DIETARY STRESS OR CULTURAL PRACTICE: FRAGMENTED BONES AT THE PUNTUTJARPA AND SERPENT’S GLEN ROCKSHELTERS

Pamela A. Smith
Department of Archaeology, Flinders University, Adelaide, SA 5001, Australia

The debate concerning the adequacy of the diet of Aboriginal people in the Western Desert of Australia has been contradictory, with some evidence for both an adequate diet and nutritional stress (Gould 1980, 1984, 1996; Veth 1993; O’Connor et al. 1998; Cane 1984; Smith and Smith 1999). The archaeological evidence is, however, limited in its ability to provide information about the full range of the traditional diet in this region; as, according to recent evidence, it was largely vegetarian leaving few bones and only occasional seeds and grinding tools in the archaeological record (Gould 1980, 1986; Veth 1993; Cane 1989; O’Connor et al. 1998). The range of foods obtained was also subject to seasonal variation and the remnants recorded in rock-shelters represent only the very limited wet season diet and were vulnerable to disturbance by predators (Schrire 1972; Walsh 2000).

Gould (1996) presented an analysis of the highly fragmented and partly burnt faunal assemblages excavated at the Puntutjarpa rockshelter and the Intitjikula rockshelter. Of several possible explanations to account for the extreme fragmentation, he concluded that the most likely explanation was human behaviour, that is, the bones had been deliberately smashed in order to extract the bone marrow which he also interpreted as being evidence of a nutritionally stressed population. O’Connor et al. (1998) reached the same conclusion in the analysis of bone assemblages excavated at the Serpent’s Glen rockshelter, also in the Western Desert. The highly fragmented and partly burnt bones were attributed to human behaviour and interpreted as an indication of resource stress.

Both the Puntutjarpa Rockshelter and Serpent’s Glen Rockshelter are in the Western Desert, although separated by several hundred kilometres. The Western Desert (comprising the Great Sandy, Victoria and Tanami Deserts) has been described as an example of an extreme world environment exploited by traditional hunter-gatherer groups (Eaton and Konner 1983; Cane 1984) and is subject to prolonged drought conditions. Whilst it is likely that dietary stress may have occurred in periods of extreme drought, there is barely sufficient evidence available from the archaeological record to attribute the formation processes to human behaviour or to interpret that behaviour as evidence of dietary stress (Walsh 2000).

There is however, evidence demonstrating that the diet of traditional hunting and gathering groups was adequate in both the Holocene and in the recent past. Archaeological evidence relevant to intensification of site use during the Holocene supports arguments for population increase and by implication, a nutritionally adequate diet (Veth 1993; O’Connor et al. 1998). It is also clear from Peile’s (1997) account of the complex Gugadja knowledge of health and well-being that they had a very sophisticated understanding of the importance of a nutritionally balanced diet in the maintenance of good health in the recent past. Elphinstone (1971) carried out medical examinations on 111 Australian Aborigines living in the Western Desert near Warburton and near to the Puntutjarpa Rockshelter in 1958 and 1967. His medical reports are among the few which recorded the nutritional status of people living a traditional lifestyle in this region and he confirmed that the people whose health he reported had had no previous contact with Europeans. Nutrition in the desert environment was seen as generally adequate and, apart from two suspected cases of scurvy, no dietary deficiencies were encountered. It was observed however, that nutritional status at the time of examination depended on recency of rainfall. Further evidence that the diet was adequate most of the time was also reported by Smith and Smith (1999) in an analysis of the nutritional composition of the traditional diet recorded by Gould (1980, 1986).

New evidence has now revealed that bone smashing behaviour was also an outcome of culturally determined behaviour which may or may not be linked to nutritional stress. Senior Aboriginal people who had lived a traditional lifestyle in the Western Desert until the 1930s were interviewed as part of a study of the transition from traditional diet to the station diet in the South Kimberley and their food stories were recorded including evidence for this alternative explanation for bone smashing behaviour. Reference was made on two separate occasions to bone being crushed in order to empower the hunters. It was reported that the bones of large animals, preferably kangaroos, were crushed and eaten by men. It was believed that by eating the bones of strong powerful animals their spirit would enter the hunter and make him strong and powerful.

Evidence supporting bone smashing as an empowering ritual behaviour is again found in the observations of Elphinstone (1971). He reported that the stools he observed during his visit to the Western Desert contained substantial amounts of fragmented bone (Elphinstone 1971: 296). This would only have been possible if the bones were smashed and eaten, rather than being smashed to extract the bone marrow. Gould’s own observations also support the argument linking bone smashing to cultural beliefs. Gould (1996:84) reported that a reason given for smashing bones was “feeling sorry” for the old people whose teeth were poor. He described two waves of bone reduction, breaking the bone and the extraction of the marrow; after the bone marrow was extracted the bones are described as being further reduced to very small fragments. The fate of these fragments fell into two categories: they were scattered around the household camps or they were swallowed (Gould 1996:84). He also observed that even when optimal conditions prevailed, people continued to reduce bones and teeth with no nutritional value (Gould 1996:84).

The above examples from the recent past clearly link bone reduction to sets of cultural beliefs and offer an alternative explanation to nutritional stress. The evidence therefore suggests that people were either smashing the bones for cultural reasons rather than nutritional stress, or that both cultural and nutritional reasons existed simultaneously. Although both explanations are speculative, this example illustrates the difficulty of attributing meaning to specific human activities when accounting for cultural formation processes.

References
Evidence for early focussed marine resource exploitation from an open coastal site in central Queensland

Sean Ulm
Aboriginal and Torres Strait Islander Studies Unit, University of Queensland, Brisbane, QLD 4072, Australia

Recent excavation of a shell mound on Seven Mile Creek, just south of Gladstone, Central Queensland, has revealed a dense midden deposit dated to 3700 cal BP (Wk-8327). This result provides some of the earliest evidence of highly focussed marine resource exploitation from an open archaeological site on the Queensland coast.

The Seven Mile Creek Mound (KE:A09) sits on a low residual beach ridge fringing Seven Mile Creek, a tributary of Rodds Harbour (Neal 1986). The site is a discrete mound with dimensions of 20 m x 10 m x 0.8 m. Its estimated volume is 43.91 m$^3$ based on a digital terrain model.

A single 1 m$^2$ pit divided into four 50 cm x 50 cm squares (A-D) was excavated into the highest part of the mound. The work revealed an 85 cm-thick single unit of dense shell resting on well-rounded beach sands containing occasional pieces of shell. A total of 1631 kg of sediment was excavated. Preliminary analysis revealed a deposit dominated by shellfish remains including (in descending order of abundance): rock oyster (Saccostrea commercialis), mud ark (syn. Sydney cockle) (Anadara trapezia), hairy mussel (Trichomya hirsuta), hercules club whelk (Pyrazus ebeninus) and lined nerite (Nerita lineata). Mud crab shell (Scylla serrata), fish bone (including whiting - Sillago sp.) and stone artefacts are present throughout.

Four radiocarbon determinations were obtained for the deposit (Table 1). All dated specimens were articulated mud ark (Anadara trapezia) valves which were plotted in situ during excavation. All samples were subjected to x-ray diffraction (XRD) analysis to confirm the absence of recrystallisation. Conventional radiocarbon ages were calibrated using the CALIB (v4.2) computer program (Stuiver and Reimer 1993). Dates were calibrated using the marine calibration dataset of Stuiver et al. (1998) with a ΔR correction value of $-5 \pm 35$ (Stuiver and Braziunas 1993). The calibrated ages reported in Table 1 span the $2\sigma$ age-range. All four dates are indistinguishable at the 95% confidence level. The dates indicate that the site was first occupied around ca. 3700 cal BP and abandoned shortly after 3450 cal BP. The lower two dates (Wk-8327 and Wk-8328) appear inverted, but overlap at one standard deviation. The dates are thus in sequence overall, suggesting extremely rapid accumulation over a period of less than 300 years.

Coastal sites dating to prior to 3000 BP are not common on the Queensland coast (see Ulm et al. 1995). Although several rockshelters containing evidence for marine resource exploitation in the Whitsunday Islands (Barker 1996) and Princess Charlotte Bay area (Beaton 1985) date to the early- to mid-Holocene, only two open sites on the Queensland coast have evidence of focussed marine resource exploitation predating 3000 BP (see Rowland 1999; Walters et al. 1987).

Results from the Seven Mile Creek Mound support the findings of research suggesting widespread residence on the Queensland coast at the time of local sea-level stabilisation (e.g. Barker 1996). Continuing research will seek to address these issues further through detailed analysis of the excavated assemblage and palaeoenvironmental context.

<table>
<thead>
<tr>
<th>SQ</th>
<th>XU</th>
<th>Depth</th>
<th>Lab. No.</th>
<th>Sample</th>
<th>$\delta^{13}C$ (‰ PDB)</th>
<th>$^{14}C$ Age (yr BP)</th>
<th>Calibrated Age/s (cal yr BP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4</td>
<td>7.14 cm</td>
<td>Wk-832</td>
<td>Anadara trapezia</td>
<td>-0.9 ± 0.2</td>
<td>3540 ± 80</td>
<td>3633(3429)3237</td>
</tr>
<tr>
<td>A</td>
<td>13</td>
<td>40.44 cm</td>
<td>Wk-832</td>
<td>Anadara trapezia</td>
<td>-0.8 ± 0.2</td>
<td>3610 ± 70</td>
<td>3690(3487)3338</td>
</tr>
<tr>
<td>A</td>
<td>20</td>
<td>67.84 cm</td>
<td>Wk-832</td>
<td>Anadara trapezia</td>
<td>-1.2 ± 0.2</td>
<td>3780 ± 60</td>
<td>3893(3700)3548</td>
</tr>
<tr>
<td>A</td>
<td>26</td>
<td>88.24 cm</td>
<td>Wk-832</td>
<td>Anadara trapezia</td>
<td>-0.5 ± 0.2</td>
<td>3750 ± 60</td>
<td>3859(3677)3485</td>
</tr>
</tbody>
</table>

Table 1 Radiocarbon dates from the Seven Mile Creek Mound.