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Research Report

Radiocarbon and linguistic dates for occupation of the South Wellesley Islands, Northern Australia

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Abstract

Radiocarbon dates from three Kaiadilt Aboriginal sites on the South Wellesley Islands, southern Gulf of Carpentaria, demonstrate occupation dating to c.1600 years ago. These results are at odds with published linguistic models for colonisation of the South Wellesley archipelago suggesting initial occupation in the last 1000 years, but are consonant with archaeological evidence for post-4200 BP occupation of islands across northern Australia, particularly in the last 2000 years.

The ten islands of the South Wellesley archipelago are dominated by Bentinck Island (c.150 km^2), the country of Kaiadilt people (Figure 1). These islands were created between 8000 and 6500 BP with rising sea-levels, peaking at +2 m around 5000–6000 years ago (Nakada and Lambeck 1989; Reeves *et al*. 2007), and comprise ancient weathered laterites and recent estuarine, beach and dune deposits. A minimum open water crossing of 10 km between Bessie and Horseshoe Islands is required to reach Bentinck from the mainland at Point Parker, with limited intervisibility between Bentinck and the mainland. The geographical isolation of Bentinck Island has been cited as a major factor in the development of the distinctive biology, language and material culture of Kaiadilt people (Curtain *et al*. 1972; Curtain *et al*. 1966; Evans 1995, 2005; Memmott *et al*. 2006; Memmott *et al*. 2008; Simmons *et al*. 1962, 1964; Tindale 1962a, 1962b, 1977, 1981; Trigger 1987; White 1997).

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Limited archaeological studies have been conducted in the southern Gulf of Carpentaria. On the adjacent mainland Robins *et al*. (1998) have reported radiocarbon dates for three sites dating between c.1200 and 200 years ago. For Mornington Island in the north, Memmott *et al*. (2006:38, 39) report dates of c.5000–5500 BP from Wurdukanhan on the Sandalwood River on the central north coast of Mornington Island. In the Sir Edward Pellew Group 250 km to the northwest of the Wellesleys, Sim and Wallis (2008) have documented occupation on Vanderlin Island extending from c.8000 years ago to the present with a major hiatus in occupation between 6700 and 4200 BP linked to the abandonment of the island after its creation and subsequent reoccupation.

Tindale (1963) recognised the archaeological potential of the Wellesley Islands, undertaking the first excavation in the region at Nyinyilki on the southeast corner of Bentinck Island. A 3' x 7' (91 cm x 213 cm) pit was excavated into the crest of the high sandy ridge separating the beach from Nyinyilki Lake:

> The first 20 cm had shells, a ‘nara shell knife, turtle bone. At 20 cm there was a piece of red ochre of a type exactly parallel with the one which one of the women was using in the camp to dust her thigh in the preparation of rope for the raft the men are making for me. The 20–30 cm band was sterile reddish sand, wind blown, except for one piece of ironstone sharp on one margin which probably was man transported. Below that 80 cm was the same sterile reddish sand (Tindale 1963:243,245).

Tindale (1977:251) also attempted to link archaeological finds on Bentinck Island to palaeogeography, speculating on a mid-to-early Holocene antiquity of some deposits:

> the finding of a crude bifacial stone tool of mariwa type … known to the islands as [‘tjilaŋand], which was in situ in deposits which had been planed during the mid-Recent high sea levels between about 6000 and 3800 BP and subsequently exposed by lateral gully erosion.

No other excavations have been conducted on the South Wellesley Islands and the chronology of the southern Gulf region as a whole remains poorly resolved. Current chronologies for occupation of the South Wellesley Islands are based on linguistic analyses. Wellesley Islanders, along with their mainland neighbours, all speak closely-related languages classified as part of the Tangkic family forming a geographically contiguous language unit derived from a common ancestral language (Evans 1990, 1995, 2005). Evans (2005) used linguistic analyses to model internal relationships within the Tangkic family, distinguishing island Tangkic from mainland Tangkic. The close linguistic relationship between Kayardild (the language of Kaiadilt people), centred on Bentinck Island, and Yangkaal, centred on Forsyth Island (North Wellesleys), is seen as incompatible with an extended period of separation. Evans suggests separation of these languages only in the last 1000 years (see also Evans 1995). The grouping of Kayardild and Yangkaal with adjacent mainland languages indicates a period of common linguistic and cultural development consistent with a model of recent colonisation of Forsyth

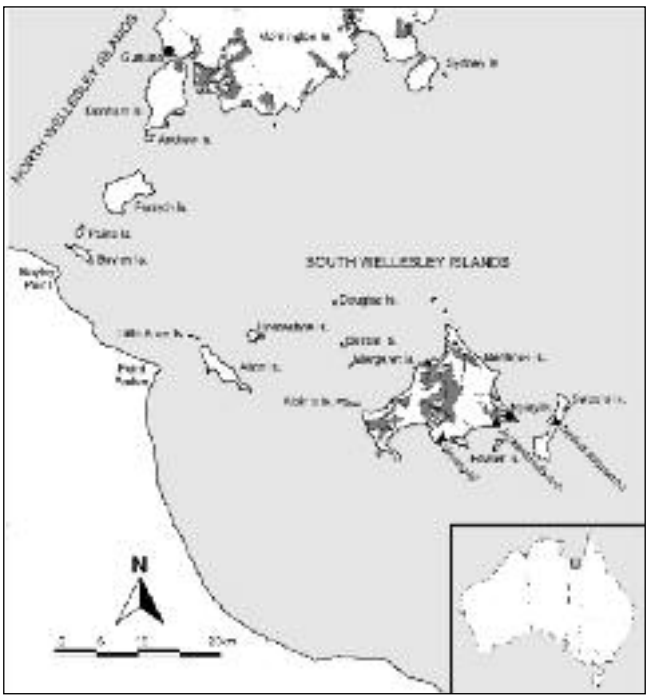

Figure 1: The Wellesley Islands, southern Gulf of Carpentaria, showing location of excavated sites as triangles. Dark grey shading indicates extent of saltflats.

and Bentinck after sea-level fall. This model finds further support in the presence of Garawa and Yanyuwa loan words from the mainland further west into the Kayardild lexicon, suggesting linguistic contact on the mainland prior to colonisation of the South Wellesleys.

These linguistic time estimates rest on the fragile assumption that small languages of hunter-gatherers change at the same rate as the large state-based languages which have been used to propose base data on rates of language change. This hypothesis has yet to be thoroughly tested against archaeological sequences. One of the major goals behind the present study is to produce some benchmark dates against which the nodes of the linguistic family tree can be compared, so as to assess what the rates of language change in Aboriginal Australia really were. One of the few studies that draws on firm dates to assess rates of language change in Aboriginal Australia is Alpher and Nash (1999) which examines the two-century record of language change in Guugu Yimithirr, the Cooktown language, for which we have vocabularies extending back to Cook's voyage and which is still spoken today. Alpher and Nash (1999:48) tentatively concluded that the Guugu Yimithirr data 'does not support the particular inapplicability in Australia of the retention rate minimum (roughly 80% per millennium) proposed from data elsewhere in the world'.

This paper reports preliminary results from excavations conducted in April 2008 at three middens in the South Wellesley Islands designed to test the modeled (<1000 years) recent colonisation of the island group.

Archaeology

Table 1 presents six radiocarbon dates obtained from three sites in the South Wellesley Islands. Five are conventional radiometric ages, and Wk-23662 is AMS. Calibrated dates were calculated using OxCal 4.0 (Bronk Ramsey 1995, 2001) and the marine calibration dataset (Marine09) (Reimer *et al*. 2009). A ΔR value of 55 ± 98 ^{14}C years was applied, based on studies of modern marine shells (Ulm 2006). Median calibrated ages represent a central best-point estimate of the probability distribution of each calibrated date (after Telford *et al*. 2004).

Wirrngaji

Wirrngaji is a large shell midden located in the upper units of an elevated beach ridge on the central south coast of Bentinck Island. Kaiadilt elder Dawn Naranatjil identified this site to one of the authors (NE) as a promising place to excavate, 'where the old people used to live', in 1997. The beach ridge is thought to be a mid-Holocene feature and is located inland c.500 m north of the current shoreline, behind a series of cheniers and beach ridges. A 50 cm x 50 cm test pit was placed in the approximate centre of the exposed shell deposits on the top of the ridge. Excavation revealed a thick upper layer of shell and a thin lower layer dated to 860 cal BP and 1048 cal BP respectively. Occasional glass artefacts on the surface indicate that the site was occupied into the recent past.

Jirrkamirndiyarrb

Jirrkamirndiyarrb is an extensive low density shell midden complex located in the near-surface deposits of mobile sand dunes between 0.5 and 1.5 km west of Nyinyilki. Scatters of gaping tapes (*Marcia hiantina*) are exposed in section in road cuttings and other areas disturbed by earthmoving machinery. Three *in situ* shell lenses exposed in section were identified: Site 8, Site 8b and Site 27. A 50 cm x 50 cm test excavation was undertaken at Site 8 (Figure 2) and dating samples were taken directly from the sections of Sites 8b and 27. The main shell exposure occurred at all of these locations between 23 and 51.5 cm below the surface. Radiocarbon dates demonstrate occupation within the last 800 years with several surface glass artefacts indicating ongoing use in the recent past.

Nalkurdalayarrb

Nalkurdalayarrb is part of a large shell midden complex intermittently exposed for c.2 km along a NNE-SSW trending dune in the approximate centre of Sweers Island. The site is equidistant between the east and west coasts and adjacent to permanent surface or near-surface freshwater soaks (Gale and Carden 2005). Stone artefacts are very common in exposed surface deposits. Almost all the observed shell midden deposits are in deflated contexts with

Site	Square	XU	Depth (cm)	Weight (g)	Lab. No.	$\delta^{13}C‰$	^{14}C Age (years BP)	Calibrated Age BP (95.4% probability)	Calibrated Age BP Median
Jirrkamirndiyarrb Site 8	A	9	23-26	10.63	Wk-23663	1.6±0.2	868±44	255*-627	432
Jirrkamirndiyarrb Site 8b	–	–	51.5	18.46	Wk-23664	1.0±0.2	1266±30	565-955	766
Jirrkamirndiyarrb Site 27	–	–	28.2	16.92	Wk-23665	0.9±0.2	688±30	0*-461	268
Wirrngaji	A	12	30.3-33.2	15.26	Wk-23661	0.3±0.2	1373±33	660-1071	860
Wirrngaji	A	23	63.4-66.4	4.19	Wk-23662~	-0.7±0.2	1549±32	831-1263	1048
Nalkurdalayarrb	A	10	24.9-27.8	14.62	Wk-23666	1.4±0.2	2068±39	1336-1821	1580

Table 1: Radiocarbon dates from the South Wellesley Islands. All dates on *Marcia hiatina*. ~ = AMS
* = Date may extend out of range (i.e. modern).

Figure 2. Jirrkamirndiyarrb, Site 8, 18 May 2008, (L-R) Duncan Kelly and John Roberts (Photograph: Daniel Rosendahl, IMG_5518).

a small area towards the northern end of the dune thought to retain *in situ* deposits, which was targeted for a 50 cm x 50 cm test excavation. A single radiocarbon date demonstrates occupation of the site by 1580 cal BP.

Discussion and conclusion

Our excavations have revealed an occupation record confined to the last 2000 years. The earliest date of 1580 cal BP is almost double that predicted by initial linguistic colonisation models (Evans 2005; Memmott *et al*. 2006). Earlier dates are likely given the limited extent of our surveys and excavations.

The emerging chronology of the South Wellesleys coincides with a period of major change documented in Indigenous lifeways across northern Australia, including on western Cape York (Bailey *et al*. 1994; Stone 1992), the mainland coast (Robins *et al*. 1998) and western Torres Strait (Barham *et al*. 2004). On Vanderlin Island, Sim and Wallis (2008:98-99) identify two gaps in human occupation – between 6700 and 4200 BP and 2500 and 1700 BP. Sim and Wallis (2008) have argued that climatic conditions, specifically climatic uncertainty and poor watercraft technology, precluded colonisation of islands across northern Australia until after 4200 BP. The second period gap between 2500 and 1700 BP correlates with increasing frequency of ENSO events (Allan *et al*. 1996). Sim and Wallis (2008) suggest that this pattern of island use is linked to the unfavourable conditions for watercraft use. The first indication of occupation at Nalkurdalayarrb on Sweers Island c.1600 years ago coincides closely with evidence for renewed occupation on Vanderlin c.1700 BP. Ongoing research will help resolve whether initial occupation of the South Wellesleys is part of the most recent phase of island use across the Gulf of Carpentaria or simply part of a long-term trend.

The available dates suggest that either (a) the Nalkurdalayarrb date on Sweers Island represents an earlier colonisation which was abandoned, with a subsequent colonisation (represented by the 1048 cal BP date for Wirrngaji) being the one founding the present Kaiadilt population (this would be consistent with the chronological assumptions given by current assumed rates of language change); or (b) language change proceeded more slowly among Kaiadilt people than is usually assumed, either because of their isolation or because rates of language change are in fact slower than those assumed by standard models. Indeed, slower rates of change have been attested in island societies elsewhere in the world, since Icelandic and Faroese (as measured on a 200-word list) has replaced its lexicon at a rate of only 7% per millennium (O'Neil 1964), giving a millennial retention rate of 93%. If Kayardild had diverged from its nearest neighbour Yangkaal at this rate, the degree of vocabulary similarity between them (86%) would be compatible with a separation/South Wellesley colonisation of as old as 2000 years, thus comfortably accommodating the Nalkurdalayarrb date we obtained.

Previous conceptions of colonisation events in the Wellesleys may be too simplistic and emerging models will need to account for the possibility of periodic island abandonment and multiple colonisation events, punctuated by periods of coresidence with cultural groups on larger islands or the mainland. At present, we are unable to distinguish between multiple-colonisation with standard rates of lexical change and a single colonisation with slower rates of lexical change. To distinguish between them, we will need more fine-grained excavation data, capable of

identifying discontinuities in occupation, as well as better dates from Mornington Island that give us another calibration point for checking the rates of linguistic change against archaeological dates. Ongoing investigation of these issues will create opportunities to achieve a more nuanced understanding of cultural change and isolation in the Wellesley Islands.

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