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Archaeology and Petroglyphs of Dampier (Western Australia) an Archaeological Investigation of Skew Valley and Gum Tree Valley

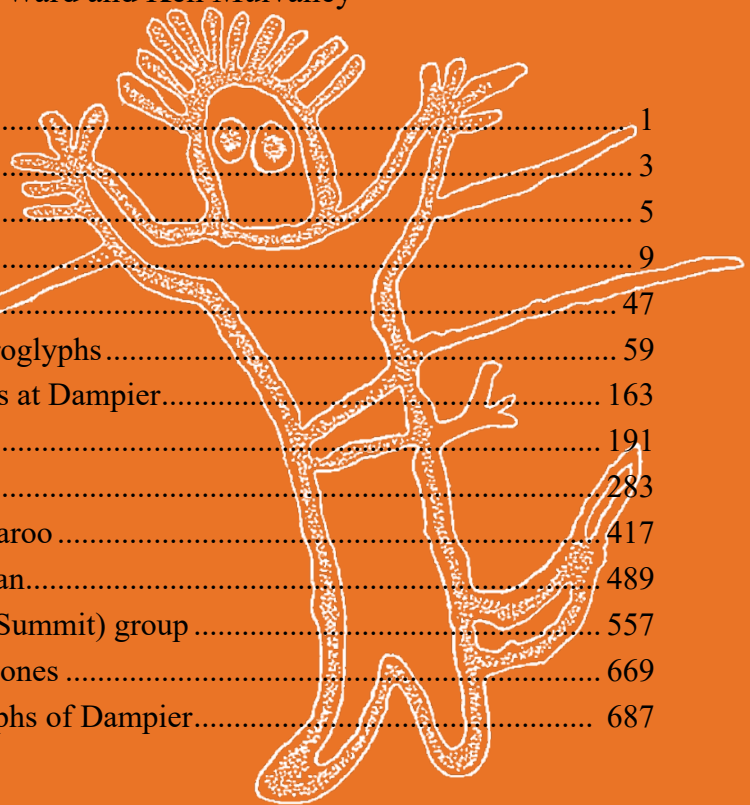
by

Michel Lorblanchet

edited by

Graeme K. Ward and Ken Mulvaney

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Author

Michel Lorblanchet joined the *Centre national de la recherche scientifique* (CNRS, France) in 1969 to study the Palaeolithic rock art of France. After graduating in 1972 from Université Sorbonne (Paris) with a doctorate in Prehistory, he was employed from 1974 to 1977 at the Australian Institute of Aboriginal Studies to conduct research into indigenous Australian rock art. From his base in Canberra, he participated in projects in Far North Queensland and in western Victoria. Between 1975 and 1976, he conducted the fieldwork at Dampier, Western Australia, on which this monograph is based, and made two further fieldtrips there in 1983 and 1984. He returned to France in 1977 to the *Centre de Préhistoire du Pech Merle* (Cabrerets). Lorblanchet was appointed *Directeur de recherches au CNRS* in 1995; he retired in 1999 and lives near Saint Sozy in the Lot Valley where he continues to research and publish about rock art. He is the author of many papers and several books on European Palaeolithic art (some are listed in the editors' introduction) as well as reports and this monograph on his Australian researches.

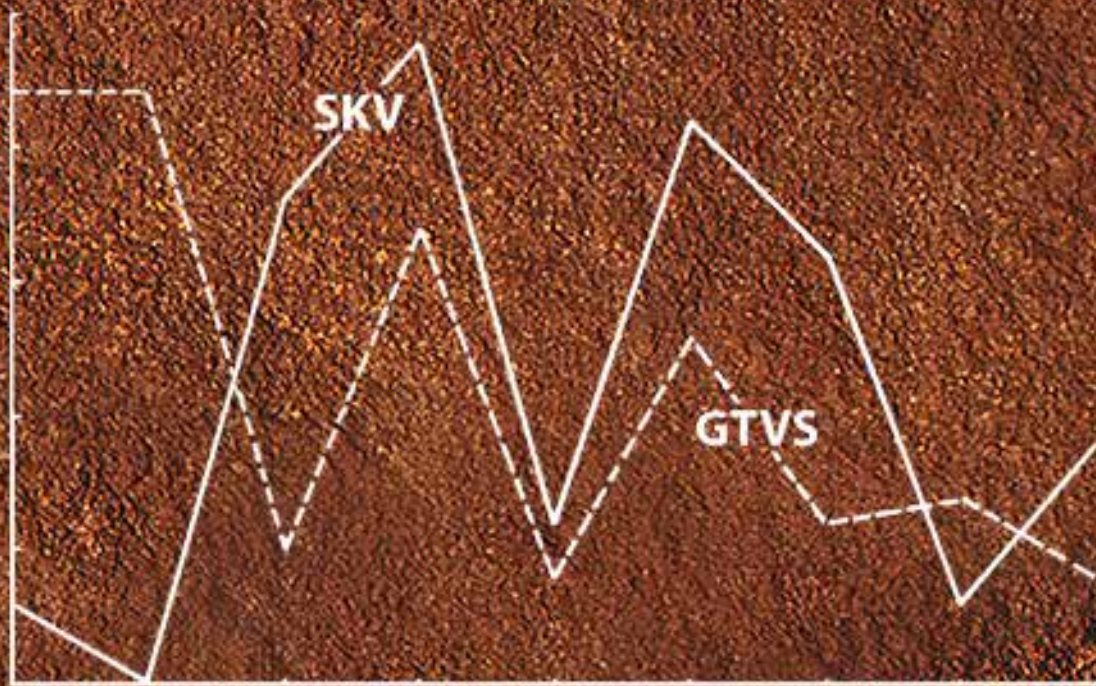
Volume Editors

Graeme K. Ward has conducted archaeological and ethno-archaeological fieldwork in the island Pacific and Australia. He gained his doctorate from The Australian National University and was employed at the Australian Institute of Aboriginal Studies where he was involved with administration of research programs including the national Rock Art Protection Program. Subsequently, as Research Fellow and Senior Research Fellow at the Australian Institute of Aboriginal and Torres Strait Islanders Studies he undertook research into Indigenous cultural landscapes in northern Australia with traditional knowledge-holders of cultural heritage places. He is the author of various research papers, of three monographs and editor of many collections of archaeological papers; he served as the editor of the Institute's journal, *Australian Aboriginal Studies*, for several years. Currently he is a visitor at the Department of Archaeology and Natural History, School of Culture, History and Language, College of Asia and the Pacific, of The Australian National University.

Ken Mulvaney has lived and worked for the past ten years on the Burrup Peninsula, where he is the Principal Advisor Cultural Heritage for Rio Tinto Iron Ore. Prior to this, Ken spent many years in the Northern Territory working with Aboriginal traditional owners documenting their cultural heritage places and land affiliations. He first came to the Burrup in 1980 when employed by the Western Australian Museum as member of a team documenting archaeological sites in areas destined for construction of a petrochemical processing plant. His doctorate from the University of New England is the first such study on the prehistory of the Dampier Archipelago. He is author of many articles on rock art and Aboriginal culture, and is currently affiliated with the Centre for Rock Art Research and Management, University of Western Australia.

Chapter 8

Comparisons Between Zones



Comparisons Between the Six Zones Studied in Skew Valley and Gum Tree Valley

MICHEL LORBLANCHET

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Australian Institute of Aboriginal Studies, Canberra, Australia (1974–1977)

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Typological categories of the Skew Valley and Gum Tree Valley petroglyphs

In the introductory chapter, I provided definitions of the typological categories of subjects that I recorded in Skew valley and Gum Tree Valley. (The summary of types of motifs is repeated in this chapter as Fig. 8.1).

In the subsequent chapters, I studied in detail the sampling zones delineated as Skew Valley, Gum Tree Valley Spirit Group (GTVS), Eagle Group (GTVE), Kangaroo Group (GTVK), Woman Group (GTVW), Top Group (GTVT), and the small ‘GTVT Village’. These sample zones are the areas of higher density of petroglyphs observed in the two valleys. They are located in different topographical places: near the sea, close to the middens, at the entrance of a valley, on top of hills commanding a view of the coast and the valley, at the top of a valley ... all these areas can be considered as ‘sites’.

It is time now to compare them in order to show their differences and their similarities, to understand clearly the use of the environment by the first inhabitants of this region and its evolution through time.¹

For each test zone a cumulative graph was established with the database. The individual site data were then combined and are presented here in Table 8.1 and the graph (Fig. 8.2) to provide information that details, develops and summarizes the multiple observations made separately during the studies of these different ‘groups’. (cf. discussion at Chapter 1: *Typology of carved motifs*.)

The graphs for each grouping show:

- GTVT (420 petroglyphs, includes two from the nearby ‘GTVT Village’) stands isolated with an almost vertical step for punctuations (dots) and a slope for geometrical forms, especially circles (category 33), arcs (36) and lines (40);
- GTVK (284 petroglyphs) and GTVW (397) are close together with two important categories: ‘eggs’ (29) and ‘kangaroo tracks’ and ‘bird prints’ (30, 31); and
- GTVS (381 petroglyphs), GTVE (591) and SKV (353) are grouped together and demonstrate the same gentle slope with no outstanding peak except for a sharp one to the right for the ‘other motif’ (47), especially in the Eagle Group (GTVE).

This graph allows an immediate visual comparison between the six different sites of Skew Valley and Gum Tree Valley. The graph of each site presents a stair shape that reflects the proportions of its different motifs. The lower series shows that the sites with middens (SKV, GTVE, GTVS) resemble each other with a gentle slope (with many ‘human’ and ‘animal’ motifs), whereas the sites far from the coast and without midden (GTVW, GTVK, GTVT) are steeper with greater proportions of ‘tracks’ and geometric forms.

¹ This chapter draws upon an earlier paper (Lorblanchet, 1992).
























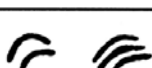


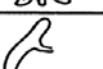

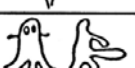

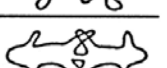
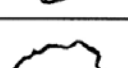
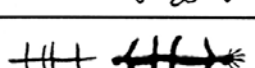
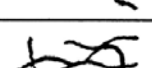

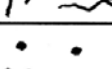

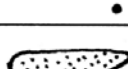

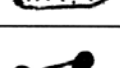
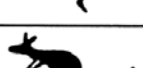
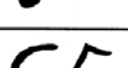

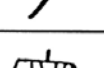
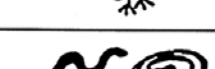


1. Hp: 'Human foot' *		25. AP: 'Fish'	
2. Hm: 'Human hand' *		26. AA: 'Other animal'	
3. H: 'Undifferentiated human'		27. AA(HO): 'Bird-man'	
4. Hf: 'Woman'		28. AA(HK): 'Kangaroo-man'	
5. Hv: 'Man with exaggerated penis'		29. AOF: 'Eggs' (bird or turtle)	
6. Hc: 'Human figure in profile'		30. EK: 'Kangaroo track'	
7. Hcv: 'Man in profile with exaggerated penis'		31. EO: 'Bird track'	
8. Hs: 'Stick figure'		32. ET: 'Turtle track'	
9. Hsc: 'Stick figure in profile'		33. GC: 'Circle'	
10. Hsv: 'Stick figure with exaggerated penis'		34. GCC: 'Concentric circles'	
11. Hsf: 'Female stick figure'		35. GCR: 'Circle with radial lines'	
12. Hscv: 'Stick figure in profile with exaggerated penis'		36. GAR: 'Arcs'	
13. Hfa: 'Ghost-like human figure'		37. GT: 'Triangle'	
14. Hfac: 'Ghost-like human in profile'		38. BG: 'Bi-lobed designs'	
15. Hfav: 'Ghost-like human with exaggerated penis'		39. GO: 'Oval'	
16. HfaSex: 'Ghost-like figures in sexual intercourse'		40. GL: 'Linear motif'	
17. Hsex: 'Humans in sexual intercourse'		41. GE: 'Maze of lines'	
18. Har: 'Tree-like human'		42. GP: 'Punctures or dots'	
19. Hpm: 'Human with exaggerated hands and feet'		43. GA: 'Other geometric'	
20. Hfc: 'Woman in profile'		44. GH: 'Dumbbell-like motif'	
21. AK: 'Kangaroo'		45. BO: 'Boomerang'	
22. AO: 'Bird'		46. Ft: 'Fruit'	
23. AS: 'Snake'		47. MA: 'Other motif'	
24. AT: 'Turtle' (saltwater)			

Figure 8.1. Typology of Skew Valley and Gum Tree Valley petroglyphs. (* See footnote on next page).

Table 8.1. Dampier. Skew Valley and Gum Tree Valley sites. Cumulative table (percentages). Key on following page.

subjects		sites											
		GTVE	GTVK	GTVS	GTVT	GTVW	SKV	GTVE+	GTVK+	GTVS+	GTVT+	GTVW+	SKV+
		totals											
		591	284	382	420	396	353						
1	Hp *	0.34	0.70	0.26	0.48	0.25	0.30	0.34	0.70	0.26	0.48	0.25	0.30
2	Hm *	0.00	0.00	0.00	0.71	0.00	2.13	0.34	0.70	0.26	1.19	0.25	2.43
3	H	11.68	0.70	6.02	2.62	7.07	5.79	12.02	1.40	6.28	3.81	7.32	8.22
4	Hf	0.34	0.00	0.26	1.19	0.51	0.00	12.36	1.40	6.54	5.00	7.38	8.22
5	Hv	0.34	0.00	0.00	0.00	0.00	0.00	12.70	1.40	6.54	5.00	8.34	8.22
6	Hc	0.34	1.06	0.00	0.24	2.27	1.52	13.04	2.46	6.54	5.24	10.61	9.74
7	Hcv	0.34	0.00	0.00	0.00	0.00	0.00	13.38	2.46	6.54	5.24	10.61	9.74
8	Hs	8.80	5.99	14.14	7.62	8.08	18.92	22.18	8.45	20.68	12.86	18.69	28.66
9	Hsc	0.00	0.35	1.31	1.43	2.53	2.44	22.18	8.80	21.99	14.29	21.22	31.10
10	Hsv	0.17	0.00	0.00	0.00	0.51	0.00	22.35	8.80	21.99	14.29	21.73	31.10
11	Hsf	0.00	0.00	0.00	0.48	2.27	0.00	22.35	8.80	21.99	14.77	24.00	31.10
12	Hscv	0.00	0.00	0.00	0.00	1.26	0.00	22.35	8.80	21.99	14.77	25.26	31.10
13	Hfa	0.85	0.00	0.26	1.67	0.00	0.00	23.20	8.80	22.25	16.44	25.26	31.10
14	Hfac	0.00	0.00	0.00	0.48	0.00	0.00	23.20	8.80	22.25	16.92	25.26	31.10
15	Hfav	0.00	0.00	0.00	0.48	0.00	0.00	23.20	8.80	22.25	17.88	25.26	31.10
16	HfaSex	0.00	0.00	0.00	0.48	0.00	0.00	23.20	8.80	22.25	17.88	25.26	31.10
17	Hsex	0.34	1.41	2.62	0.48	0.51	0.61	23.54	10.21	24.87	18.36	25.77	31.71
18	Har	0.88	1.06	0.00	0.00	0.00	0.30	24.22	11.27	24.87	18.36	25.77	32.01
19	Hpm	0.00	0.00	4.71	0.00	0.00	0.30	24.22	11.27	29.58	18.36	25.77	32.31
20	Hfc	0.00	0.00	0.00	0.00	0.25	0.00	24.22	11.27	29.58	18.36	26.02	32.31
21	AK	6.26	1.41	1.57	2.38	2.28	0.61	30.48	12.68	30.81	20.74	28.30	32.02
22	AO	0.68	0.35	1.05	0.71	1.52	2.13	31.16	13.03	31.94	21.45	29.82	35.05
23	AS	0.68	0.35	0.52	0.48	0.00	0.61	31.84	13.38	32.46	21.93	29.82	35.66
24	AT	1.86	5.63	3.66	1.19	8.94	1.22	33.70	19.01	36.12	23.12	38.66	36.88
25	AP	1.35	1.41	7.33	0.48	1.26	3.05	35.05	20.42	43.46	23.60	39.92	39.93
26	AA	0.34	0.35	0.52	0.71	0.25	0.30	35.39	20.77	43.97	24.31	30.17	40.23
27	AA(HO)	0.17	0.00	0.00	0.00	0.00	0.00	35.56	20.77	43.97	24.31	30.17	40.23
28	AA(HK)	0.30	0.00	0.00	0.00	0.00	0.00	35.56	20.77	43.97	24.31	30.17	40.23
29	AOF	7.11	35.21	0.00	0.00	18.15	0.15	42.97	55.98	43.97	24.31	38.32	39.38
30	EK	1.02	3.52	2.88	3.33	6.57	2.44	43.99	59.50	46.85	27.64	64.89	51.82
31	EO	3.72	1.41	6.81	1.43	8.59	6.10	47.71	60.91	53.66	29.07	73.48	57.02
32	ET	0.17	1.41	1.05	0.00	1.26	3.35	47.88	62.32	54.71	29.07	74.74	61.29
33	GC	0.17	1.41	1.05	4.05	0.25	0.30	48.05	63.73	55.76	33.12	74.99	61.57
34	GCC	0.51	0.35	1.05	0.00	0.00	0.00	48.56	64.08	56.81	33.12	74.99	61.57
35	GCR	0.34	0.00	0.52	0.00	0.00	0.00	48.90	64.08	57.33	33.12	74.99	61.57
36	GAR	6.43	8.45	1.57	2.61	3.54	3.05	55.33	72.53	58.90	35.73	78.53	64.62
37	GT	0.85	0.00	1.57	0.00	0.51	0.30	56.18	72.53	60.47	35.73	79.04	64.02
38	GB	0.68	2.11	1.31	1.43	0.00	2.74	56.86	74.64	61.78	37.16	79.04	67.66
39	GO	1.18	2.11	2.62	3.10	4.55	2.13	58.04	76.75	64.40	40.26	83.59	69.79
40	GL	1.35	5.28	11.78	4.05	4.04	1.93	59.39	82.03	76.18	44.31	87.63	71.62
41	GE	0.00	0.00	0.00	0.48	0.00	0.00	59.39	82.03	76.18	44.79	87.63	71.62
42	GP	2.03	3.17	0.26	44.49	1.52	0.00	61.42	85.20	76.44	89.28	89.15	71.62
43	GA	0.85	4.23	0.52	0.00	0.51	0.61	62.27	89.43	76.96	89.28	89.15	72.32
44	GH	0.00	0.35	0.00	0.00	0.76	0.00	62.27	89.78	76.96	89.28	90.42	72.32
45	BO	0.00	0.00	1.57	2.24	0.00	0.00	62.27	89.78	78.53	89.28	90.42	72.32
46	Ft	0.00	0.00	6.29	0.00	0.00	0.00	62.27	89.78	84.81	89.28	90.42	72.32
47	MA	37.73	10.22	15.19	10.48	0.58	27.77	100.00	100.00	100.00	100.00	100.00	100.00
subjects	sites:	GTVE	GTVK	GTVS	GTVT	GTVW	SKV	GTVE+	GTVK+	GTVS+	GTVT+	GTVW+	SKV+

* Qualification of use of the term 'human prints': (a) These are not 'hand prints' comparable to the ubiquitous pictograms found throughout Australia (and widespread throughout the world) that are produced by blowing pigment across a hand (also done with other items such as a boomerang), or made by pressing a hand wet with pigment onto a shelter or cave wall. (b) Rather, in the context of this discussion of Dampier petroglyphs, 'human hand print' and 'human foot print' are shorthand terms for representations of the hand/s or foot/feet of a 'human'. (c) Since they are most often the depiction of part of the integral anatomy of a being, they are qualitatively different from the 'animal prints' discussed subsequently in each chapter, the 'kangaroo track', 'bird print' and 'turtle track', which represent simply the 'footprint' left in the soft ground by a passing animal—Editors.

Key to Table 8.1			
'Human' motifs		'Animal' motifs	
H	'human' figure (single: diverse undifferentiated human)	AK	Animal: 'kangaroo'
Hm	'human hand print'	AO	Animal: 'bird'
Hp	'human foot print'	AS	Animal: 'snake'
Hpm	'human' with exaggerated 'hands' and 'feet'	AT	Animal: 'turtle'
Hv	undifferentiated 'human' with exaggerated 'genitalia'	AP	Animal: 'fish'
Hsex	'human' figures 'in coitus'	AOF	Animal: 'eggs'
Stick figures		AA	Animal: 'other animal'
Hs	stick-figure	Mythical figures	
Hsc	'male' stick-figure in profile	AA(HO)	'Man-bird'
Hsv	'human' stick figure with exaggerated 'genitalia' (only examples recorded are 'male')	AA(HK)	'Man-Kangaroo'
Hsf	'female' stick-figure	'Print' motifs	
Motifs in profile		EK	'macropod track'
Hscv	'male' stick-figure in profile with exaggerated 'genitalia'	EO	'bird print'
Hc	undifferentiated 'human' in profile	ET	'turtle track'
Hcv	'human' in profile with exaggerated 'genitalia'	'Tool' and 'fruit' motifs	
Hcv	'male' in profile with exaggerated 'genitalia'	BO	'Boomerang'
Hscv	'male' stick-figure in profile with exaggerated 'genitalia'	Ft	'fruit'
Hfac	ghost-like 'human' figure in profile	Geometric forms	
'Female' motifs		GC	circular form
Hf	'female' figure	GCC	concentric circles
Hsf	'female' stick-figure	GCR	circle with rays
Hfc	'female' in profile	GAR	arc-like form
'Ghost-like' motifs		GT	triangular form
Hfa	ghost-like 'human' figure (phantom form)	GB	bi-lobed form
Hfac	ghost-like 'human' figure in profile	GO	oval form
Hfav	ghost-like 'human' figure with exaggerated 'penis'	GL	linear form
Hfasex	ghost-like 'human' figure 'in coitus'	GP	punctations (dots)
Figures 'in coitus'		GE	scratched surface
Hsex	'human' figures 'in coitus'	GA	other geometric form
Hfasex	ghost-like 'human' figure 'in coitus'	GH	dumbbell shape
Arboriform motifs		Indeterminate	
Har	tree-like 'human' figure	MA	indeterminate motifs
Indices			
IA	index of association		
NMIR	mean number of repeated individuals		
NMIA	mean number of individuals associated with the theme		

Different types of sites in the Skew and Gum Tree Valleys

The groupings described above are quite significant. Their statistical structures reveal two main different types of sites that I name 'decorated dwellings' and 'task-specific sites' (or 'specialized sites').

The 'decorated dwellings' category includes sites associated both with a shell midden and with a water resource such as a seasonal creek or pool (SKV, GTVS, GTVE). The typology of the petroglyphs of these three sites have the same structure: the subject variety is large and there is no emphasis on any particular theme; here, the category, 'other motifs', constitutes a significant proportion of the petroglyphs. This last feature (in GTVE at least), consisting of unstructured motifs—'simple rubbed' and 'hammered' patches—is linked to the accumulation of the petroglyphs on the same rock faces through time and to the fact that earlier figures often were defaced and erased.

The three other groups, GTVK, GTVW and GTVT, are 'Task-specific' sites. They are located far from the coast and from water resources and are more difficult of access; the typology of their petroglyphs is much less homogeneous. A

few motif categories are dominant: there is a focus on 'eggs' and 'tracks' (GTVW and GTVK) or on geometric forms and punctations (GTVT), and these distinguish the three groups from the others. What I named 'punctations' are round, pecked dots; they are different from the 'eggs' due to their small size (diameter under 40 mm) and their scattered distribution, whereas the 'eggs' are big and clustered.

Decorated dwellings

The 'decorated dwellings' sites show two important features: they are camp-sites with evidence of long occupation by groups including women and children, and they are closely associated with the petroglyphs. The three sample zones, SKV, GTVS and GTVE, each centre on one or more shell middens, have one or several water sources nearby, and a dense area of surrounding petroglyphs. The distribution of the artefacts, shells and petroglyphs, and the orientation of the carved surfaces, emphasize a strong link between midden and petroglyphs. It was notable that the corners of many carved granophyre (and less frequently gabbro) blocks on the edge of the midden were chipped for flakes to make artefacts. Some of the carved rocks were used by the midden dwellers as cores from which to flake tools.

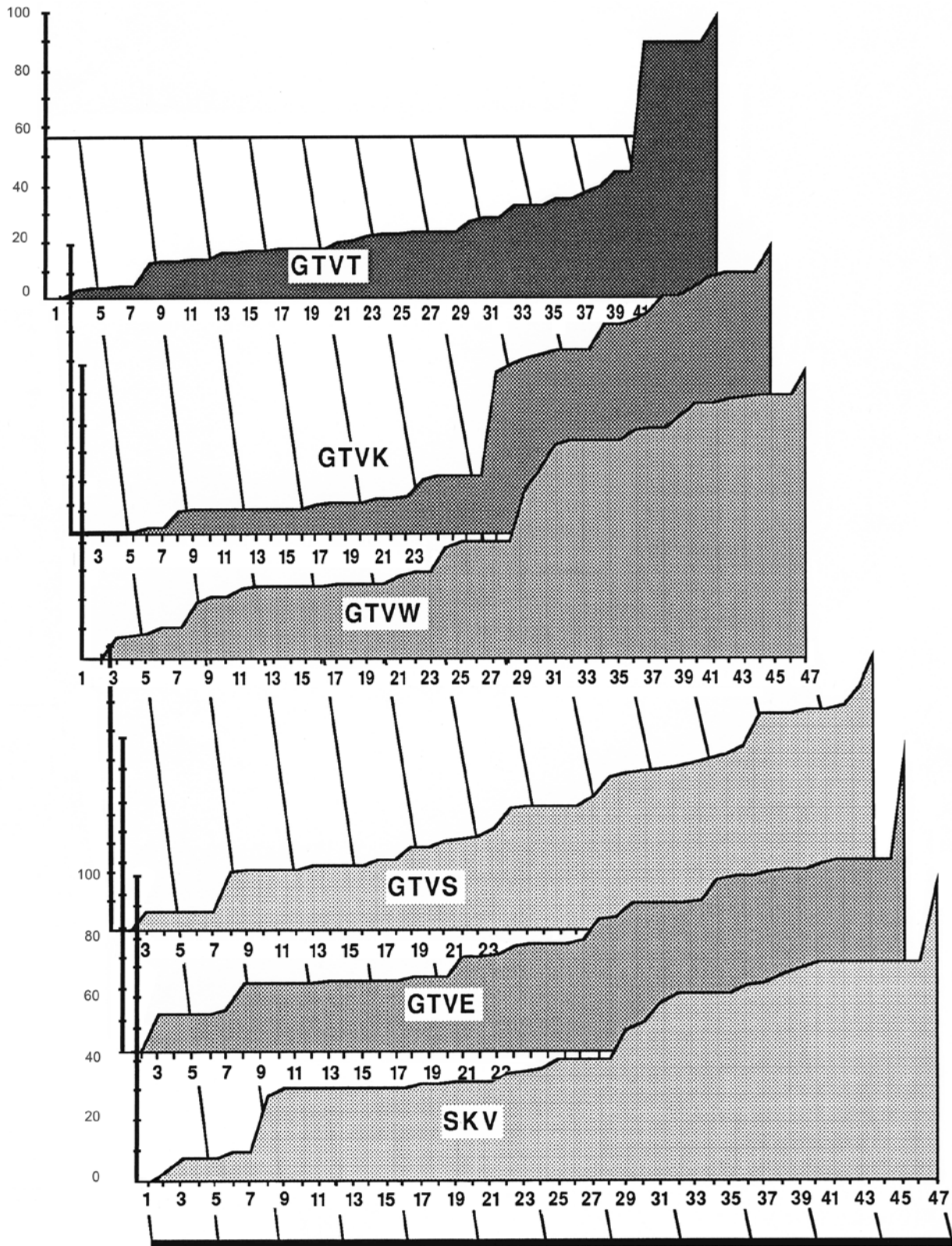


Figure 8.2. Cumulative graphs of the petroglyphs of the six sampled zones of Skew Valley and Gum Tree Valley. Horizontal axis: Typological list of the motifs (there are 47 different types of motifs—reference Table 8.1 and Fig. 8.1). Vertical axis: Cumulative percentages of the various motifs (0–100%).

Two interpretations can be suggested: either it was more convenient to obtain the material locally than from a distance, or the stone artefact from a carved rock had a link with the petroglyphs and a special power: they were thought of as more efficient. The first interpretation is preferred since non-carved slabs at the sites also display evidence of knapping. Whatever the interpretation, there is a close association between habitats and petroglyphs.

The excavation of the Skew Valley midden and the faunal analysis by Dr David Horton indicated that the site was frequented sporadically, but all the year around, by groups whose numbers can be estimated. According to the first European navigators of the West Australia coastline—Dampier (in 1688 and 1699), Gregory (in 1861) and King (in 1818)—who encountered the inhabitants of this coast at different times of the year, the number of temporary occupants

of Skew Valley (at least in the sixteenth to nineteenth centuries), at the beginning of the contact period (and perhaps at the end of intensive occupation of the site), can be estimated as between 20 and 30 persons. Moreover, such a number seems to suit the surface of the camp-site living area, which is about 500 m² (the surface of the midden was about 300 m² and the surface of the outer living ring was 200 m²).

The presence of the women, and therefore of children, is revealed by the grinding stones located on the margin of the midden (26 examples in GTVE and 12 in SKV). At the GTVS site the presence of the children may be also inferred by the presence of two small petroglyphs (depictions of a 'turtle' and a possible 'man'). These are differentiated from the others by their technique and especially by their location in a deep crevice between blocks, very difficult of access, where it would be impossible for an adult carver to work.

Excavation confirms that the inhabitants lived mainly on the products of the sea, the beach, the mangrove swamps and the Fenner Creek mud-flat. Both the excavation and the study of the petroglyphs reveal the marine focus of daily life in Skew Valley and Gum Tree Valley. Almost all the edible animal species found in the Skew Valley midden were represented in the local carving; there are only a few differences between eaten and depicted species: certain fish and birds were depicted but not represented in the midden.

Task-specific sites

The 'task specific' sites, GTVK, GTVW and GTVT, are located further from the coast and at a higher altitude than the other category. They are sited in the upper part of Gum Tree Valley (GTVT) and on top of the plateau commanding a view of the whole of Gum Tree Valley and of the Fenner-Creek mud flat (GTVK, GTVW). A few water holes exist; these are small man-made wells (about 0.5 m in diameter and 0.6 m deep) probably excavated in the rocks to access the ground water (GTVT), and natural concavities in massive rocks that can hold about 20 L of rain water, and that might be covered with a slab lid to prevent evaporation (GTVK).

Some signs of occupation were found among the petroglyphs in all task-specific sites. Stone artefacts were found in GTVT, GTVW and GTVK, although these sites were not associated with middens. In GTVT it was possible to reconstruct an original core by fitting several flakes together, indicating that stone knapping was carried out here. I also recorded *Anadara* shells scattered among the carved rocks.

On the plateau commanding Gum Tree Valley, especially at GTVK, I defined stone huts arranged on natural oval or circular places ('Huts A' and 'B'). These are the only small areas with less rugged ground; they are characterized by a sandy earthy soil that has sustained vegetation (Kurrajong trees). The early inhabitants used these naturally shady places to construct dwellings: stone walls surrounded a central living place where a scattering of artefacts and shells were found. I mapped and excavated these previously unrecognized dwellings. The two GTVK radiocarbon dates obtained correspond exactly to those of the Skew Valley *Anadara* layer.

These sites are quite different from those I have called the 'decorated dwellings'. The total lack of grinding stones reveals that a part of the population—men only—frequented these places. Furthermore, the small size of the stone huts, and of the wells and water holes, allowed only a few persons to stay at each place. The artefacts and shells found on the ground and between the blocks are few. Often one or two handfuls of shells were found and these appear to be the simple remains of occasional meals.

It is possible that these sites were visited and even inhabited for a few days by small groups during the wet season. Today the wells and water holes can provide water only during the rainy months. It is only during the rainy season that a stay of several days on this plateau would be possible. During the Dry season, short visits of a few hours only could be made. The large shell *Syrinx aruanus*, used as a water carrier, found at GTVT and dated by the radiocarbon technique, illustrates that access to water was a problem at this site since the earliest period, more than twenty millennia ago.

This discrete occupation of the higher places that were more difficult to access (GTVT, GTVK, GTVW) possibly related to ceremonial activities carried out by a minority. This contrasts with the general, dense occupation by the whole social groups of main water hole areas in the lower part of the valleys and of the beaches.

Patterns of site use

However, such a simple distinction between 'decorated dwellings' and 'specific sites' should be qualified by two important points.

First, the so-called 'decorated dwellings' include at least two areas with different functions. The groups near the middens (SKV, GTVS, and GTVE) contain certain petroglyphs that are intentionally exposed to the view of any visitor to the site. The motifs are placed on vertical slabs oriented towards the centre of the camp. Other petroglyphs, however, tend to be hidden by being placed on the upper surfaces of blocks and at top of the slopes, some distance from the middens.

The statistical study of the relationships between motif subject and orientation showed that the first (more public) subject matter is comprised mainly of various kinds of 'human' figures, while the second category is mainly 'animal footprints' and geometrical motifs. Thus, two categories of motif can be distinguished, those with free access and those with more limited access.

Moreover, a comparison of the distribution of the grinding stones with the subjects of the petroglyphs was revealing. On the maps of the distributions of grinding stones (which are located at the foot of the slopes), the density contours outline those sectors frequented by the women (who used the grinding stones). Within these sectors, the percentages of various motif subjects were calculated. There were significantly different proportions between the subjects on the lower (near the grinding stones) and the upper parts of the slopes (far from the grinding stones). Near the grinding stones, depictions of humans are dominant, whereas on the tops of the slopes, geometric motifs (especially arcs, round pecked marks, and signs of various kinds) dominate. In both areas, the percentages of the dominant motifs are much higher than the mean percentages of these motifs for the whole site. Thus it would appear that some geometrics 'avoid' the grinding stones and thus the areas probably frequented by the women.

The marriage of the daily domestic activities and the artistic activities is not total. Several sets of data indicate the presence of *specialized areas within the 'decorated dwelling' site type*. This suggests that there were areas of public art and areas of representations that were of a more restricted access.

Second, the 'specific task' category of sites (GTVT, GTVK and GTVW) is not homogeneous. These sites are characterized by difficult access, lack of water, discrete occupation, an abundance of certain motifs, including 'eggs',

'tracks' and geometric forms (especially punctations). These three sites, moreover, seem able to be subdivided further. At GTVS there are two standing stones associated with the petroglyphs, and at GTVK there is another one.

According to Palmer (1975: 158), there is, associated with petroglyphs, one form of stone arrangement

... that has been noted at several places both in the Archipelago and on the mainland. ... The placed stones are usually situated in a prominent position, and in some cases number only five or six, and in others several hundred.

At one such site, Palmer's informant '... stated that they represented an increase site, known generally in the region as a *dalu* site.'

In certain periods, GTVK and GTVW, or at least a part of them, were probable 'dalus' devoted to turtle-increase rituals. They overlook the ocean and Fenner Creek mud-flat, which (prior to the development of the Dampier Salt Fields) was a traditional turtle breeding place according to the biologist, Nathan Sammy. Both sites have many petroglyphs depicting turtles and turtle eggs, some panels showing clearly the migration of turtles. Moreover, I recorded on several rocks, scratchings and repeated incisions that are probably rituals marks (linked to hammering or other forms of marking of the rock during the rituals). Many of the petroglyphs of GTVK and GTVW appear to have even been re-marked during repeated rituals. In GTVK, for example, sometimes 'turtle eggs' have been re-pecked or renovated.

However, it is possible that these two sites were not restricted to turtle-increase rituals: 'The Kangaroo' (GTVK-1), which often was renovated, could also be linked to the same rituals for kangaroo. Other functions of the site associated with other petroglyphs could be considered also.

GTVT a special site

GTVT is a special site, as shown by its isolated position (and as demonstrated by the cumulative graphs). It has three main characteristics:

- Abundance of punctations or pecked dots;
- Presence of large and very crude 'ghost-like human' figures; and
- Presence of a little burial-like cairn with a stele decorated with a 'human' motif; excavation would be necessary to confirm its function. Besides the cairn, a rock bears 'ritual marks' in the form of intensive pecking.

This site seems to be a 'specific task site' but its real functions seem different from those of GTVK and GTVW. For example, the presence of 'turtle' motifs is unusual. To understand more clearly the uses of the sites it is also necessary to consider their chronological change over time.

Chronology

Several methods were used to date the petroglyphs: excavation and stratigraphic dating of carved slabs buried in a shell midden, radiocarbon analysis, comparisons of the patinae of the petroglyphs, relationships of the patination states with the subjects of the petroglyphs, distribution of the patination states, and relationships of carving techniques and patination states.

Radiocarbon results

Eighteen radiocarbon dates were obtained during my research in Skew Valley and Gum Tree Valley (Fig. 8.3). Twelve were processed by the ANU Radiocarbon Research Laboratory, and the remaining six were produced by the Radiocarbon Laboratory of Lyon University.

Most of the analyses were made on marine shells. The three made using charcoal (ANU-1833, -1844, -1870) and one on the outer part of the shells of a sample (ANU-1835A) were not considered further because they appeared to be contaminated. Determinations made on complete, well preserved, solid and large shells (especially the inner part of the shells) seem to be more reliable.

At Skew Valley, eight dates were obtained on samples from my excavation of a midden. In GTVK, three dates were produced from samples collected during my excavation of 'Hut A', from a surface collection from the 'Hut B', and from another location among the petroglyphs. At GTVW and GTVT, three more dates came from shells collected from among the carved rocks.

Skew Valley. The results from the excavation of the Skew Valley midden show that the period of intensive shellfish gathering started towards 7500 years ago, and came to an end towards 2200 years ago (cal BP). However, the late date (around 1100 BP) on *Anadara* shells in GTVT shows an episodic gathering of *Anadara granosa* long after the abandonment of the Skew Valley midden. Moreover, the top of this midden gave us artefacts made of glass, signifying brief occupation of the Skew Valley midden during the contact period.

The excavation showed that the Skew Valley midden marks marine encroachment of the Dampier area, as elsewhere of the Australian coast, towards 7500 BP. This midden is formed of two superposed layers:

- The bottom layer is formed largely of *Terebralia palustris*, dated from 7500–7000 years ago; and
- the upper layer consists mainly of the bivalve, *Anadara granosa*, dated to between 4500–2200 years ago with evidence of later episodic visits.

It is probable that changes in the environment, and especially of the raised sea level, explain the shift from gastropod gathering to bivalve collecting.

In our current state of knowledge, it is impossible to explain the end of the intensive exploitation of the shellfish towards 2200 years ago, and to understand the significant gap of 2500 years (from 7000 BP to 4500 BP) between the two shell layers. During this interregnum, the Skew Valley midden area seems to have been deserted, unless one imagines an exceptional natural phenomenon such as a cyclone (for which I have no evidence) washing away the summit of the midden some 5000 years ago.

More data from further excavations of middens are needed to gain an understanding of the use of the environment by the shellfish gatherers of the Dampier Archipelago, who were also the carvers of many petroglyphs.

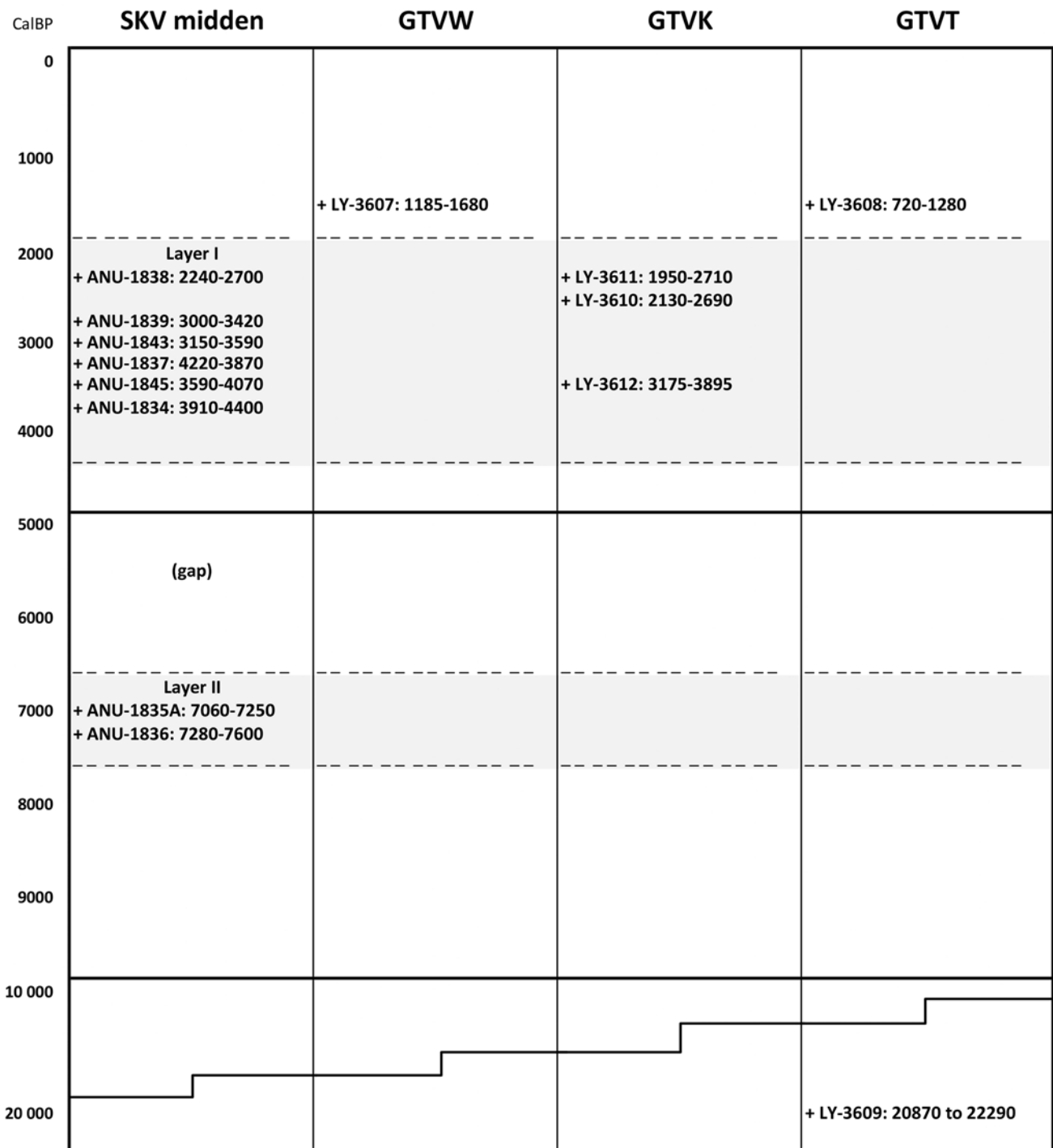


Figure 8.3. Calibrated radiocarbon age-estimates for Skew Valley and Gum Tree Valley sites. (Details of the analyses are provided in the discussions of each petroglyph group.)

Five carved blocks buried in the SKV shell midden and unearthed in the excavation were dated. Slab I, bearing three stick figures in profile are dated to earlier than about 3600 years ago (ANU-1837: 3420–3870 cal BP—Chapter 2, Part II, Addendum, Tables 10 and 11). Slab II with three ‘human’ figures, and Slab III with one stick figure, are older than 2450 years (ANU-1838: 2240–2700 cal BP). The fourth petroglyph, a depiction of a coiled ‘snake’, is older than 2450 BP (based on ANU-1838, and considering the rate of shell deposition). The fifth slab, bearing only a groove, is dated to earlier than 3200 years ago (ANU-1839: 3000–3420 cal BP). These petroglyphs are among the few examples of Australian rock art firmly dated and the only ones stratigraphically dated in the Dampier area.

Gum Tree Valley. Six radiocarbon dates from shells of the higher sites of Gum Tree Valley showed that the *Anadara* gatherers frequented these hilltop sites from approximately 4000–1000 years ago.

GTVW. At the Woman Group, *Anadara granosa* shells gave a date of about 1450 years ago (LY-3607: 1185–1680 cal BP—Chapter 6: Table 6.15).

GTVK. At the Kangaroo Group, *Anadara* shell samples, collected from the floors of the stone huts, dated them to about 2300 years ago (Hut A: LY-3610: 2130–2690 cal BP, and Hut B: LY-3611: 1950–cal 2710 BP—Chapter 6: Table 6.15). The *Anadara* gatherers used this site on the plateau; they built the stone shelters there at a time when the top

layer of the Skew Valley midden was accumulating. A third GTVK *Anadara* sample gave a range (LY-3612: 3175–3895 cal BP) corresponding to the intensive bivalve gathering of the upper layer of the Skew Valley midden (Chapter 6: Table 6.15). It dates this area to an older phase than the other sites.

GTVT. For the Top Group, there are two analyses on shells. The first, made on *Anadara granosa* shells (LY-3608: 720–1280 cal BP), belongs to the last period of gathering this type of shellfish on the Dampier coast. The second was made on large pieces of a *Syrinx aruanus* (trumpet shell) lying among the petroglyphs of the summit of Gum Tree Valley. The date of about 22 000 years was unexpected (LY-3609: 20 870–22 290 cal BP—Chapter 7: Table 7.18).

This Pleistocene date is much older than that of any shell midden. At this time, during the last glacial period, the sea level was low. The coast was about 130 km to the west of the present shoreline. This unexpected date poses three questions (Chapter 7: *The Shell Assemblage*).

First, are shell dates always reliable? Second, is the use of the shell concurrent with the death of the shell? Was it possible for a Pleistocene fossil shell to be picked up from the beach, say only 2000 years ago, to be used to carry water to the top of Gum Tree Valley? Third, what are the links between this old shell and the rock petroglyphs?

The first question was answered by Jacques Evin, then director of the radiocarbon laboratory of Lyon University, who emphasized the validity of the date (Chapter 7: Addendum A). The second question was answered by Mr George Kendrick, palaeontologist, and Mr Peter Bindon, archaeologist, both of the Western Australian Museum in Perth (Chapter 7: Addendum B). *Melo amphora* and *Syrinx aruanus*, both used as containers, have been found at other inland sites. Their diffusion is, of course, more restricted than that of the shell pendants studied by Mulvaney (1975: 111), since small ornaments were carried more easily than large whole shells. But in July 1984, Peter Randolph and I saw pieces of a large Baler Shell at the base of carved rocks of Egina Granite at Woodstock, which were 150 km inland. If this shell is Pleistocene in age, then it was carried an even greater distance since the coast then was further off-shore. Flood (1977: 70) reported a shell of *Melo amphora* at Tom Price, 230 km from the present coast, and cited Newall's description of large broken sea shells at Millstream. This was clear evidence of an exchange or trade system with coastal tribes or some trips of inland people to the sea. Such relationship could have had a Pleistocene origin. The Woodstock find provided us with a better understanding of the presence of a Pleistocene shell at the top of Gum Tree Valley.

The third question is difficult to answer; one might think that the presence of the old shell indicates that Gum Tree Valley Top was inhabited over twenty millennia ago, but that the rocks were not yet carved. However, the Pleistocene *Syrinx aruanus* was in the centre of the site surrounded by deeply patinated petroglyphs whose motifs and styles suggest that they too belong to the Pleistocene. Moreover, most of the artefacts scattered among the petroglyphs of the site belong to the 'Australian Core Tool and Scraper Tradition' and are linked to the old period of petroglyphs. It is more likely, therefore, that the *Syrinx* belongs to the same assemblage as the old tools and petroglyphs. The problem here is similar to the one posed by the radiocarbon results obtained from charcoal found on the ground of Koonalda Cave or from Lascaux. It is likely that drawings and ground remains are associated and are contemporaneous. The Gum Tree Valley Top site is different from rock art sites on the

shore that are close to the middens; it is one of the oldest groups of petroglyphs in the area. Some of its figures were probably carved twenty millennia ago.

Relationships of the petroglyphs to dated cultural remains

In addition to the radiocarbon results, the topographical distribution of the petroglyphs and other archaeological remains on the sites can provide some important information on the age of the petroglyphs themselves.

The general map of the western end of the Dampier Peninsula (Chapter 1: Fig. 1.3) shows an obvious link between shell middens and petroglyphs. Petroglyphs are usually missing or rare in the gaps between the shell middens and their number increases as one gets closer to the middens. In fact, the petroglyphs are even more numerous right on the edge of the midden: At Skew Valley, at the foot of the block-covered slope adjacent to the midden, almost every rock is carved, whereas on the opposite slope of the valley, separated from the midden by the creek, the petroglyphs are many fewer.

A further statement can be made: The contour map of the density of the carvings in Skew Valley (Chapter 2, Part I: Fig. 2.7) shows two main clusters. The more important one is located just in front of the top of the midden (9.5 m contour), the second cluster is to the north, commanding the path to the water pools. Such a distribution is a good example of the close connection between the central part of the habitation area and the zone of the maximum density of petroglyphs. It testifies that the petroglyphs are linked to the habitat and that most of them were produced by the shellfish gatherers between 7500 and 2200 years ago.

Moreover, the map of the orientations of the carved surfaces shows everywhere a dominant orientation towards the middens (Chapter 2, Part I: 2.47). This supports again the connection between petroglyphs and shell middens.

At every site, there is also a significant topographic relation between the map of the petroglyphs and that of all the archaeological remains.

In the Eagle Group at Gum Tree Valley, 2200 stone artefacts, a few bones and several thousand shells from among the carved rocks that surround a central midden were recorded and studied. The maps show the distributions of these different items (Chapter 4: Figs 4.55, 4.56). A clustering of petroglyphs corresponds to a clustering of artefacts or a clustering of shells. Such a close conformity is unlikely to happen by chance. It reveals that most of the petroglyphs, tools and shells are contemporaneous. The tools scattered among the petroglyphs are identical to those discovered in the excavation of the Skew Valley midden; they belong both to the 'Australian Core Tool and Scraper Tradition' and to the 'Small Tool Tradition'. The shells among the petroglyphs are *Anadara granosa*, as at the top of the Eagle Group midden (not excavated), and as in the upper layer of the Skew Valley midden. These observations lead to the conclusion that many petroglyphs of the Eagle Group (GTVE) were made by the *Anadara* collectors mainly between 4500 and 2200 years ago according to the Skew Valley excavation.

The same fact was observed in Skew Valley: The shells scattered among the petroglyphs show the same groupings as the petroglyphs; almost all of them are *Anadara granosa* as in the upper layer of the midden nearby. Only three were *Terebralia palustris*, as in the bottom layer of the midden; thus, it is probable that the first dwellers were few and that

they visited the area from time to time, whereas the main occupation of the site was that of the bivalve collectors between 4500 and 2200 years ago who were responsible for the main production of the petroglyphs.

The situation is quite different at the top of Gum Tree Valley (GTVT) where there is no midden. However, 12 clusters (three of them very important) are noticeable in the distribution of the petroglyphs. The distribution of the artefacts shows another series of groupings which correspond exactly to those of the petroglyphs (Chapter 7: Figs 7.5, 7.6). The spatial association of the petroglyphs and the artefacts implies a chronological association: it appears that the petroglyphs are contemporaneous with an artefact assemblage of the older Australian Core Tool and Scraper Tradition. The 22 000 date for them is appropriate. Moreover, the few *Anadara* shells scattered on the bottom of the valley have a different distribution, showing that they probably are not associated with petroglyphs that mostly pre-date the shellfish gathering and the appearance of the middens.

Patination

During my work on the sites, I observed that the petroglyphs presented different states of conservation. Many appeared very faded; they are often difficult to see because the grooves and incisions made by the carvers are deeply patinated and almost the same colour as the surrounding rock. Some others look very fresh and are visible from afar. Many others show different states of patination which range between the extremes. In the field, I classified visually the petroglyphs into three categories: Patina 1 (the most faded), Patina 2, and Patina 3 (the fresh ones).

Moreover, I devised a method to go beyond this subjective statement. I measured accurately the contrast between the figures and the rock using a sophisticated photoelectric cell (Mastersix-Gossen). The densities were measured on ten points of every figure and on ten points on the rock outside but close to the figure. The difference between the mean density of the points inside the figure and the mean density of the points outside the figure is the value of the contrast of the figure. These measurements were made in the field directly on the carved rocks and sometimes on slides projected onto a frosted screen. I also have used this method in my studies of European Palaeolithic rock paintings.

In five of the sample zones, percentages of the various measured values of the petroglyph contrast were established (Fig. 8.4). For the sixth zone (GTVE), these percentages were not calculated because their light meter measurements were too few to allow a reliable diagram to be constructed (this method is accurate but time consuming!). The GTVE measurements give a general tendency only. The five diagrams were compared:

- That for GTVT (Top of Gum Tree Valley) shows a skewed distribution with a high peak for the contrasts of nil or extremely low (0–0.04: deeply patinated petroglyphs) and a steep slope for the other values which quickly decrease. It is noticeable that the range of the values is small (from 0–0.20);
- The curves for GTVW and GTVK, again have a skewed distribution. The deeply patinated figures with a very low contrast are the most numerous, but a second small peak appears that underlines the presence of a series of fresh figures (with a high contrast) in the group. The range of the values is larger than before (from 0–0.34); and
- SKV and GTVS present bimodal distributions; the patinated figures give a peak towards a contrast of 0.25–0.29. GTVS (but not SKV) possesses a third important peak for the deeply patinated figures with a very low or nil contrast. The range of the values of the contrast is the widest (from 0–0.40).

At the Eagle Group, the measurements simply show that GTVE seems to present the same type of diagram as GTVS: a high proportion of deeply patinated figures, then two peaks for patinated and fresh figures, with a very wide range of contrast values.

The differences between the three types of curves are easy to understand: In SKV and GTVS (and probably GTVE) figures of different periods are mixed together. Those with high contrasts are 'recent', whereas others with lower contrast are 'older'. Would it be possible that the two central peaks correspond to the two layers of the Skew Valley midden? That the petroglyphs made by the gastropods gatherers are those heavily patinated, and that the figures drawn by the bivalve gatherers are those described as 'fresh'?

In GTVS and probably in GTVE, could most petroglyphs represented by the 'deeply patinated' peak (contrast nil or almost nil) be older than the first middens? The question is posed but the reality probably is complex. In GTVE we know only that the depictions of the thylacine (GTVE-62) are deeply patinated and that they must be older than 3000–4000 BP (but we don't know how much older), whereas the probable dingo motif (GTVE-361), again deeply patinated, should not be older than about 4000–6000 years. Therefore, if GTVE-361 is, as I think, really the representation of a dingo, this carving would already be deeply patinated.

It is interesting to note that, in contrast to GTVS and GTVE, heavily patinated petroglyphs do not exist around the SKV midden: Here, only one block bears an unusual type of very old geometric motif (SKV-90T), one that can be seen in other Dampier sites such as Hunters Valley and Watering Cove.

On the plateau (GTVK and GTVW), and in the upper part of Gum Tree Valley (GTVT), far from the middens, the petroglyphs seem to be more homogeneous. There the figures are often associated with low contrast and some are deeply patinated. GTVT, with a low range of contrasts, is different to the rest. This is the site that produced the Pleistocene date.

Thus, my observations and measurements statistically confirm the chronological value of patination.

Patination states and petroglyph subjects

We studied the relationships between the motif subjects of the six zones and the states of the patination. In the sample selected there is a total of 1360 figures with Patina 1 ('deeply patinated'), 970 with Patina 2 ('patinated') and only 216 with Patina 3 ('fresh').

The classification of the subjects of the petroglyphs according to their states of patination distinguishes four groups of subjects:

Group 1: Geometrics (punctuations, circles, concentric circles, lines, ovals) and a few depictions of humans ('man-with-exaggerated penis', 'man-in-profile', 'stick figures with exaggerated genitals'; 'tree-like men'), and some of animals ('thylacines' and probable 'dingo'). They are all 'deeply patinated' (Patina 1);

Group 2: Geometrics (triangular, linear and bi-lobed motifs forms, dumbbell-like motifs), depictions of humans ('ghost-like figure with exaggerated penis', 'human hands' [see footnote p. 671]), composite 'animal-men' (kangaroo-man) and other subjects like 'fruits' and 'other motifs'. They are 'patinated' (Patina 2);

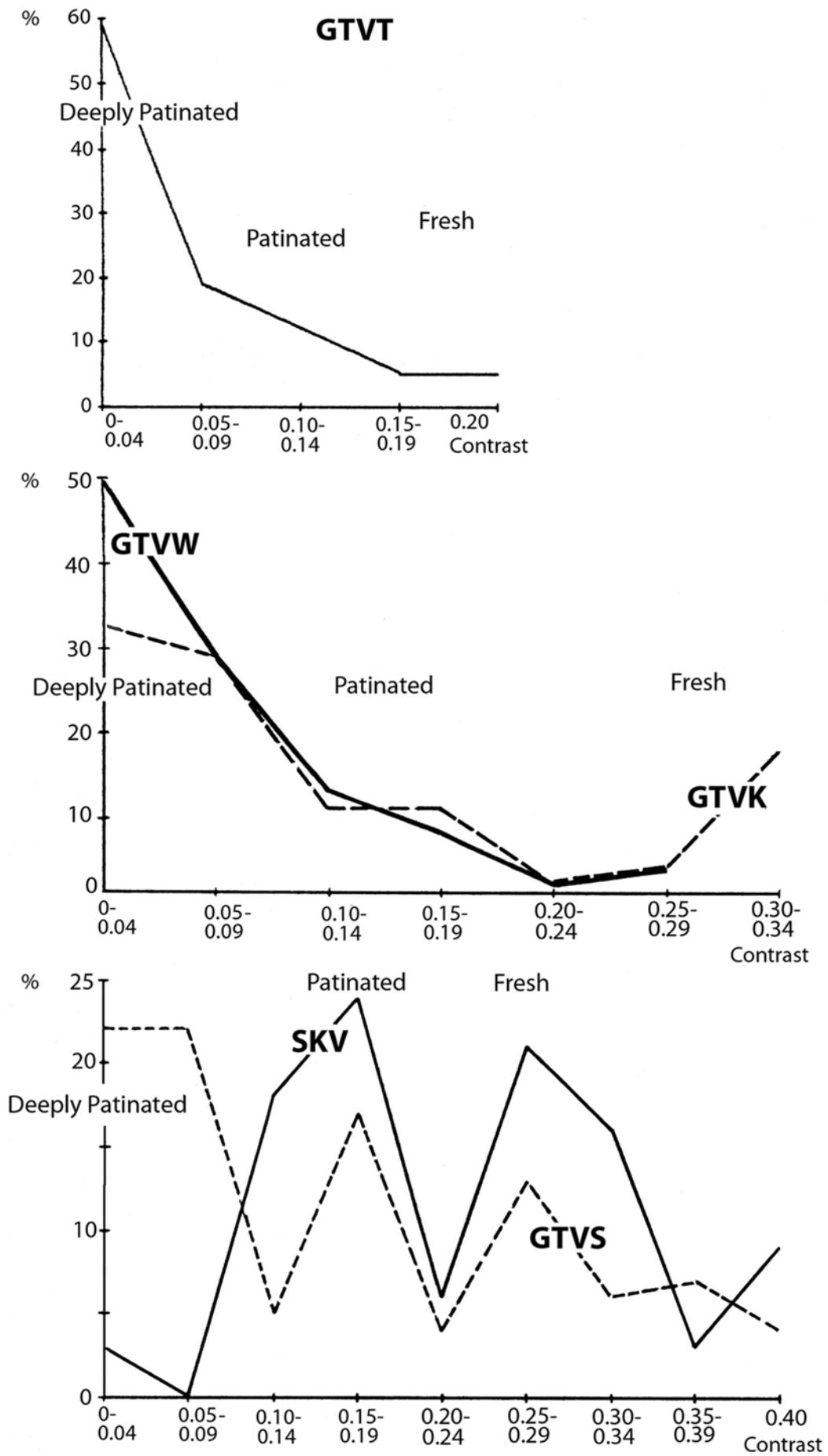


Figure 8.4. Study of patination at Skew Valley and Gum Tree Valley. Horizontal axis = patination 'contrast factor' or 'density'.

Group 3: Depictions of humans ('human with exaggerated hands and feet', 'bird-men'—The Eagle of GTVE), snakes, other animals, turtle tracks and boomerangs. They are associated with Patina 3 and look 'fresh'; and

Group 4: There are 13 motifs which appear to have no obvious association with one patina class; they are found with all three patinae. They include depictions of human feet, undifferentiated human forms; stick figures, human females, 'ghost-like' forms (several in GTVT and GTVS), and of turtles, kangaroo, birds, fishes, bird tracks and kangaroo tracks, arcs, eggs and 'other geometrics'. The use of these motifs has considerable longevity, and this has resulted in them being associated with different states of patination.

The Group 4 long-duration motifs are stable depictions and repeatedly carved, little changed, over time.

Re-marking

But there is another type of long-duration motif: the very old figures that have been renovated constantly up to recent times. These figures were seen by the inhabitants as always important: examples are 'The Eagle' of GTVE and 'The Kangaroo', GTVK-1.

Re-marking of figures is a characteristic of Gum Tree Valley petroglyphs. At GTVK one fifth of the figures were renovated, in GTVS one eighth, and in GTVE 6.5%. However, in GTVT, only 1% (five cases) was renovated. Skew Valley is different from Gum Tree Valley: only one case of re-marking was recorded there.

Often, large-sized figures located in prominent positions, visible from afar, were re-marked. I recorded three types of renovation:

- the localized re-marking of a previous petroglyph that achieves a simple 're-activation' of an old figure without changing it significantly; examples are found in some of the turtle eggs of GTVK-42, and the repeated re-grooving (by abrading) of the outline of some figures (GTVE-1, GTVK-1);
- the addition of details to an old motif; examples are the 'forked penis' of the 'ghost-like' figure GTVT-16, the 'eyes' added to GTVT-1, the several new 'feet' of GTVE-3; and
- the renovation-transformation of a previous important figure (e.g., GTVS-10, or SKV-18a on which a new 'human' motif was added to an older one to make a coital scene), where only a part of the earlier image is kept. In these cases, the meanings of the old figures seem to have evolved through time, even if something of the original meaning of the old motif was sometimes respected.

Changes over time in site use

Our mapping of the different states of patination shows how the evidence from patinae can be used to study chronological changes in the sites.

At GTVT, 'deeply patinated' motifs are found over much of the site with a concentration at its western end. Conversely, the 'patinated' petroglyphs (Patina 2) are more numerous in the eastern part of the site, while the few 'fresh' figures show a small clustering at the western entrance. Over time, the focus of the petroglyph-making activity had shifted.

At GTVE, the 'deeply patinated' figures do not occupy the entire site; they are clustered on the top of the southern slope and the centre of the northern slope, whereas the 'patinated' and 'fresh' petroglyphs have a wider distribution, tending to

be grouped in the west. At the Eagle Group, there is a shift over time to the west. The two distribution maps reveal an old linear occupation of both slopes oriented along the valley, followed by a more recent occupation whose area is curved and tends to envelope the central GTVE midden (Chapter 4: Fig. 4.46). The focal point of the petroglyphs probably has changed over time, and the presence of the midden seems to have influenced the distribution of the figures.

Carving techniques

Two main techniques were used to make the petroglyphs at Skew Valley and Gum Tree Valley:

- **deep pecking** (linear and intaglio) consisting of lines of large punctures (from a few to ten mm in diameter), sometimes discrete (that is, separated from each other), and including totally deeply pecked (intaglio) surfaces; and
- **superficial pecking**, much finer and denser and much more carefully executed than the other technique. This shallow pecking is made of tiny, closely-placed dots. It is either linear or covers a part of the figures, producing silhouettes.

Other techniques recorded were the deep regular *grooving* (often re-carved), the rough superficial *abrasion* or *hammering* and the V-shaped *incision*. These three techniques are not as common as the first two.

The relationship between techniques and patination in all the studied sites, show an obvious point: Deep pecking and intaglio are mainly associated with Patina 1 and secondarily with Patina 2, whereas the superficial techniques are associated with Patina 2 and secondarily with Patina 3.

There is almost no recent deep pecking. The incision technique, which is rare, seems to be linked to all three states of patination with a slight preference for Patina 2.

Relationships among the categories of figures

The assemblages of petroglyphs from different periods concentrated in a relatively small area at Skew Valley and Gum Tree Valley challenge the scientific insights of the prehistorian and of the anthropologist. In these large assemblages of carvings, researchers must indeed strive to understand the hidden dialogue that accompanies the images, a dialogue that persists through time.

The analyses of the relationships between the figures—their modes of association, how they cluster or disperse on the rock surface—are the primary goals of the study of rock art, just as the distribution of the remains and the search for hidden structures are among the primary goals of archaeological excavation.

The study of parietal structures (that is, motifs on shelter or cave walls, or here, on blocks of stone) must incorporate *the notion of time*. What we see today is only the result of various processes and it is very rarely that of a single human act. Parietal dynamism, highlighted by modern surveys, is a given that the researcher constantly must keep in mind; it has the connotation that the decorated wall or support is constantly changing over time—it is 'living'—and any interpretation of the motifs needs to have this idea to the fore. Parietal dynamism is my systematic point of view on rock art; I discovered in Australia during my own fieldwork that pictograms and petroglyphs had been used for long periods of time and had been renovated over time, and this knowledge

was reinforced by the ethnoarchaeological approaches of others to the study of rock art. It was this that informed my own approach to rock art; it was new in France where this idea (*pariétal dynamisme*) can be seen to be opposed to the structuralist-static stance of Leroi-Gourhan.

Relationships between the figures through time can take three different modalities:

- ‘**an attraction**’, forming a positive relationship between the motifs that are spatially close and are frequently associated with each other;
- ‘**a repulsion**’, a negative force ‘dispersing’ the motifs and precluding mutual association; and
- ‘**an indifference**’ shown by the fact that the motifs ‘ignore’ each other, sometimes distant, sometimes close, sometimes overlapping in mutual oblivion.

The graphic layout of carvings on a block may be of the following types: ‘Isolation’, ‘juxtaposition’, and ‘superimposition’. These three categories illustrate how the three modalities discussed above might have arisen:

- **Isolation**—that is, the state when motifs are never co-located with other carvings and a motif is always exclusive of other motifs in its occupation of a block surface. It is as if it is a consequence of a ‘repulsion’ of all other carvings. In reality, this is rarely the case. Figures appear rather simply as more or less pronounced in their isolation from other motifs, and this factor may be measured, for example, by calculating the proportion of isolated examples of a particular subject.
- **Juxtaposition**—that is, motifs are found near to each other. It can be a distant juxtaposition: a very loose group; or a close juxtaposition: a tight grouping. Cases of ‘distant juxtaposition’ may be accidental in the sense of having happened over time through a gradual accumulation of patterns on the same surface. Or ‘distant juxtaposition’ may have been instantaneous, having been intended by the carver. It also may be the result of a gradual accumulation, the first patterns having retained their meaning and ‘force’ over time.
- **Superimposition**—graphically shows evidence of chronological order in the making of the petroglyphs and suggests a time interval between two or more executions. Such an interval could be of the order of several minutes or several millennia.

Superimposition can be of, at least, three different types: *True superimposition* (partial or total, accidental or intentional), involving the covering of a previous pattern by a new pattern; *re-marking* (partial or total); and *erasure*. It can be the manifestation of the importance of these various possible relational forces. Indeed, a true superimposition can be accidental when the time interval between successive executions of the motifs is so large that the original motive goes unnoticed because it has lost its importance or is deeply weathered. A possible example is ‘The Woman’ (with big ‘feet’ and big ‘hands’—GTVW-48) that is superimposed on an old, difficult-to-read ‘Emu’.

A true superimposition can also be a form of association between two patterns, as has been suggested by Max Raphael (1945) and by André Leroi-Gourhan (1965) who saw it as an element of the organization of European Palaeolithic cave art. A superimposition can thus be a positive encounter, one of creating a new graphics state. In this case, a relationship exists between the underlying pattern and the superimposed motif.

Finally, the superimposition may have been intended to conceal or to destroy a pre-existing motif by covering it with another carving. At GTVE, I noted instances of hammering and intensive abrasion of original designs: this iconoclastic destruction is a form of superimposition.

On the other hand, it is often a scrupulous respect for the first petroglyph that leads to its first re-marking; the renovation suggests a ‘return to service’, partial or total, by a faithful editing of an earlier pattern. However, as we have seen, there are also cases of re-marking that do not respect the original but instead appears to change its meaning.

Moreover, the organization—or composition—of a decorated surface can be *instantaneous* or *gradual*, and *narrative* or *symbolic*. Indeed, the composition can be done in a single artistic event or be the result of an accumulation of figures over time. The homogeneity of patinae and layout of figures lead one to think that the scene of the ‘Emu hunt’ (GTVW-75) or the depiction of the ‘spear duel’ (GTVW-27) are instantaneous compositions.

By contrast, the large panel representing the migration of nesting sea turtles (GTVW-36) appears to have attained its true meaning through repeated additions of carvings of ‘turtles’—the passage of time is suggested by their slightly different states of patination. Such additions give rise to the idea of a massive migration of these reptiles, an idea that was finally realized by new, even more significant figures, including the depictions of eggs. Similarly, some ‘coital’ scenes of Skew Valley (e.g., SKV-18a) or those at the entry to Gum Tree Valley (GTVS) were achieved by later adding a second ‘human’ figure to the first, already patinated, motif.

A survey of depictions of kangaroo and Emu tracks, in particular, has highlighted the often progressive realization of some Gum Tree Valley petroglyphs. The large single ‘kangaroo tracks’ or ‘Emu footprints’ from 0.23–0.30 m in length (e.g., GTVE-103), which, by their sheer size (probably twice the reality), possibly symbolize giant mythological creatures.

We also see in Gum Tree Valley an impressive series of depictions of prints, especially of Emu, which seem to represent the path of the bird racing across the valley from one side to the other (GTVE-200 to -204 or GTVT-57, -59, -60). But the result of surveys sometimes persuades us that these sets of ‘prints’ with different patination states result from carvings made at various times. Some old ‘deeply patinated’ motifs have been renovated and extended with new ‘footprints’ to represent the track of the animal through the valley, as if a sentence begun in ancient times was ended some millennia later when, however, carving techniques had changed considerably (moving from ‘linear pecking’ to ‘abrasion’ and ‘intaglio’ as in GTVT-57, -59, -60).

The distinction between *narrative* and *symbolic* composition is delicate. It is theoretically possible to oppose a narrative composition to a symbolic composition by the fact that the first depictions of animals depend on a naturalistic narrative (for example, hunting scenes, dance, fighting, mating, childbirth, etc.), while the second does not appear natural and simply shows an arbitrary association and repetitive patterns that do not approach reality (for example, the combination of ‘kangaroo’ and ‘turtle’ in GTVK-1).

It is clear from these observations that the decorated walls are ‘living walls’. Everything happens as if these rock surfaces were sacred surfaces. Through their permanence, the blocks are, in a sense, more important than the figures, because they carry ephemeral patterns. They are living places, the sacred places where images meet and temporarily attach to one another.

Synthesis

A synthesizing table and diagram bringing together the entire population of petroglyphs—combining all sites and all periods—highlight the major associative trends that I recorded at Skew Valley and Gum Tree Valley (Table 8.2, Fig. 8.5).

- **Some subjects show a strong tendency to isolation:** These subjects are isolated in over one half of occurrences. They include the ‘kangaroo’ (AK) and ‘triangle’ (GT) categories. The depictions of ‘human-kangaroo’ (AAHK) are so rare that their isolation is perhaps not significant. The graph also shows that the ‘human’ (H) and ‘fish’ (AP) categories are close to the line of 50%, that is, they have a quite high ‘isolation index’. The isolated themes that show the greatest tendency to repetition on the same panels are ‘humans’ (H), ‘prints’, especially those of ‘macropods’ (EK), the arcs (GAR) and ovals (GO). This general statistical finding suggests a particular figurative intention: the representation of dance scenes, various gatherings (‘corroboree’ for men), animal tracks (macropods and birds), pairs or double pairs of nested boomerangs, and so on. By contrast, the fairly frequent repetition of ovals remains unexplained because we do not know what they represent.
- **Subjects with a strong tendency to association:** First, the graph shows that the themes which, in more than half their occurrences, are in association with other themes, are particularly ‘birds’, ‘turtles’, ‘eggs’, ‘turtle tracks’ and several geometric themes: linear forms, points, ‘other geometrics’ and ‘dumbbell motifs’. Finally, some other themes occupy the middle ground: ‘snakes’, ‘fish’, ‘macropod prints’ and ‘bird prints’. Second, the variation among the Indices of Association (IA: average number of subjects related to a given subject) confirms the results summarized by the previous graphs. These are that ‘turtle tracks’ and some geometric forms are found not only most frequently in combination with other themes, but also associated with the greatest variety of subjects.

Of course, all the above findings are of very general value. They are based on averages, and my studies showed significant variations depending on the site.

Depictions of kangaroo, for example, showing a general tendency to isolation, are more often isolated at GTVE where large petroglyphs often are the sole occupant of a single block, whereas at GTVS they are sometimes accompanied by other subjects. Similarly, turtles, often isolated on blocks at GTVE, are participants in the extensive and visually rich scenes recorded among the Eagle Group.

Finally, I have calculated the average Index of Association for each site (average of the Indices of Association of the subjects at that site). I simply note that sites with figurative themes have the highest tendency to association (IA average greater than 2.5); these are the sites of the plateau—GTVK and GTVW—that already are distinguished by panels which are particularly rich in motifs. Moreover, sites with the lowest average indices of association (IA average between 1 and 1.6) are the areas—habitats (‘dwelling sites’)—surrounding the shell middens (Fig. 8.6). This is a confirmation of the trend in these places toward an exhibition of motifs and fragmentary execution, pattern after pattern, on separate blocks and panels.

Comparisons between sites: conclusions

In the chronological development of both artefacts and petroglyphs, two main forces constantly interact, typological change and activity specialization. My excavation of the Skew Valley midden showed that the basic evolution of the artefact assemblage from the bottom to the top of the midden was constantly affected by the changes over time in settlement pattern. Specialized areas (living, sleeping, discarding areas) were constantly shifting on the surface of the camp so that, at any one time, at any one place, the artefact assemblage was influenced in consequence. The fundamental temporal trend was sometimes difficult to perceive clearly but it remained distinguishable nevertheless.

My study of the petroglyphs of Skew Valley and Gum Tree Valley indicated the same phenomenon. To evaluate chronological change of Dampier art, the task specificity of the sites needed to be considered. It has been noted, for example, that the sites on the plateau (GTVK, GTVW and GTVT)—which are more difficult of access and furthest from the most frequented parts of the valleys—at some time could have been places of turtle-increase rituals that probably only involved men. The different uses of sites through time obviously influenced the production of the petroglyphs.

Taking these problems into account as well as all the data presented above, I propose the following general chronology of the Skew Valley and Gum Tree Valley sites (Fig. 8.7):

- A significant number of petroglyphs was produced by the midden-dwellers between 7500 and 2200 years ago, within a maximum production by the *Anadara granosa* gatherers towards 4500–2200 years ago. After the accumulation of the Skew Valley midden had ceased, a much more discrete shellfish gathering continued but soon came to an end. Then other domestic activities took place on the sites. Some petroglyphs were nevertheless executed from time to time up to quite a relatively recent period because the patina contrast of a few figures is equivalent (with values of 0.3–0.4) to those of the petroglyph experiments that I made on pieces of gabbro. It must be emphasized that all the sites on the southern parts of the Dampier archipelago were inhabited or simply visited by the shellfish gatherers.
- Many petroglyphs are older than the middens. This statement is made for the following reasons: First, on the sites with middens, two different distributions are distinguishable: ‘deeply patinated’ figures mainly are scattered on the higher part of the slopes, and ‘patinated’ and ‘fresh’ petroglyphs are more numerous at the foot of the slopes near the middens. The dense distribution of the latter contrasts to that of the former. Thus, two sets of petroglyphs seem to be partly superimposed: one is linked topographically to the middens, the other not. Second, the sites where the most deeply patinated figures largely dominate have no midden and are located far from the coast and the middens (GTVT, GTVW and GTVK). On the other hand, the Skew Valley site petroglyphs—all either ‘patinated’ or ‘fresh’—are closely linked to a midden.
- The GTVT site is the oldest on the Dampier Peninsula. Most of its petroglyphs are ‘deeply patinated’. Subjects, styles, and techniques show original features. There are many depictions of

Table 8.2. Skew Valley and Gum Tree Valley. General intra- and inter-thematic associations (all sites and periods combined).

themes	total number of themes	single themes isolated		single themes repeated			themes in association			
		n	%	n	%	NMIR	n	%	IA	NMIA
HP	12	6	50.0	1	8.3	2.0	5	41.7	2.6	14.8
H	300	131	43.6	54	18.0	3.2	115	38.4	1.6	5.0
AK	62	41	66.1	0	0.0	0.0	21	33.9	1.8	4.8
AO	21	5	23.8	1	4.7	2.0	15	71.5	2.1	4.4
AS	11	5	45.4	0	0.0	0.0	6	54.6	1.5	4.0
AT	50	19	58.0	1	2.0	2.0	30	60.0	2.0	2.1
AP	46	21	45.7	1	2.1	2.0	24	52.2	2.4	5.0
AA	10	3	30.0	0	0.0	0.0	7	70.0	1.2	1.1
AA(HO)	1	0	0.0	0	0.0	0.0	1	100.0	3.0	8.0
AA(HK)	2	2	100.0	0	0.0	0.0	0	0.0	0.0	0.0
AOF	14	5	35.7	0	0.0	0.0	9	64.3	2.5	7.9
EK	27	2	7.4	12	44.4	2.4	13	48.2	1.9	3.3
EO	55	16	29.0	9	16.4	4.2	30	54.6	1.8	5.2
ET	12	1	8.3	0	0.0	0.0	11	91.7	2.8	9.0
GC	26	10	38.4	0	0.0	0.0	16	61.6	1.8	4.2
GAR	51	9	17.6	10	19.6	3.2	32	62.8	2.0	5.0
GB	21	9	42.9	1	4.7	5.0	11	52.4	2.2	11.8
GT	13	8	61.5	0	0.0	0.0	5	38.5	3.5	5.8
GO	48	18	37.5	6	12.5	2.1	24	50.0	2.5	10.8
GL	56	10	17.8	0	0.0	0.0	46	82.2	2.8	9.2
GP	26	0	0.0	0	0.0	0.0	26	100.0	3.3	18.7
GA	19	3	15.7	0	0.0	0.0	16	84.3	2.8	9.3
GH	4	1	25.0	0	0.0	0.0	3	75.0	1.2	2.5
MA	354	231	65.3	24	6.7	3.1	99	28.0	1.8	4.7

Key to Table 8.2					
'human' motifs		'animal motifs'		geometric forms	
HP	'human' prints	AK	'kangaroo'	GC	circular form
H	'human' figures	AO	'bird'	GAR	arc-like form
'mythical figure motifs'		AS	'snake'	GB	bi-lobed form
AA(HO)	'man-bird'	AT	'turtle'	GT	triangular form
AA(HK)	'man-kangaroo'	AP	'fish'	GO	oval form
'prints' / 'tracks'		AOF	'egg'	GL	linear form
EK	'macropod print'	AA	'other animal'	GP	punctations (dots)
EO	'bird print'			GA	other geometric form
ET	'turtle track'			GH	dumbbell shape
				MA	indeterminate motifs
Indices					
IA	index of association				
NMIR	mean number of repeated individuals				
NMIA	mean number of individuals associated with the theme				

'ghost-like human' forms and crude representations of kangaroo, outlined with deep linear pecking made of separated dots. The round pecked marks and circles are unusually numerous. This site was used for an extremely long period. Possibly initially a men's site, frequented mainly after the rains, it could have become a burial site towards the end of its period of use.

GTVE and GTVS were occupied before the appearance of the middens, but most of their petroglyphs were executed by the shellfish gatherers. GTVK and GTVW, also carved before the midden period, were probably task-specific sites devoted to some turtle-increase rituals. This use lasted until recent times but probably varied over time.

Almost all the petroglyphs of Skew Valley were made by the midden-dwellers, but one 'deeply patinated' petroglyph of 'bird tracks' and geometric lines belongs to the oldest carving period of the area.

Finally, the forms of representation used at Gum Tree Valley and Skew Valley seem to have developed in two main general phases; these could be called 'the art of the kangaroo hunters' and 'the art of the shellfish gatherers'. A shift in the shore line that brought changes in the way of life, could explain the changes in the art. At the end of the Pleistocene, a marine transgression that probably lasted millennia would have prompted a switch from land-based hunting, to an economy based on the exploitation of marine resources. A transition also happened in the form of carving used in the area, from a concern with mainly geometrical motifs (round-pecked marks

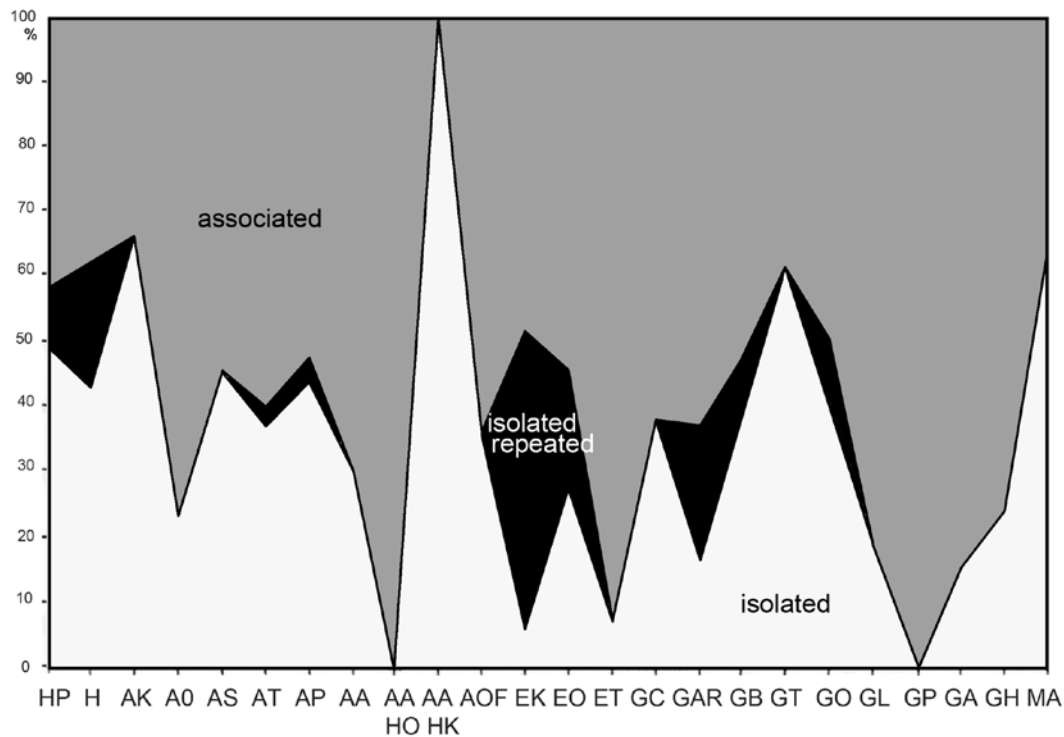


Figure 8.5. Themes (subjects) of Skew Valley and Gum Tree Valley petroglyphs: General tendency of associations. Key as for Table 8.2.

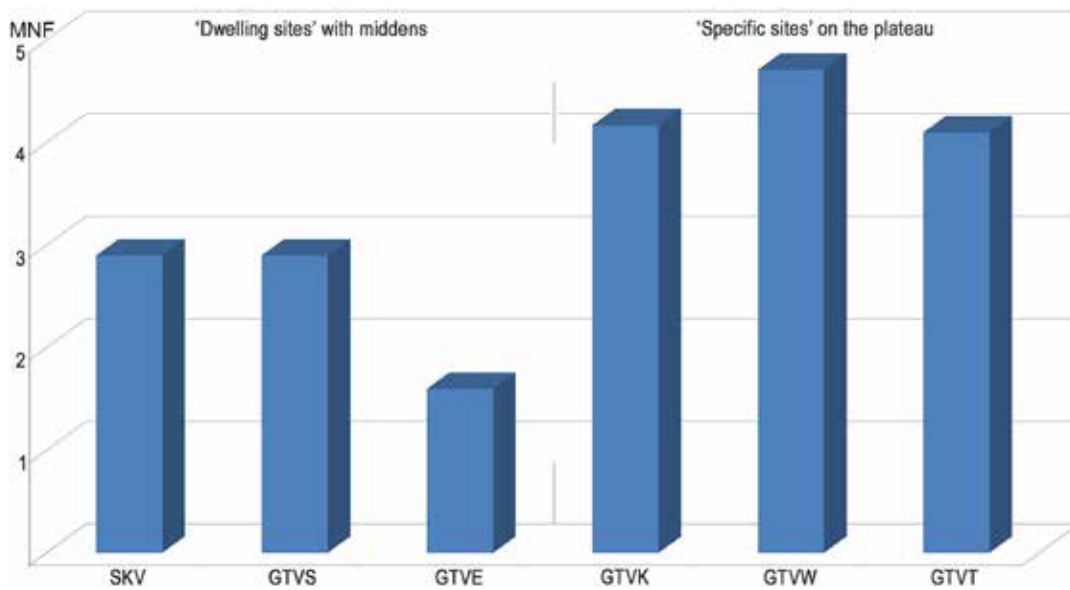


Figure 8.6. Skew Valley and Gum Tree Valley sites. Mean numbers of figures (MNF) per panel.

and circles), ‘ghost-like human’ figures and a few depictions of animal species (kangaroo motifs predominating), to more varied subject matter with different types of ‘human’ figures, fewer and different geometric forms and animal representations of, mostly, ‘fishes’ and ‘turtles’. The newer focus is on the sea shore and associated with shell middens.

Our study, however, revealed a more complex chronology: Among the deeply patinated turtles of GTVW and GTVK are some that may be older than the figures closely connected with the shell middens, because the latter are usually less patinated. Some of the turtle figures probably predate the accumulation of the local middens, and the arrival of the sea right at this spot. The ‘deeply patinated’ turtles of GTVK and GTVW could have been related to a shoreline further

off than today. In a zone 50–70 km wide along the present coast, I found evidence in the petroglyph motifs of links with the sea (for example, depictions of boats, salt-water fishes, crocodiles and turtles). Such examples of marine subjects in inland rock art sites at a distance from the sea exist elsewhere in Australia, in Queensland (Laura), Arnhem Land and in Western Australia in the Pilbara (Pinduri Hill) and in the Murchison district (Walg Rock).

It is possible that the Gum Tree Valley inhabitants made expeditions to collect turtle eggs at a time when the coast was some 10–20 km further off shore; that is, during the marine transgression that began more than 7500 years ago. At this time, Gum Tree Valley could have been situated at the back of the coastal lowlands but, as the sea was reaching its present

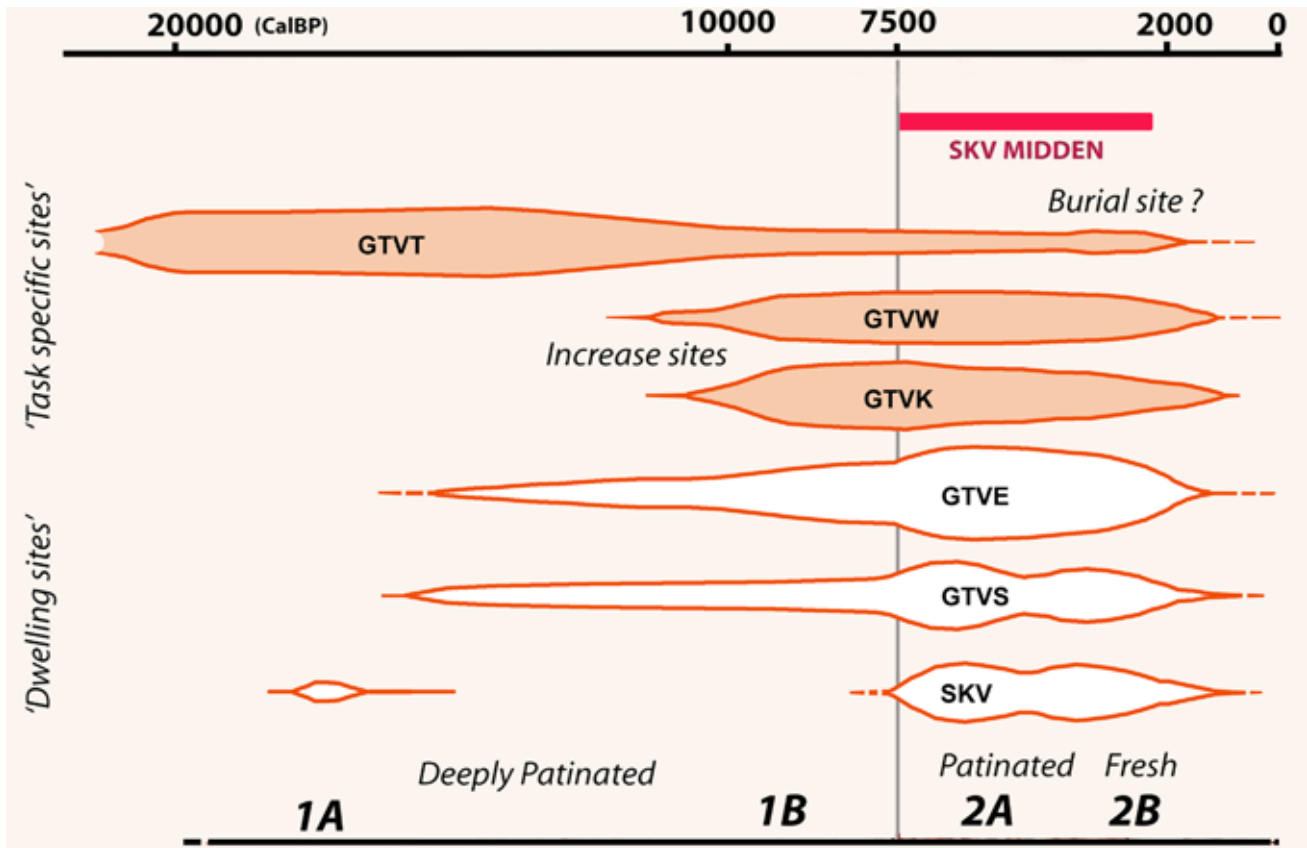


Figure 8.7. Chronology of Skew Valley and Gum Tree Valley sites.

level, the location was progressively invaded by the water and became associated with the middens. Some of these earliest, 'deeply patinated', carved turtles could thus date from about 8000 or 9000 years ago, and possibly even older.

Finally, my study leads me to propose a sketch of the chronology of the Skew Valley and Gum Tree Valley petroglyphs. Despite my clear awareness of the many difficulties—huge number of petroglyphs of different ages mixed together, patination of the figures, superimposition of motifs, obliteration and re-markings, the long duration of the use of some motifs, and other incomplete data—I present the following attempt to define the evolution of the Skew Valley and Gum Tree Valley rock art in four chrono-stylistic periods (Fig. 8.8).

Period 1A: Pleistocene. The main types of petroglyphs are the older motifs of the Top of Gum Tree Valley: 'ghost-like human' figures, 'kangaroo' and many geometric forms (round-pecked dots and circles).

Period 1B: Pleistocene. The main types of petroglyphs are the older figures of GTVW and GTVK, 'turtles' and 'turtle eggs', large grooved outlined 'humans' and 'animals', many large grooved 'kangaroo' in GTVE, a few early 'fish'.

Period 2A: Time of the Skew Valley and Gum Tree Valley midden-builders. Some of the previous figures are obliterated by superficial hammering; others are re-carved (large 'humans' and 'kangaroo', and 'animal-men' such as 'The Kangaroo' or 'The Eagle' of GTVE that could have a Pleistocene origin); the numbers of 'fish' and bi-lobed forms (probable 'fish livers') increase. Depictions of birds, boomerangs and arcs are also numerous.

Period 2B: Later time of the Skew Valley and Gum Tree Valley midden-builders. The petroglyphs are fresher, superficially and/or totally pecked, or abraded, and more frequently represent human figures of different kinds; one of these types has exaggerated 'hands' and 'feet'.

My study has shown that all the motifs pre-dating the arrival of the sea and the building of the first middens there are deeply patinated. The grooves of these petroglyphs had completely lost their contrast with their support block surfaces in about six to eight millennia, whereas the petroglyphs made by the midden-dwellers in the last six millennia can be categorized as 'patinated' or 'fresh'. Some of the last petroglyphs were carved at the end of the nineteenth century. Three artefacts made of European bottle glass were recovered at the top of the Skew Valley midden. These last figures are at least more than a century old, and yet their contrast is equivalent to that of the experimental petroglyphs that I made on gabbro. On Depuch Island, the inscriptions left by the *HMS Beagle* crew 160 years ago are still quite fresh (Ride *et al.*, 1964). It is obvious that the weathering takes time.

For more than 20 000 years, different activities linked to the petroglyphs were carried out in Skew Valley and Gum Tree Valley. These reflected the main environmental changes that occurred during this long period.

The correlations between subject, technique, topography and states of patination, as well as the presence of superimposed figures made with different techniques, and different degrees of weathering on the same sites and on the same rock surfaces, clearly indicate the chronological and cultural values of studies of style, technique and patination.

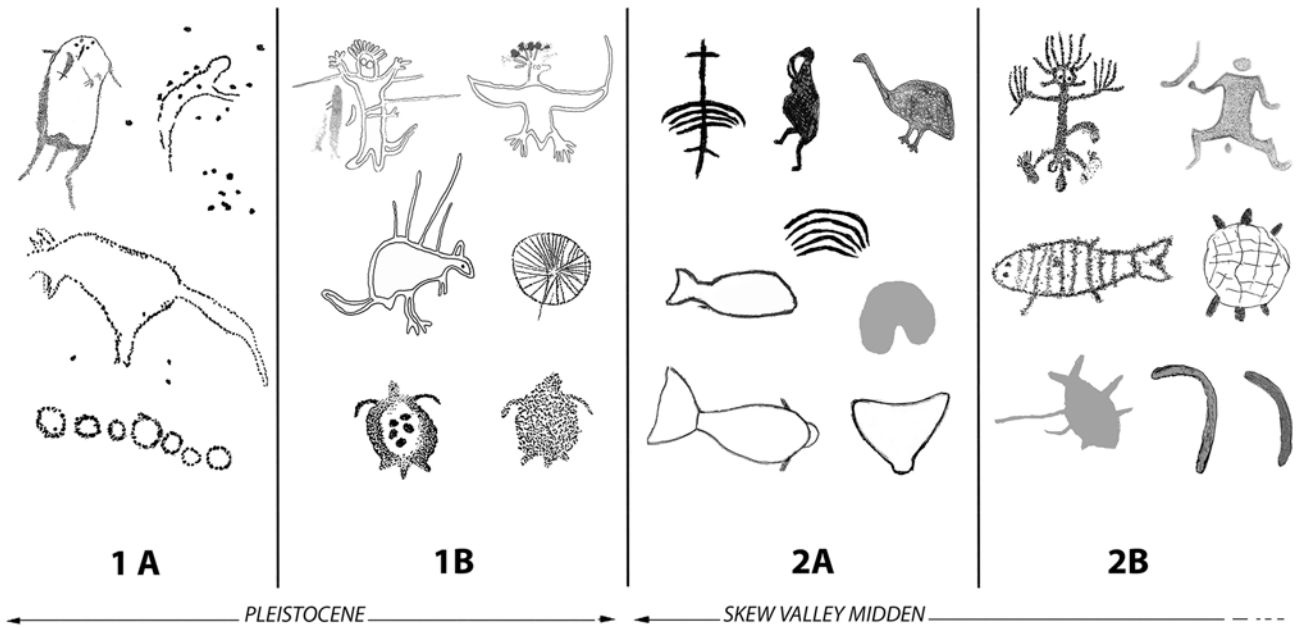


Figure 8.8. Chronology of the Skew Valley and Gum Tree Valley petroglyphs (the 'human' figure and the 'Eagle-man' of 1B are in their original states; more recently they have been re-marked).

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