

Pundawar Manbur





Pundawar Manbur

The art sequence of a major Kwini rock art site in the Kimberley, northern Australia

Robert Gunn, Bruno David, Jean-Jacques Delannoy,
Benjamin Smith, Damien Finch,
Augustine Unghangho, Ian Waina,
Balanggarra Aboriginal Corporation, Leigh Douglas,
Pauline Heaney, Cecilia Myers, Sven Ouzman
and Peter Veth



Augustine Unghangho, Senior Traditional Owner of Pundawar Manbur, at the site in 2023.
(Photograph by Mark Jones, Copyright Balanggarra Aboriginal Corporation).



Ian Waina, Delegated Traditional Owner, who oversaw fieldwork at Pundawar Manbur.
Photograph courtesy of Sven Ouzman, 2017.



ARCHAEOPRESS PUBLISHING LTD
13-14 Market Square
Bicester
Oxfordshire OX26 6AD
United Kingdom
www.archaeopress.com

ISBN 978-1-80583-147-1
ISBN 978-1-80583-148-8 (e-Pdf)

© the individual authors and Archaeopress 2025

Cover: The *manbur* (kangaroo) motif from Pundawar Manbur. (Photograph by Robert Gunn).



This project is supported with funding from Rock Art Australia



This work is licensed under the Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License. To view a copy of this license, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/> or send a letter to Creative Commons, PO Box 1866, Mountain View, CA 94042, USA.

This book is available direct from Archaeopress or from our website www.archaeopress.com

Contents

List of Figures and Tables.....	iii
Authors and Affiliations.....	xiii
Acknowledgements	xv
Chapter 1: Introduction	1
Chapter 2: Rock Art of the Kimberley, Western Australia	4
Chapter 3: Pundawar Manbur: Background and Approach	14
Chapter 4: Geological and Geomorphological Setting, from the Plateau to the Site	22
 PART A: Pundawar Manbur Art Panel A	
Introduction: Art Panel A	35
Chapter 5: The Art of Art Panel A1	38
Chapter 6: The Art of Art Panel A2	43
Chapter 7: The Art of Art Panel A3	51
Chapter 8: The Art of Art Panel A4	61
Chapter 9: The Art of Art Panel A5	78
 PART B: Pundawar Manbur Art Panels B–L	
Introduction: Art Panels B–L	93
Chapter 10: The Art of Art Panel B	94
Chapter 11: The Art of Art Panel C	100
Chapter 12: The Art of Art Panel D	102
Chapter 13: The Art of Art Panel E.....	108
Chapter 14: The Art of Art Panel F.....	110
Chapter 15: The Art of Art Panel G	112
Chapter 16: The Art of Art Panel H.....	115
Chapter 17: The Art of Art Panel J	119
Chapter 18: The Art of Art Panel K	124
Chapter 19: The Art of Art Panel L.....	130

PART C: Superpositions at Pundawar Manbur

Introduction: Superpositions at Pundawar Manbur.....	135
Chapter 20: Art Panel A1 Superpositions	137
Chapter 21: Art Panel A2 Superpositions	141
Chapter 22: Art Panel A3 Superpositions	145
Chapter 23: Art Panel A4 Superpositions	151
Chapter 24: Art Panel A5 Superpositions	159
Chapter 25: The Art Sequence and Chronology of Pundawar Manbur	169
Chapter 26: Conclusion	183
References	186
Appendix 1: Art Panel A Motif List	192
Appendix 2: Art Panels B–L Motif List.....	203
Appendix 3: Pundawar Manbur Motif Tallies for Art Panel A	209

List of Figures and Tables

Chapter 2: Rock Art of the Kimberley, Western Australia

Figure 2.1. Location of Pundawar Manbur.	5
Figure 2.2. Pundawar Manbur rock shelter (A) and the smaller alcove with rock art next to it (B). (Note: the vegetation was burnt prior to our 2018 visit to record the art). (Photograph by Leigh Douglas).	5
Figure 2.3. The <i>manbur</i> (kangaroo) motif from Pundawar Manbur. (Photograph by Robert Gunn).....	6
Figure 2.4. Contrasting art styles of the Kimberley region. A: Wanjina from Borologa 1, Kwini Country. B: Gwion from Kwini Country. (Photographs by Robert Gunn).	7
Figure 2.5. Welch's 1993 Kimberley rock art sequence (Welch 1993a: 15).	9
Figure 2.6. Welch's illustrated sheet of his initial Kimberley rock art sequence, which he distributed at the 1992 AURA conference. It was subsequently published in Welch (1993c: 100).	9
Figure 2.7. Walsh's initial Kimberley rock art sequence (Walsh 1994: 18).	10
Table 2.1. Published rock art sequences: nomenclature and characteristics. Compiled from Donaldson 2012; Veth et al. 2018; Welch 2000 and Welsh 1993c.	11

Chapter 3: Pundawar Manbur: Background and Approach

Figure 3.1. Typical unburnt vegetation from the study area. (Photograph by Leigh Douglas).	14
Figure 3.2. Pundawar Manbur from the southeast. (Photograph by Leigh Douglas).	15
Figure 3.3. Shelter interior from the southeast. (Photograph by Robert Gunn).....	16
Figure 3.4. Photo-mosaic of the sloping rock-slabs from the northwest. The top-left area was not captured as part of the panorama. (Photograph by Robert Gunn).....	16
Figure 3.5. Plan of the Pundawar Manbur shelter.....	16
Figure 3.6. Shelter cross-section at X-X'	17
Figure 3.7. Shelter cross-section at Y-Y'	17
Figure 3.8. The highly decorated rear wall at Pundawar Manbur. (Photograph by Robert Gunn).	18
Figure 3.9. Recording Pundawar Manbur. From top, Robert Gunn, William Maraltadj Jnr, Rowan Waina, Madeleine Kelly and Ken Mulvaney. (Photograph by Leigh Douglas, 2017).....	18
Figure 3.10. Position of the Art Panels within the shelter. (Note the off-vertical distortion of the far right edge of Art Panel A in this photograph). (Photograph by Robert Gunn).	19
Figure 3.11. Art Panel A subdivisions (Art Panels A1–A5). (Photograph by Robert Gunn).	19

Chapter 4: Geological and Geomorphological Setting, from the Plateau to the Site

Figure 4.1. Pundawar Manbur's geological context. Infographic: Jean-Jacques Delannoy.....	23
Figure 4.2. Oblique view of Pundawar Manbur's landscape setting. The plateau, which developed at an altitude of 160–200m above sea level, is criss-crossed by a dense network of fractures (here shown by the straight black lines). These fractures guide water-flows, and the intermittent stream that passes below Pundawar Manbur has low hydrological and erosional energy. This is a key reason why it continues to follow the WNW–ESE fracture. Infographic by Jean-Jacques Delannoy.	23
Figure 4.3. Satellite image of the quartzite plateau and Drysdale River that runs along its edge. CNES–Airbus 2023 satellite image of the network of fractures in the quartzite bedrock. The fracturing is particularly noticeable where the quartzite outcrops. The hydrographic network is also highly dependent on the structural geology. Infographic by Jean-Jacques Delannoy, from Google Earth base photo.	24
Figure 4.4. Evolution of the study region's valley slopes incised in quartzite bedrock. A: Block diagram representing Pundawar Manbur's geological environment. The network of fractures can be seen along two orthoclinal (i.e., perpendicular) directions (in red). Watercourses cut into the geological substratum at points of weakness. B: Zoom-in onto the side of the valley. After the valley was established, mechanical relaxation of the bedrock surface took place parallel to the slope and edge of the plateau. Mechanical stress-relief cracks developed along the edge of the escarpment, weakening the rock mass. C: Under the effect of mechanical stress-relief, parallel voids formed along the upper part of the bedrock. D: When the point of mechanical failure was reached, sections of the exposed bedrock broke away from the escarpment near the top of the slope, which is more prone to mechanical stress-relief. The collapsed blocks may ('1') gradually slide down the hillside, or ('2') undergo sudden collapse. Both these trends are evident along the Pundawar Manbur slope. Block A1, which contains Pundawar Manbur, formed through Type 1 rockfall. Infographic by Jean-Jacques Delannoy.	25
Figure 4.5. Pundawar Manbur in its geomorphological setting. The two slipped rock masses A1 and A2 (light colour; A3 is not readily visible at this angle) and the collapsed blocks (orange colour) that together make up the site of Pundawar Manbur, highlighted on a black and white rendition of the original photo. The photo shows the tabular nature of the quartzite plateau and piles of boulders that litter the valley slope all the way down to its thalweg (lowest level) in the foreground. Photograph by Leigh Douglas. Infographic by Jean-Jacques Delannoy.	26
Figure 4.6. The rugged slope of Pundawar Manbur. Pundawar Manbur formed as a result of the downslope slide of two rock masses, quartzite blocks A1 and A2. The entire slope is prone to gravitational forces, resulting in parallel mechanical stress-relief cracks and geological fractures. Blocks A1, A2 and A3	

became detached from the plateau's upper ledge, descending down the slope until blocks A1 and A2 came to rest against the outcropping bedrock downslope. Initially, A1, A2 and A3 formed a single, continuous quartzite mega-block along the valley's upper ledge. To the east (left of photo), 'B' and 'C' represent a collapsed chaos of blocks that also originated from the top of the slope. The blocks numbered '1' represent rockfall from the edge of A1. Their collapse probably took place during A1's downward slide into the slightly separated A2, causing stresses along A1's lower edge. This resulted in the formation of the current overhang. Subsequent rockfalls from the ceiling are shown as blocks '2'. Photograph by Robert Gunn. Infographic by Jean-Jacques Delannoy.	27
Figure 4.7. Morphogenesis of the Pundawar Manbur slope. Photograph by Leigh Douglas. Infographic by Jean-Jacques Delannoy.	28
Figure 4.8. Geomorphological map of Pundawar Manbur. The legend is the same as that of Figure 4.7. The map clearly shows the collapse of the overhanging cap of the 'A' set of blocks, which was initially a much larger conjoined set consisting of A1, A2 and the smaller satellite blocks ('1' and smaller conjoining blocks). A2 came to rest on the outcropping bedrock, halting its descent down the slope. A1 abutted against A2 and remained directly below its point of origin. This can be clearly seen in the parallel edge of the overhang of the rock shelter and collapsed boulder. 3D photogrammetric model by Jean-Jacques Delannoy, from photos by Leigh Douglas and Robert Gunn. Infographic by Jean-Jacques Delannoy.	29
Figure 4.9. Morphogenic evolution of the Pundawar Manbur rock shelter in block A1. The colour code differentiates three phases of rockfall under the overhang. '1' corresponds to the collapsed blocks on the edge of the shelter. '2' relates to the collapsed ceiling layer under much of the overhang. '3' refer to the collapsed blocks from the cornice at the top of the back wall. The gap—a narrow corridor—between the back wall and the fallen ceiling slab ('2') is clearly visible; rockfall '3' is wedged in this gap. '4' are blocks that were manually removed by people in the past from the gap between the back wall and the large fallen slab ('2'). Photo: Robert Gunn. Infographic by Jean-Jacques Delannoy.	30
Figure 4.10. Physical evolution of the interior of the rock shelter. Colour coding is the same as for Figure 4.9. Photograph by Robert Gunn. Infographic by Jean-Jacques Delannoy.	31
Figure 4.11. Archaeomorphological map of the rock shelter at Pundawar Manbur. Detailed cartography by Jean-Jacques Delannoy, from basemap by Robert Gunn.	32

Introduction: Art Panel A

Table A.1. Art Panel A: Size and number of motifs per art panel.	35
Table A.2. Art Panel A: Motif and superposition density for each sub-panel.	36
Figure A.1. Art Panel A: Condition summary, with prominent motifs indicated.	36
Figure A.2. Recent, deteriorating white pigment overlying well-preserved dark red pigment produced some 12,000 years before the white, as determined by radiocarbon ages on overlying mud-wasp nests (Art Panel A3).	36

Chapter 5: The Art of Art Panel A1

Table 5.1. Art Panel A1, summary of the art by technique. 'Fragments' includes fragments in all techniques.	38
Figure 5.1. Art Panel A1, photograph taken with flash. (Photograph by Robert Gunn).	39
Figure 5.2. Art Panel A1, photo-tracing.	39
Figure 5.3. Art Panel A1, motif codes.	39
Figure 5.4. Photo-tracing of the scratched motifs on Art Panel A1. The dimensions of motif #2 (scratched anthropomorph) are 133 x 57cm. Superpositioning: #4 overlies #5 and #186 overlies #14.	40
Figure 5.5. Photograph of faintly scratched outlined hands. Maximum lengths of hands: motif #14: 22cm; motif #17: 13cm. (Photograph by Robert Gunn).	40
Figure 5.6. Art Panel A1 motif #20 (variant hand stencil). Knuckle width: 9.5cm. (Photograph by Robert Gunn).	40
Figure 5.7. Art Panel A1 motif #3 (Dala Gwion). (Photograph by Robert Gunn).	41

Chapter 6: The Art of Art Panel A2

Table 6.1. Art Panel A2, summary of the art.	43
Figure 6.1. Art Panel A2, Photographed with flash. (Photograph by Robert Gunn).	44
Figure 6.2. Art Panel A2, original photograph enhanced with DStretch_lye10 to highlight indistinct yellow paintings.	44
Figure 6.3. Art Panel A2, photo-tracing.	44
Figure 6.4. Art Panel A2, variant and standard red hand stencils, and red animal motifs (#26 and #30) from the Irregular Infill Animal Period.	45
Figure 6.5. Art Panel A2, Ngunuru Gwion figures in red and yellow, with other contemporaneous motifs.	45
Figure 6.6. Art Panel A2, non-figurative motifs and a fragmentary anthropomorph (#78).	45
Figure 6.7. Ngunuru Gwion with superimposed battering (#25 and #27). The larger figure is 132cm tall. (Photograph by Robert Gunn).	46
Figure 6.8. Ngunuru Gwion (#25 and #27) and battering (#25a and #27a). A: Gwion figures. B: Gwion figures with battering. C: Detail of battering on the knees/thighs.	46
Figure 6.9. Head and headdress details on motif #27. Note the use of two colours in outline and infill, and subsequent battering over the head. (Photograph by Robert Gunn).	46
Figure 6.10. Details of body decoration on motifs #25 and #27. (Photograph by Robert Gunn).	47
Figure 6.11. Yellow Ngunuru Gwion (#74 and #75). The larger motif #75 is 78cm tall. (Photograph by Robert Gunn).	48

Figure 6.12. Superposition of Gwion (#89) over Gwion (#88), over variant hand stencil (#90). Photograph, DStretch_rgb010 enhancement, and detail of the superpositions. The variant hand stencil's knuckle width is 9cm.	48
Figure 6.13 Small Gwion figures (#31 and #32). Motif #31 (left) is 17cm tall. The percussion marks on the bodies of both figures may be battering or accidental damage. (Photograph by Robert Gunn).	49
Figure 6.14. Variant hand stencil, motif #48. Note the similarity of form to motif #20 (Figure 5.1) and other variant hand stencils on this panel. The knuckle width of motif #48 is 9.5cm. (Photograph by Robert Gunn).	49
Figure 6.15. Large geometric design (#44), which is one of the most recent motifs on Art Panel A2. Photograph and DStretch_rgb010 enhancement. The motif is 103 x 62cm in its two greatest perpendicular dimensions. (Photograph by Robert Gunn).	50

Chapter 7: The Art of Art Panel A3

Table 7.1. Art Panel A3, summary of the art by technique. 'Fragments' includes fragments in all techniques.	51
Figure 7.1. Art Panel A3, photograph taken with a flash. (Photograph by Robert Gunn).	52
Figure 7.2. Art Panel A3, photo-tracing.	52
Figure 7.3. Art Panel A3, hand and boomerang stencils, and painted animals from the Irregular Infill Animal Period.	52
Figure 7.4. Art Panel A3, Ngunuru Gwion (#127–#129), Yowna Gwion (#132–#136) and other contemporaneous motifs.	53
Figure 7.5. Art Panel A3, Wanjina figure (#138) and other contemporaneous motifs.	53
Figure 7.6. Art Panel A3, dry pigment drawings (#145–#154), yellow fragmented motif (#155), scratching (#156), and a painted boomerang (#157) that follows the shape of an earlier stencilled boomerang (#115).	53
Figure 7.7. The Wanjina image, motif #138 (photograph and DStretch_yye10 enhancement). Note the deterioration of the Wanjina's pigment compared with that of the underlying Gwion figures. The Wanjina is 106cm tall and 108cm wide. (Photograph by Robert Gunn).	54
Figure 7.8. Details of Wanjina image (#138) showing the overlapping of the white infill by its red outline. A: Showing the lack of earlier red outline. B: Red overpainting of stem bases of headdress. C: Rapid application of thin red pigment cutting over the edge of the white pigment. (Photograph by Robert Gunn).	54
Figure 7.9. Two Ngunuru Gwion (#127 and #128) underlying the Wanjina image (#138). A: Flash photograph. B: DStretch_lds10 enhancement. C: Photo-tracing. Motif #127 is 66cm tall. (Photograph by Robert Gunn).	55
Figure 7.10. The four Yowna Gwion on Art Panel A3. Motif #136 length: 47cm. (Photograph by Robert Gunn).	56
Figure 7.11. Unusual, simplified anthropomorphic figure (#126). Motif length: 13cm. (Photograph by Robert Gunn).	56
Figure 7.12. Stick figure with solid head (#131). Motif length: 18cm. (Photograph by Robert Gunn).	56
Figure 7.13. Photo-tracing of the large animals from the lower art layers. Motif #105: macropod; motif #119: unidentified (and possibly incomplete).	57
Figure 7.14. Bar rows (#478–#480) on Art Panel C (above Art Panel A2). Note the row of superimposed Gwion figures (#481–#484) with legs curving under the overhang of the panel. (Photograph by Ken Mulvaney).	57
Figure 7.15. Bar row (#124) above the main area of Art Panel A3. Motif width: 47cm. (Photograph by Leigh Douglas).	57
Figure 7.16. Three dry pigment drawings in dark red pigment. Motif #153 length: 39cm. (Photograph by Robert Gunn).	58
Figure 7.17. Red drawing (#149) over exfoliated surface that has damaged hand stencils #106 and #107. Detail of Red drawing (#149) at right. (Photographs by Robert Gunn).	58
Figure 7.18. Red line drawing (#150) and parallel black line drawing (#151) overlying the white of the Wanjina image (#138). Neither line could be accurately measured. (Photograph by Robert Gunn).	59
Figure 7.19. Scratched simple design (#156): photo-tracing and flash photograph. Motif length: 28cm. (Photograph by Robert Gunn).	59
Figure 7.20. Yellow+white painting (#155): Flash photograph and DStretch_lds10. Height of yellow pigment area c. 110cm. (Photograph by Robert Gunn).	60
Figure 7.21. Red painting infill (#157) of dark red boomerang stencil (#115). Boomerang width: 44cm. (Photograph by Robert Gunn).	60

Chapter 8: The Art of Art Panel A4

Table 8.1. Art Panel A4, summary of the art by technique. 'Fragments' includes fragments in all techniques.	61
Figure 8.1. Art Panel A4, flash photograph. (Photograph by Robert Gunn).	62
Figure 8.2. Art Panel A4, photo-tracing.	62
Figure 8.3. Art Panel A4, hand stencils in red and deep red pigments.	62
Figure 8.4. Art Panel A4, animal motifs from the Irregular Infill Animal Period, including the initial painting of the <i>manbur</i> motif, and a boomerang stencil (#165).	63
Figure 8.5. Art Panel A4, Yowna Gwion (#136, #188–#191), Ngunuru Gwion (#187) and remnant Dalal Gwion (#192).	63
Figure 8.6. Art Panel A4, first re-painting of the <i>manbur</i> image (#177a), and a row of flying foxes hanging from a branch (#201) and other assorted motifs.	63

Figure 8.7. Art Panel A4, small anthropomorph (#208; 18cm tall), and various non-figurative motifs. Motif #120 is the tail-half of the snake that began on Art Panel A3.	64
Figure 8.8. Art Panel A4, assorted motifs in a range of colours and techniques. The complexity of the design of motif #226 is unique at this site. The set of drawn black lines (#177b) are all across the body of the <i>manbur</i> motif and overlie motifs #177 and #177a.	64
Figure 8.9. Art Panel A4, highlighting the battering (depicted in white) present on the art panel and the painted motifs impacted by the battering.	64
Figure 8.10. Art Panel A4, the uppermost (most recent) re-painting of the <i>manbur</i> motif, and other motifs that are also in very good condition. Motifs #201b and #201c are superimposed additions to the row of flying foxes (#201).	65
Figure 8.11. Photograph and photo-tracing of the <i>manbur</i> macropod. (Photograph by Robert Gunn).	65
Figure 8.12. Initial <i>manbur</i> motif (#177) and the first two stages of subsequent engagement (#177a and #177b).	66
Figure 8.13. Final two modifications of the <i>manbur</i> motif (#177c and #177d).	67
Figure 8.14. <i>Manbur</i> motif highlighting aspects of re-engagement with the motif. (Photograph by Robert Gunn).	67
Figure 8.15. Detail of the body of the <i>manbur</i> motif highlighting aspects of re-engagement. A: Most recent repainting (#177d). B: Deep-red drawing (#177b). C: First repainting over original image (#177a). D: Battering (#177c). E: Addition to original body-infill design during the most recent repainting (#177d). (Photograph by Ken Mulvaney).	68
Figure 8.16. The concentrated battering of the tip of the tail of the <i>manbur</i> motif (#177), which was subsequently over-painted by motif #177d. (Photograph by Robert Gunn).	68
Figure 8.17. Detail of the head of the <i>manbur</i> motif, highlighting the earlier smaller solid eyes (arrowed) beneath the more recent larger ovals. (Photograph by Robert Gunn).	68
Figure 8.18. Modifications of the sex attributes of the <i>manbur</i> motif over time. (Photograph by Robert Gunn).	69
Figure 8.19. The spatial relationship between the <i>manbur</i> motif (#177) on Art Panel A4 and adjacent macropod head (#406) on Art Panel A5. (Photograph by Robert Gunn).	69
Figure 8.20. Yowna Gwion figures (#188–#190). Flash photograph and photo-tracing. (Photograph by Robert Gunn).	70
Figure 8.21. Partial (uncompleted?) Yowna Gwion (#191; 32cm tall). Photograph, Dstretch_lab10 enhancement, and photo-tracing. (Photograph by Robert Gunn).	70
Figure 8.22. Faint Ngunuru Gwion (#187; 45cm tall). Photograph, Dstretch_lrd10 enhancement, and photo-tracing. (Photograph by Robert Gunn).	71
Figure 8.23. Possible remnant Dalal Gwion (#192; c. 30cm tall). (Photograph by Robert Gunn).	71
Figure 8.24. Crescent-shaped boomerang stencil with supporting finger stencil at right (A). Motif #165; 50 x 4.5cm. (Photograph by Robert Gunn).	72
Figure 8.25. Indeterminate mammal (#161; 96cm long). (Photograph by Robert Gunn).	72
Figure 8.26. Row of flying foxes hanging from branch-like line (#201; photograph and photo-tracing). (Photograph by Robert Gunn).	73
Figure 8.27. Detail of motif #201 (flying fox) showing subsequent modifications to the original motif (#201b and #201c).	74
Figure 8.28. Later outlining with orange-red pigment (#201b) of the ears of one of the flying foxes. Note also the battering on the head, and brush marks from the nose. (Photograph by Robert Gunn).	74
Figure 8.29. Detail of the flying fox (#201c; 17cm tall) added to the row of flying foxes (#201) at a later date. (Photograph by Robert Gunn).	74
Figure 8.30. Unusual red painted complex design (#226; 48cm long). (Photograph by Robert Gunn).	75
Figure 8.31. Oval-shaped drawing in dark red pigment (#237; 8cm long). (Photograph by Robert Gunn).	75
Figure 8.32. Anthropomorphic figure with raised arms drawn in dark-red pigment (#236; 19cm tall). (Photograph by Robert Gunn).	76
Figure 8.33. Solid ovoid designs or implements in orange-red pigment. Motifs #233 and #234 (32cm and 35cm long, respectively). (Photograph by Robert Gunn).	77
Figure 8.34. Faint yellow drawing (#226) overlying all the other motifs it touches. It is thus the most recent motif on this part of the art panel. A: Flash photograph of motif #226. B: Motif #226 highlighted by tracing on the photograph. (Photograph by Robert Gunn).	77

Chapter 9: The Art of Art Panel A5

Table 9.1. Art Panel A5, summary of the art by technique. ‘Fragments’ includes fragments in all techniques.	78
Figure 9.1. Art Panel A5, photograph. (Photograph by Robert Gunn).	79
Figure 9.2. Art Panel A5, photo-tracing.	79
Figure 9.3. Art Panel A5, red and dark red hand stencils, and fish motif (#271) from the Irregular Infill Animal Period.	79
Figure 9.4. Art Panel A5, white hand stencils and painting, along with an assortment of red paintings.	80
Figure 9.5. Art Panel A5, large unidentified animal (#318), grass prints (#314, #328–#337), and other assorted red paintings.	80
Figure 9.6. Art Panel A5, Ngunuru Gwion (#353 and #355) and Yowna Gwion (#349, #350 and #352).	80
Figure 9.7. Art Panel A5, yellow hand stencils, red anthropomorph (#384), grass prints (#377–#383) and an unusual tree-like design (#376). Note also the small half-anthropomorph with headdress (#365), which may be an unfinished Gwion figure.	81

Figure 9.8. Art Panel A5, red drawings including a large anthropomorph (#390; 76cm tall) and two fish motifs (#385 and #386), along with a cluster of finely painted motifs (#392–#396).	81
Figure 9.9. Art Panel A5, highlighting the battering (#318a, #349a, #350a, #352a, #355b, #397–#402), abraded motifs (#403–#405) and painted motifs (shown in grey; #318, #349, #350, #352, #355) impacted by the battering.	81
Figure 9.10. Art Panel A5, large anthropomorph painted in orange-red, later embellished with brown-red highlight, after which the body was again infilled with purple-red pigment (#408; 89cm tall). Motif #406 is a macropod head similar in shape and colour to that on the <i>manbur</i> motif on Art Panel A4. Art Panel A5 also contains a pair of white boomerang stencils (#407a and #407b) and a red painting of a waterbird-shaped motif that has been subsequently embellished with white (#411 and #411a, respectively), and other motifs.	82
Figure 9.11. Art Panel A5, the repainted macropod head at the upper-left corner of the panel reveals the repainting episodes of motif #406 (see Figures 9.10 and 9.12), with #406a being the first repainting event and #406c the most recent. The orange-red-coloured motifs here are all in very good condition and among the most recent on this art panel.	82
Figure 9.12. Sequence of modification of motif #406 (#406, #406a and #406c). (Photograph by Robert Gunn).	83
Figure 9.13. Two parallel hand+arm stencils (#265 and #269). (Photograph by Robert Gunn).	83
Figure 9.14. Grouping of hand+arm stencils over time. The initial red hand+arm stencil (#266) underlies the dark red stencil (#265), which is one of a parallel pair with motif #269. A yellow hand stencil (#361), which overlies the dark red stencil (#265), is contemporaneous with the parallel pair of yellow hand+arm stencils (#359 and #360), as determined by similar states of preservation. Hence the yellow hand+arm pair are the most recent in this sequence, given that the yellow superposes both the dark red and red stencils.	84
Figure 9.15. Large unidentified animal (#318). (Photograph by Robert Gunn).	84
Figure 9.16. Yowna Gwion pair (#349 and #350). (Photograph by Robert Gunn).	85
Figure 9.17. Sequence of modifications of motif #408.	85
Figure 9.18. Sequence of modifications of motifs #354, #355 and #356.	86
Figure 9.19. Motif #356, a ‘companion animal’ to Ngunuru Gwion motif #355. (Photograph by Robert Gunn).	87
Figure 9.20. Large anthropomorphic motif #384. Note that the outlined foot lies over the hand stencil at lower right (arrowed). (Photograph by Robert Gunn).	87
Figure 9.21. Large drawn anthropomorph (#390; 76cm tall).	88
Figure 9.22. Drawing of an unidentified object (#391; 36cm long).	88
Figure 9.23. Two dry pigment drawings of fish. Motif #387’s form is reminiscent of a Freshwater Sawfish (?); 62cm long. Motif #385 Catfish; 39cm long.	89
Figure 9.24. Two versions of grass prints. A: Grass seed-head prints. B: Flicked and impressed pigment. The art panel was struck with a pigment-laden applicant (S), such as a handful of grass stalks, so that a fine spray of paint first landed on the rock (D), followed by a solid vertical band when the body of the applicant stroke the rock surface. (Photograph by Robert Gunn).	89
Figure 9.25. Abraded areas. A: Original photograph. B: The abraded areas made clearer by superimposing a photo-tracing of the abrasions over a darkened photograph. (Photograph by Robert Gunn).	90

Chapter 10: The Art of Art Panel B

Table 10.1. Art Panel B art summary.	94
Figure 10.1. Subdivisions of Art Panel B (Art Panels B1–B3).	95
Figure 10.2. Art Panel B1, daylight photograph. Composite (stitched image). (Photographs by Ken Mulvaney).	95
Figure 10.3. Art Panel B1, photo-tracing.	95
Figure 10.4. Art Panel B1, motif interpretation.	96
Figure 10.5. Art Panel B2, daylight photograph. (Photograph by Ken Mulvaney).	96
Figure 10.6. Art Panel B2, photo-tracing.	96
Figure 10.7. Art Panel B2, grass prints (#442–#453) and hand stencil (#441).	97
Figure 10.8. Art Panel B2, string skein prints (#454–#460).	97
Figure 10.9. Art Panel B2, photograph enhanced in DStretch_lye10.	97
Figure 10.10. Art Panel B3, daylight photograph. (Photograph by K. Mulvaney).	98
Figure 10.11. Art Panel B2, photo-tracing.	98
Figure 10.12. Art Panel B3, hand stencils (#461–#463), line set (#464), bar row (#465), and smear (#466).	98
Figure 10.13. Art Panel B3, grass prints (#467–#476) and white fragment (#477).	99
Figure 10.14. Art Panel B3, dark red- (mulberry) coloured smear (#466). (Photograph by Ken Mulvaney).	99

Chapter 11: The Art of Art Panel C

Table 11.1. Art Panel C, summary of the art.	100
Figure 11.1. Art Panel C, daylight photograph. (Photograph by Ken Mulvaney).	100
Figure 11.2. Art Panel C, photo-tracing.	101
Figure 11.3. Art Panel C, motif interpretation.	101
Figure 11.4. Art Panel C, group of Ngunuru Gwion (#481–#484). A: Daylight photograph (by Ken Mulvaney). B: Photograph taken with oblique flash, showing the change of plane of the lower limbs of the figures (photograph by Leigh Douglas).	101

Chapter 12: The Art of Art Panel D

Table 12.1. Art Panel D art summary.....	102
Figure 12.1. Art Panel D, showing the panel's sub-divisions.	103
Figure 12.2. Art Panel D1, flash photograph. (Photograph by Leigh Douglas).	103
Figure 12.3. Art Panel D1, photo-tracing.....	103
Figure 12.4. Art Panel D1, battered area (#487) and other battered motifs, and a single set of drawn lines (#489).	104
Figure 12.5. Art Panel D1, detail of battering (#487). (Photograph by Robert Gunn).	104
Figure 12.6. Art Panel D1, set of vertical drawn lines (#489). (Photograph by Robert Gunn).	104
Figure 12.7. Art Panel D2, flash photograph. (Photograph by Leigh Douglas).	105
Figure 12.8. Art Panel D2, photo-tracing.	105
Figure 12.9. Art Panel D2, apparently uncompleted Gwion figure (#494), four hand stencils and a fragment (#492).	105
Figure 12.10. Art Panel D2, details of incomplete Ngunuru Gwion (#494). Two DStretch enhancements (lrd10 and labi10) highlight different characteristics of the motif. (Photograph by Robert Gunn).	106
Figure 12.11. Art Panel D3, flash photograph. (Photograph by Leigh Douglas).	106
Figure 12.12. Art Panel D3, photo-tracing.....	106
Figure 12.13. Art Panel D3, row of Yowna Gwion, hand stencils, a pair of bar rows (#499) and a bird track (#500).	107
Figure 12.14. Art Panel D3, battering of the Yowna Gwion figures.	107
Figure 12.15. Art Panel D3, detail of battered Gwion figures (#503–#506 and #503a–#506a). (Photograph by Leigh Douglas).	107

Chapter 13: The Art of Art Panel E

Table 13.1. Art Panel E, summary of the art.....	108
Figure 13.1. Art Panel E, flash photograph. (Photograph by Robert Gunn).	108
Figure 13.2. Art Panel E, photo-tracing of the panel and motifs.	109

Chapter 14: The Art of Art Panel F

Table 14.1. Art Panel F, summary of the art.....	110
Figure 14.1. Art Panel F, flash photograph. (Photograph by Leigh Douglas).	110
Figure 14.2. Art Panel F, photo-tracing.....	111
Figure 14.3. Art Panel F, the two hand stencils (#509 and #510), and the area of smeared paint (#511).	111
Figure 14.4. Art Panel F, the boomerang stencil.	111

Chapter 15: The Art of Art Panel G

Table 15.1. Art Panel G, summary of the art.....	112
Figure 15.1. The triptych-like Art Panels G, H and J below Art Panel A3. (Photograph by Ken Mulvaney).	112
Figure 15.2. Art Panel G, flash photograph. (Photograph by Ken Mulvaney).	113
Figure 15.3. Art Area G, photo-tracing.....	113
Figure 15.4. Art Panel G, various motifs including all that is visible of what appears to have been the original painting of a Ngunuru Gwion (#515).	113
Figure 15.5. Art Panel G, unclassified anthropomorph (#520) and subsequent additions to the Ngunuru Gwion (#515a and 515b).	114
Figure 15.6. Art Panel G, detail of sequential modifications to motif #515. (Photograph by Ken Mulvaney).	114

Chapter 16: The Art of Art Panel H

Table 16.1. Art Panel H, summary of the art.....	115
Figure 16.1. Art Panel H, flash photograph. (Photograph by Ken Mulvaney).	115
Figure 16.2. Art Panel H, photo-tracing.	115
Figure 16.3. Art Panel H. A: Yowna Gwion (#526) and various motifs. B: Repainted Yowna Gwion (#526a) and fragment.	116
Figure 16.4. Art Panel H. A: Back-to-back macropods (#541 and 542), various Dynamic Gwions, and other anthropomorphs. B: Suite of painted plants in orange-red pigment and dark red fragments of apparently flicked pigment.....	116
Figure 16.5. Art Panel H, detail of the 'back-to-back macropods' composition (#541 and #542). (Photograph by Ken Mulvaney).	116
Figure 16.6. Art Panel H, DStretch_yye10 enhancement of two of the plants (#544 and #552). (Original photograph by Ken Mulvaney).	117
Figure 16.7. Art Panel H, detail of the 'running' anthropomorph (#532) and DStretch-rgb010 enhancement. (Photograph by Ken Mulvaney).	117

Chapter 17: The Art of Art Panel J

Table 17.1. Art Panel J, summary of the art.	119
Figure 17.1. Art Panel J, flash photograph. (Photograph by Leigh Douglas).	119
Figure 17.2. Art Panel J, photo-tracing.	120
Figure 17.3. Art Panel J, suite of fragmented red motifs including two horned-figure heads (#562 and #563).	120

Figure 17.4. Art Panel J, three Yowna Gwion (#574, #575 and #578), a Ngunuru Gwion (#570), other anthropomorphs (#572, #573, #576 and #577) and fragments.	120
Figure 17.5. Art Panel J, three Yowna Gwion (#582, #586 and #587), a stick figure with Yowna Gwion attributes (#585) and an object often associated with Yowna Gwion (#583).	121
Figure 17.6. Art Panel J, a hand stencil (#591), an indistinct pigment spray (#596), an anthropomorph (#588), three drawings (#592 and #593), two scratchings (#594 and #595) and fragments.	121
Figure 17.7. Art Panel J, position of battering across the panel.	121
Figure 17.8. Art Panel J, distribution of the dark red (mulberry) coloured paintings.	122
Figure 17.9. Art Panel J, details of the horned-figure heads (#562 and #563). (Photograph by Leigh Douglas).	122
Figure 17.10. Art Panel J, details of the superposed scratchings (#594 and #595). Motif #594 overlies motif #595. (Photograph by Leigh Douglas).	122

Chapter 18: The Art of Art Panel K

Table 18.1. Art Panel K, summary of art.	124
Figure 18.1. Oblique view of Art Panel K with Madelaine Kelly providing the human scale. (Photograph by Leigh Douglas).	124
Figure 18.2. Art Panel K, photomosaic. Note differences in scale lengths – K1 and K2. (Photographs by Ken Mulvaney).	125
Figure 18.3. Art Panel K1, flash photograph. (Photograph by Ken Mulvaney).	125
Figure 18.4. Art Panel K1, photo-tracing.	125
Figure 18.5. Art Panel K1, red and yellow hand stencils, brown string prints, and various other motifs.	126
Figure 18.6. Art Panel K2, flash photograph. (Photograph by Ken Mulvaney).	126
Figure 18.7. Art Panel K2, photo-tracing.	126
Figure 18.8. Art Panel K2, red hand stencils, cream and red grass prints, small red quadruped (#629), and dark red bar row (#639).	127
Figure 18.9. Art Panel K2, quadruped (#629 and embellishment #629a). (Photograph by Ken Mulvaney).	127
Figure 18.10. Art Panel K2, dark red bar row (#639). (Photograph by Ken Mulvaney).	127
Figure 18.11. Art Panel K2, stencil of possible metal object (#612) and DStretch_yye10 enhancement. Note the drawn red line (#628) overlying the yellow stencil. (Photograph by Ken Mulvaney).	128
Figure 18.12. Art Panel K2, cream-coloured grass prints (#637 and #638) and DStretch_crgb10 enhancement.	129

Chapter 19: The Art of Art Panel L

Table 19.1. Art Panel L, summary of the art.	130
Figure 19.1. Oblique photograph of location of Art Panel L. (Photograph by Ken Mulvaney).	130
Figure 19.2. Detail of the central section of Art Panel L. (Photograph by Leigh Douglas).	131
Figure 19.3. Art Panel L, selection of the ceiling string prints. All are shown as enhanced images: a-d, h-i: DStretch_lye10. e: DStretch_yrd10. f: DStretch_yre10. g: DStretch_lrd10.	131
Figure 19.4. Art Panel L, showing superpositioning of two string skein prints: DStretch_lye10 highlighting the orange-red pigment (#656) over red pigment (#655), and DStretch_rgb010 highlighting the underlying red pigment (#655).	132
Figure 19.5. Art Panel L, remnant hand stencil (#663): photograph, DStretch_lye10 enhancement and resultant interpretation.	132

Introduction: Superpositions at Pundawar Manbur

Figure C.1. Interpreting Harris Matrices. A: Example of a raw, unvalidated matrix. B: Example of corresponding interpreted layers, where redundant associations have been removed and evidence of relative chronology are added to form any contemporaneous associations. In this example, motifs #5 and #7 are considered contemporaneous through having corresponding attributes. The colours in the circles on this figure, representing the individual motifs, are for demonstrative purposes only.	136
--	-----

Chapter 20: Art Panel A1 Superpositions

Table 20.1. Art Panel A1, list of motif superpositions. The motifs in the orange cell are not involved in superposition relationships.	137
Table 20.2. Art Panel A1, art layer components from the interpreted Harris Matrix. Green cells indicate that the relative sequence of these layers is not demonstrated on this panel and is derived from common attributes with motifs on the adjacent art panel sequences.	137
Table 20.3. Summary of Art Panel A1's art layer superpositions. Key: Superposed relationships: in x/y, x is superposed directly over y. Assumed relationships: in x/y (x is younger than y, but not in direct superposition). x = y (x and y are contemporaneous).	138
Table 20.4. Summary of Art Panel A1's art layers. The green cells indicate the relative sequence of these layers is not evident on this panel.	138
Figure 20.1. Raw Art Panel A1, Harris Matrix of motif superpositions. Green cells reflect those with both a lower and upper association.	138
Figure 20.2. Interpretation of the Art Panel A1 Harris Matrix. The full-size of the Harris Matrix is 32 x 50cm.	139

Chapter 21: Art Panel A2 Superpositions

Figure 21.1. Art Panel A2, unvalidated Harris Matrix of motif superpositions. The green cells are the motifs with both a lower and upper association.	142
Table 21.1. Art Panel A2, list of motif superpositions. Motifs in the blue cells also occur in Art Panel A1. Those in the orange cells are not involved in superpositions.	143
Table 21.2. Art Panel A2, art layer components from the interpreted Harris Matrix. The layers in the blue cell (A2-4 and A2-5) are interpreted as broadly contemporaneous. Although motif #41 in Layer A2-4 has a different colour density to those in Layer A2-5, their contemporaneity is implied by their correlation in the Harris Matrix. The green cells are the layers whose position in the relative sequence is not evident on this panel. The '# of motifs' include all motifs from Art Panel A2 plus those that overlap with Art Panel A1.	144
Table 21.3. Summary of Art Panel A2's superposition layers. Key: Superposed relationships: for x/y, x is superposed directly over y. Assumed relationships: for x/y, x is younger than y, but not in direct superposition. x=y means that x and y are contemporaneous.	144
Table 21.4. Summary of the Art Panel A2 layers, including the motifs overlapping with Art Panel A1. The layers in the blue box are interpreted as broadly contemporaneous. The position in the relative sequence of those in the green boxes is not evident on this panel.	144
Figure 21.2. Interpretation of the Art Panel A2 Harris Matrix. The full-size of the matrix, as produced by the digital Harris Matrix programme, is 90 x 70cm.	145

Chapter 22: Art Panel A3 Superpositions

Figure 22.1. Art Panel A3, unvalidated Harris Matrix of motif superpositions. The green cells are the motifs with both a lower and upper association.	147
Table 22.1. Art Panel A3, list of motif superpositions. Motifs in the blue cells overlap with motifs also shown in Art Panel A2. Those in the orange cells are not involved in superpositions.	148
Table 22.2. Art Panel A3, art layer components from the interpreted Harris Matrix. The layers in the green cells are interpreted as broadly contemporaneous. The relative positioning of those in the other cells is not evident on this panel. The '# of motifs' includes all motifs from Art Panel A3, excluding those that overlap with Art Panel A2.	149
Table 22.3. Summary of Art Panel A3's art layer superpositions. Key: Superposed relationships: x/y, where x is superposed directly over y. Assumed relationships: x/y, where x is younger than y, but not in direct superposition. x=y means that x and y are contemporaneous.	149
Table 22.4. Summary of the Art Panel A3 art layers. Motifs that overlap with those in Art Panel A2 are excluded. The relative positioning of the layers in the green cells is not demonstrated on this panel.	149
Figure 22.2. Interpretation of the Art Panel A3 Harris Matrix. The full-size of the matrix, as produced by the digital Harris Matrix programme, is 72 x 68cm.	150
Figure 22.3. Detail of the yellow painting (#155) overlying the unpatinated scratched motif (#156).	150
Figure 22.4. Details of Art Panel A3's sequence for motifs surrounding the boomerang painting (#157).	151

Chapter 23: Art Panel A4 Superpositions

Figure 23.1. Details of Art Panel A4. A: Details of motif #207, as an example of the variation in the hue and density of the red paint. The white dots (#207a) are an elaboration on the earlier red line (#207). B: Details of motif #201, showing modifications of the original motif.	152
Table 23.1. Art Panel A4, list of motif superpositions. The motifs in the blue cells also occur on Art Panel A3. Those in the orange cells are not involved in superpositions.	153
Figure 23.2. Art Panel A4, unvalidated Harris Matrix of motif superpositions. The green cells are those with both lower and upper associations. The full-size of the matrix, as produced by the digital Harris Matrix programme, is 115 x 66cm.	155
Table 23.2. Art Panel A4's art layer components, from the interpreted Harris Matrix. The motifs in the blue cells are interpreted as broadly contemporaneous on the basis of common attributes. The relative positioning of those in the green cells is not evident on this panel and is derived from common attributes with motifs on the adjacent art panel sequences. The motifs in the white cells contain direct superpositions derived from this art panel. All the motifs from Art Panel A4, plus those that overlap with Art Panel A3, are included in this table.	156
Table 23.3. Summary of Art Panel A4's motif superposition layers. Key: Superposed relationships: for x/y, x is superposed directly over y. Assumed relationships: for x/y, x is younger than y, but not in direct superposition. x=y means that x and y are contemporaneous.	156
Table 23.4. Summary of Art Panel A4's art layers. The layers in the blue cells are interpreted as broadly contemporaneous. The relative positioning of those in the green cells is not evident on this panel. All the motifs from Art Panel A4, plus those that overlap with Art Panel A3, are included in this table.	157
Figure 23.3. Interpretation of Art Panel A4's Harris Matrix. The full-size of the matrix, as produced by the digital Harris Matrix programme, is 127 x 139cm.	158
Figure 23.4. Four of the five layers of the <i>manbur</i> motif (#177).	159
Figure 23.5. Detail of the superimposition of the latest, orange-red painting of the <i>manbur</i> motif (#177d) over drawn deep red vertical stripes (#177b) that were previously added to an earlier painted version of the <i>manbur</i> motif.	159
Figure 23.6. Superposition of the yellow drawing (#235) over the battering (#252).	159
Figure 23.7. Superposition of the red painting (#246) over the battering (#252).	159

Chapter 24: Art Panel A5 Superpositions

Figure 24.1. The smudged area over motif #384 (a large anthropomorph) in the lower right-hand side of Art Panel A5.	160
Table 24.1. Art Panel A5, list of motif superpositions. The motifs in the blue cells also occur on Art Panel A4. Those in the orange cells are not involved in superpositions.	161
Table 24.2. Art Panel A5's art layer components, from the interpreted Harris Matrix. The motifs in the blue cells are broadly contemporaneous, as determined by the presence of common attributes in sequential positions in the Harris Matrix. The relative positioning of the motifs in the green cells is not evident on this panel. All the motifs from Art Panel A5, plus those that overlap with Art Panel A4, are included.	164
Table 24.3. Summary of Art Panel A5's superpositions. Key: Superposed relationships: for x/y, x is superposed directly over y. Assumed relationships: for x/y, x is younger than y, but not in direct superposition. x=y means that x and y are contemporaneous.	164
Table 24.4. Summary of Art Panel A5's art layers. The layers in the blue cells are broadly contemporaneous, as determined by the presence of common attributes in sequential positions in the Harris Matrix. The relative positioning of those in the green cells is not evident on this panel and is derived from common attributes with motifs in sequences on adjacent art panels. All the motifs from Art Panel A5, plus those that overlap with Art Panel A4, are included.	165
Figure 24.2. Art Panel A5, unvalidated Harris Matrix of motif superpositions. The green cells are those with both lower and upper associations. The full-size of the matrix, as produced by the digital Harris Matrix programme, is 170 x 61cm.	166
Figure 24.3. Interpretation of Art Panel A5's Harris Matrix. The full-size of the matrix, as produced by the digital Harris Matrix programme, is 129 x 81cm.	167
Figure 24.4. Contemporaneous deep-red painting (#460: macropod head) and hand stencil (#260), as determined by their common pigment colour, state of preservation and pattern of superpositions.	168
Figure 24.5. Yowna Gwion (#352) superposed over Ngunuru Gwion (#353).	168
Figure 24.6. Dark red drawing (#387) superposed over battering (#318a), with both motifs overlying an older red painting (#318).	169

Chapter 25: The Art Sequence and Chronology of Pundawar Manbur

Table 25.1. Correlation of the art layers from the individual panels across each of Art Panels A1–A5. The colours of the cells approximate those of the motifs in the corresponding art layers.	170
Table 25.2. Art Panel A's art sequence, as derived by amalgamating the Harris Matrix interpreted layer sequences shown in Table 25.1. The colours of the cells approximate those of the motifs in the corresponding art layers, with unpatinated scratched and abraded motifs represented in blue. The firm lines delineate currently proposed art period boundaries for Kimberley rock art; dashed lines delineate possible art period boundaries.	171
Table 25.3. The six possible combination of sequences of Art Panel A3's Layers 2 to 4. The final arrangement is not established on this Art Panel, but the relative position of the layers is derived from other Art Panels where the sequence is demonstrated.	172
Figure 25.1. Interpretation of the Harris Matrix for Art Panel H (cf. Table 25.2).	173
Figure 25.2. The location of six of the dated mud-wasp nests on Art Panel A. Samples D124, D134, D136 and D392 are on Art Panel A3; samples D131 and D390 are on Art Panel A4.	176
Table 25.4. The Pundawar Manbur motifs with pigment below or above the dated mud-wasp nests. All the radiocarbon samples were taken prior to the art recording, resulting in minor omissions in the recording of motifs #127, #189, and #104.	176
Table 25.5. Radiocarbon ages for mud-wasp nests at Pundawar Manbur. IIAP = Irregular Animal Infill Period. Age calibrations undertaken with SHCal20 in OxCal v4.4.4.	176
Table 25.6. Summary of sample pretreatment protocol and measurements. The $\delta^{13}\text{C}$ of OZT-797U2 was measured to be -22.5‰. Other samples were not able to be reliably measured but are assumed to be -25‰ for the isotopic correction, based on an average for other similar samples. For a complete description of the pretreatment sequence, fraction, and reliability score, see Finch <i>et al.</i> (2019).	177
Figure 25.3. Dated mud-wasp nest (sample D124) over motif #128, on Art Panel A3. A: Location of the mud-wasp nest over the motif. The Ngunuru Gwion is older than 320 cal BP. The yellow square indicates sample location. B: Area of sample D124 before sample removal. C: Area of sample D124 after sample removal.	177
Figure 25.4. Dated mud-wasp nest (sample D131) under motif #189, on Art Panel A4. A: Location of the mud-wasp nest under a Yowna Gwion (#189). The Yowna Gwion is younger than 14,110 cal BP. The yellow rectangle indicates sample location. B: The area of sample D131 (below the scale card), before sample removal. C: The area of sample D131 after sample removal.	178
Figure 25.5. Dated mud-wasp nest (sample D134) under motif #104 (boomerang stencil), on Art Panel A3. A: D134 is an agglomeration of multi-generational wasp nests with some overlying paint splatter from the boomerang stencil. The yellow rectangle indicates sample location. B: The area of sample D134 before sample removal. C: Sample D134 after sample removal; the yellow triangles point to dots of sprayed paint over the mud-wasp nests.	179
Figure 25.6. Dated mud-wasp nest (sample D136) under motif #104 (boomerang stencil), on Art Panel A3. A: Sample D136 is at the thinning edge of an agglomeration of multi-generational wasp nests, with some	

overlying paint splatter. The yellow rectangle indicates sample location. B: The sample area in context of paint sprayed from the boomerang stencil. C: The area of sample D136 after sample removal.....	180
Figure 25.7. Dated mud-wasp nest (sample D392) under motif #127 (Ngunuru Gwion), on Art Panel A3. A: Sample D392 is the stump of a mud-wasp nest underlying pigment from the held and raised boomerangs of a Ngunuru Gwion motif. The yellow rectangle indicates sample location. B: The yellow rectangle identifies the area of sample D392 before sample removal. C: The area of sample D392 after sample removal.....	181
Figure 25.8. Dated mud-wasp nest (sample D390) under motif #190 (Yowna Gwion), on Art Panel A4. A: Sample D390 is the stump of a mud-wasp nest underlying pigment from a feather head-dress on a Yowna Gwion. The yellow rectangle indicates sample location. B: The yellow rectangle identifies the area of sample D390 before sample removal. C: Sample D390 after sample removal, showing deep red pigment over the sampled mud-wasp nest, with scale in millimetre units.....	182

Authors and Affiliations

Robert Gunn

Monash Indigenous Studies Centre, 20 Chancellors Walk, Monash University, Clayton campus, VIC 3800, Australia.
and 329 Mt Dryden Rd, Lake Lonsdale, VIC 3381, Australia.
<https://orcid.org/0000-0002-7565-8697>

Bruno David

Monash Indigenous Studies Centre, 20 Chancellors Walk, Monash University, Clayton campus, VIC 3800, Australia.
and ARC Centre of Excellence for Australian Biodiversity and Heritage, Canberra, ACT 2601, Australia.
<https://orcid.org/0000-0002-8567-6135>

Jean-Jacques Delannoy

ARC Centre of Excellence for Australian Biodiversity and Heritage, Canberra, ACT 2601, Australia
and Laboratoire EDYTEM, Université Savoie Mont Blanc, F-73376 Le Bourget du Lac Cedex, France.
<https://orcid.org/0000-0002-2815-4920>

Benjamin Smith

Archaeology, School of Social Sciences, University of Western Australia.
and Centre for Rock Art + Management, School of Social Sciences, University of Western Australia.
<https://orcid.org/0000-0003-1215-4093>

Damien Finch

School of Earth Sciences, Faculty of Science, The University of Melbourne, Parkville, VIC 3052, Australia.
<https://orcid.org/0000-0002-9447-5685>

Augustine Unghangho

P.O. Box 372, Wyndham, WA 6740, Australia.

Ian Waina

P.O. Box 372, Wyndham, WA 6740, Australia.

Balanggarra Aboriginal Corporation

P.O. Box 372, Wyndham, WA 6740, Australia.

Leigh Douglas

329 Mt Dryden Rd, Lake Lonsdale, VIC 3381, Australia.

Pauline Heaney

Rock Art Australia, Level 4, 71 Collins Street, Melbourne, VIC 3000, Australia.

Cecilia Myers

Dunkeld Pastoral Co Pty Ltd, Theda Station, PMB 14, Kununurra, WA 6743, Australia.

Sven Ouzman

Archaeology, School of Social Sciences, University of Western Australia
and Centre for Rock Art + Management, School of Social Sciences, University of Western Australia.
<https://orcid.org/0000-0002-9379-2996>

Peter Veth

Archaeology, School of Social Sciences, University of Western Australia
and ARC Centre of Excellence for Australian Biodiversity and Heritage, Canberra, ACT 2601, Australia
and Centre for Rock Art + Management, School of Social Sciences, University of Western Australia.
<https://orcid.org/0000-0002-1717-6390>

Acknowledgements

This project was undertaken in partnership between Augustine Unghangho (senior Kwini Traditional Owner of Pundawar Manbur), supported by Ian Waina and other Balanggarra Traditional Owners, the Balanggarra Aboriginal Corporation, the Kimberley Land Council and the non-Kwini researchers listed as co-authors. Thank you for permission and the privilege to work on your lands and to the Balanggarra Rangers for field support. Thank you also to those who provided invaluable field assistance: Sam Harper, Madeleine Kelly, William (Coco) Maraltadj, Michael Morlumbum, Ken Mulvaney, Joc Schmeichen, Rowan Waina, the staff of Theda Station, the Dunkeld Pastoral Co. Pty Ltd, Mike Donaldson for additional site information and references, and Nick Sundblom for piloting the helicopter.

The project was partially funded by the Kimberley Foundation Australia (now 'Rock Art Australia'), the Australian Research Council Centre of Excellence for Australian Biodiversity and Heritage (Monash University Node) (CE170100015), and the Australian Research Council 'Kimberley Visions: Rock art styles of North Australia' Linkage project (LP150100490) administered by the University of Western Australia. Two Australian Research Council grants provided funding for the radiocarbon dates presented in Chapter 25: 'Dating the Aboriginal rock art of the Kimberley region, Western Australia' (LP130100501) and 'Dating the rock art sequence of the Kimberley, NW Australia' (LP170100155). Bruno David thanks Australian Research Council grant IL240100034, under whose auspices he completed parts of this monograph. The Western Australia Department of Planning, Lands and Heritage provided the Section 16 permit facilitating the collection and dating of samples and the Western Australia Department of Biodiversity, Conservation and Attractions provided permission to work in Drysdale River National Park and participated as project partners.

Full Open Access as well as print publications for key partners is supported by a grant from Rock Art Australia.

The photographs of the art presented in this monograph are copyrighted to the Balanggarra Aboriginal Corporation and any permission to re-use requires authorisation through them following the precepts of Indigenous Cultural Intellectual Property.

Final editing and formatting of the monograph was patiently undertaken by Kat Szabó.



Chapter 1

Introduction

PUNDAWAR MANBUR ROCK SHELTER

Pundawar Manbur is one of the largest painted rock shelters in the Drysdale River valley of the Kimberley, Western Australia. It contains more than 600 rock paintings, engravings and other rock markings and a complex series of overlapping styles of rock art. It is a cultural jewel of Kwini Country, within the lands of the Balanggarra Native Title determination. This monograph presents the first detailed recording and analysis of the site and its art.

Like many Kimberley rock art sites, Pundawar Manbur is not simply an occupation site as conventionally defined. While it has a generous overhang that provides shelter, the floor is covered with large slabs of outwardly slanting rock that fell from the ceiling as part of the shelter formation process. These slabs provide comfortable and shaded seating, but seem to make the shelter unsuitable as a sleeping place. Whether there are deep stratified occupational deposits underneath these slanting surface slabs is presently unknown, but it is clear that some kind of archaeological deposit is present beneath, as evident from the fine sediments on the floor in the narrow gap between the back wall and inner edges of the fallen slabs. As we explore in more detail in Chapter 4, for at least the past c. 12,000 years and possibly considerably longer – as determined by confirmed radiocarbon ages for some (yet not the oldest) of the rock art styles found at the site (Finch *et al.* 2020, 2021) – the basic material structure of the site, its overhang and boulder-strewn floor, seems not to have changed to any great extent over long periods of time.

While in an area considered extremely remote for researchers today, for local people in the past the site would have been relatively accessible, just a short scramble up a steep slope from an open valley. It is, and probably always was, clearly visible from the flat valley floor slightly below. Today, the valley contains a seasonal stream that fills during the wetter months and that feeds into Planigale Creek onto the Drysdale River some 4km downstream. Perhaps during wetter climatic phases, such as between c. 10,000–5000 years ago (e.g. Field *et al.* 2017), this stream would have flowed more frequently, but today the small valley probably remains much as it would have appeared for most or all of the period that people knew the rock shelter.

AN ARCHAEOLOGICAL VIEW

Pundawar Manbur is the type of site that rock art researchers love: a huge panorama of rock art spread out along a nice, clean vertical rock shelter wall. There are ample contemplation, photography and note-taking spaces directly in front of the panel, and these are nicely raised to allow close observation and meticulous recording of the art. There are many aspects of the rock art here that make it interesting for research: the condition of the art is broadly excellent and there is a large range of painting styles and techniques present, including styles from all the major identified periods within the Kimberley art sequence. There are many figures in superposition, and many also in carefully targeted patterns of superimposition (Gunn *et al.* 2022; see Chapter 3), making for a rich story of sequential engagements potentially going back many thousands of years. There is much figurative art, including images from the earliest purported phase of Kimberley art, the Irregular Infill Animal Period, but there are also stencils and other markings. There is evidence of additive reuse – some of the figures have been repainted. There is also fascinating evidence of subtractive reuse, some of the images showing signs of having been ‘battered’ and/or scratched, that is, directly engaged with subsequent to their painting. In Chapters 5 to 25, we explore these curious details. But, this monograph is not only about the rock art; it is a monograph about a special Kwini place.

For the majority of archaeologists who do not specialise in rock art, the site would be of limited interest. It would probably be deemed to have 'low archaeological potential' – meaning that it has minimal excavation potential – and they would stop, take some catchy photographs and then walk on by, looking for a site with greater excavation potential. Pundawar Manbur would risk consignment to a footnote in a field journal, or be just a pretty picture in a book about another site or on the regional archaeology. This other site, one with deep stratified occupational deposits, would then capture and arouse archaeological interests. This other site would receive months, if not years, of scientific attention and through subsequent publication would become famous and would dominate the archaeological narrative of this landscape. Our monograph is unusual in Australian archaeology because it does not focus on an excavated site; it focuses solely on Pundawar Manbur and gives it the attention it deserves. In this sense it is more akin to the long-standing monographic tradition of French rock art sites, with their detailed illustrated inventories and expositions of the structure of the art in their landscape settings (e.g. Lorblanchet 2010).

The Rock Art Monograph

In Europe, French and Spanish caves containing rock art have long been considered of sufficient significance to warrant their own dedicated monographs (e.g. Capitan *et al.* 1910, 1924; Cartailhac and Breuil 1906; Fritz *et al.* 2009; Lorblanchet 2001, along with many others). Australia has not had the same tradition, even though Australian rock art is no less significant, with the notable exception being with the major input of a French archaeologist (Coutts and Lorblanchet 1982). Detailed recordings of Australian First Peoples' (Aboriginal peoples and Torres Strait Islanders) rock art sites mostly exist as unpublished, and occasionally restricted, reports or theses (e.g. Gunn *et al.* 1997; McDonald 1997; Officer 1991; Rosenfeld 1990). While no recording can ever be 'complete' or fulfill the objectives of all later researchers (cf. Rosenfeld 1977), few published records of Australian rock art sites have attempted to present illustrations and analysis of every visible rock art image within a site. Most published records are in black and white, and they rarely identify all images and place them in a chronological sequence, as is presented here (e.g. Coutts and Lorblanchet 1982; Gunn 1981, 1983, 2006a; Macintosh 1951, 1952; McCarthy 1976, 1983; Morwood 1978; Rosenfeld and Smith 2002; Sim 1969). In recent years, with the greater use of colour illustrations, published recordings have become steadily more comprehensive (e.g. Brady 2010; Roberts *et al.* 2024). The recordings from individual sites, however, have generally been published within wider thematic analyses or regional studies, a major direction being the recording of rock art jointly with Aboriginal Traditional Owners (Cole *et al.* 2024; McDonald 2020; McDonald and Veth 2012; McDonald *et al.* 2018; Roberts *et al.* 2014; li-Yanyuwa [Yanyuwa Elders] *et al.* 2023). Unlike thematic recordings, site monographs focus on a singular place that was of specific value to people who used or continue to use the place. The only comparable Australian example to our archaeologically data-rich recording of Pundawar Manbur, is that of the Jawoyn site of Nawarla Gabarnmang in Arnhem Land, some 600km to the east (Gunn 2018). Utilising similar techniques to those employed here, the Nawarla Gabarnmang site monograph illustrated and analysed 1391 rock art motifs from multiple layers on 41 separate art panels within the shelter.

In Australia, the value of detailed recordings for site management, Aboriginal community archives and research, is generally acknowledged (McCarthy 1972; Edwards 1975; Flood *et al.* 1989; Gale and Jacobs 1987; Rosenfeld *et al.* 1984), but the fundamental rationale for recording is seldom identified (Pearson and Sullivan 1999; Rosenfeld 1977). According to the Victorian Government's First Peoples – State Relations (2024), the recording of rock art is important for three reasons:

1. Rock art is one of the few traces of pre-colonial Aboriginal society that does not directly relate to the society's economic needs.
2. It gives a valuable glimpse of the aesthetics, psychology and spirituality of the artists and their cultures.
3. Rock art places are particularly valuable as important links with the Old Ancestors and their ancestral practices for descendent communities today.

In some instances, at the instruction of communities or at the request of management authorities, site recordings remain intentionally unpublished in order to protect culturally restricted information or to conceal the site for conservation management reasons. For some, and possibly many sites, however, detailed recordings have been allowed to be published by local First Nations communities and their representative organisations. Such recordings can then make primary data available for future community, management and research purposes.

It is therefore curious that there are so few examples of rock art monographs in Australia and, conversely, so many in Europe. The difference is perhaps in the number of sites. Whereas around 400 caves contain rock art in Europe, more than 100,000 rock shelters and open sites contain rock art in Australia (Taçon 2016: 245). Clearly, it would not be feasible for each Australian rock art site to be given its own monograph in a timely manner, but we imagine a series where a representative sample of larger sites, or groups of sites, from all the major art regions in Australia are afforded this treatment. We hope to set such an agenda of detailed published rock art recordings of individual sites with Pundawar Manbur. The reason is that it is only with such detailed recordings that the specific key features of the rock art, and their patterns of superposition, that evidence-based spatial and chronological patterns can emerge using formal methods and, where cultural knowledge for individual sites and regions is at hand from First Nations communities, that such patterning in informed knowledge can also be worked out relative to image formal details (as the latter can be directly archaeologically investigated).

We follow the format of European rock art monographs, introducing the site and its context and then working systematically, left to right facing the wall, through the various panels of rock art images at the site. The chapters in Part A detail sections of the large, complex 'Art Panel A', while the chapters in Part B systematically consider the surrounding art, panel by panel. We describe and illustrate each, before considering the multiple layers or clusters of superpositions within Part C. We analyse and interpret each layer, so as to produce an overall stylistic sequence for the rock art at Pundawar Manbur. We use the latest approaches to panel recording and art sequencing and we report on a systematic attempt to place the stylistic sequence within a chronological framework using a combination of absolute and relative dating techniques. A major aim is to make this information available for research now and into the future, and to set the first detailed site-scale study to test the established and widely accepted relative chronology for Kimberley rock art (see Chapter 2).