THE MALLEE CLIFFS BURIAL (CENTRAL RIVER MURRAY) AND POPULATION BASED ARCHAEOLOGY

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INTRODUCTION

In this paper I describe the site, the morphology and pathology of a burial from Mallee Cliffs, on the River Murray, which dates to 6600 years BP. Known and described prehistoric materials from the early Holocene (roughly 6000 to 10,000 years ago) are becoming increasingly common over a large area of western New South Wales. Human skeletal remains and the archaeology of the graves form a significant fraction of that archaeological information. However, it is important to note that archaeological investigation is limited in this particular stretch of river. Cemeteries with large numbers of skeletal remains occur at Robinvale, 175 to 225 km upriver from Mallee Cliffs, at Snaggy Bend 120 km downriver and at Lake Victoria, a further 50 to 120 km. For the roughly 300 km between, there is little to represent prehistoric populations materially or biologically, and archaeological investigations are few (Lance 1986; Bennett and Ellender 1987).

A preliminary analysis demonstrates that regional variation is as important as change through time in organising morphological variation. As more information becomes available, we can move from an individual oriented, non-geographic approach centering on change through time, to a population oriented regional approach emphasising diversity in an area. This is important for the prehistory of the region because of the demonstrated diversity along the River Murray (Pardoe 1984), especially in this area of complex patterns of inter-relationships between groups of the Murray, Darling and Willandra watercourses.

In September 1986, Dan Witter, the regional archaeologist for National Parks and Wildlife Service, NSW, was notified of a burial eroding on the cliffed margin of the River Murray. Apparently, the skull had been taken by a 'pot-hunter' and there was speculation that grave goods were still in the grave. Two nearby Aboriginal communities (Dareton and Mildura) were concerned that the burial be investigated, particularly with respect to the vandalism and the management of the site.

Dan called me since I had an ongoing research project on burial archaeology of the Darling River and knew members of the Dareton community. We considered it important to examine this burial for a number of reasons. It was an important site because of the possibility that the burial would be *in situ*, a rare occurrence in salvage archaeology, and because there was talk that grave goods reminiscent of Nitchie (Macintosh 1971) or Roonka (Pretty 1977) were visible. It was an important event because there was Aboriginal interest in the site and we were able to respond to their requests for study, which happened to correspond with our own research interests.

SITE DESCRIPTION

The site is located on the cliffed margin of the River Murray, in Mallee Cliffs State Forest (142° 25' long.; 34° 25' lat.; Fig. 1). It is on the edge of the rolling sand plain about 10 m. above the very narrow floodplain and about 500 m from the present river channel. This cliff edge has been extensively eroded over the last 150 years. Not only has the ground surface dropped, but numerous erosion gullies have cut into the ground as far back as 100 m from the edge and 2-3 m deep. This particular gully is much smaller and shallower. Numerous burials are evident along the cliff margin.

The soil profile is typical of this area, with a friable, light brown sandy sediment in the upper 20 cm. Flecks of carbonate are visible throughout. The lower layer is about one metre deep and consists of carbonate streaked sandy clay, light brown in colour and slightly mottled. Beneath this is the heavy carbonate zone with calcareous root casts.

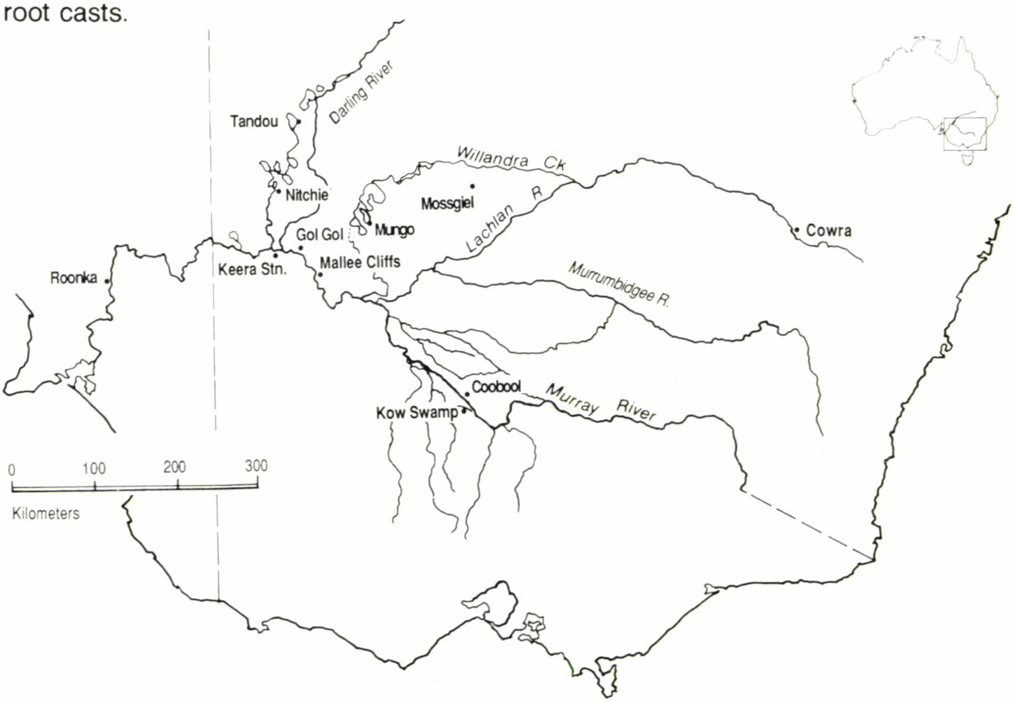

Figure 1. Map of the Murray - Darling basin with sites referred to in the text

The surface surrounding the gully has degraded to a lag deposit scattered with shell and human bone fragments, debitage and burned calcrete. This surface has no stratigraphic connection with the bones in the gully.

The excavation took place in the upper end of the gully and revealed no part of the grave *in situ*. The bones were broken, jumbled and worn. Three individuals are represented on the basis of femoral shafts and teeth. The bones were intermixed. The reconstruction of individuals was quite straight-forward. Preservation, ground wear, carbonate encrustation, mineralisation, size, tooth wear were all used as criteria. Colour was not.

It became obvious that three burials had been cut into by the gully. The lowest, least disturbed and the one last eroded out was Mallee Cliffs I (MC I). MC II and III must have been higher and could have come from an area of about 100 m^2. They may have been from above the present soil surface, since there was no trace of grave or bone in the gully walls. MC III was either only partially cut by the gully, or had almost completely disappeared down the slope. No bones were visible at the bottom of the slope, in the wash area.

The disturbed soil from the gully was sieved in a 0.5 cm screen. Many small fragments of bone were recovered and formed the basis of reconstruction of the post cranial skeleton of Mallee Cliffs I. Some fragments evidently come from the other two skeletons, but apart from the femoral midshafts, almost no reconstruction was possible. Other material recovered included a small number of mussel and gastropod shells, one lump of baked clay and some charcoal fragments.

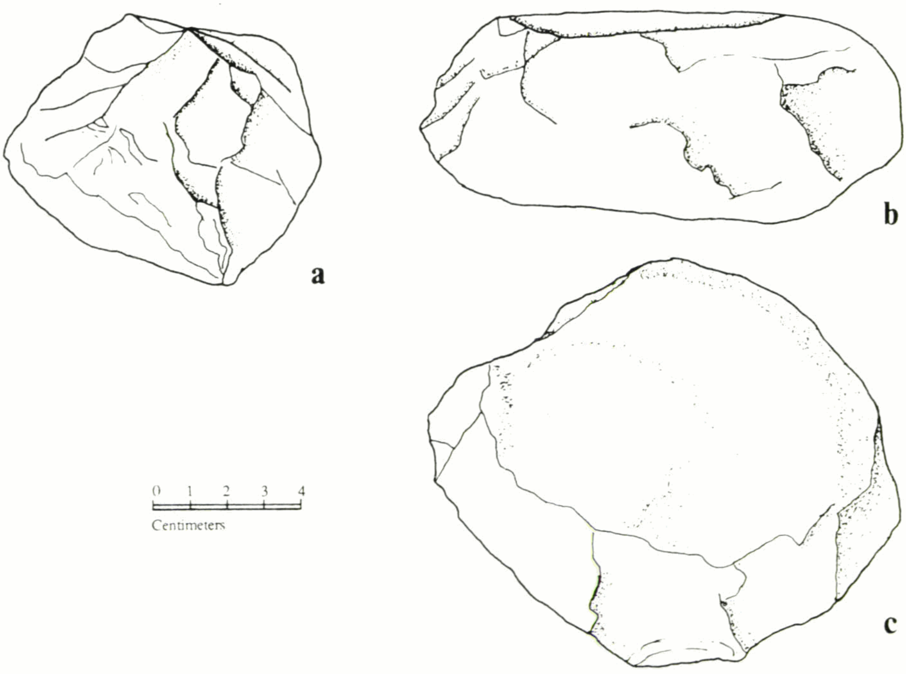

Figure 2. The two stone tools found in the disturbed gully deposit. Silcrete core (a); side view of flaked and ground cobble (b); three quarter top view of same (c).

Two artefacts were found, a large silcrete core and a round, flat flaked cobble with a shallow depression ground into the surface (Fig. 2). Almost no debitage was recovered, even though some is evident along the cliff top on the lag surface.

The core is a yellowish white, coarse grained silcrete measuring about 90 mm in length and 50 mm thick. Cortex covers the base and part of one side. The flake scars are large and there are numerous small, step terminated scars on one platform.

The ground cobble has been roughly flaked on three quarters of the circumference to give the rounded shape. The ground hollow measures roughly 10 cm in diameter and deepens to a maximum of about 5 mm. A purple/reddish discolouration on parts looks more like ochre than manganese staining, although this was not tested, nor were samples taken.

Whether or not these were grave goods is unknown. While the disturbed condition of the site precludes a definite answer, stone tools are generally rare along the floodplain of the River Murray, where all stone must be carried in.

CHRONOLOGY

With permission from members of the Dareton Aboriginal community, a sample of bone was submitted to the Radiocarbon Laboratory at the Australian National University. A date of 6610 ± 190 BP (ANU-5787) was returned on the apatite fraction. The collagen fraction was significantly different at 2430 ± 260 BP. John Head (of the Radiocarbon Laboratory) suggested that contamination of the collagen fraction is responsible for the disparity in dates and that the apatite date be accepted as a minimum age for this individual. The soil conditions and state of bone preservation support his interpretation. The soil is sandy, with quick water percolation and a highly variable water table. Being on the edge of the cliff, the bone would be affected by water percolating down after rain, up in dry, hot conditions as well as by flood waters. The bone, as mentioned above, is irregularly weathered, consistent with water percolation and plant root damage.

The date of 6610 BP is for MC I only. MC III is a single fragment, while MC II is not as extensively mineralised or carbonated. On this evidence MC I may have been buried deeper or earlier or both.

It is premature to start looking for patterns based on only a few dates. However, morphological comparisons cover a large area and time span and it might be worthwhile commenting on the dates associated with these. In Table 1 are dates for a number of burials. The Kow Swamp - Coobool Creek complex covers a span of about 3500 years at the Pleistocene - Holocene boundary. These are cemetery burials and include both males and females. Later cemeteries on the River Murray also include males and females in approximately equal numbers (Pardoe 1988b). All the later burials are, with the exception of Roonka, individual burials. They do not come from cemeteries. Clustering in a span of barely a thousand years are four male burials. This may well be a random result considering the small number of dated individuals, however considering the even distribution in cemeteries and the fact that the dates for females are 4400 and 750 years BP, it is worth keeping in mind. Was it a cultural manifestation to bury males between 6000 and 7000 years ago? Was it also an environmental event of favourable preservation comparable to the one at about 13,000 years? There is certainly some evidence to suggest this may be the case. A phase of increased aridity begins at about this time (Bowler *et al.* 1976; Ross 1981).

Individual	**date**	**sex**	**source**
Mungo III	?28,000	male	Bowler and Thorne 1976
Mungo I	24,700	female	Bowler et al. 1972
Tandou	?15,000	male	Freedman and Lofgren 1983
Kow Swamp 5	13,000	male	Thorne 1975
Coobool Creek 65	12,500	male	Brown 1987
Kow Swamp 9	9,590	male	Thorne 1975
Roonka 89	6,910	male	Pretty 1977:297
Nitchie	6,820	male	Macintosh 1971
Mallee Cliffs I	6,610	male	this study
Mossgiel	6,010	male	Macintosh 1967
Keera Station no. 2	5,900	?	Blackwood and Simpson 1973:105
Keera Station 29	5,840	?	" " "
Keera Station 28	5,350	?	" " "
Keera Station 11	4,400	female	" " "
Keera Station 10	4,170	?	" " "
Keera Station 69	750	female	" " "

Table 1. Dated burials of the River Murray and lower Darling.

MORPHOLOGICAL DESCRIPTION: MALLEE CLIFFS I

This is the most complete individual. The skull, arms and legs are all represented. The long bones are only midshaft sections. The cranium is mostly present, but missing the basal and lower facial regions (see Fig. 3). Hand and foot bones are mostly missing, although two metatarsals are present and complete. Only a few vertebral and rib fragments survive.

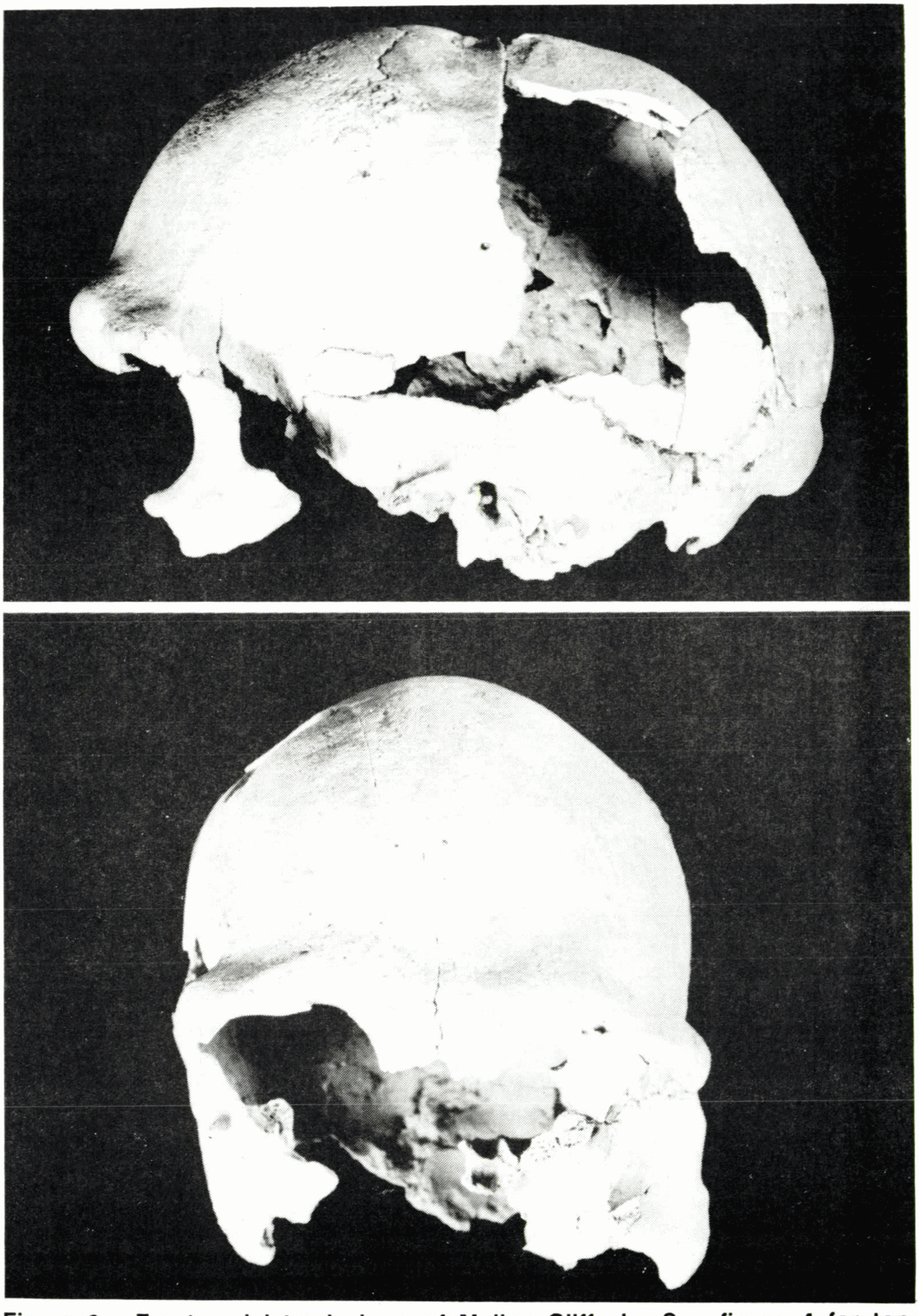

Figure 3. Front and lateral views of Mallee Cliffs I. See figure 4 for top view. The depression fracture is visible at vertex.

Measurements follow the University of Toronto database (Melbye 1971) with additions relevant to Australian research (notably Thorne 1975, Brown 1982, and Freedman 1985). Given the usual conditions of bone in western NSW, where midshaft fragments are most common, I have concentrated to some extent on definable midshaft diameters and circumferences. I prefer minima and maxima, rather than anterior-posterior and medial-lateral standards, as the former are mechanically more meaningful in some ways and are more objectively measured with incomplete bones.

The fused cranial sutures and the wear of the teeth suggest an age between 40 and 50 years (Table 2). On the basis of size, it is clear that MC I is male. The overall size of the the cranium is well above male averages and beyond female ranges. The data for the femur also show that this man was fairly large.

Measurement	**M-C I**	**Gol Gol**
midfrontal squama at midline	9	
frontal at bregma*	10.5	
right parietal at vertex	8	
occipital near lambda*	10	7.3
external occipital protuberance	16	

Table 2. Cranial thickness data for Mallee Cliffs I and Gol Gol (individual I, Bennett and Ellender 1987).
*** measured 5mm from anatomical landmark**

Cranial size of MC I is comparable to all of the other individuals listed in Table 3 except for breadths; the former is much narrower. Post depositional warping is common in burials in sandy ground, but is probably not a factor here for two reasons. The skull was broken soon after interment; early enough to allow carbonate deposition on the broken edges. These were breaks from ground pressure and plant root damage, not from cultural factors. Breakage soon after interment would obviate the ground pressures responsible for warpage. Second, the frontal bone is not flattened from side to side. The frontal widths are proportional to the maximum, bi-auriculare and bi-asterionic breadths. However, two of these are flagged as estimates in Table 3. While the cranium is narrower, it is about as long as, and of similar shape to Nitchie and Coobool Creek. For the latter, length of the frontal is greater and the parietal is shorter, with greater curvature. The similarities of Mallee Cliffs I to Coobool Creek are greatest on the posterior and superior vault.

Fourteen mandibular and 15 maxillary teeth are identifiable, most of these to their correct side. Only a few teeth were still in bony sockets. Measurements are only possible for bucco-lingual diameters (Table 4) except for combined first and second molar lengths. These are 20.3 mm for upper left and 22.1 mm for lower right. Corpus thickness of the mandible at the right M2 is 15 mm. Morphology is typical of Aboriginal dentition. The teeth are large with extreme occlusal wear obliterating most surface morphology. Lower M2 and M3 are clearly *+4* cusp patterns while the upper left M2 is a *Y4*. Carabelli's cusp is not evident on any molars. Tooth roots are large and in the case of multiple roots, well spaced.

Code	Measurement	Mallee	Nitchie	Tandou	Mossgiel	Coobool
XCB	maximum bi-parietal breadth[3]	(121)[1]	146	(140)	(138)	138.1
GOL	glabella - opisthocranion length[3]	197	197	(202)	201	196.4
GLL	glabella - lambda	192	190			192.8
AUB	bi-auriculare breadth	(102)	132		136	126.8
ASB	bi-asterionic breadth	104	120		112	110.8
GBL	glabella - bregma	112	119			117.7
FRC	nasion - bregma chord[3]	115	122	(122)	120	121.0
FRS	nasion - bregma subtense[3]	23	30	(28)	21	23.2
FRF	nasion - bregma fraction	55	54			53.7
FRK	nasion - bregma arc[3]	134	140	(135)	133	135.8
PAC	bregma - lambda chord[3]	122	122	113	118	121.5
PAS	bregma - lambda subtense[3]	23	23	23	25	25.3
PAF	bregma - lambda fraction	63	63			61.9
PAK	bregma - lambda arc[3]	134	134	124	131	135.6
XSB	maximum supraorbital breadth	110	122	(120)	120	115.9
WFB	minimum postorbital breadth[3]	91	106			99.1
	lambda - inion[3]	67	57	(69)	54	68.5
	lambda - asterion	87	80		86	87.7
	auriculare - bregma	127	137			132.3
	auriculare - glabella	121	128			121.0
	auriculare - nasion	115	124			114.6
	auriculare - lambda	118	120			126.1
	auriculare - inion	104	113			100.1
	auriculare - asterion	52	54			55.0
EKB	ectoconchion breadth	(106)[2]	111			108.6
ZMB	bi-zygomaxillary chord	104	102			102.0

Table 3. Cranial measurements of the Mallee Cliffs cranium and comparative individuals and samples: Nitchie (Macintosh 1971 and D. Donlon pers. comm.); Tandou (Freedman and Lofgren 1983); Mossgiel (Freedman 1985); Coobool Creek, average male values (Brown 1981, 1982).

[1] estimates in brackets.
[2] (left side to midline x 2).
[3] variables used in the Principal Components analysis.

	Mallee Cliffs I				Gol Gol	
	upper		lower		lower	
	left	right	left	right	left	right
Canine			8.3			6.8
1st premolar			9.0			
2nd premolar			9.1			8.6
1st molar	12.4			11.4	11.6	12.1
2nd molar	13.0		11.1	10.9	11.1	11.2
3rd molar	11.6	12.1	11.0	10.7	10.3	10.7

Table 4. Bucco-lingual breadths for Mallee Cliffs I and Gol Gol (individual I, Bennett and Ellender 1987 and personal observation).

code	measurement	Mallee Cliffs I left	Mallee Cliffs I right	Gol Gol left
humerus				
HMD	maximum diameter midshaft	19	21	23
HWD	minimum diameter midshaft	14	16	17
	circumference at midshaft	55	63	66
radius				
	least distal circumference		42	
	minimum distal diameter		12	
	maximum distal diameter		13	
	circumference [1]		40	
	minimum diameter[1]		11	
	maximum diameter[1]		13	
ulna				
	least diaphyseal circumference[2]		45	36
	minimum diameter		12	
	maximum diameter		14	

Table 5. Arm measurements for Mallee Cliffs I and Gol Gol (individual I, Bennett and Ellender 1987) .

[1] measured between the radial tuberosity & the inter-osseous crest.

[2] measured about 1/3 up from the distal end. The diameters are also measured at this point.

Occlusal surfaces are worn flat and most of the surface enamel is gone. The stages of dental attrition as devised by Melbye (1983) indicate older middle age, but in the Australian context his scheme may overestimate age. Interproximal wear is noticeable and most teeth have facets. Of the tooth and bone present in the jaws, there is no indication of any pathology.

Measurements for the appendicular skeleton are presented in Tables 5, 6 and 7. Most of these are of MC I, with only femoral data for the other two individuals. As mentioned previously (Pardoe and Webb 1986) archaeological investigation of burials in western NSW must deal with mostly fragmentary remains. In this burial as at Cowra, metatarsals tend to survive complete and may be worthwhile measuring as indicators of sex and general size. No non-metric observations were made on the post cranial remains, given the preservation.

A pathological description is hindered by the bone preservation, but is rather interesting none the less. The condition of the external bone surface is variable, but some areas are worn, obliterating any surface detail. It was not possible to x-ray the long bones for Harris, or growth arrest lines, as the ends of the bones were missing.

		MC I		**MC II**		**MC III**	**Gol**	**Gol**
code	**measurement**	**lt**	**rt**	**lt**	**rt**	**rt**	**lt**	**rt**
femur								
FSM	midshaft a-p[1] diam.	33	34	25	25	28	26	25
STM	midshaft m-l[2] diam.	24	24	26	25	27	29	29
	midshaft maximum diam.	33	34		25			
	midshaft minimum diam.	24	24		25			
	midshaft circumference	94	95	82	80	88	83	83
tibia								
TWC	nutrient foramen m-l diam.	22	23				22	
TXC	nutrient foramen a-p diam.	37	35				32	
TWM	midshaft m-l diam.	20	21				21	22
TXM	midshaft a-p diam.	30	32				27	30
	least circum. min. diam.	21	22				20	21
	least circum. max. diam.	25	26				26	22
	nutrient foramen circum.	96	94				89	
	midshaft circumference	86	85				81	82
	shaft least circ. [dist.1/3]	75	76				72	68

Table 6. Leg measurements of the Mallee Cliffs individuals and Gol Gol (individual I, Bennett and Ellender 1987 and personal observation).

1 anterior-posterior diameter.
2 medio-lateral diameter

Measurement	Metatarsal I	Metatarsal IV
maximum length	(59)	
physiological length	59	
midshaft diameters:		
superior - inferior	12	10
medio - lateral	14	7

Table 7. Measurements of right metatarsals of Mallee Cliffs I.

From the available material, there appears to be only one pathological lesion. There are no healed fractures to the long bones nor any infection. The exception is a healed depression fracture of the parietals (Fig. 4). The dent is oblong and crosses the midline. It is approximately 3 mm deep and 18 cm by 43 cm in extent. There is a region of secondary infection surrounding the depression, which measures about 20 mm across at midline and 74 mm long. Not surprisingly a blow of this force lacerated the scalp, leaving the way open to superficial infection. Luckily, the blow was not powerful enough to rupture the inner table of the skull, where the major drainage vein of the brain, the *superior sagittal sinus* lies against the bone and leaves its imprint. A more powerful strike would have been lethal. As it was, the wound eventually healed, with the infected bone showing signs of healing and remodelling.

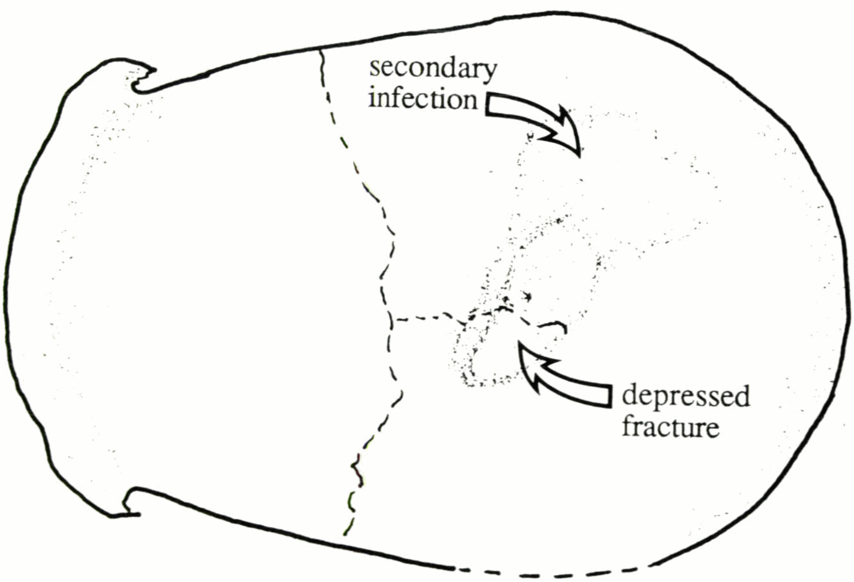

Figure 4. Diagram of the depression fracture of Mallee Cliffs I. The healed central portion is roughened and well defined. The area of secondary infection is less well defined.

The direction and shape of the fracture is very suggestive of a blow received from face to face combat: the direction of a nulla-nulla wielded by a right-handed opponent. Naturally, this is just speculation, fuelled by a desire to clothe the past in flesh and blood. It is just as easy to suggest that a left-handed woman crept up behind him and struck him unawares, or that it was self inflicted. However, the evidence from historic records of warfare makes the first suggestion at least tenable. Cranial depression fractures are found in 12% of males from Robinvale and 26% from Lake Victoria regions (Webb 1984). These figures are among the highest for males throughout Australia. Women are typically afflicted more than men and Webb records comparable female values of 20% and 28% respectively.

MORPHOLOGICAL DESCRIPTION: MALLEE CLIFFS II & III

Individual II is represented only by teeth and femoral midshafts. I assigned the long bones to the teeth on the basis of preservation and to a certain degree, size. The lone fragment of MC III may belong to these teeth, but I found that doubtful, again on the grounds of preservation. Strictly speaking, these data should not be used individually, but in population estimates. This is because there is no definite association between these teeth and femora as there is for Mallee Cliffs I. In any event, the only data presented for these two individuals are the femoral measurements (Table 6).

Ten mandibular and 12 maxillary teeth are identifiable for this person, but only a small number to correct side and position. These are all four of M1 and M2, upper left I2, C, P1, upper right C, P1, lower right I2, C. The rest are assigned to this individual on levels of attrition and the state of preservation. They are generally friable and chalky, with much of the unworn enamel broken off.

The teeth of MC II appear to be larger overall than for MC I. They have extreme wear typified by stubs of anterior teeth (incisors and canines) and the first molars are reduced to functional roots. The second molars are worn down to the pulp chamber with no enamel on the grinding surface. The upper molars have three roots each and these are highly divergent. There does not appear to be any pathology visible, such as caries or breaks. However, without any bony tissue surrounding the teeth it is not possible to assess the state of dental health.

Mallee Cliffs II is older than MC I and is also male, as judged by tooth wear and by size. The third individual is adult and probably male on the basis of femoral size, but this is a supposition based on the most minimal data.

REGIONAL VARIATION: POPULATIONS vs THE INDIVIDUAL

To highlight the regional nature of variation, and specifically without ignoring the evident changes that occurred over a 7000 year period, I have performed a principal components analysis. This preliminary study does not engage questions of robusticity and size reduction by examining dated skeletal remains from a wide area, but rather emphasises the nature of regional similarity.

Principal components were calculated from 10 craniometric variables chosen only in reference to the Mallee Cliffs skeleton. Principal components might be seen as new variables derived from common or shared variation in all the other variables. For instance, from two variables such as minimum and maximum diameter of the thigh bone, a principal component would account for 'size': in bigger bones, both measurements would be bigger. The raw data were standardised by variable, to give equal weighting to each; and by individual, to negate absolute size effects. Many of the important facial and vault breadth measures identified by Brown (1987) are not used.

Figure 5 is a plot of the first two principal components which account for 42.5% and 25.7% of the total variation. The first three principal components combined account for 90.1% of the total variation. The plot has been rotated to make comparison with the map (Fig. 1) easier.

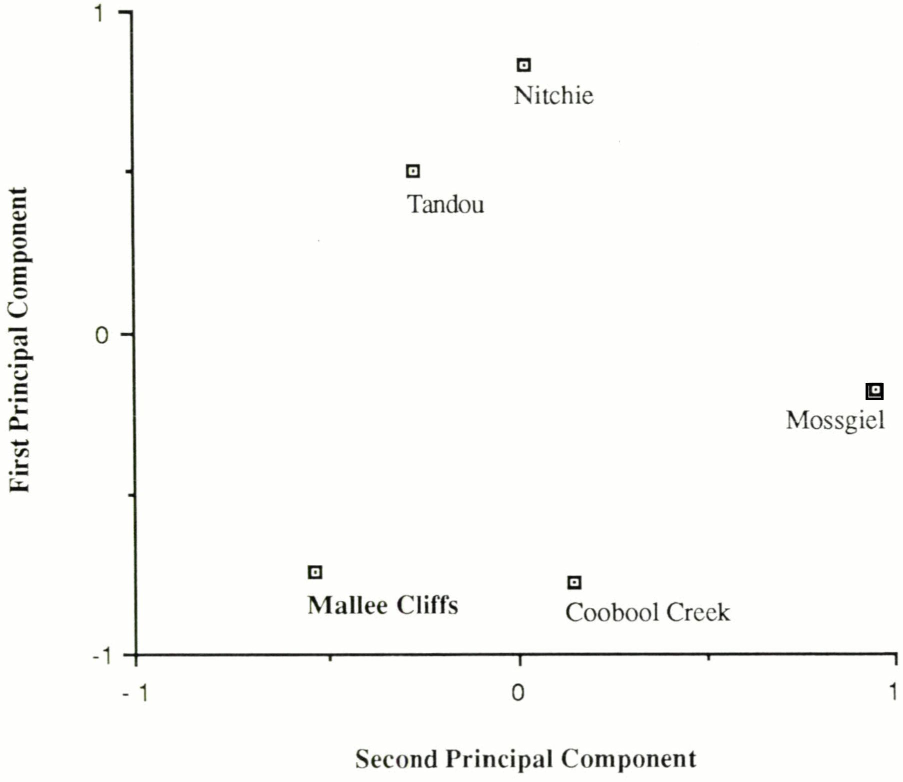

Figure 5. Principal components analysis of craniometric measures for individuals between 6000 and 12,500 years. Coobool Creek is based on male sample averages. The measurements have been standardised by variable and by case. The plot has been rotated to emphasise the regional or geographic nature of variation. Compare the placement of these to the map in figure 1.

Rather than ask questions about systematic temporal change, or slot this individual into a robust or gracile group, this analysis places the Mallee Cliffs man in a context of biological relations that demonstrates why a regional perspective is needed (Pardoe 1988a:7). In the report for the Dareton Aboriginal community I posed the question of group affiliation of the Mallee Cliffs man. Is he more similar to Darling or other Murray peoples? Is he typical of Central Murray, Murray - Darling Junction or other peoples? Does he fit into some of the proposed regional patterns of this area (Pardoe 1984)? From the results of the principal components analysis, it looks as if there is a consistent unifying similarity that underlies extensive change through time. Not only does the plot separate these individuals along geographic lines, separating the three river systems of the Murray, Darling and Willandra; it also groups them as population samples.

This regional variation crosscuts change through time on a level that is interpretable archaeologically. This might be defined as the local population level; groups that were culturally and biologically distinct from their neighbours.

A change in perspective from individual to population is imminent. Information is constantly accumulating, from which it is possible to jump from the study of temporal variation in individuals (for instance, Habgood 1986; Brown 1987) to a study of regional variation (including chronological change) using populations. We can no longer talk about chronological change independently of regional or geographic variation. We must examine change through time in a context of an individual's population affiliation. The population perspective is the only valid avenue in our understanding of prehistory. This is not meant to be an attack on previous work, for populations are made up of individuals, but rather an assessment that the state of scientific endeavour is close to a significant shift in perspective in the near future: from the individual to the population; and from the continental (Thorne and Wolpoff 1981, for instance) to the regional.

I have previously discussed spatial and chronological population variation in the Upper Murray (Pardoe 1984) based on cranial non-metric trait percentages and that method described separate time and space components of variation. The description of an individual such as the Mallee Cliffs man can only be an addition to current information, not an analysis of current understanding of variation.

PREHISTORIC SOCIETY

The region of the River Murray between Lake Victoria and Lake Benanee at Robinvale is becoming more heavily settled with each passing year. It should come as no surprise that Aboriginal occupation is and was also dense. The pattern of occupation is only slowly becoming known, as we piece together the time span, economy and biology of these prehistoric populations. The Mallee Cliffs man is an important link in building this picture. There are tantalising hints in the historical literature of groups moving between the Darling River and Lake Benanee (Sturt 1833). There is the persuasive evidence of biology, history and linguistics, which points to small, densely packed groups characterising river life.

The changes from the Pleistocene - Holocene boundary to 6600 years ago give rise to great changes in morphology such as dental and general size reduction. These changes are also part of the extreme diversification along the River Murray increasingly evident through to the later Holocene (Pardoe 1984). The difference between Mallee Cliffs man and the Kow Swamp and Coobool Creek samples is as little as 3000 years (or as much as 7000 years) but the former would be called 'essentially modern' in morphology, following Brown (1987). Even so, these changes have not swamped the regional similarities that characterise people of the River Murray.

These changes do not come about purely as a result of selective response to environmental variation (Brown 1987), but as the continuing process set up on the River Murray whereby change is enhanced by a particular combination of environmental, social organisation and gene flow patterns. Large, dense populations packed along a linear strip of productive land set up the potential for diversification which is both fast and extreme. One suggested pattern of social organisation for the River Murray is another avenue for extreme diversification (Pardoe 1988a). The social organisation of these groups involves corporate lineages organised unilineally who maintained rights to land that were exclusive rather than inclusive. In other words, relations and land tenure were restricted and incorporated in a group. Relations with other groups, mainly neighbours on either side along the River, were probably predicated on boundary maintenance, warfare and alliance.

The cranial depression fracture may be a tenuous indicator that cultures based on restricted resources, with competitive exclusivity and boundary maintenance based on warfare existed nearly 7,000 years ago on this stretch of the river. I have already suggested that the social organisation noted for the River Murray was probably in place by this time on the Central and Lower Murray (Pardoe 1988a). This single manifestation is perhaps more than speculation when placed in a population perspective: the frequency of warfare or violence related skeletal injuries is greater around Lake Victoria (Rufus River) than for almost any other region of Australia (Webb 1984).

BURIAL

Elsewhere (Pardoe 1988a, b), I distinguished between cemeteries along the River Murray and individual burials. I believe that the many skeletons that line the cliff here are not arranged in a cemetery. I have not systematically surveyed the immediate area, nor tested this idea by excavation. However the reasons for believing this to be a number of random inhumations are based on density and contiguity. No doubt there are vast numbers of burials all along this strip of land. It is a landmark of high relief in an otherwise gently flat land and it seems reasonable that people might wish to be buried overlooking their lifesource.

The burials are bounded in a sense and this causes me some trouble in making a distinction between cemeteries as cultural entities and random interments. The density of burials quickly decreases as we move away from the cliff edge. In the open citrus plantations up to a kilometre away, there are fewer skeletal remains. Thus, it could be that a long strip of cliff edge along the river, only a few metres wide, might be thought of as a cemetery. Is it possible that my own engrained ideas of 'cemetery-ness' cause me to reject a one-dimensional graveyard?

However, the overall density of burials is low. In the immediate area there is about one burial every (linear) 15 m to 20 m. Furthermore, the burials are not contiguous. Judging by the preservation of the three individuals which are very close together, they are not contemporaneous and may cover a large time span. The others do not show a clustering, but a random placement along the ridge. In total, it seems likely that this area and landmark is not a cemetery.

Information on the chronological distribution of burials is slowly accumulating. There is no doubt that cultural patterns of burial (age and sex biases) occur, especially when considered in concert with cemeteries. This bias shows up provisionally as the burial of older males on their own over a one thousand year period between 6000 and 7000 years. It may well be that environmental circumstances are responsible for preservation in this time period. Clearly such biases must be taken into account for future discussions of robusticity and migration theories. In other words, these individuals may not represent the more complete picture of population variation that we have for other groups. It has never been sufficient for unified theories of prehistory to consider only biological or only cultural information in constructions of the past.

In October, 1987 I returned the bones to the Dareton community along with a report written for them. The report outlined how I looked at the bones, where the burial came from, who the person was and roughly how old. The blow to the head and a comparison of pictures of other known burials was included.

As agreed, the bones were returned to nearly the same spot and reburied. At the present moment return of bones is a necessary part of research. We can demonstrate our interest and good intentions only with open negotiations and good faith in returning the information in an appropriate manner. It is no good saying that we need to hoard skeletons if we never get the results of our studies back to the communities. Perhaps in the future we will be able to demonstrate the scientific value of prehistoric skeletons, not to ourselves (in 'scientific assessments' of collections), but to the other people most interested in skeletal studies: Aboriginal people who can claim descent from those prehistoric remains.

ACKNOWLEDGEMENTS

I would like to redress an omission made in the community report, where I neglected to note the substantial help of NPWS, both in money and the excavation. Dan Witter and Badger Bates (Western Region) were both involved in the discussion with the community, the excavation and the reburial of the remains. Further discussions with Dan were invaluable. Denise Donlon took the time and trouble to provide me with some extra measurements of Nitchie and I am grateful for these. Betsy-Jane Osborne drew the base map for Figure 1.

Funding for this study came from the Australian Institute of Aboriginal Studies and National Parks and Wildlife Service (NSW).

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