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Archaeology and the Great Barrier Reef

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The Great Barrier Reef and its associated islands form one of Australia's most neglected archaeological provinces. Only now can some of the most obvious parameters be described. Islands which evolved in Holocene times have been incorporated into local coastal Aboriginal economy yet also show evidence of having been visited by Torres Strait peoples. Islands which were inland hills during lower sea level Pleistocene times could have had a near continuous use by Aboriginal Australians since the continent was first colonized by them. Even this early approximation of the area's prehistory suggests complex and varied adaptation to this peculiar habitat. This reconnaissance shows that there are highly varied archaeological remains. Other evidence, some of which comes from living Aborigines, attests to the importance of this complex habitat even to most recent times. The earliest human use of the area is not known, but much can be inferred.

Arguments can be put forward to suggest that the Great Barrier Reef area was occupied as early as any other part of Australia. One argument reasons from the established early dates for man in Australia. Lampert (1975, p. 197) has claimed as much as 40 000–50 000 years ago for the first colonization of Australia. Whatever the foundation date might be, the continent was certainly well colonized by 26 000 a B.P. (Bowler, Thorne & Polach 1972). This date (ANU-375B) comes from about latitude 34° S and since colonization is presumed to have been from south Asia, this date should be considered as an estimate for the widespread occupation of the continent. Other Pleistocene dates for man in the south of the continent come from Koonalda Cave, Devil's Lair, in the southwest, and elsewhere (Jones 1973). Recently, Bowdler (1975, p. 24) has reported on the human occupation of what is now Hunter Island, Tasmania, at about 23 000 a B.P. (ANU-1498).

Closer to the Barrier Reef, human occupation has been described at Kenniff Cave in the area of the Great Dividing Range in southeast central Queensland (Lat. 26° S) at about 19 000 a B.P. (Mulvaney 1975). Rosenfeld has more recently dated sediments overlying engraved rock art at Laura (Lat. 16° S) as being about 13 000 a B.P. (ANU-1441) (personal communication). Also near Laura, Wright (1971) has estimated a terminal Pleistocene date of about 10 000 years for a rockshelter site. C. White and J. P. White respectively have dated pre-22 000 a B.P. edge-ground axes from Arnhem Land (White 1967) and waisted blades from New Guinea (White 1970).

These early dates are not presented to suggest that man was evenly or densely distributed in these times, in fact quite the opposite is the more likely case (Bowdler 1976). The dates do imply that man had at least attempted to establish himself throughout Australia. That he should have somehow overlooked the northeast coast does not seem possible. Moreover, Golson's suggestion (1971) that the northern and coastal plant communities would be more suitable than interior plant communities only enhances the probability of an early occupation of this

coast. We might reasonably even underline this argument if we accept the recent environmental reconstructions which show a significantly drier than present Australia (Nix & Kalma 1972; Kershaw & Nix 1975) in the late Pleistocene.

Human groups would then have occupied an open-forest covered shelf that becomes increasingly closed from 20000 to 8000 a B.P., if the reconstruction suggested by Nix & Kalma is correct (1972, pp. 85–89). Whatever might have been the plant community composition and distribution on the continental shelf, some change due to burning by Aboriginal man could be expected from the general Australian case (Jones 1969) and for northeast Queensland in particular (Kershaw 1975, p. 187).

Jennings (1972, p. 37–37) has reasoned from glacio-eustatic time–depth curves and other data that the low land-bridge between Cape York and New Guinea became a straits between 5000 and 11000 a B.P. If we take 8000 years ago as an estimated date for the submersion of the continental shelf south of the Torres Strait, we are invited to speculate that man has existed as many as 30000 years on the continental shelf before its latest evolution as a reef habitat. One unfortunate consequence of the inundation of the reef platform is that most of, if not all of, the archaeological remains deposited in the early prehistory of the area would now be under water. Some unduly hopeful prehistorians have long awaited the opportunity to explore Pleistocene coastal archaeological sites via underwater archaeology. Moore (1967, p. 422; 1971, p. 9) voiced these hopes for the archaeology of the Torres Strait. But coastal archaeological sites which are usually found on foreshores and deposited on unconsolidated sand dunes, often deflated by winds and eroded by rains, have only the action of surf and tide to look forward to as the sea envelops them. No archaeologist should have *a priori* expectations that the fragile elements that constitute an archaeological deposit could survive this exposure *in situ*. Although the Barrier Reef province may not be as rigorous an intertidal environment as, say, that of the Bass Straits, neither submerged shelf should preserve significant archaeological deposits. Even if my predictions are incorrect and there are significant archaeological deposits preserved in benthic sediments, as they apparently have been elsewhere (Selwyn 1965; Emery & Edwards 1966), present archaeological technology and priorities argue strongly against underwater exploration and excavation. For a picture of man's use of the continental and reef islands of the Great Barrier Reef we must look to Holocene deposits as we now find them.

Two kinds of islands are considered below: reef islands, which are recent formations and continental islands, which were mainland land forms in the Pleistocene but are now separated from their parent land by straits.

Lizard Island: a continental island

Lizard Island was the largest island (*ca.* 6 km²) visited. The island's transverse ridge (elevation 359 m), forming the northwest half of the island, slopes abruptly to the southwest. The southwest half of Lizard island is comparatively flat with occasional rock outcrops and vegetated dunes. Since time was limited, the survey specialized on the central saddle portion of the island and south-facing dunes.

The largest site discovered on Lizard Island is a midden deposit bordering the recent airstrip. The overall site dimensions are roughly 100 m north–south by 75 m east–west. A profile, cut by tractor preparation of the airstrip, showed a deposit of about 50 cm of midden. There is enough ash and decomposed organic matter to give the soils a light brown colour contrasting

with the Recent white sands and the cemented red Pleistocene sands. Faunal remains included a clam-type mollusc, probably *Tapes turgida*, the giant clams, *Tridacna* spp., the oysters, *Saxostrea* and *Crassostrea* and others. No bone or turtle carapace was seen. The absence of bone, the fact that the site sits on a Pleistocene base and the chalky appearance of much of the shell gives one the impression, however speculative, that the site is considerably older than other island sites which are situated close to the littoral zone. Many quartz flakes with obvious edge wear can be seen on the surface. No projectile points were seen. One ground stone artefact, much like that described for north Queensland by Roth (1904, pl. 10, fig. 66), eroded from the bank cut for the airstrip. The dense porphyritic cobble had been battered at one end and fractured. The other end of the cobble had been bifacially polished which resulted in an adze or axe-like ground edge. The tool measured $7.0 \times 5.5 \times 2.5$ cm.

A series of dune sites were found facing the seasonally windward southeast. These sites are almost certainly the same sites seen by the *Endeavour's* Captain, James Cook and naturalist Joseph Banks on 12 August 1770 (Banks 1962, p. 103; cf. Cook 1768–1771, p. 229):

> Distant as this Isle was from the main, the Indians had been thus in their poor embarcations, sure sign that some part of the year must have very settled fine weather; we saw 7 or 8 frames of their huts and vast piles of shells the fish of which I suppose had been their food. All the houses were built upon the tops of eminences exposed entirely to the SE, contrary to those of the main which are commonly placed under the shelter of some bushes or hillside to break off the wind.

The dune sites continue as occasional shell scatters nearly to the top of the narrow peninsula that forms the southernmost tip of the island. Dune sites differ from the airstrip site in that no dark midden soils are observable, at least on the surface, and the majority of surface shell is *Trochus niloticus*.

Other areas of Lizard Island which were not surveyed include the extreme southwest perimeter, the high rocky granitic formations and the eastern coast.

Howick Island: a continental island

Howick Island has a complex geography, the three 'high' formations (elevations 30, 47 and 56 m) of the southeastern corner being separated from the vegetated sand cay to the northwest by 4000 m of dense mangrove. The vegetated sand cay was surveyed and found to be littered with *Trochus* shell. No dark soil midden deposits were apparent on the sand cay but one dugout canoe and one modern grave was recorded. The canoe was originally collected by a previous phase of the expedition on the northwest side of Ingram Island, 12 km northwest of Howick Island and moved to the Howick sand cay.

The modern grave is bordered with drift timbers and beach-rock and decorated with *Trochus* and *Triton* shell. The timbers are arranged as a rectangle, 2×1 m, and a crucifix, also of drift timber, decorates one end of the grave plot.

'Drift' canoes from the Torres Strait and New Guinea are not uncommon flotsam on Barrier Reef islands. The Ingram–Howick canoe is decorated with a 5 cm wide 'strip' in 2 cm relief which runs nearly the entire length of the 5 m canoe parallel to and 10 cm below the gunwale. Lashing marks on the gunwale imply parallel boom pairs for fixing at least one outrigger. The actual number of outriggers cannot be specified as only one gunwale remains.

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The three elevated portions of Howick Island were not surveyed. One attempt at a landing on the windward side of Howick was made, but wind and surf conditions discouraged the effort. The elevated peaks of Howick probably have archaeological remains. MacGillivray (1882, p. 110), on the voyage of the H.M.S. *Rattlesnake*, observed a 'party of natives' on the highest of the hillocks. MacGillivray landed on the Howick sand cay and noticed remains of turtle and fish (p. 111). Turtle bone and carapace are still present along with dugong bones on the sand cay.

Noble Island: a continental island

One site, a rock shelter at *ca.* 5 m elevation on the southeast side of Noble Island, was found. The site is chiefly a broad (*ca.* 20 m) apron deposit spread at *ca.* 180° from the rock shelter proper which is 15 m wide (at the mouth) and relatively shallow (2 m). No rock art was seen on the friable shelter roof or walls. The deposit, a dark midden, may be 1 to 2 m deep. Stone tools seen on the surface were wholly quartz flake tools but vegetation obscured most of the surface from scrutiny. Fragments of burnt wood, not seen in most of the other island sites, were exposed on the surface. *Trochus* was the most abundant shell. Other sites may occur on Noble Island, especially the west side of the island which is formed by heavily vegetated dunes.

Pipon Island: a reef island

Pipon Island, 5 km off Cape Melville, is a low island vegetated almost entirely by mangrove. The only elevated portion of Pipon Island has been the site of a lighthouse for many years and earthworks at the lighthouse site may have obscured any archaeological deposits. Dugong bones, and some turtle carapace, were found, but no artefacts, other than those of recent European origin, were found.

Bewick Island: a reef island

Bewick Island is a low island covered by mangrove flora, *Rhizophora stylosa* and *Avicennia marina*. There is an elevated portion, roughly 400 m^2 of vegetated coral sand dune, on the northwest side of the island. The dunes are elevated to a maximum of about 4 m above mean sea level. The dunes, especially those portions immediately fronting the littoral, are scattered with shell, turtle bone and carapace, dugong bone and exotic stone materials. Because the reef islands are formed by coral growth, the stone material found on Bewick must derive from mainland or continental island sources. Since no excavation was performed and no natural soil profiles existed, no estimate of the persistence of archaeological materials throughout the vertical dune strata could be made.

One modern grave on Bewick Island was recorded. The grave is outlined in a rectangular fashion, much like the grave on Howick Island, except that the outline material is wholly beach-rock. The grave is decorated with *Trochus* and *Hippopus* shell, glass fishing floats and a hexagonal bottle. Two large *Pinctada margaritifera* decorate each end of the grave. No cross was apparent on the grave.

Ingram Island: a reef island

On the highest part of Ingram, about 8 m above m.s.l., on the windward side of the island, McLean sampled the sediments and discovered continental rocks where none should reasonably have been. Two quartz rocks, weighing 55 and 15 g, and two quartz bearing sedimentary rocks, weighing 39 and 6 g, were collected. While none is an ideal typological specimen of

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a flake tool, their association in a dark grey sedimentary layer, which contrasts strikingly with the natural off-white colour of the natural coral sand sediments, argues very strongly for their transportation from elsewhere, probably the mainland. *Tridacna*, the largest bodied shellfish food source available, and *Melo* shells were associated with this strata as well. *Melo* shell ornaments, usually pendants, were traded well inland from sources on Cape York (Tindale 1975, pp. 26, 87, 199; Roth 1910–13, p. 18). *Melo* shell has also been used for utilitarian purposes, e.g. cook pots, water containers and a kind of knife (Tindale 1975, p. 85). The square *Melo* shell fragment from Ingram measures 6 × 6 cm and does not have any abraded or sharpened edge.

Nymph Island: a reef island

Like Ingram, Nymph Island was noted by McLean to have a dark grey coloured surface deposit contrasting in colour with the coral sand sediments found beneath it. As on Ingram, the deposit was found on the highest part of the island (4.2 m), but unlike Ingram, the deposit was found on the lee side of the cay. Four continental rocks of different kinds were collected in his strata sampling. They were a quartz-bearing quartzite (24 g), a silcrete flake (11 g) and two oxidized red decomposing sandstone fragments (269 and 22 g). *Melo* and *Tridacna* both occur in the deposit as they do on Ingram. The *Melo* fragment, triangular in shape, has one smooth abraded edge in contrast to its other two margins, which are roughly broken as are all the edges of the example from Ingram. This *Melo* fragment measures about 8 cm on each of its three sides.

The Turtle Islands: reef islands

From McLean's soil pit 1, 4.5 m above m.s.l., a sample has been found to contain six continental rocks of various materials. In the relevant soil sample, taken from just below the surface, two fractured quartzite rocks (80 and 45 g), one concave quartzite spall (28 g) suggestive of heat induced fracture, two mudstone rocks (260 and 69 g) and one breccia (486 g) have been identified. The 80 g fractured quartzite rock is a fraction of a cobble and retained part of the original cobble cortex. On the cortex surface a battered area, very suggestive of a hammer function, has been noted. None of the other rocks or rock fragments showed unequivocal evidence of use wear. McLean's soil sample, which included the continental rocks, is dark in colour and ashy in appearance. These two attributes make the sample appear very unlike the light coloured natural sand beneath the dark upper strata. The colour and texture of the upper strata are consistent with the kind of rich organic deposits found as types of archaeological shell middens, particularly those that are not eroded or deflated. The characteristics of the rocks present in this sample are puzzling in that for the most part they are not suggestive of quality stone material suitable for flake tool manufacture; they are suited to either hammer or grinding functions, yet none show evidence of having been so used. While it is clear that these rocks were carried to the islands and incorporated in human midden deposits, it is not clear why.

A note of caution to soils scientists should be added here. Aboriginal man on these islands (sand cays) is known to have dug deep and probably broad pits to collect low-saline water. Where there is no good indication of horizontal integrity of the sedimentary strata and radiometric tests do not show significant age differences where they might well be expected, then man must be considered as a source of reworking of the sediments.

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Summary and discussion

Both kinds of islands, those created by rising sea levels, and evolving sand cays which have developed after the sea level has been relatively stabilized, show evidence of human use. The continental islands may have ancient archaeological sites which were deposited when their basal land forms were well removed from intertidal zones. The sites on the sand cays, however, due to the recent evolution of the cays themselves must be as young or younger than three or four thousand years.

The stone axe and flake tool components of the airstrip site on Lizard Island are in keeping with those known from interior sites in Queensland. The stone material associated with the sand cays is quite different and does not fit the interior assemblage model nor does it fit my expectation that *any* stone carried to the islands from another stone source should be well used.

Of the 13 continental rocks collected by McLean on sand cay islands only one appears to have obvious use characteristics. Even though this is quite in keeping with the 10–20 % use-worn tools I recognize from total stone inventories from excavated sites in interior Queensland, the sample is certainly too small to assess the Aboriginal use of stone resources on the Barrier Reef. Similarly, these limited observations provide only a bare beginning for an archaeological study of the Barrier Reef. We do at least know that the islands are a part of the Aboriginal economy in prehistory. McLean's samples, though useful, are 'incidentals'. My own observation, from visiting Lizard, Bewick, Noble, Pipon and part of Howick, only underscores the fact that archaeological resources do indeed exist in quantity on the Barrier Reef islands and cays.

The kinds of questions we need to direct future sampling towards are: what are the differences in the archaeological prehistories of the continental and reef islands, and what is the explanation for those differences? We have at least now the beginnings of observations upon which to base further sampling and research. Clearly, there are two kinds of sites on Lizard Island alone. I suspect that one represents a pre-island condition and that the other, the dune sites first discovered by Banks and Cook and rediscovered by me, represented a later seasonal shellfish gathering camp. I suspect too that the middens on the sand cays represent evidence of the exploitation of food resources by the coastal inhabitants. Certainly coastal hunter–gatherers would be attracted by the comparatively very high proportion of rich intertidal resources to coast-line that these islands offer.

I am indebted to Dr Roger McLean who recorded archaeological remains on Ingram, Bewick, Two Isles, The Turtles and Nymph Island. I remain accountable for the conclusions and interpretations in this paper. I thank Dr D. R. Stoddart, the Royal Society, the Universities of Queensland and the other Expedition participants for this opportunity. For permission to use unpublished material I thank Athol Chase, John Flinders, Bob Flinders, Robert Layton and Peter Sutton. The Queensland Department of Aboriginal and Island Affairs gave permission for the work and Kate Sutcliffe considerately expedited the permit. Rhys Jones was instrumental in organizing my part in the exercise. Professor J. Golson gave useful suggestions. The Department of Prehistory, Research School of Pacific Studies, A.N.U. provided the support.

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