that of fine art studies and feel we have presented sufficient evidence that, on the basis of probability, the painting is indeed a representation of Genyornis newtoni.

Both the Genyornis painting and the previously recorded Palorchestes painting are large and visually dominant remnant-red paintings on vertical surfaces. Possibly contemporary, large and dominant paintings of macropods appear in similar contexts in other sites on the plateau suggesting that there was a particular and important social role for these visually outstanding paintings.

The question of the painting being at least 25,000 years old or greater cannot be answered on present data. Similarly, the question as to whether Genyornis was present in western Arnhem Land, or survived until much more recently than the present. Finally, as the ‘Genyornis’ image is not a part of the living Jawoyn culture, informed methods cannot determine if it is an image of some imaginary bird/creation ancestor. However, the undertaking of further archaeological and palaeontological studies at this site and elsewhere may help resolve some of these questions.

Acknowledgements

Our thanks go to the Jawoyn Association and Margaret Katherine, traditional owner, for permission to work on their sites and to develop this paper. David Lee and Charlotte Anderson assisted with the fieldwork and Chris Morgan flew us out to the site. Particular thanks go to Peter Murray and Pat Rich for discussions on the attributes of the image, Kim Akerman, Ken Mulvaney, Bert Roberts, Matt Cupper and Graeme Ward for discussions on the background for, and comments on, aspects of the paper. Further, our thanks go to Bruno David, June Ross and an anonymous referee for their constructive and supportive criticisms of the paper, and to Robert Bednarik for his critical insights and comments into the problems raised by our interpretation of the motif. The title of the paper is taken from What Bird is that? A Guide to the Birds of Australia, a popular guide by Neville Cayley that served bird observers from 1931 until the advent of the more environmentally aware generation of the 1970–1980s (e.g. Pizzey 1980 etc).

References


Archer, M. and A. Baynes 1972 Prehistoric mammal faunas from two small caves in the extreme southwest of Western Australia. Journal of the Royal Society of Western Australia 55:80–89.


Tempsus 6. St Lucia, QLD: Anthropology Museum, Department of Anthropology and Sociology, University of Queensland.


Roberts, R.G. and B.W. Brook 2010 And then there were none? Science 327:420-422.

