7 THE JAMES RANGE

East of the Hugh river, the James range forms a narrow sandstone escarpment with a broad sandplain to the north and undulating, stony country to the south. Water resources in this section of the range are poor. In the 1880's a government well-sinking party dug a deep well in a gap in the James range at Ilwempe atnunte. This became known as Deep Well and together with the rockhole at Urwemwerne (see chapter 9) it provided the only reliable water between the MacDonnell ranges and Frances Well, on the Hugh river. Aboriginal settlement in the region was dependent upon ephemeral rockholes and soakages along the northern side of the range. Aboriginal people list the following as important named localities: (from west to east) Urre [Rainbow valley], Mpwelarre [Walkabout bore], Intirtekwerle and Kwerlpe. Judging from present rights in land it seems likely that this section of the James range was bisected by two clan estates; one including Urre and Mpwelarre, the other including Intirtekwerle and Kwerlpe. When the waters in the James range failed the population would fall back upon waterholes and soakages in the bed of the Hugh river south of the range, such as at Imarnte.

In this chapter I shall deal with archaeological work at four sites along the James range - beginning with the major excavation at Intirtekwerle (James range east) rockshelter. The changes in prehistoric landuse registered in these sites exemplify the

Central Australian sequence.

INTIRTEKWERLE

Intirtekwerle (cf. Strehlow 1971:xxxvii, 765 Intitagula; Gould 1978:94 Intitjikula) is identified by Aboriginal people as having been the main campsite in this part of the range. According to Walter Smith[1], Intirtekwerle was a favoured camping place because of the diversity of the country accessible from this point. The name intirte-kwerle translates as stinking (or bad tasting) rockhole and refers to a large ephemeral rockhole here. Walter Smith met Aborigines living in this area sometime between 1916-1923 (Kimber pers. comm.) and the mother of one of my informants[2] was born at Intirtekwerle, presumably around 1920. However regular use would have ceased with the construction of the railway through this part of the range in 1929.

THE ARCHAEOLOGICAL SITES

At Intirtekwerle occupation focussed on two areas. The first is a sheltered, sandy flat near the rockhole. Here there is a dense scatter of chipped stone artefacts and grindstones and these lie on the surface of a dark grey, ashy deposit.

Further away from the rockhole but with better access to country on both sides of the range is another open site. This adjoins a rockshelter (see fig. 7.1) containing a small number of hand stencils and paintings. This second location is about 1.5 km southeast of the rockhole. An erosion gully cutting into the occupation deposit in front of the rockshelter shows a grey ashy deposit, about 50 cm thick. Chipped stone artefacts and fragments

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1. see Kimber (1986) for a biography. 2. Alan Drover.

of grindstones and seedgrinding implements extend out from the shelter for 20-30 m.

THE 1973 AND 1974 EXCAVATIONS

Intirtekwerle rockshelter was excavated by R. A. Gould in 1973 and 1974. He dug three trenches, totaling about 29 m^2, spanning the deposits on the sandy flat in front of the shelter as well as those inside the dripline. The position of trenches 1-3 is shown in figure 7.2. The excavation methods are described in Gould (1978).

According to Gould's interpretation of the chronology, major occupation at Intirtekwerle began at about 5000 yrs BP. The underlying levels were not directly dated but were estimated to date to about 10,000 yrs BP. Thus the sequence was interpreted as directly comparable to that of Puntutjarpa (Saggers 1982; Gould and Saggers 1985). However, the key radiocarbon date for this framework appeared to me to be inconsistent with the age/depth relationships of the other three dates from trench 1 and it was clear that further excavation would be necessary to clarify the chronology of the site - see Smith (1983).

THE 1983 AND 1985 EXCAVATIONS

In 1983 and 1985 I undertook further work at Intirtekwerle to examine the depositional history of the site and to collect further samples for radiocarbon dating. Five square metres were excavated at the eastern end of trench 1 (fig. 7.2 inset and fig 7.3). As Gould's site grid is based on imperial rather than

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Overleaf **Figure 7.1 :** Intirtekwerle (James Range East) rockshelter. View looking west. June 1985. The staff held by the person is 4 m long.

metric measurements it was not possible to extend the existing system. Instead I established a separate metric site grid, with alpha-numeric coordinates. The overlap of the 1983 grid is sufficiently accurate for individual rocks to be matched on the 1974 and 1983/85 stratigraphic drawings.

In 1983 I re-opened the northern end of Gould's trench 2 and excavated a further 2 m^2 - squares L11 and L12, according to my grid system. This was sufficient to collect further radiocarbon samples but not sufficient to test Gould's suggestion that there may be archaeological deposits at a greater depth than his excavation reached. In 1985 I resolved to excavate a deeper trench in order to establish whether the basal occupation had been reached. Accordingly I widened the trench by excavating squares M10 and M11 and used a rock drill and feather-wedges to remove the large slabs of rock that had limited the 1983 excavation. This excavation reached bedrock at a maximum depth of 2.81 m below the surface.

The results of this work are outlined in Smith (1986) and show that major occupation at Intirtekwerle rockshelter began at about 850 yrs BP. In my interpretation the basal age of occupation at the site need not be older than 5000 yrs BP. In the following account of the stratigraphy and stone artefacts I have integrated as far as possible the results of the 1973/4 and 1983/5 excavations.

Stratigraphy.

The deposits at Intirtekwerle are part of the sand sheet which forms the floor of the valley in front of the shelter (see fig. 7.1). Occupation debris extends out from the shelter on the surface of this sand sheet for 20-30 metres. The stratigraphy of the site reflects both the accumulation of the sand sheet and the weathering and progressive collapse and retreat of the shelter.

Deposits outside the dripline

The deposits outside the present dripline consist of a fine red aeolian sand containing varying amounts of occupational debris, sandstone rubble and rockfall. The stratigraphy of the site is shown is figures 7.2 and 7.3 and the composition of the various layers is given in table 7.1.

Layer I[1] contains a large amount of finely divided charcoal giving the deposit a dark grey or black colour (Munsell 5YR 3/3 pH 6.5). This layer also contains the bulk of the occupational debris such as burnt bone, chipped stone artefacts and grindstones. Layer I grades from dark grey to brown in colour (Munsell 5YR 4/6) and then grades into the uniform red sand which comprises layer II (Munsell 5YR 5/8 pH 4.5). The latter contains little charcoal and very few artefacts. Layer III is a layer of sandstone rubble in a matrix of red sand. Figure 7.3 shows that on the slope outside the dripline the rubble interdigitates with aeolian sand. At the interface of layer III and the bedrock surface there is a thin band of pale pink sand (Munsell 5YR 6/4 pH 7.0) less than a

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1. Using Gould's nomenclature the F3 soil, and its subunits - F11 and F21 - are equivalent to my layer I. His F46 soil is my layer II. His "layer 4" equals my layer III. Note that he regarded the latter as a subunit of F46 and that he does not provide separate artefact tallies for "layer 4". Gould's stratigraphic drawings show many smaller stratigraphic units that are not described in the text of his 1978 report. In 1983/85 I failed to find evidence of any features - such as cut and fill features, laminae, or graded bedding - within layers I-III to indicate that these had any stratigraphic significance. I can only suggest that they represent minor colour variations or differential drying.

centimetre thick and with a definite "musty" smell. My interpretation is that this is the post-depositional product of some interaction between the slightly damp bedrock surface and the adjacent sediments.

Deposits in the shelter

Gould (1978:98) notes that the deposits within the shelter are slightly different in texture and colour to those outside the dripline. This is presumably due to a greater proportion of fine white sand derived from weathering of the Mereenie sandstone which forms the shelter. Thus the sediments at the eastern end of trench 1 are observed to be redder in colour and slightly coarser in texture than those at the western end. Within the shelter layer I is also noted to contain more fine ash and charcoal and to lie directly upon the layer III rubble.

Layer III rubble

The rubble in layer III consists of poorly sorted sub-angular pieces of sandstone (the term rubble is used for rocks 5-50 mm in size, which loosely approximates the Wentworth size class for pebbles). Larger rocks up to 100 mm are common but the modal size for rocks is about 30-40 mm (excluding large boulders).

The rubble is distributed within a matrix of red sand which is identical in colour and texture to that forming layer II (see fig. 7.4). Particle-size analysis of the sand fraction shows that layers II and III are made up of predominantly fine to very fine sand (approximately 80% wt.) with a small silt/clay fraction (approximately 10% wt.).

The composition of layer III, plus the presence of artefacts throughout it, suggests that the layer was not formed by a single large rockfall or debris flow. Gould interpreted it as a layer of rockfall that had progressively accumulated over some time (1978:99). Slopewash is another process which could have contributed material to this layer and it is likely that some of the sediment and pebbles derive from the small cone of debris at the foot of the scarp on the north side of the shelter.

Despite the obvious change in the proportion of rubble and sand from layer III to layer II the sequence appears to be essentially a continuous record of deposition. Figure 7.4 shows the boundary between the layers. There is no evidence of erosion, reworking or sorting of the sediment nor of epimorphic processes such as weathering, leaching, or induration. There is little to suggest a disconformity. However without local information about the rate of such processes I cannot entirely dismiss this possibility.

Chronology.

Problems with the existing framework

Gould presented seven radiocarbon dates to support his chronological framework (table 7.2). He accepted the oldest of this series of dates as reliable and inferred that the basal age of layer I was approximately 5,000 yrs BP. Extrapolating from this

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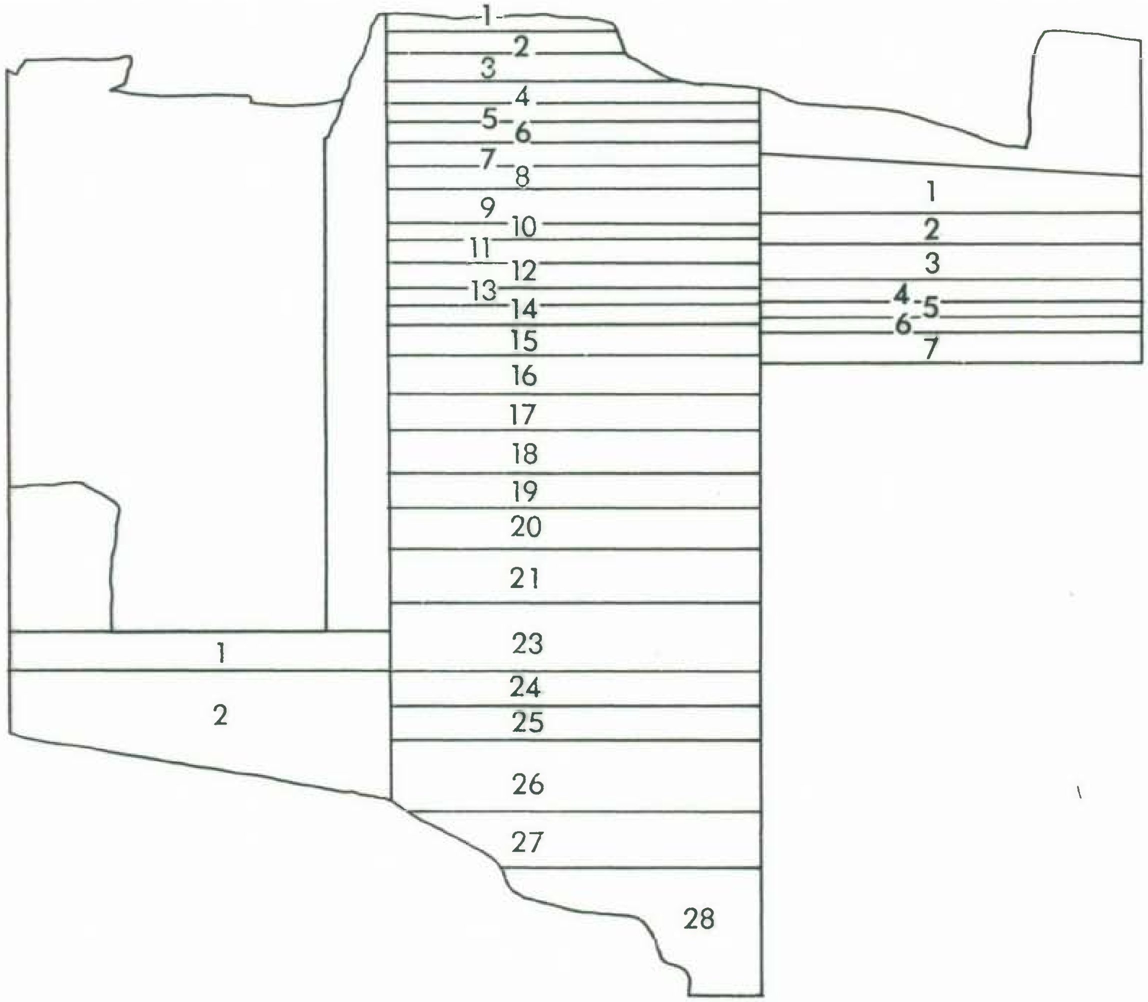
Overleaf **Figure 7.2 :** The stratigraphy in trench 1, Intirtekwerle (James Range East) rockshelter showing the relationship of the 1983/85 trench to the earlier excavation. Redrawn from Gould (1978) with additions from the 1983/85 excavations shown at right. The lower case letters in the right margin key the section into figure 7.6. The inset shows the position of Gould's trenches 1-3 and the 1983/85 trench. **Figure 7.3 :** Section drawings showing the stratigraphy in the 1983/85 trench. The overlay shows the location of excavation units.



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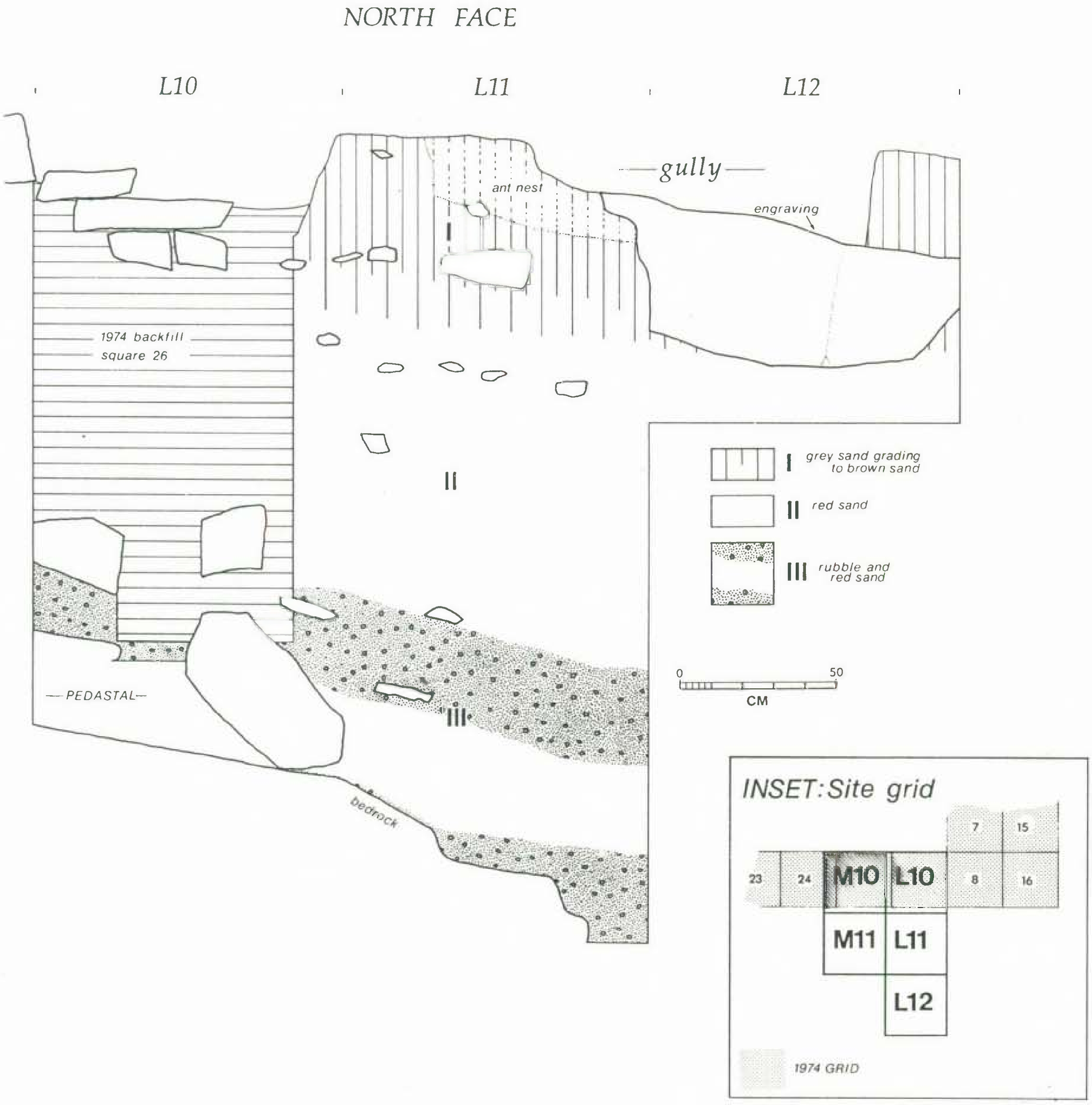
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L11
L12
gully
ant nest
I
engraving
1974 backfill
square 26
II
III
PEDASTAL
bedrock
I grey sand grading to brown sand
II red sand
III rubble and red sand
0
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INSET: Site grid
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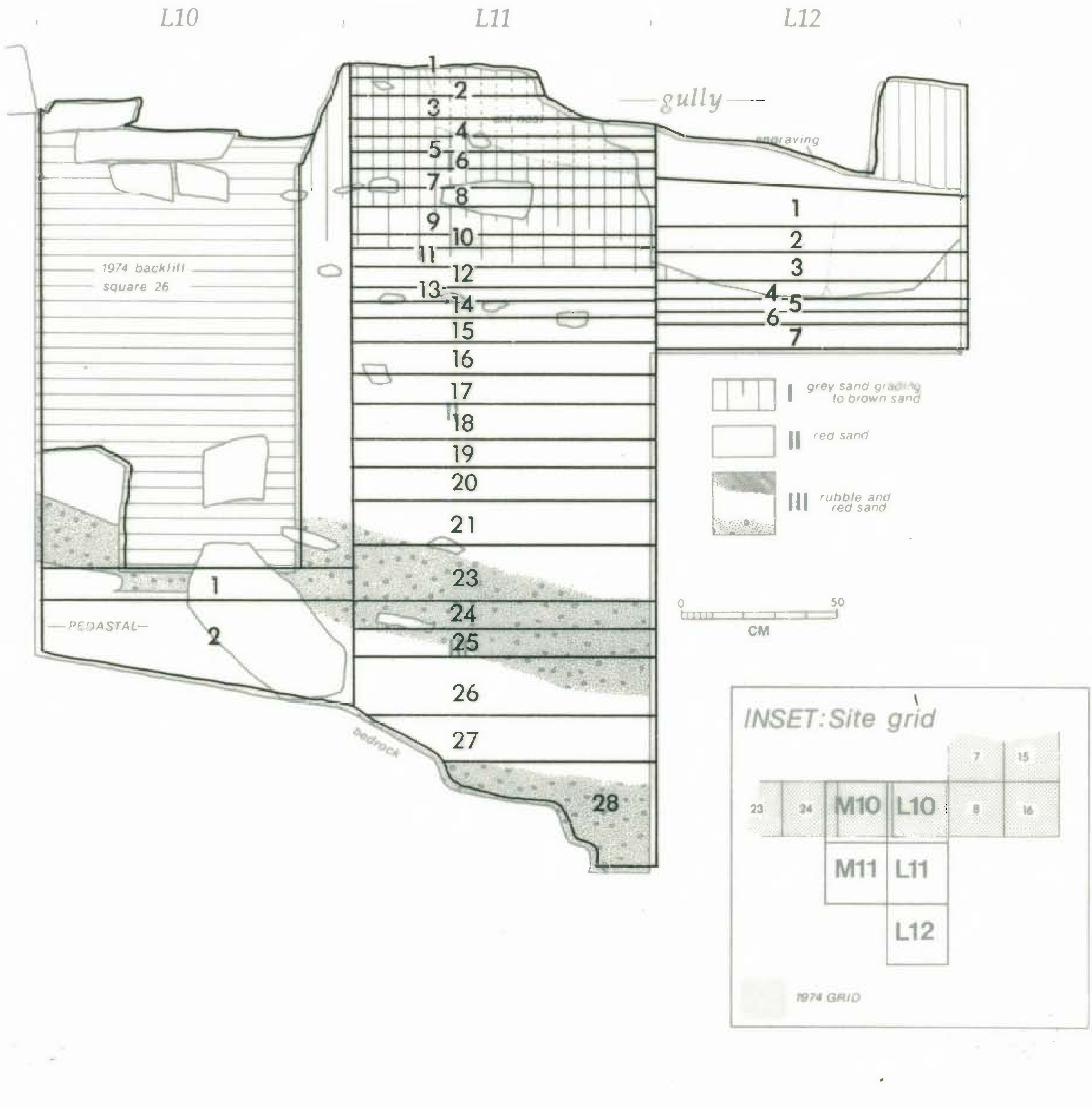
L12
1974 GRID

NORTH FACE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II red sand
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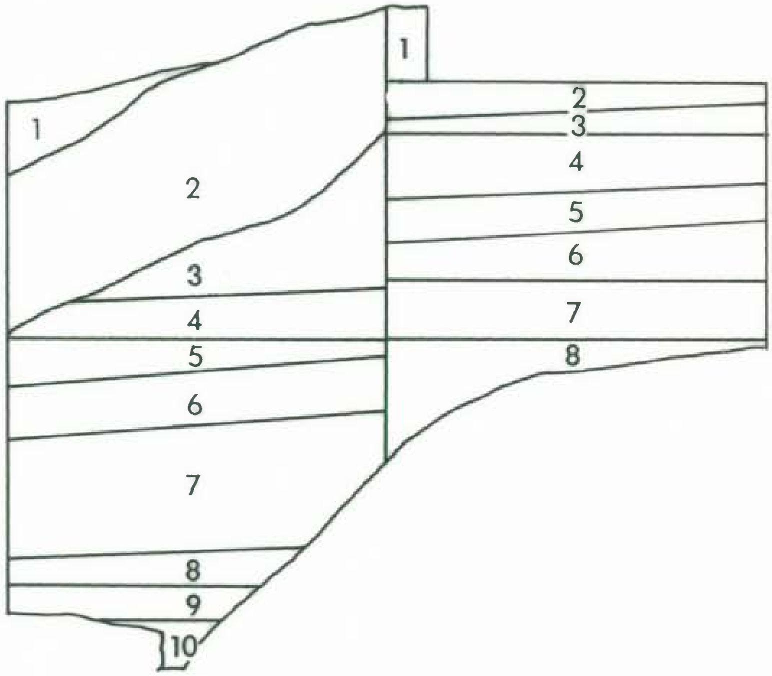
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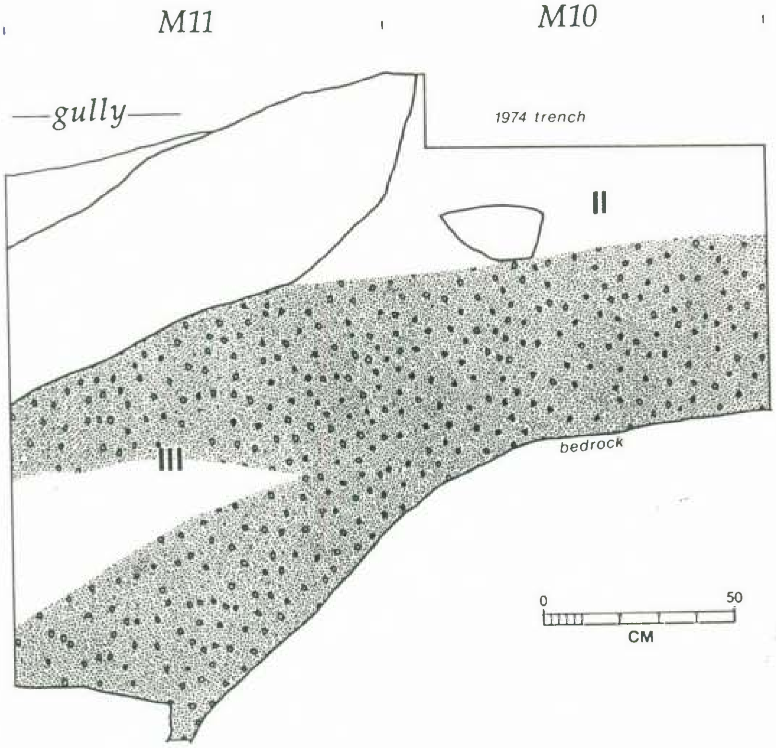
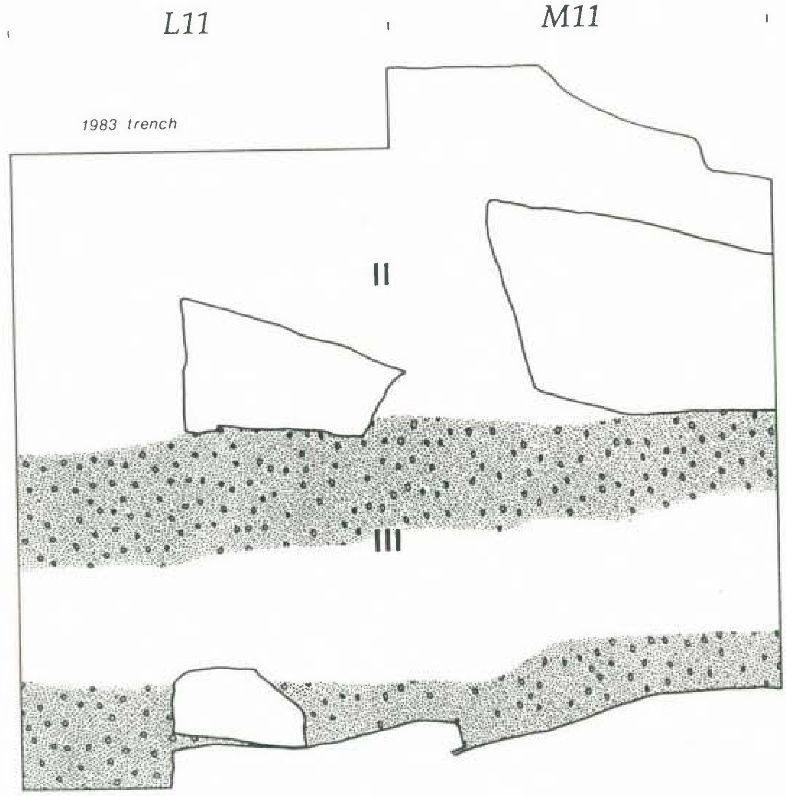
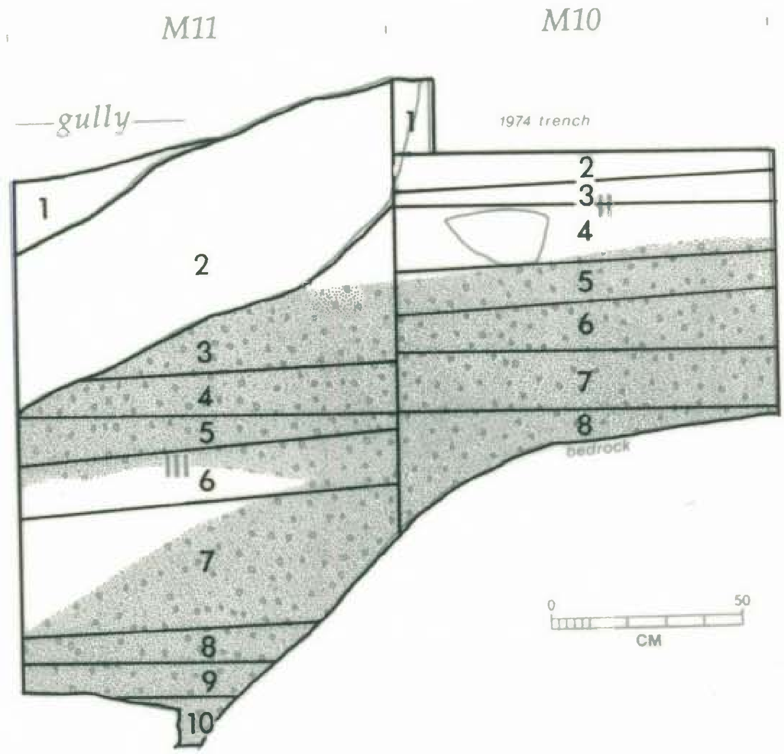


EAST FACE



SOUTH FACE



EAST FACE

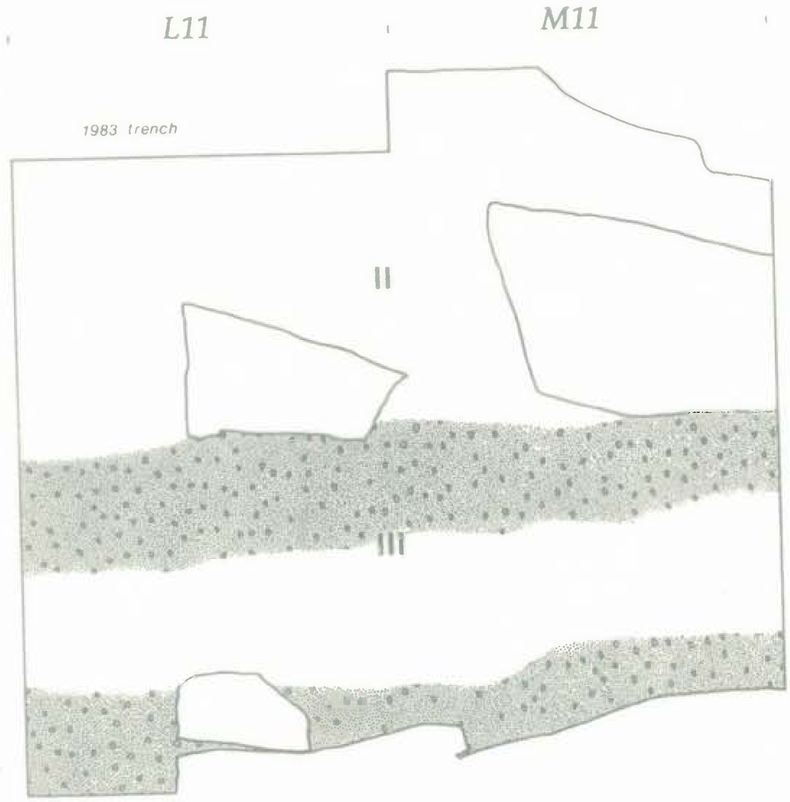


Table 7.1 : Composition of the deposits. The terms rocks and rubble are defined in chapter 3. Depths are in cm below site datum. L11/22 is a gap left in the sequence to accommodate any discrepancy between the base of the 1983 trench and the top of the 1985 excavation. As it turned out this was an unnecessary precaution as the 1983 end levels and 1985 start levels were identical.

unit	mean depth cm.	sediment gross wt kg.	rocks no.	rocks wt. g.	charcoal wt. g.	charcoal wt. g/10kg sediment	rubble wt. kg.	rubble %
L10:layer III								
1	190	136.6	273	41.2	N.A.		1.32	1.0
2	212	235.4	565	81.5	N.A.		26.79	11.4
L11:layer I								
1	33	65.1	34	10.8	2.7	0.41	3.32	5.1
2	39	48.5	9	1.6	2.1	0.43	1.22	2.5
3	45	56.1	26	9.9	0.4	0.07	1.91	3.4
4	50	48.5	17	2.9	4.5	0.93	1.69	3.5
5	56	63.6	24	9.6	1.4	0.22	1.87	2.9
6	61	75.2	18	5.1	1.9	0.25	2.79	3.7
7	66	76.2	37	9.1	3.7	0.49	3.74	4.9
8	73	93.8	34	10.7	1.2	0.13	2.49	2.7
9	80	97.9	7	2.6	0.9	0.09	1.72	1.8
10	87	90.4	8	1.6	0.9	0.10	1.92	2.1
L11:layer II								
11	94	127.1	32	8.9	0.5	0.04	4.20	3.3
12	100	44.9	10	2.9	0.1	0.02	1.95	4.3
13	104	61.1	9	2.4	0.1	0.02	2.87	4.7
14	109	81.3	12	3.4	0.3	0.04	1.55	1.9
15	116	129.9	-		0.2	0.02	0.57	0.4
16	127	166.6	6	0.6	0.2	0.01	0.33	0.2
17	137	163.4	-		0.1	0.01	0.37	0.2
18	146	152.5	8	1.6	0.3	0.02	1.83	1.2
19	156	118.1	1	0.2	0.6	0.05	0.48	0.4
20	166	115.1	-		0.5	0.04	0.50	0.4
21	178	148.4	26	7.8	1.4	0.09	4.39	3.0
L11:layer III								
23	190	189.6	439	43.5	0.2	0.01	11.47	6.0
24	201	146.6	363	23.8	0.3	0.02	17.72	12.1
25	212	152.1	361	16.7	0.2	0.01	5.68	3.7
26	229	251.2	448	33.9	0.2	-	11.51	4.6
27	247	130.0	122	29.8	0.2	0.02	3.06	2.4
28	270	176.8	508	71.1	0.1	0.01	14.01	7.9

Table 7.1 : (Continued from page 208).

L12:layer I								
1	81	57.0	8	2.4	-	-	3.85	6.8
2	90	115.5	48	13.6	0.9	0.08	5.44	4.7
3	99	112.9	85	13.3	3.5	0.31	3.97	3.5
L12:layer II								
4	106	51.5	8	0.6	0.1	0.02	1.02	2.0
5	111	79.7	48	6.6	0.1	0.01	1.20	1.5
6	117	84.2	27	6.3	0.1	0.01	2.11	2.5
7	122	75.2	15	2.1	1.1	0.15	0.60	0.8
M10:layer II								
1	113	14.3	-		N.A.		0.12	0.8
2	135	121.6	11	1.0	N.A.		2.06	1.7
3	143	54.6	21	5.1	N.A.		2.64	4.8
M10:layer III								
4	154	204.9	240	98.0	N.A.		10.57	5.2
5	168	130.0	505	23.9	N.A.		14.90	11.5
6	180	143.6	405	32.4	N.A.		18.49	12.9
7	192	133.3	488	41.6	N.A.		15.85	11.9
8	205	167.0	583	55.1	N.A.		21.14	12.7
M11:layer II								
1	113	304.7	28	11.2	0.1	-	5.90	1.9
2	154	-	large rock slab occupied entire excavation unit					-
3	188	315.6	538	31.4	N.A.		19.96	6.3
M11:layer III								
4	198	186.0	357	43.9	N.A.		21.15	11.4
5	208	152.9	256	23.4	N.A.		15.01	9.8
6	229	150.3	258	38.0	N.A.		15.76	10.5
7	251	491.2	862	233.9	N.A.		25.10	5.1
8	263	127.1	346	49.2	N.A.		15.85	12.5
9	272	75.1	221	27.5	N.A.		14.53	19.3
10	293	202.4	430	118.8	N.A.		16.98	8.4

he suggested that the basal levels of the site may date to 10,000 yrs BP (Gould 1978:105 1979:32). Unfortunately the key date for the framework (I-7599) diverges markedly from the age/depth relationship of the other layer I dates and layers II and III are not directly dated.

The age/depth context of I-7599.

Some inconsistency with respect to the age of layer I is evident in Gould's radiocarbon dates (listed in table 7.2). To accommodate these divergent results one could argue that the rate at which the deposit accumulated varied markedly in different parts of the site. However, such an interpretation is not consistent either with Gould's description of the stratigraphic relationships across the site nor with his section drawings which show layer I as a continuous layer. Furthermore Gould attributes his dates of 715+/-80 and 4640+/-260 (I-7599) to the same subunit of layer I which implies that he saw no evidence of any disconformity separating these levels. My own field observations suggest that the sandsheet in the valley has progressively built up and that it is unlikely that layer I could vary so much in its age across the site.

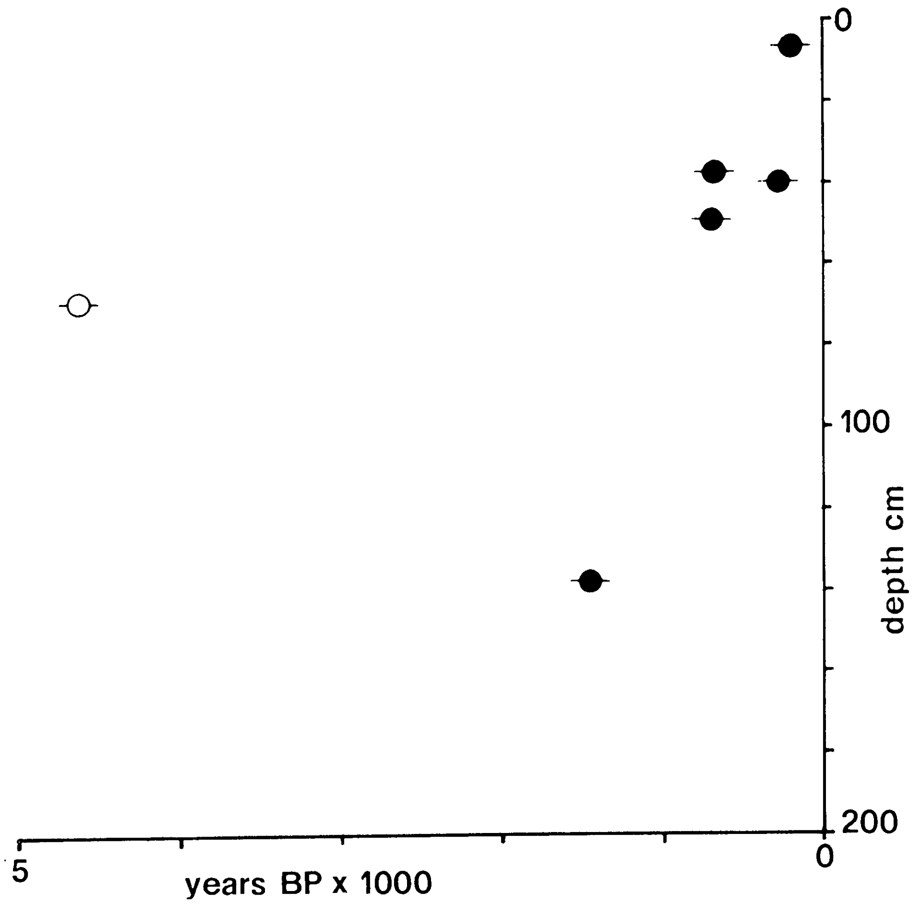
The problem lies with the date of 4640+/-260 yrs BP (I-7599). Figure 7.5 shows the extent to which it diverges from the age/depth relationship of the other dates for trench 1. Of Gould's four dates from adjacent squares in this trench, three form a consistent sequence back to 715+/-80 yrs BP and date charcoal from features that he interpreted as hearths. There is only 20 cm difference in level between the dates of 715+/-80 and 4640+/-260 yrs BP. Given that both are attributed to the same part of layer I by the excavator, a prima-facie case can be made that I-7599 is anomalous and does not give a true basal age for layer I.

Provenance of I-7599.

With the benefit of hindsight it is also possible to cast some doubt on the provenance of I-7599. Firstly, the sample has come from a stratigraphically complex part of the site which has been disturbed by burrowing animals. Secondly, it was collected during the comparatively limited 1973 test-excavation.

The sample consisted of scattered charcoal pieces collected from the south face of trench 1 just above bedrock. Gould's section (1978 fig. 5) shows that this part of the site has been disturbed by burrowing animals and the sample itself has come from an area flanked by disturbed deposits. An independent study by Webster (1982) confirmed that the deposits within the shelter are extensively disturbed by *Bettongia lesueur*, a small macropod. It is possible therefore that I-7599 could be either charcoal dislodged from layer III (which directly underlies layer I in the northern part of the shelter) or charcoal from a pocket on the shelter floor possibly predating layer III. The fact that this sample was collected during the excavation of a test pit in 1973, rather than during the major excavations in 1974 must further add to uncertainty regarding its provenance. The stratigraphic relationships are unlikely to have been as clearly visible at the time it was collected, bearing in mind the burrows and other disturbances subsequently revealed.

Overleaf **Figure 7.4 :** The north face of square L11 (1985). The boundary between layers II and III is shown by the arrow. The fill of the 1974 trench is visible on the left. **Figure 7.5 :** Age/depth graph for radiocarbon dates from trench 1 and the 1983/85 excavation. Depths are in cm below ground surface. I-7599 is shown by the open symbol at the far left.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depth cm
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years BP x 1000

Table 7.2 : Radiocarbon dates from _Intirtekwerle_ rockshelter. Depths in cm below surface. Figures in brackets give depths below site datum for the 1983 samples.

Radiocarbon dates from the 1973/74 excavation

Layer I				
Trench 1.	I-7600	195+/-80	8 cm	hearth
	I-8308	285+/-80	42 cm	hearth
	I-8306	715+/-80	50 cm	hearth
	I-7599	4640+/-260	70 cm	dispersed charcoal
Trench 2.	I-8307	1840+/-105	57 cm	dispersed charcoal
Trench 3.	I-8643	1525+/-80	17 cm	hearth
uncertain context				
Trench 2	I-7601	2495+/-85		dispersed charcoal from fill of feature interpreted as a pit.

Radiocarbon dates from the 1983/85 excavation

Layer I					
L11/7	SUA2247	670+/-100	33-39 cm	(63-69)	dispersed charcoal
Layer II					
L11/19,20 and 21	SUA2125	1460+/-210	120-155 cm	(150-185)	dispersed charcoal

Further radiocarbon dates.

In setting out to collect further samples for dating I located my trench where it would avoid the disturbed western end of trench 1 but where it would still be close enough to the earlier excavation to easily correlate with the stratigraphy. The deposit was excavated in 5-10 cm spits and sieved using 3mm and 6mm mesh. The sieve residues were retained and later wet sieved. Charcoal was recovered by flotation.

Layer III was found to contain very little charcoal and the amount recovered was too small to be useful in dating this layer. From a cubic metre of deposit only 1.2 g of charcoal was recovered by flotation. From the base of layer II a date of 1460+/-210 BP (SUA2125) was obtained on finely divided charcoal. Care was taken to ensure that the sample was not contaminated by recent material. The sandy matrix in this part of the site was uniform and there was no sign of root penetration, burrows or insect casts. Figure 7.6 shows the minor peak in charcoal at the base of this unit. A second sample , of scattered charcoal pieces, was submitted from the base of layer I as a cross-check on SUA2125. This sample gave a date of 670+/-100 BP (SUA2247).

These dates appear to be internally consistent and except for I-7599 they agree well with Gould's dates for trench 1. Together with the latter these now form a consistent chronological sequence for the site.

The revised chronology.

The balance of the evidence suggests that the date of 4640+/-260 yrs BP (I-7599) does not accurately reflect the age of layer

I. Since this date is the cornerstone of the published chronology the following revisions are warranted.

If one excludes I-7599, the sequence of five dates, from trench 1 and the 1983/85 excavations, show that the basal age of layer I can be interpolated as about 850 yrs BP. For layer II SUA2125 suggests a basal age of about 1500-2000 yrs BP. On these figures layer II accumulated rapidly at 128mm/100yr but by the time layer I was deposited the rate had dropped to 54mm/100yr. This decline in the rate of aeolian deposition is in accord with the probable palaeoenvironmental changes towards slightly wetter conditions at this time (see chapter 2).

The date of 1460+/-210 forms a terminus ante quem for layer III. As I see no evidence to indicate a major disconformity here I suggest that the top of layer III dates to about 1500-2000 yrs BP. This is in line with Gould's date of 2495+/-85 (I-7601) obtained from a deep pit or burrow which from its depth (2.13 m) must have penetrated well into layer III. If the rapid rate of deposition evident in layer II is extrapolated this would give a basal age of approximately 3000-3500 yrs BP for layer III. However, if the rate of accumulation of layer III was slower, as seems likely, this figure would represent a minimum basal age for site. Given the possibility that I-7599 may represent older charcoal resting in a pocket on bedrock the maximum age of layer III need not be greater than about 5000 yrs BP. Without direct radiocarbon dating it is difficult to further refine these estimates.

Unresolved problems.

Whilst the revised chronology is an improvement upon the earlier scheme in regard to age/depth relationships in trench 1 and typology (see below) it still leaves the two radiocarbon dates from trenches 2 and 3 unaccounted for (see table 7.2). Both I-8307 and I-8643 appear anomalously old. Bearing in mind their positions within the layer neither of these dates could be incorporated into the chronological framework without rejecting at least three other dates.

I am unable to offer an explanation of these apparently anomalous dates and they must remain the achilles heel of the revised chronology. At this point it is worth reiterating that there is no doubt from Gould's report and from my own observations that the stratigraphy across the site is continuous and that layer I in trench 3 is the same stratigraphic unit as layer I in trench I. Nor do the unpublished stratigraphic drawings for trenches 2 and 3 suggest any major episodes of gullying and redeposition.

Charcoal.

The visible stratigraphy of layer I is the product of large amounts of finely comminuted charcoal. Much of this material is simply too fine to be recovered by the techniques that I used. These consisted of dry sieving of the deposits followed by flotation of sieve residues. However, as the distribution of charcoal produced by these methods closely correlates with the visible stratigraphy of the site I believe that it gives an accurate measure of the overall concentration of charcoal in the deposit.

As can be seen in figure 7.6 and table 7.1 the weight of charcoal recovered from each excavation unit is low compared to other sites such as Therreyererte (chapter 9) and Tjungkupu 1 (chapter 5). Nonetheless, the relative concentration of charcoal matches the distribution of other types of occupation debris such as chipped stone artefacts and bone.

Chipped stone artefacts.

The 1973/74 excavations at Intirtekwerle recovered more than 34,500 stone artefacts. The bulk of this material is now housed in the Northern Territory Museum in Darwin. In July 1984 I worked through this collection to examine the grindstones, to record the basic dimensions of the cores, and to reclassify the retouched artefacts into the typological and raw material classes used throughout this project. I did not attempt a complete typological breakdown of the collection, firstly, because of its size and secondly, because the present organisation of the collection necessitates a tedious search through the specimen catalogue to establish the provenance of each artefact.

Excavated material from trench 3 is entirely absent from the collection. Correspondence on file at the museum indicates that this material was lost in transit somewhere in the United States. In reconciling the specimen numbers on the artefacts with Gould's catalogue entries it also clear that a small number of retouched artefacts and grindstones from trenches 1 and 2 are missing. Except where otherwise indicated these specimens do not affect the stratigraphic distribution of the various artefact types shown in the tables below.

density

The distribution of chipped stone artefacts is shown in tables 7.3 and 7.4 and figure 7.6. A comparison of layer I with the underlying layers shows that it contains approximately ten times the density of chipped stone artefacts suggesting that significantly more intensive use of the site occurred after 850 yrs BP. In this regard the 1973/74 and 1983/85 excavations produced very similar results. Gould (1978:119) also noted the peak in artefact densities that occurs at a depth of 20-30 cm below the surface (see fig. 7.6).

Chipped stone artefacts are present throughout layers II and III in small numbers and there is a minor peak near the top of the latter (see fig. 7.6). Again the peak in artefact density was also noted by Gould (1978:119). Although he described the distribution as bimodal it is clear from the figures in his report, as well as from figure 7.6, that the peak in layer III does not involve large numbers of artefacts.

size

Table 7.4 shows the mean weight of chipped stone artefacts in each excavation unit. For layer I the average weight of artefacts is around 1-2 g. Artefacts from the underlying layers are slightly larger and more variable with mean weights ranging from 0.1 to 11.4 g. This difference is probably a product of the change towards more intensive use of the site in that it reflects the presence of more debitage from on-site knapping in layer I. Despite the fact that the values for mean weight lump cores, flakes and other artefacts into the one category a weak inverse correlation between mean weight and the density or number of artefacts in each excavation unit is evident.

Overleaf **Figure 7.6 :** Intirtekwerle, square L11. Graphs showing the distribution of charcoal, chipped stone artefacts, bone and rubble, in g. per 10kg. of sediment. Depths are in cm below datum.

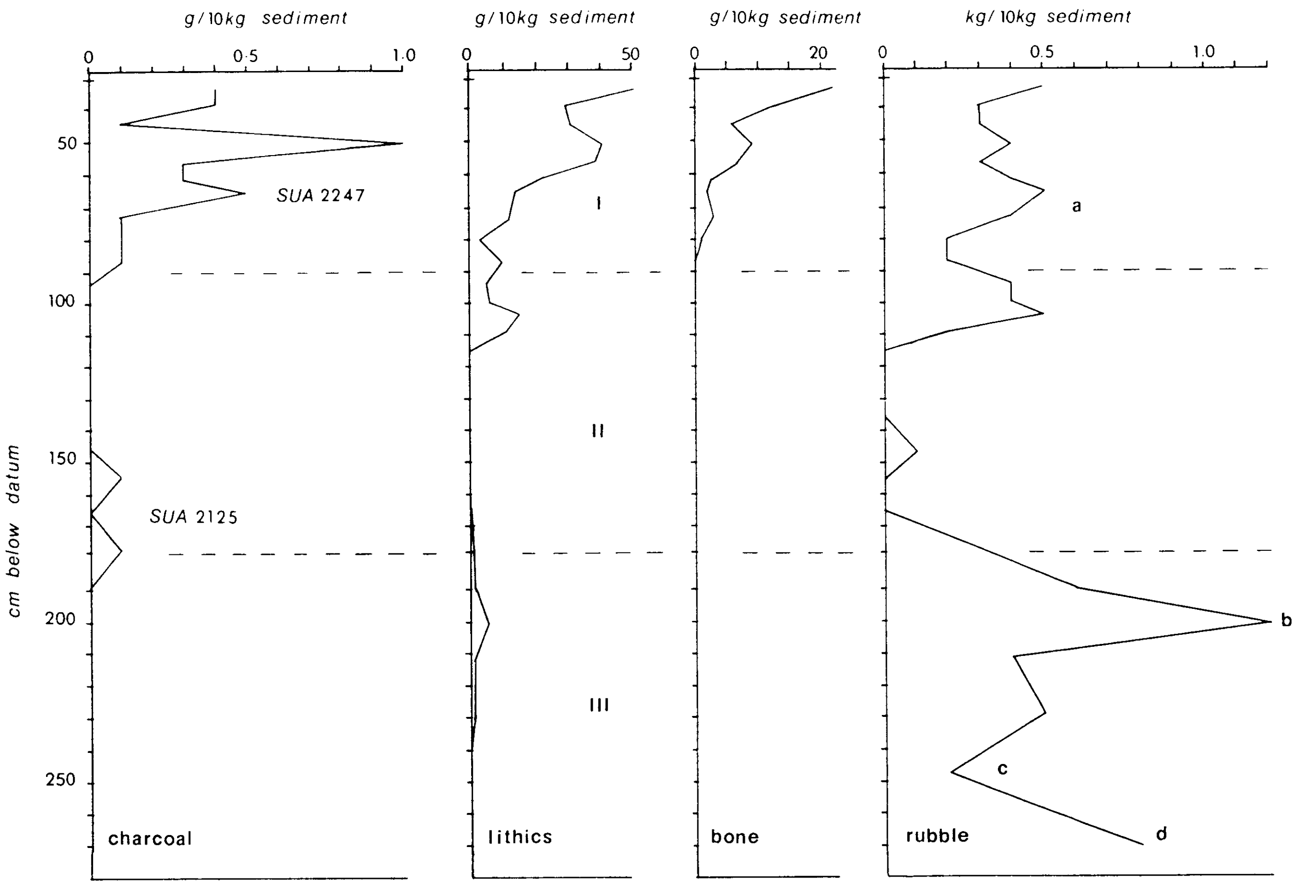

g/10kg sediment
g/10kg sediment
g/10kg sediment
kg/10kg sediment
cm below datum
SUA 2247
SUA 2125
I
II
III
a
b
c
d
charcoal
lithics
bone
rubble

Table 7.3 : Comparative density of chipped stone artefacts in layers I-III at Intirtekwerle.

trench 1 1973/4

layer	volume m^3	no. artefacts	estimated no./m^3
I	7.2	17,742	2464
II/III	15.7	3,219	205
total	22.9	20,961	915

1983/5 excavation - all squares

			estimates	
layer	volume m^3	no. artefacts	no./m^3	no./1000yrs
I	0.9	1,985	2206	2595
II	1.6	422	264	406
III	2.8	72	26	7
total	5.3	2,479	468	

Table 7.4 : The distribution of chipped stone artefacts, grindstones and bone in the 1983/85 excavation. (6mm sieve fraction only).

unit	mean depth cm	chipped stone artefacts no.	wt. g	wt. g/kg sediment	mean wt g	grindstones no.	wt. g.	bone wt. g	wt. g/kg sediment
L10:layer III									
1	190								
2	212	3	4.2	-	1.4				
L11:layer I									
1	33	319	328.4	5.0	1.0			143.7	2.2
2	39	150	140.9	2.9	0.9			63.2	1.3
3	45	160	172.6	3.1	1.1	2	63.9	31.0	0.6
4	50	181	185.2	3.8	1.0			41.6	0.9
5	56	165	211.0	3.3	1.3	2	347.6	39.4	0.6
6	61	104	162.1	2.2	1.6			21.6	0.3
7	66	121	106.6	1.4	0.9			13.6	0.2
8	73	99	102.2	1.1	1.0	1	66.2	20.8	0.2
9	80	90	32.2	0.3	0.4	1	661.9	7.5	0.1
10	87	60	82.4	0.9	1.4			0.6	-
L11:layer II									
11	94	68	60.1	0.5	0.9			1.9	-
12	100	23	24.9	0.6	1.1			0.8	-
13	104	24	94.2	1.5	3.9			1.7	-
14	109	27	79.8	1.0	3.0			0.4	-
15	116	17	6.2	-	0.4			0.6	-
16	127	11	1.3	-	0.1				
17	137								
18	146								
19	156								
20	166								
21	178	2	16.1	0.1	8.1				
L11:layer III									
23	190	3	11.2	0.1	3.7				
24	201	6	68.1	0.5	11.4				
25	212	4	9.3	0.1	2.3				
26	229	8	32.7	0.1	4.1				
27	247								
28	270	1	7.4	-	7.4				

Table 7.4 : (continued from page 219).

L12:layer I

1	81	139	481.6	8.4	3.5			20.2	0.4
2	90	162	185.1	1.6	1.1			25.1	0.2
3	99	235	264.4	2.3	1.1	3	77.2	38.2	0.3

L12:layer II

4	106	24	24.8	0.5	1.0			4.9	0.1
5	111	78	112.7	1.4	1.4	1	133.4	10.9	0.1
6	117	78	208.3	2.5	2.7			14.5	0.2
7	122	26	33.7	0.4	1.3			0.7	-

M10:layer II

1	113								
2	135	5	3.1	-	0.6				
3	143	10	61.3	1.1	6.1				

M10:layer III

4	154	8	41.1	0.2	5.1				
5	168	3	3.4	-	1.1				
6	180	5	7.0	-	1.4				
7	192	3	5.9	-	2.0				
8	205	3	54.0	0.3	18.0				

M11:layer II

1	113	26	46.1	0.2	1.8			2.4	-
2	154								
3	188	3	12.9	-	4.3				

M11:layer III

4	198	9	20.2	0.1	2.2				
5	208	6	4.8	-	0.8				
6	229	3	6.4	-	2.1				
7	251	2	0.7	-	0.4				
8	263	4	8.4	0.1	2.1				
9	272	1	5.2	0.1	5.2				
10	293	-							

raw material

Fine-grained grey silcrete is the dominant raw material in this assemblage. Frequent use has also been made of hard, local, silicified sandstone. Various types of chert are next in importance followed by chalcedony.

The silcrete is easily available locally and occurs as a duricrust capping hills throughout the region (see Mabbutt 1967:fig. 8.3 for the distribution of silcrete capping in the Alice Springs district). Two large blade quarries of this material are known along the northern side of the range - one approximately 35 km west of Intirtekwerle and the other near where the Hugh river cuts through the range. Chalcedonic limestone also outcrops within 10-15 km of the site and this is presumably the source of the chalcedony and much of the chert. However, in a more detailed study of the possible sources of raw material, Gould and Saggers (1985) list a significant amount of the chert as 'exotic', that is, derived from sources lying outside of the 24 km radius around Intirtekwerle that they surveyed for raw materials.

Table 7.5 shows the proportion of different raw materials by layer in square L11. An increase in the use of silcrete in layer I, associated with a decline in use of chert, is shown. This pattern is also true of the site as a whole and is reflected in the assemblage of cores from trench 1 (table 7.6). My impression from examining the 1974 collection, and from my own excavations, is that the large increase in the number of artefacts in layer I is disproportionately made up of silcrete artefacts. If so one could argue that more intensive occupation of Intirtekwerle created a demand for greater amounts of isotropic stone and that this was drawn from the nearest sources - in this case silcrete rather than chert.

Gould and Saggers (1985) identified a change from quartzite (silcrete in my classification) towards greater use of local chert for adzes (sensu Gould) in the last few hundred years. Unfortunately the significance of their analysis is obscured by the very broad definition of "adze" that they employ. Under their definition this category includes tula adzes, discoidal scrapers and other flake scrapers (see Saggers 1982:122). My analysis of the tula adzes from the 1974 excavation does not support their conclusions. Table 7.7 shows the composition of tula adzes from trench 1. Layer I has been divided into an upper and lower half to assist comparison with Gould's data. The table shows that very few adzes are made of silcrete and that the proportion of chert and chalcedony does not significantly differ between the layers.

manufacture.

The cores in the 1974 assemblage have been primarily reduced as single platform (54.5%) or informal cores (19.8%). There are comparatively few multi-platform cores (13.8%) implying little attempt to prolong use of a core by rotating it and establishing a second platform. This suggests that raw material was easily available and it is not surprising that 70% of the cores are of silcrete. Bifacial cores are rare and make up only 3% of the 148 cores examined from trenches 1 and 2. There are no cores made on the quartzite river cobbles which can be found in the bed of the Hugh river, about 30 km to the west.

There are 15 blade cores in the 1974 assemblage and these are the only type of core restricted to layer I. Unretouched blades

Table 7.5 : The proportion of different raw materials, calculated as % weight, in layers I-III, square L11 (6mm sieve fraction only).

1983/85 - L11

layer	total weight g.	chalcedony %	chert %	silcrete %	silicified sandstone %
I	1598.4	4.0	8.7	61.3	26.0
II	278.9	1.6	11.6	47.8	38.9
III	126.8	0.6	8.4	72.1	18.8

Table 7.6 : Raw materials represented amongst the cores, calculated as % of the total number of cores in each layer.

1974 - trench 1

layer	total number of cores	chalcedony %	chert %	silcrete %	silicified sandstone %
I	75	2.7	14.7	73.3	9.3
II/III	17	17.6	35.3	41.2	5.9

Table 7.7 : Raw materials represented amongst tula adzes and tula adze slugs. Layer I has been divided into levels above and below a depth of 30 cm below surface. The figures give the number of artefacts in each category.

1974 - trench 1

layer	total number of adzes	chalcedony	chert	silcrete	silicified sandstone
Ia	101	10	88	3	-
Ib	21	2	19	-	-
II	2	-	2	-	-

are common in this layer but note that Gould (1978 table 4) also lists two specimens from layer II.

There is no correlation between particular types of core and specific raw materials. The blade cores are ~~predominately~~ predominantly made of silcrete but this reflects the overall predominance of silcrete in the assemblage. Cores made of chert or chalcedony are smaller and have less cortex than other cores suggesting these were more heavily reduced than other materials (table 7.8), or perhaps were available in smaller nodules. Table 7.8 shows that there is little difference between the layers in the mean size of cores.

The 13 cores recovered during the 1983/85 excavations show the same distribution of types and raw materials evident in the larger assemblage from trenches 1 and 2. The 1983/85 specimens include 1 blade core and 2 bifacial cores from layer I.

typology

Tables 7.9 and 7.10 show the distribution of cores, retouched artefacts and use-polished flakes. Gould (1978:86) divided the assemblage into two phases. The James Range II phase, represented by artefacts from layer I, was seen as equivalent to the small-tool tradition while the James Range I phase, from layers II and III, was presumed to be older than 5,000 yrs BP and to correspond with the core-tool and scraper tradition. However this scheme is not corroborated by the typology of the artefacts from the various layers. Even if one sets aside the revised chronology proposed above, the presence of tula adze slugs, endscrapers, unretouched blades and possibly also backed blades in layer II indicates that this layer dates to less than 5,000 yrs BP. The similarities between the cores in layers I and II also suggest that little industrial change took place at this time.

backed blades: In the 1983/85 excavations two backed blades were recovered (see fig. 3.7). Both were from layer I and both were made of silcrete. The larger assemblage of backed blades from the 1974 excavation also shows that backed blades are restricted to layer I. Gould (1978 table 4) lists one specimen from layer II, trench 1, but this was not located in the collection in 1984 and is not listed in the 1974 catalogue. Quite possibly it is from the 1973 test excavation. If so, its provenance may be subject to the same doubts raised about the radiocarbon samples.

tula adzes: In the 1983/85 excavations three tula adze slugs, all of chert, were found. One of these specimens, IDK/L12/5-1, was from a depth well within layer II. The presence of tula adze slugs in layer II is confirmed by the distribution of these artefacts in trench 1. Here two tula adze slugs were found at depths of 69-76 cm and 91-99 cm below the surface. A third adze slug from this layer at a depth of 99-107 cm is listed in the catalogue but could not be located in the collection.

Unlike that of backed blades and endscrapers, the distribution of tula adzes closely corresponds with the overall density of occupation debris in each level. The distribution of tula adzes within layer I, trench 1, shows that 83% of the specimens (101 out of a total of 122) have come from the top 30 cm of the layer.

pirri graver: Kamminga (1985:2-25) has described a distinctive type of engraving tool from the Lake Eyre region. In the 1974 assemblage there is one artefact that meets his definition. This specimen is from layer I, trench 2, at a depth of 15-23 cm. It is

Table 7.8 : Size of cores from trenches 1 and 2, 1974.

Differences between layers

layer	number of cores	mean wt. g.	mean length[1] mm.
I	148	57.1	32.8
II/III	19	52.8	30.2

1. maximum dimension perpendicular to main platform.

Differences between raw materials

material	number of cores	mean wt. g.	weight range
chalcedony	6	26.3	10.8 - 60.0
chert	29	25.3	1.1 - 109.0
silcrete	117	44.5	7.0 - 651.4
silicified sandstone	15	223.8	21.9 - 746.5

Table 7.9 : The distribution of retouched artefacts, cores and other implements by layer.

1974 - trench 1

layer	backed blades	tula adzes	endscrapers	cores	use-polished flakes	axe fragments
I	48	122	32	75	1	4
II/III	-*	2	3	12	-	-

* 1 backed blade listed in catalogue but not located in collection.

1974 - trench 2

layer	backed blades	tula adzes	endscrapers	cores	use-polished flakes	axe fragments
I	37	78	29	73	2	3
II/III	-	-	-	2	-	-

1983/85 - all squares

layer	backed blades	tula adzes	endscrapers	amorphous retouched artefacts	cores	use-polished flakes
I	2	2	3	35	10	1
II	-	1	1	10	1	-
III	-	-	-	4	2	-

Table 7.10 : The distribution of retouched artefacts, cores and use-polished flakes by excavation unit. 1983/85 excavation - all squares.

unit	backed blades	tula adzes	endscrapers	amorphous retouched artefacts	cores	use-polished flakes
L10:layer II						
1	-	-	-	-	-	-
2	-	-	-	-	-	-
L11:layer I						
1	1	-	-	5	2	-
2	-	1	-	1	-	-
3	1	-	-	5	-	-
4	-	-	-	6	-	-
5	-	-	1	1	1	-
6	-	-	1	2	1	1
7	-	-	-	-	-	-
8	-	-	1	2	1	-
9	-	-	-	-	-	-
10	-	-	-	-	-	-
L11:layer II						
11	-	-	1	1	-	-
12	-	-	-	-	-	-
13	-	-	-	2	-	-
14	-	-	-	-	-	-
15	-	-	-	-	-	-
16	-	-	-	-	-	-
17	-	-	-	-	-	-
18	-	-	-	-	-	-
19	-	-	-	-	-	-
20	-	-	-	-	-	-
21	-	-	-	-	-	-
L11:layer III						
23	-	-	-	-	-	-
24	-	-	-	-	1	-
25	-	-	-	-	-	-
26	-	-	-	-	-	-
27	-	-	-	-	-	-
28	-	-	-	1	-	-

Table 7.10 : (continued from page 228)

L12:layer I

1	–	–	–	9	4	–
2	–	1	–	2	1	–
3	–	–	–	2	–	–

L12:layer II

4	–	–	–	–	–	–
5	–	1	–	1	–	–
6	–	–	–	3	–	–
7	–	–	–	–	–	–

M10:layer II

1	–	–	–	–	–	–
2	–	–	–	–	–	–
3	–	–	–	1	1	–

M10:layer III

4	–	–	–	2	–	–
5	–	–	–	–	–	–
6	–	–	–	–	–	–
7	–	–	–	1	–	–
8	–	–	–	–	1	–

M11:layer II

1	–	–	–	1	–	–
2						
3	–	–	–	1	–	–

M11:layer III

4	–	–	–	–	–	–
5	–	–	–	–	–	–
6	–	–	–	–	–	–
7	–	–	–	–	–	–
8	–	–	–	–	–	–
9	–	–	–	–	–	–
10	–	–	–	–	–	–

made of chert and therefore the possibility remains open that it is of exotic raw material.

endscrapers: Four endscrapers were found in the 1983/85 excavations. One of these, IDK/L11/11-1, is from layer II. Similarly, three endscrapers were recovered from layer II from trench 1 in 1974. These specimens were from depths of 53-61 (2) and 68-76 cm respectively. In addition, there is one endscraper from layer II listed in the catalogue but not located in the collection.

use-polished flakes: There are a number of artefacts with heavily worn, rounded and polished edges in the *Intirtekwerle* assemblage. The use-wear sometimes takes the form of a pronounced edge bevel. In addition to the specimens listed in tables 7.9 and 7.10 several endscrapers and other retouched artefacts have the same distinctive use-wear along one edge. These artefacts appear to be exclusively of silcrete. In the 1983/85 excavations a silcrete core, IDK/M10/3-1, with use-polish along the platform edge was found in layer II.

Grindstones.

The 1974 excavations produced a large assemblage of grindstones. The distribution of these is shown in table 7.11 and further details can be found in Smith (1986a table 2). In addition to the 104 grindstones examined there are 22 other specimens listed in the catalogue which could not be located in the collection. These missing specimens are all from layer I.

In the 1974 collection there are 33 specimens which can be identified as parts of seedgrinding implements. These include 8 pieces of millstone, 23 mullers, 1 broken mortar and 1 pestle. These specimens are all from layer I - 29 out of the 33 from the top 30 cm of the layer. In this respect their distribution correlates with the overall distribution of occupation debris which reaches peak densities in the top 30 cm of layer I. The 1983/85 excavations recovered only 11 grindstones. Their distribution is shown in tables 7.4, 7.11 and 7.12. The only seedgrinding implement is IDK/L12/5-2, a rim fragment from a millstone, recovered from layer II.

One of the striking features about this assemblage is the high proportion of grindstone fragments which are undiagnostic. This is a reflection of a high degree of breakage of grindstones. Many specimens are fragments measuring less than 100 mm in their largest dimension.

Ground-edge artefacts.

No ground-edge artefacts were found in the 1983/85 excavations. There are 7 ground-edge fragments, of basalt, from the 1974 excavations, all from layer I. The most likely source of this material is in the MacDonnell ranges, about 100 km to the north.

Bone.

density.

Figure 7.6 and table 7.4 show that bone in the deposit is largely restricted to layer I and that it reaches its greatest concentration in the top 30 cm of the layer. Figures given in Webster (1982: table 52) show a similar pattern for the 1974 excavation. In this case only 4.5 % of the bone, by weight, came

Table 7.11 : The distribution of grindstones by layer.

1974 - trench 1

layer	seedgrinders	amorphous grindstones	undiagnostic fragments
I	21	6	22
II/III	-	1	-

1974 - trench 2

layer	seedgrinders	amorphous grindstones	undiagnostic fragments
I	12	-	42
II/III	-	-	-

1983/85 - all squares

layer	seedgrinders	amorphous grindstones	undiagnostic fragments
I	-	2	8
II	1	-	-
III	-	-	-

Table 7.12 : Typology of grindstones excavated in 1983/85. Distribution by excavation unit.

unit	millstone fragment	undiagnostic fragment	amorphous artefact	total
L11:layer I				
3	-	2	-	2
4	-	1	-	1
5	-	1	1	2
8	-	1	-	1
9	-	-	1	1
L12:layer I				
3	-	3	-	3
L12:layer II				
5	1	-	-	1

from layer II or III. All of the bone from the site is highly fragmented and much of it is burnt or calcined. For the 1974 excavation Webster's study shows that 88 % of the bone is burnt.

species identification.

In view of the small amount of bone from the 1983/85 excavations I have made no attempt at species identifications or counts of minimum number of individuals. In a detailed study of the 1973/74 material Webster (1982) identified 16 vertebrate species. The best represented of these were Trichosurus vulpecula, Bettongia lesueur and Macropus robustus. The only species recorded for layer II are Isoodon auratus and Macropus robustus.

KWERLPE

Kwerlpe (cf. Gould 1980:184 Ikulpa; Strehlow 1971:map Kolba) is an unusual site located near the summit of the James range about 7-8 km east of Intirtekwerle.

There are two deep rockholes here, located in a gorge on the slopes of Mt Brunonia. These are readily recharged by runoff from the surrounding surfaces but are not permanent waters. The surrounding area consists of low scrub covered hills and bare rocksheets with a little skeletal soil cover. Not surprisingly plant foods, except for Ficus platypoda are poor. The range is approximately 4 km wide at this point and, although the sandplains at the foot of the range are accessible, Kwerlpe is not well placed to tap their resources. Unfortunately there is little oral information about Aboriginal use of the site or its status within the pattern of settlement. According to George Breaden people gathered seeds "in a sort of a bag" and took them up to the site to offset the paucity of plant foods there. The area from Intirtekwerle through to Kwerlpe is generally known to have been an important foraging area (Kimber pers. com. citing Walter Smith).

The variety of archaeological material at Kwerlpe is impressive. Lying on the rocksheet around the rockholes is an extensive scatter of chipped stone artefacts and grindstones. In 1975 K. L. Hutterer undertook a major surface collection here. According to correspondence on file with the Northern Territory Museum he collected approximately 47,700 artefacts from three transects totaling 2,384 m². These figures give an overall artefact density of 20 artefacts per m². There are seedgrinding implements amongst the grindstones at the site but their total number is much lower than at Therreyererte (chapter 9), Keringke (chapter 9) or even Urre (below). Near the rockhole there are also several bedrock milling grooves.

Rock engravings and rockpaintings are a prominent feature of the site. The engravings are very weathered and are concentrated around the rockholes and along the gorge. The paintings are present in several small rockshelters.

In 1973 Gould excavated one of the small rockshelters at the site and produced some useful results. Two other rockshelters were also dug during the same period by L. K. Napton and A. Albee but these contained less than 30 cm of deposit.

Gould's excavation was a 6 x 3 foot pit which reached bedrock at 51 cm. The stratigraphy consisted of a thin surface layer of red aeolian sand underlain by brown sand, containing stone artefacts and some pieces of animal bone. One radiocarbon date of

3635+/-90 (I-7602) was obtained from a depth of 38-41 cm, on several large pieces of charcoal. Tula adze slugs and backed blades were found throughout the upper 30 cm of the deposit, including the 3 inch spit immediately above the radiocarbon sample. None were found in levels below the sample. This suggests that the first appearance of these artefacts at Kwerlpe took place about 2700 - 3600 yrs BP - an estimate in line with the evidence from other Central Australian sites.

URRE

Urre (cf. Strehlow 1971:map Wora) is an increase site for Eragrostis eriopoda, an important grass seed species. The striking rock formations and large claypan here are the focus of an area that Europeans call Rainbow Valley. Two kilometres east of Urre is a rockhole and an important campsite. It is this site that has been the subject of the archaeological work described below. The Arrernte name for a small gap in the range near the site may be nterneme atwatye but as I have been unable to cross-check this with informants on the ground I have chosen to use Urre as the name for the archaeological site.

THE ARCHAEOLOGICAL SITE

The rockhole at Urre is small but well formed. It is not permanent but is important because it is one of the few rockholes in this part of the range. The rockhole lies a few hundred metres up a small gully and on the sides of this near the rockhole are extensive panels of rock engravings. Near the mouth of the gully there are also several small rockshelters with paintings.

The main archaeological deposits are part of an extensive sandsheet at the mouth of the gully. The main concentration of occupation debris lies in an area of about 100 x 100 m sheltered amongst low sandstone ridges. Here there is a grey/brown horizon about 30-40 cm thick containing charcoal, some burnt bone and large amounts of chipped stone debitage. Grindstones are numerous and at least 30 large seedgrinding implements, either millstones or mortars, are known to have been originally present. Unfortunately, the proprietor of a local camel tour enterprise has souvenired many of the larger artefacts and the recent establishment of a new bore and access track has further damaged the site.

Immediately to the southwest, where the creek cuts across the point of the ridge, several pecked circles are exposed on a sloping rocksheet in the creek bed. None appear to be buried.

About 1 km to the northwest, in a blowout on a sand dune, there is another dense scatter of chipped stone artefacts - including backed blades - and grindstones.

EXCAVATION OF PIT D40

Urre is one of a number of similar sites along the northern edge of the James range. My objective in excavating here in 1985 was to establish the age of the occupation horizon that is visible as a grey/brown deposit in the top part of the sandsheet. I chose to excavate at Urre rather than at one of the other sites because the density and variety of archaeological remains appeared to be greatest at this site.

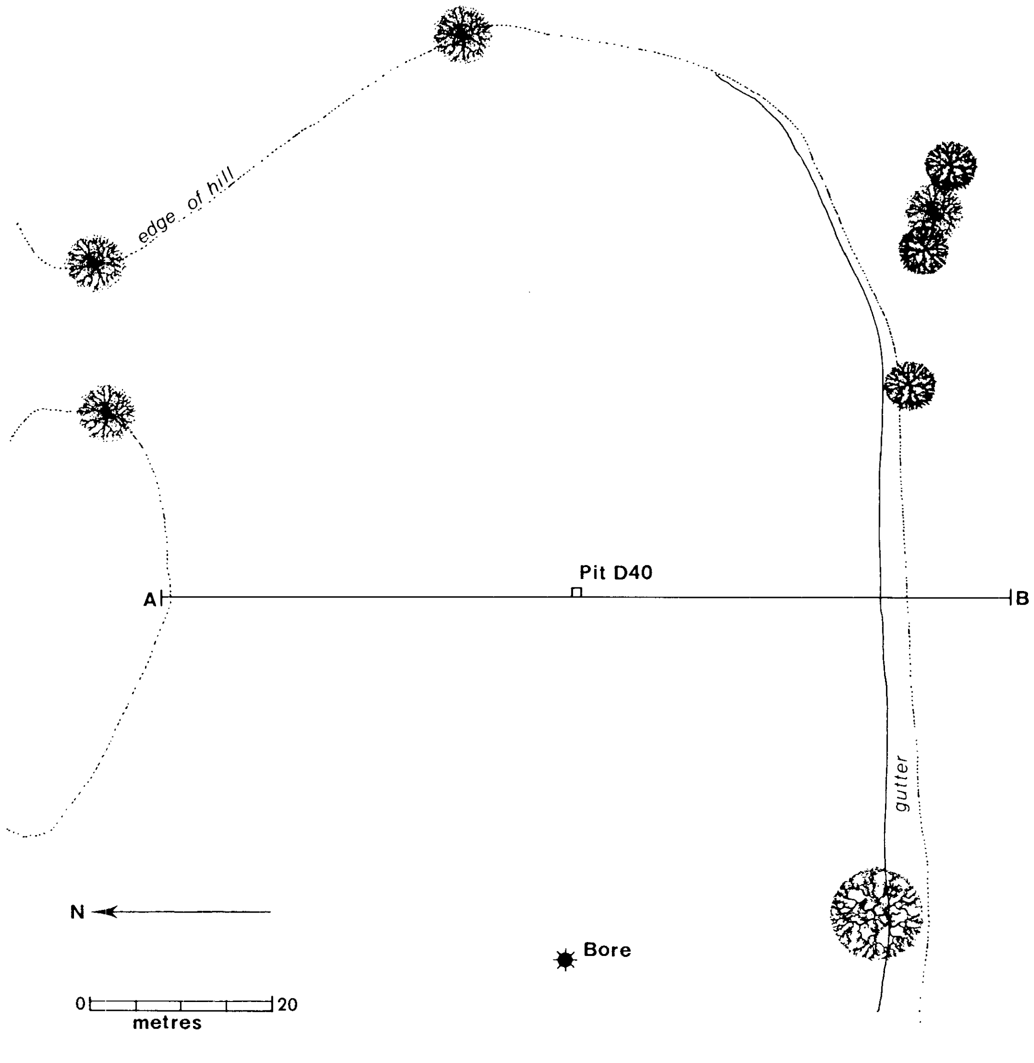
I laid out a 1 m² pit near the centre of the site (fig. 7.7). This was designated D40 on a nominal site grid. A series of auger holes were later used to trace the grey/brown horizon in a transect across the site. The lowest step on the superstructure of a nearby bore served as zero datum for the excavation - in lieu of a more suitable point.

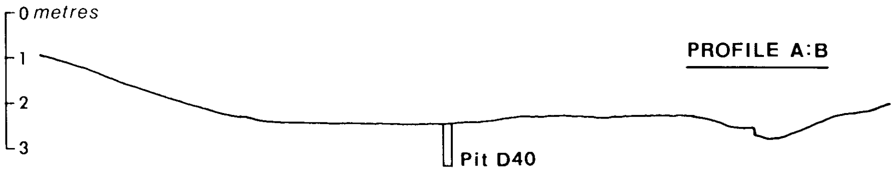
Stratigraphy and chronology.

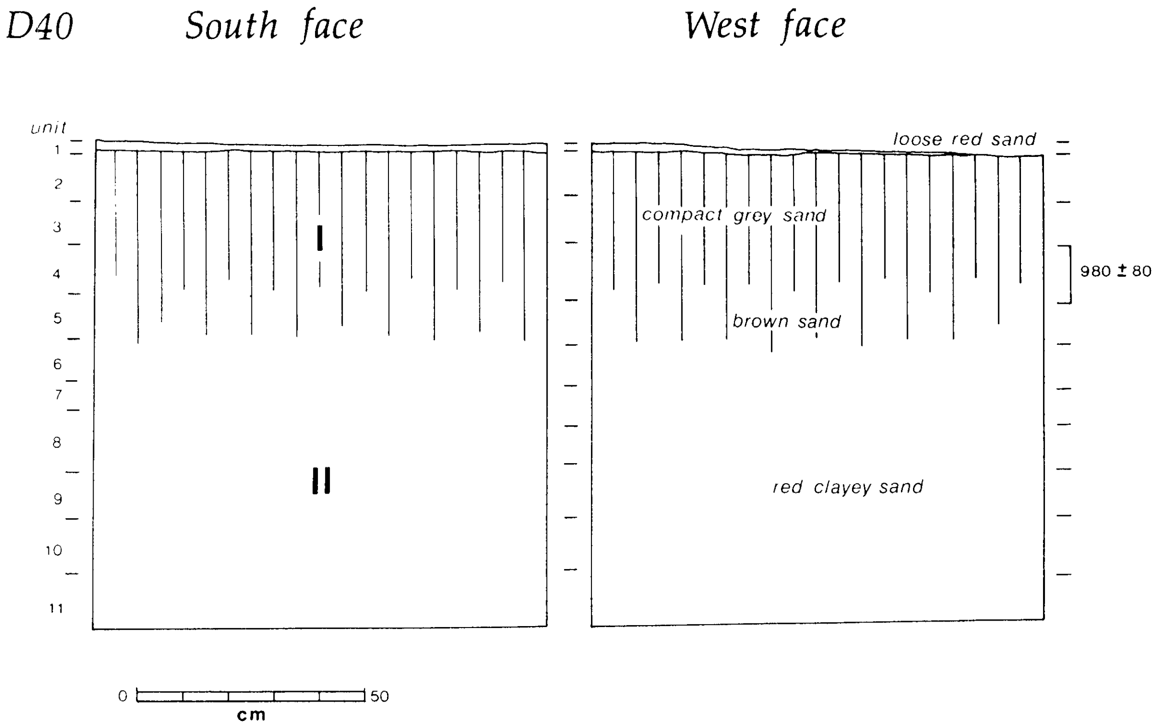
The deposits in Pit D40 (see fig. 7.8) consist of compact, fine, red, aeolian sand. The surface layer is a thin band, 5 mm thick, of loose red sand. This aeolian veneer has an abrupt boundary with the underlying archaeological deposits. Layer I is a compact, fine, grey/brown sand (Munsell 5YR 4/6, pH 4.0), about 30 cm thick, with large amounts of chipped stone debitage, grindstones and finely divided charcoal. The auger holes show that the layer is from 20-30 cm thick across the site, with it being shallower upslope from the excavation. Layer I becomes more brown and less ashy at a depth of 30-40 cm below the surface and grades into layer II. The latter is a very compact, fine, red clayey sand (Munsell 2.5 YR 4/8, pH 4.0). This becomes increasingly clayey and consolidated with depth. Pit D40 reached a maximum depth of 1.05 m below surface.

Table 7.13 summarises the composition of layers I and II. The sediment matrix is essentially red aeolian sand throughout and it is the amount of finely comminuted charcoal that gives layer I its grey/brown colour. For the purposes of the analysis I have grouped units 1-5 together as layer I and units 6-11 as layer II.

Overleaf **Figure 7.7 :** Flan and profile of the open site at Urre.
Figure : 7.8 Urre, Pit D40, stratigraphic section.


edge of hill
Pit D40
A
B
gutter
N
Bore
0
20
metres


0 metres
1
2
3
PROFILE A:B
Pit D40



D40
South face
West face
unit
1
2
3
4
5
6
7
8
9
10
11
I
II
loose red sand
compact grey sand
brown sand
red clayey sand
980 ± 80
0
50
cm

Table 7.13 : Composition of the deposits at Urre, Pit D40. Depths are in cm below ground level.

unit	mean depth cm.	sediment gross wt kg.	rocks wt. kg.	rubble wt. kg	charcoal total wt. g.	charcoal wt. g/10kg sediment
layer I						
1	1	22.5	0.3	0.17	5.3	2.39
2	7	201.2	0.1	0.65	39.6	1.97
3	18	148.7		0.08	3.5	0.24
4	29	156.0		0.21	2.1	0.13
5	39	155.7	0.8	0.39	1.8	0.12
layer II						
6	49	141.0	0.2	0.08	0.6	0.04
7	58	95.1	0.1	0.05	0.1	0.01
8	67	170.4		0.13	0.1	-
9	78	148.3		0.09	0.1	-
10	89	168.8	0.3	0.20	0.1	-
11	100	127.6		0.07		-

Beta-16306 on scattered charcoal pieces from unit 4 (23-34 cm below surface) gave a radiocarbon date of 980+/-80 yrs BP. This suggests that the main occupation horizon at Urre corresponds to that at Intirtekwerle. Beta 16306 suggests a rate of sediment accumulation of about 29mm/100yr. Using this estimate the changes registered at this site took place a little before 980 yrs BP, in the period 980-1300 yrs BP. Extrapolating from this to the base of the excavation suggests that the basal levels in Pit D40 date to about 3600 yrs BP.

Stone artefacts.

The density of chipped stone artefacts (table 7.14) shows a rough correlation with the concentration of charcoal (table 7.13) in the deposit. Both reach their highest densities in layer I. If the density of artefacts is calculated as the number per m^3 layer I has about ten times the concentration of chipped stone artefacts as layer II (table 7.15). This is of the same order of magnitude as the change registered at Intirtekwerle. The change at Urre is most clearly marked in the concentration of fine debitage from the 3 mm sieve (see table 7.14).

Fine-grained silcrete and chert are the dominant raw materials throughout the deposit. Small amounts of chalcedony are also present in both layers. There is little evidence of any change in the proportions of these raw materials throughout the history of the site. However, the presence of small amounts of red chert or jasper in layer I, units 1, 2 and 4, is worthy of note as it may reflect the introduction of raw materials not available in the immediate area.

Table 7.14 : The distribution of chipped stone artefacts, fine flaking debitage and grindstones in Pit D40. Depths are in cm below surface.

		chipped stone artefacts								
		6mm sieve fraction				3mm sieve fraction			grindstones	
unit	mean depth cm.	no.	wt g.	mean g.	wt. g/kg sediment	no.	wt g.	wt. g/100kg sediment	no.	wt. g.
layer I										
1	1	42	68.4	1.6	3.08	41	1.3	5.86	1	178.3
2	7	168	268.2	1.6	1.33	212	11.3	5.62	3	461.6
3	18	72	70.5	1.0	0.47	122	8.1	5.45	1	474.4
4	29	69	123.6	1.8	0.79	113	6.7	4.29		
5	39	124	186.8	1.5	1.21	129	8.9	5.75		
layer II										
6	49	36	31.4	0.9	0.22	59	3.6	2.56		
7	58	9	45.3	5.0	0.48	34	1.9	2.00		
8	67	4	17.4	4.4	0.10	12	0.7	0.40		
9	78	6	3.4	0.6	0.02	11	0.6	0.40		
10	89	-				4	0.1	0.01		
11	100	-								

Table 7.15 : The comparative density of chipped stone artefacts in layers I and II.

layer	no. artefacts.	volume m^3	estimated no/m^3
I	475	0.44	1080
II	55	0.61	90

Table 7.16 : The distribution, by excavation unit, of retouched artefacts, cores and grindstones.

unit	backed blades	tula adze slugs	amorphous retouched artefacts	cores	amorphous grindstones	pestle	undiagnostic grindstone fragments
layer I							
1	1	1	1	-	-	-	1
2	2	-	5	1	-	1	2
3	1	-	-	-	1	-	-
4	-	-	-	-	-	-	-
5	-	-	2	-	-	-	-
layer II							
6	-	-	-	1	-	-	-
7	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-
9	-	-	-	-	-	-	-
total	4	1	8	2	1	1	3

The assemblage is too small to usefully comment on changes in manufacture except to note that two single platform cores were recovered - one from each layer. Table 7.16 shows the distribution of retouched artefacts, cores and grindstones. Four backed blades and 1 tula adze slug were recovered from layer I and several long, thin, blades were noted in units 2 and 3.

In layer I there were five fragments of grindstone. Only 1 of these can be positively identified as a fragment of a seedgrinding implement. This is part of a pestle or alyere from unit 2. Two of the undiagnostic fragments - one in unit 1 and another in unit 2 - are probably rim fragments from millstones but they do not retain sufficient characteristics to be certain of this identification.

Bone.

Very little bone is present in the deposit. Small fragments, including teeth, were noted in the 3mm sieve residue from layer I. Most of the teeth are from medium sized macropods. I have not attempted species identifications but the teeth include at least 1 upper premolar with the closely-spaced serrations characteristic of bettongs.

JAMES RANGE NORTHWEST ROCKSHELTER

In 1973 Gould excavated a small rockshelter situated on the northern side of the James range, about 9 km east of the point where the Hugh river cuts through the range. Nothing is known of the recent Aboriginal use of the site and no Arrernte name is available. Gould named it the James Range Northwest site.

The site consists of a small rockshelter, 6 m wide and 3 m deep, which faces west overlooking a gap in the range. There is a light scatter of chipped stone artefacts and grindstones on the sandy flat in front of the shelter. There is no obvious water source near the site. Presumably water would be available after rain in ephemeral soakages in nearby creeks.

In June 1973 Gould excavated three 3 x 3 foot pits to a maximum depth of 114 cm. The sandy deposit consisted of three layers. Firstly, the deposit was capped with a veneer of aeolian red sand, up to 5 cm thick. This was underlain by 58-60 cm of grey/brown ashy deposit containing abundant chipped stone artefacts, charcoal and bone. The basal layer in the shelter was a red sand containing a few stone artefacts and flecks of charcoal. Bedrock was not reached.

Backed blades and tula adze slugs are reported to have been present in all levels of the grey/brown deposit, down to depth of 46 cm. A waterworn cobble was recovered from the basal part of the red sand at a depth of 107 cm. Gould describes this specimen as a seedgrinding implement but I have examined it and can find no evidence of abrasion or use-wear.

The sequence, as it is described in Gould's fieldnotes, appears to document the same shift in site use that is reflected at the other James range sites. Gould obtained two radiocarbon dates. The first, I-7596 1700+/-80 yrs BP, was on several large pieces of charcoal, from the boundary between the grey/brown deposit and the basal red sand, at a depth of 64 cm. The second, I-7597 1045+/-80 yrs BP, was on charcoal from a hearth at a depth of 28 cm. This sample was from the middle of the grey/brown deposit, at the boundary between the upper part of the layer which Gould noted to be loose and unconsolidated and the underlying more compact deposit. On these radiocarbon dates the basal levels of Gould's excavation must date to roughly 2500-3000 yrs BP. The first appearance of backed blades and tula adzes at this site is neatly bracketed by the two dates to between 1000-1700 yrs BP.

Although Gould's notes do not include details of the density of bone, charcoal and chipped stone artefacts throughout the deposit he provides enough information to be certain that a major increase in use of the site took place from 1700 yrs BP. If the boundary between the basal red sand and the grey/brown layer marks an abrupt change then we could be confident that the change in site use took place at 1700 yrs BP. However, if the grey/brown deposit grades into the red sand, as at other sites, then the specific stratigraphic position of the change must be less certain without corresponding information on the density of stone artefacts, bone and charcoal. Whatever the case, progressive changes in the use of this rockshelter appear to have begun at 1700 yrs BP and by about 1370 yrs BP, with the first appearance of backed blades and tula adzes, one can assume that the transformation had reached a degree comparable to that at Intirtekwerle.

CHANGES IN PREHISTORIC LANDUSE IN THE JAMES RANGE.

Three sites in the James range - James Range NW, Urre, and Intirtekwerle - record a marked shift in intensity of use in the period between 850-1700 yrs BP.

At Urre and Intirtekwerle this change is marked by a tenfold increase in the density of chipped stone artefacts and corresponding increases in the amount of bone and charcoal and in the number of grindstones. At both of these sites the change is also marked by an increase in fine debitage and a reduction in the mean size of artefacts from about 3 g to about 1 g. Another feature of the change is the increase in the numbers of specialised implements, such as backed blades, tula adzes and seedgrinders.

The change is also marked by some adjustments in the raw materials used for stone artefacts - a decline in chert at Intirtekwerle and the introduction of a red chert at Urre - but as might be expected the nature of these adjustments is specific to each site. Similarly, there are smaller changes in the intensity of occupation within the last 1000 years but again the direction of these appears to vary between sites. For instance, Intirtekwerle is most heavily used after about 300-400 yrs BP whilst at Urre occupation declined after about 900 yrs BP reaching its lowest point during the last 1000 years at about 600 yrs BP.

Bearing in mind the difficulties of dating the change using samples of detrital charcoal, and that the shift in site use is progressive rather than abrupt, the radiocarbon dates from Intirtekwerle, Urre and James Range NW rockshelter are surprisingly consistent. At James Range NW the change took place at about 1045-1700 yrs BP, at Urre at 980-1300 yrs BP, and at Intirtekwerle at 850 yrs BP.

The changes at these three sites do not appear to be the direct result of any change in technology. The evidence from Intirtekwerle shows that there is little difference between the assemblages in layers I and II. Seedgrinding implements, tula adzes, endscrapers, unretouched blades and use-polished artefacts are all present in levels predating the change and the cores give no sign of any transformation of flaking techniques. The presence of backed blades and tula adze slugs at Kwerlpe in levels dated to 2700-3600 also shows that the explanation for the change should not be looked for in the arrival of the novel artefacts that are the hallmark of the small-tool tradition.

If one takes into account that these sites, excluding perhaps the James range NW rockshelter, were the focus of recent Aboriginal occupation of the James range the nature and extent of the changes suggests that the regional population was either smaller before 850-1700 yrs BP or that the pattern of landuse was quite different to the ethnohistoric pattern. Explanations for this will be pursued in chapter 10 but the interpretation that I favour is that better regional rainfall after about 1500 yrs BP allowed the population to establish clan estates and permanent occupation away from the Hugh river.