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THE MURRAY ISLANDS ARCHAEOLOGICAL PROJECT: EXCAVATIONS ON MER AND DAUAR, EASTERN TORRES STRAIT

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This paper reports results of excavations undertaken on the islands of Mer and Dauar, eastern Torres Strait. These investigations were conducted as the first phase of the Murray Islands Archaeological Project, coordinated as an interdisciplinary and collaborative investigation into the cultural and natural prehistory of the Murray Islands. The excavations at *Kurkur Weid* and *Pitkik* on Mer produced dense shell deposits and a radiocarbon chronology that suggests initial use of marine resources at these sites around 1200 years BP. The excavation of a shell midden deposit at *Sokoli* on Dauar recovered over 2m of marine faunal remains, and at that time produced the earliest radiocarbon dates for occupation in the Torres Strait at around 2500 to 3000 years BP. The recovery of a ceramic sherd from the excavation at *Sokoli* dated to around 1200 years BP also attests to an established prehistoric trade network with Papua New Guinea. These results have established the significant archaeological potential of the Meriam Islands and will continue to further our understanding of occupation and subsistence in the Torres Strait and its Papua New Guinea connections. ❒ *Prehistoric settlement, prehistoric trade, pottery, shell middens, Torres Strait.*

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Mer (Murray), Dauar and Waier comprise the easternmost islands in Torres Strait and are home to the Meriam, the indigenous Melanesian inhabitants (Fig. 1). During 1998 an international field team conducted systematic reconnaissance and excavations of 3 archaeological sites on Mer and Dauar. One of these excavations recovered an earthen pottery sherd and an intricately carved bone artefact. These artefacts represent 2 previously unrecorded artefact types for Torres Strait, and provide possibly the first in situ archaeological evidence for pre-European cultural links with broader Melanesia. Preliminary analysis and radiocarbon dating of the excavated archaeological sites has produced evidence to suggest occupation and exploitation of marine resources in the Eastern Torres Strait from as early as 2500-3000 years ago. These data represent the first, reliable archaeological sequence of this antiquity in the Torres Strait.

The 1998 field season included a preliminary survey of archaeological sites and other sites of cultural significance, as well as excavation of 3 stratified archaeological contexts as part of the Murray Islands Archaeological Project (MIAP), coordinated by Peter Veth and Douglas Bird on behalf of the Mer Island Community Council. This paper reports on the preliminary field results of the first stage of the project. Firstly, we provide a brief introduction to MIAP, and some details on the environment and local geography of the Murray Islands. A discussion of archaeology in Torres Strait is then provided, paying particular attention to the eastern Torres Strait and the issue of the timing and emergence of prehistoric horticulture. An introduction to Meriam ethnography and subsistence is also included, followed by the details of the archaeological reconnaissance work, the site types recorded on Mer and Dauar, and a description of the sites excavated. The results of the excavations and post-excavation analyses will be discussed in relation to the results of radiocarbon dating, the two significant artefacts recovered and details of a stratigraphic feature which may provide evidence of prehistoric horticulture.

THE MURRAY ISLANDS ARCHAEOLOGICAL PROJECT

The Murray Islands Archaeological Project arose from the long running anthropological investigations of Bird and Bliege Bird on Mer and adjacent islands (Bird & Bliege Bird, 1997, 2000, 2002; Bliege Bird & Bird, 2002; Bliege Bird et al., 1995, 1997, 2001, 2002). Since 1993 these researchers have studied contemporary Meriam marine subsistence activities and their material correlates. Their collaboration with the Mer Island Community Council led to recognition of a need for a fuller evaluation of the archaeological potential of the islands and future development of a program for the management and conservation of cultural heritage sites on behalf of the Mer community. This was initiated as MIAP, through liaison with Peter Veth and Melissa Carter at James Cook University. The Murray Islands Archaeological Project has the full support of the Mer Island Community Council, Council Chairman and traditional Meriam landowners.

The excavations described here aim to determine the antiquity of human occupation and the development of prehistoric subsistence economies, particularly the origins of horticulture. This research forms the basis of Melissa Carter's PhD research, and includes analyses of the marine and terrestrial faunal deposits, identification of phytolith and starch grains in excavated sediment samples and mineralogical analyses of recovered pottery sherds (for details see Carter in prep, 2002a, 2002b, Carter et al. in press and Parr &Carter, 2003). A Masters dissertation has been undertaken by Jennifer Richardson of the University of Arkansas, in which she examined the excavated shellfish deposit from *Sokoli*, *Pitkik* and *Kurkur Weid*, and offers explanations for prehistoric assemblage variability in relation to contemporary Meriam shellfish gathering strategies (see Richardson, 2000 for details; Bird et al., this volume).

THE MERIAM ISLANDS — LOCAL GEOGRAPHY AND ENVIRONMENT

The islands of Mer (or Murray), Dauar and Waier are commonly referred to as the Murray (or Meriam) Islands, and lie 6km from the outer Great Barrier Reef, some 250km northeast from the Australian mainland and 140km south-east from PNG's southern coast. Historically the Meriam permanently inhabited all three islands. During the 1920's settlements on Dauar and Waier were abandoned and the community today is concentrated on Mer, mostly along the north-west foreshore and the eastern beach at Las. Dauar and Waier are still used extensively for temporary residence, gardening, fishing and gathering activities (see Bird, 1996).

The Meriam Islands are situated within 2km of each other (Fig. 1). Waier is the smallest, formed from the eroded rim of a small volcanic crater composed entirely of volcanic tuffs (Haddon, 1935: 32; Haddon et al., 1894: 438-439). The island is only 610m in diameter with minimal soil and vegetation cover, and is separated from Dauar by only 100-150m of intertidal sandbars and sub-tidal sandflats.

Dauar is 1.6km in length and approximately 800m at its widest point. The remains of two volcanic ash cones, formed of steeply dipping tuffs, dominate the island. The coastline is varied, ranging from low undercut cliffs, erosional notches and intertidal rock platforms, boulder and sand beaches, and cemented beachrock within embayments. Most shorelines within these embayments show evidence of active marine erosion, exposing beach sands and colluvium in low (1-4m high) cliff sections. The island interior has variable soil cover, with grassland and bushes on the upper slopes and denser woodland with deciduous thicket on lower areas (Haddon et al., 1894: 437).

Mer is the largest of the Murray Islands. It lies 2km northeast of Dauar and is separated from the smaller islands by a deep channel. The island is approximately 2.8km long and 1.6km wide, with an area of 386ha (Haddon et al., 1894: 426). The western half of the island consists of remnants of a crater rim, called *Gelam Paser*, and reaches a height of 210m above sea level. A deep valley, running ESE reaches the coast at *Er*, and marks the geological boundary between tuffs (to the west) and lava flows (to the east). The western half of the island now supports low scrub and fired grassland, and is generally less fertile than the eastern half of the island.

The eastern interior of Mer is extremely fertile, with deep reddish-brown soils developed on the underlying lavas. An early observation of this region described profuse coconut groves, fruit trees such as mangoes, and gardens of bananas, yams and sweet potatoes (Haddon, 1935: 30-31). In 1929 pawpaws, watermelons, sugar cane, maize and numerous cultivated plants were also

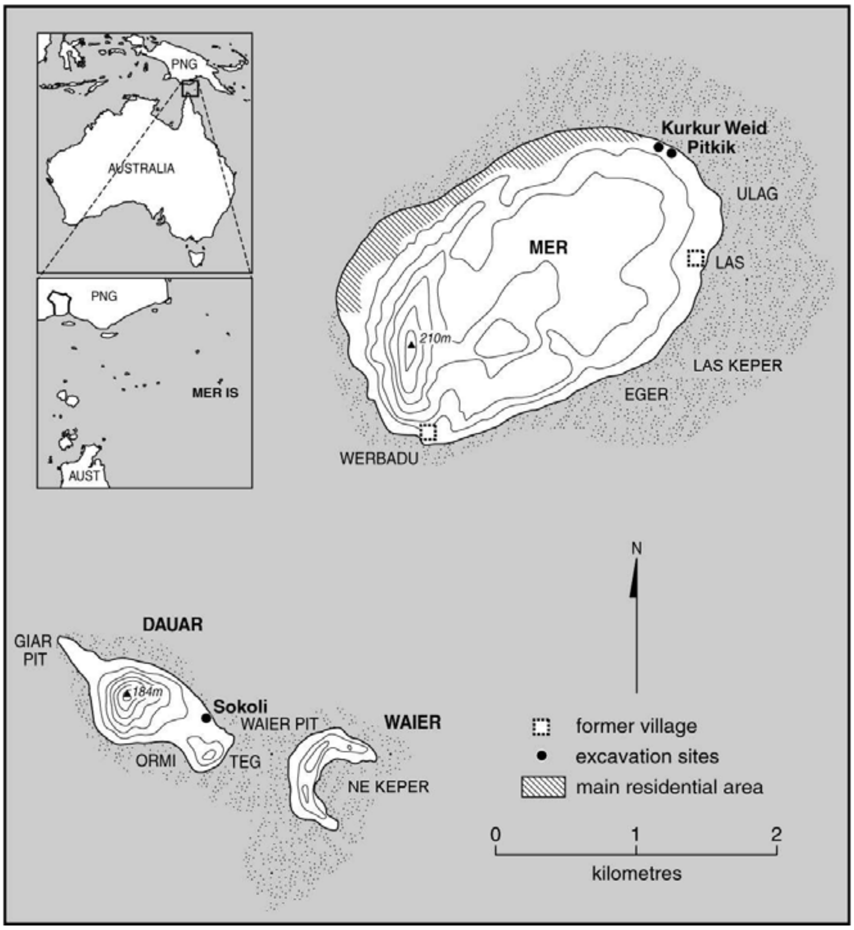

FIG. 1. The islands of Mer, Dauar and Waier, eastern Torres Strait, showing archaeological sites excavated in 1998 and 2000.

observed in this part of the island (Yonge, 1930). Today, the eastern interior tableland still supports dense vine thicket, groves of bamboo, wild mango trees and secondary woodland regrowth interspersed with garden plots.

Mer is surrounded by a large fringing reef of variable width, being widest around the east facing shorelines. As on Dauar, most parts of Mer's coastline exhibit contemporary erosion, revealing archaeological stratigraphy in beach sections. On the NW coast the fringing reef is partially covered by sea-grass beds developed on calcareous muds deposited within protected areas formed by interconnected systems of stone-walled fish traps. The southern coastline consists of low cliffs or undercut bedrock notches with boulder beaches marginal to the reef flat. Large sand beaches are restricted to the N and NW coastline, and exhibit local outcrops of cemented beach deposit containing boulders, coarse sand and even archaeological material. Many of the beachrock outcrops are subject to significant contemporary erosion and slab undercutting. Other geomorphological attributes of the shorelines and inshore reef flats suggest that coastal sedimentation, wave energy and inshore water depths have altered significantly since the mid-Holocene.

ARCHAEOLOGY IN TORRES STRAIT

Prior to the 1970s the Torres Strait Islands had only received limited archaeological attention. During this decade, however, the region received considerable archaeological attention (Moore, 1979; Vanderwal, 1973), and ethnohistorical and field investigation of evidence for traditional island methods of subsistence, in particular relating to horticulture (Harris, 1975, 1976). Here we summarise hypotheses relevant to interpreting new data from the Eastern Islands of Torres Strait.

Archaeological investigations during the 1970s focused primarily on the Western and Top Western Island Groups (Harris, 1975, 1976, 1979; Moore, 1979). In 1972, however, Vanderwal (1973) undertook a six-month survey of most of the principal islands in the Strait. His primary aim was to outline the pattern of prehistoric trade relationships at both the inter-island and trans-Strait scale. Vanderwal concluded that the surface occupational evidence he recorded on the majority of islands was of limited antiquity. This interpretation was supported by several radiocarbon dates (Moore, 1979), producing a chronology for the Torres Strait of no greater than 600-700 years. Subsequently, researchers suggested that human occupation of the islands had been most intensive during this period, and that the lifeway evidence was broadly comparable with 19th Century ethnographic accounts (Moore, 1979).

One other critical hypothesis to emerge from these early investigations concerns the nature and antiquity of horticulture in Torres Strait. Harris (1975, 1977, 1979) restricted his research to the western sector of Torres Strait, but with respect to islands in that area he concluded that 'more intensive horticulture was practiced on the smaller islands of Mabuiag, Dauan and Naghir than on the larger islands of Badu, Moa, Saibai and Boigu' (Harris, 1977: 444). This was reflected also, he maintained, by an apparent increase in the dependence on horticulture northwards across the Strait. Harris (1977: 445) argued that pressures experienced on the smaller islands, such as population increases and limitations in the availability of plant and animal resources, were instrumental in the intensification of horticulture, in comparison to the larger islands where more land was available and resources were in greater abundance.

The 1980s saw archaeological research in the Torres Strait expand to include palaeoenvironmental investigations, and studies of Holocene coastal dynamics, with the question of horticultural origins and its place alongside maritime/coastal subsistence a continuing theme. This work was primarily conducted in the Western and Top Western Island Groups (Barham & Harris, 1983, 1987; Harris et al., 1985). Rowland (1985) conducted 2 small excavations of middens on Mua (Moa) and Naghir. His primary objective was to determine whether there was any evidence for earlier phases of occupation (Rowland, 1984, 1985). Radiocarbon dates obtained from basal charcoal samples excavated from each of the sites, however, produced dates of c.800 years ago and younger. In spite of these results, Rowland (1985) emphasised that at the time of European contact Torres Strait Islanders displayed a sophisticated and unique cultural system, questioning whether such a development could occur within 700-800 years, thereby implying greater antiquity.

Investigations by Harris, Barham and Ghaleb during the 1980s led to the excavation and recording of a number of rockshelter burials, rock-art sites and fish traps on Mua, Murulag and Mabuiag along with sites on Badu, Gebar, Dauan and Naghir, and extensive mound-and-ditch systems associated with wells and surface middens on Saibai. Of direct relevance to our research were results from investigations of extensive areas of relic mound and ditch systems on Saibai. These agricultural field systems were associated with constructed canal features recorded in 1974 by Harris (Barham, 1999; Harris, 1975, 1977, 1995), and also large excavated wells. Importantly, the 1980 and 1984 excavations at Woam and the resultant radiocarbon determinations (Barham & Harris, 1985) produced the first evidence for the antiquity of horticulture in the Torres Strait, and the first data indicating island occupation in Torres Strait prior to 2000 years BP.

The Woam site, located inland of the western coast of Saibai, displayed a well-stratified shell midden which had been reworked in the upper profile by later construction of overlying mound-and-ditch field systems. Three samples from the lower part of the basal excavation unit produced radiocarbon ages of 780 ± 70 BP on charcoal, and dates (corrected for Ocean Reservoir Effect) of 2540 ± 60 years BP and 1080 ± 60 years BP on shells of the bivalve *Anadara antiquata* (Barham & Harris, 1985; Barham, 1999). Although these dates suggested age mixing in the basal shell assemblage (Barham & Harris, 1985: appendix 1), based on stratigraphic criteria, the overlying field systems at the Woam site must post-date 700-850 years BP. This estimate for earliest evidence of agricultural mound-and-ditch systems on Saibai has been independently assessed against new data from the palaeoenvironmental record of adjacent swamps and is now estimated at 1200 years BP (Barham, 1999).

Recent research has led to substantial revisions of the earlier hypotheses regarding the nature of initial maritime-focused Holocene occupation of the Torres Strait islands, and in particular the role of horticulture in prehistoric resource utilisation and subsistence (Harris, 1995, Barham, 1999, 2000). Firstly, the work in the 1980s showed that intensive prehistoric horticulture was not restricted to, or most prevalent on, small high rocky islands, as had been initially modelled by Harris from ethnohistorical sources (Harris, 1977, 1979). More recent reviews acknowledge the substantial evidence for the widespread practice of mound-and-ditch agriculture on larger low islands in northern Torres Strait, especially on Saibai (and to a lesser extent Boigu, and adjacent areas of the lowland PNG coast and islands of the Fly River delta) (Barham, 1999; Barham & Harris, 1985; Harris, 1995; Hitchcock, 1996). However, the relationship of these agricultural practices to intensive swidden plot horticulture, as practiced on smaller high islands throughout Torres Strait, is far from clear, either in terms of modes of subsistence practice, the cultivars used, or chronology. Secondly, recent reviews now argue for first evidence of occupation of the Torres Strait Islands dating to around 2500 BP, with emerging evidence for more intensive widespread occupation of islands throughout Torres Strait, from 1500 BP onwards (Barham, 1999, 2000: 271-275, 296-297). Present data suggest earliest Holocene Torres Strait island occupation pre-dates evidence for horticulture/ agriculture by over 1300 years, and that the onset of island occupation and emergence of the Torres Strait Cultural Complex (sensu Barham, 2000) by maritime-resource focused populations took place over 700 years prior to the westward movement of Austronesian-speaking ceramic manufacturing populations along the southern coast of PNG west of Torres Strait, from the PNG tip, which commenced around 1900 cal BP (Bickler, 1997).

PREVIOUS ARCHAEOLOGICAL RESEARCH ON THE MURRAY ISLANDS

Prior to investigations by the MIAP team, the only archaeological work on the Murray Islands was by Vanderwal (1973), although Beckett (1963: 54), Laade (1973) and Sullivan (unpubl. site files, Queensland Heritage Branch) have documented middens, stone arrangements and rock engravings on the foreshores of Mer. Vanderwal (1973: 174) was concerned primarily with 'the seemingly diverse appearance, both physically and culturally, of the Western compared with the Eastern Islands, as they spoke two different languages and inhabited very different kinds of islands'. His further aim was to determine the origin and cultural antiquity of both the island groups. His work on Mer consisted of survey only; no excavations were undertaken.

Vanderwal (1973: 183) noted that the most outstanding archaeological feature on Mer and Dauar were linear ridges of varying lengths and heights, in some places up to several hundred metres long and 4m high. These were located in Mer's interior, with one ridge also recorded behind the village along the NW foreshore. Vanderwal (1973: 183) observed that they comprised a great deal of shell and bone food deposits, and suggested they may have been constructed from occupational debris. On Mer, Laade (1969) observed similar food debris mounds near the public hall and medical aid building at *Umar*, the site 'where the *zogo le* formally met and feasted with central island traders'. He interpreted the mounds as worthy of excavation, as they might reveal the remains of feasting such as shells and possibly Dugong and turtle bone (Laade, 1969: 39; 1973: 158).

The only other archaeological features recorded by Vanderwal included 3 stone artefacts, 2 from Mer and 1 from Dauar. He remarked that 'stone suitable for flaking does not occur in the eastern high islands', and described the raw material of the artefacts as derived from the Western Islands (Vanderwal, 1973: 184). Most historical evidence relating to stone artefacts on Mer and the other islands of Torres Strait concerns the prized stone-headed club *gabagaba* (Haddon, 1890, 1900; Sweatman in Allen & Corris, 1977). *Gabagaba* were carved into a variety of shapes and were used as weapons and for ceremonial purposes (McNiven, 1998). On Mer, rayed *gabagaba* called *seuriseuri*, were strictly reserved for sorcery and ceremony (Haddon, 1912). McNiven (1998: 99) suggested that there are 3 sources of the stone used in the manufacture of *gabagaba*, including lowland PNG, Cape York and local manufacture using Torres Strait stone. Most of the evidence collected during the Cambridge Anthropological Expedition suggested that Dauan Island in the Northern Strait was the source of local *gabagaba* stone (Haddon, 1912, 1935). Recent investi-gations, however, reveal local availability of suitable stone for *gabagaba* and axe-head manufacture in the Western, Top Western and Eastern Islands (McNiven, 1998: 106). McNiven (1998: 107) attributed the distribution and movement of *gabagaba* to inter-island looting, warfare and trade interactions between Torres Strait Islanders and PNG Mainlanders.

Vanderwal's limited archaeological observations apparently did not lead to any significant hypotheses regarding the origin, nature and development of subsistence on the Eastern Islands. In spite of the lack of any firm archaeological evidence, he concluded that the Eastern Islands demonstrate an intensity and dependency on horticulture, more so than most of the other Torres Strait islands (Vanderwal, 1973: 187). A major aim of the MIAP is to seek evidence of the prehistoric horticultural economy on the Murray Islands.

MERIAM ETHNOGRAPHY AND SUBSISTENCE

In contrast to their relatively sparse record of archaeological research, the eastern Torres Strait Islands, especially Mer and Dauar, have a remarkably long and varied tradition of ethnographic research. For example, Meriam ethnography ranges across topics of pre-colonial socio-political organisation (Haddon, 1908, 1935), customary trade and exchange (Lawrence, 1991, 1994), linguistics (Ray, 1907; Shnukal, 1983; Wurm, 1972), colonial socio-economy (Beckett, 1987), contemporary identity and continuity (Kitaoji, 1979; Sharp, 1993, 1996), myth and oral tradition (Beckett 1975; Lawrie 1970), horticulture (Harris, 1979; Laade, 1973), and marine subsistence (Johannes & MacFarlane, 1991). Here we will briefly review some aspects of historic and contemporary Meriam subsistence, both horticultural and marine, relevant to our archaeological questions.

Traditional subsistence on the Murray Islands appears to have been a complimentary system of land based production and marine resource procurement. While the islands extensive fringing reefs supported the foraging, gathering and hunting of marine resources, the fertile volcanic soils also provided ideal conditions for horticultural production. Ethnohistoric accounts indicate that the traditional horticultural economy in the Eastern Torres Strait comprised the common Pacific crops of yams (*Dioscorea* spp.), bananas (*Musa* spp.) and taro (*Colocasia* spp.) (MacGillivray, 1852; Haddon, 1912). Within the last several hundred years, sweet potato, sugar cane, coconut and pawpaws also became major contributors to daily horticultural subsistence (Haddon, 1912; Yonge, 1930). Each of these species was grown and cultivated in swidden garden plots over most of the interior of Mer and Dauar, and were owned and managed by specific patrilines. Primarily, gardens were of two types: those for household consumption and those for display and feasting. Many Meriam men are still well known throughout the region for their skill at growing yams and bananas for competitive displays at public feasts.

The traditional Meriam marine-based economy was based on subsistence fishing and the gathering of shellfish. Green turtle (*Chelonia mydas*) also made a substantial contribution to marine subsistence, particularly during the nesting season (from October to April). Dugong was also occasionally consumed, the deep waters of the Eastern Islands, however, making them a rare but savored marine resource.

As a result of European contact, the introduction of store bought commodities, and access to government benefits, Meriam reliance on gardening for subsistence has gradually declined, particularly over the last 40 years. Today, however, marine fishing, hunting and gathering remain vital for daily household consumption and feasts. The following description of contemporary marine subsistence on the Murray Islands is provided to give some indication of the types of resources that are exploited, and the various marine habitats in which they are procured.

The research of Bird (1996) and Bliege Bird (1996) indicates that marine foraging activities take place in three habitats: the foreshore beach, the offshore and the intertidal reef. In terms of daily dietary importance, the foreshore zone has always been a vital, if not the most important, component of marine subsistence. Here women and men mostly acquire sardines (*Harengula ovalis*) with nets and spears, and small (<1kg) reef and surf fish with handlines. At dawn and dusk, beachfishers occasionally catch large pelagics (mostly blue-spotted trevally) that feed on the dense schools of sardines. During the nesting season (from October to April) the Meriam also intercept nesting green sea turtles (*Chelonia mydas*) and collect their eggs from beach nests around Mer and Dauar.

The offshore zone includes deep-water trolling for pelagic fish (mostly Spanish mackerel and trevally >5kg) and reef top and slope handline fishing for tropical cods, emperors and sea perch (mostly <5kg). From May to September, Meriam men also hunt green turtles on distant reefs for distribution at public feasts (see Bird & Bliege Bird, 1997 for details).

There are three primary foraging activities in the intertidal zone: reef flat collecting, rocky shore harvesting and spearfishing. Reef flat collecting involves mobile search for shellfish in the mid to sublittoral margin at a low spring tide. Women and children collect a wide array of molluscs, but the majority of meat (94%) comes from only three prey types: spider conch (*Lambis lambis*) and two tridacnid clams (*Hippopus hippopus* and *Tridacna squamosa/maxima*). Most of the shells of these molluscs are culled prior to transport. Rocky shore harvesting is generally conducted less than reef flat collecting, and is done mostly by women in the upper littoral. There they excavate small bivalves (*Asaphis violascens*) from shallow beds beneath volcanic cobbles and boulders, and pluck nerites (especially *Nerita undata*) from the overlying rocks (see Bird, 1996 and Bird & Bliege Bird, 1997 for extensive analysis of shellfishing). In the intertidal, men spent most of their time spearfishing with iron-pronged bamboo spears. This is done at low tide either in the large, clan-owned fish traps surrounding much of Mer, or in the mid to sublittoral margin of the fringing reef. While large fish are especially sought out, squid and smaller reef fish are often taken.

Field observations and laboratory analysis conducted as part of MIAP have shown that the remains of resources from each of these marine habitats are represented in the archaeological assemblages excavated from Mer and Dauar. Evidence for horticultural subsistence practices, however, was virtually absent in each of the excavations, except for a possible horticultural feature at one site that has been revealed through post-excavation research and observations (see below). Before details of the excavations are provided, a description of the archaeological site types recorded on Mer and Dauar is provided.

ARCHAEOLOGICAL RECONNAISSANCE AND SITE TYPES ON MER AND DAUAR

During the three-month field season in 1998, a wide variety of archaeological site types and contexts were recorded on Mer and Dauar. Waier, although visited initially, was not included in the archaeological reconnaissance program as most of the island comprised non-secular places where archaeological survey and recovery was not deemed appropriate. Site types recorded on the two larger islands included stone arrangements, land boundary markers, *zogo* (sacred) sites, stone fish traps, carved designs in bedrock on foreshores, grinding grooves, a shell decorated rock overhang and various middens.

Along the southwestern foreshore of Mer large numbers of carved bedrock panels were recorded. From *Gigo* to *Nem*, several panels of ten to 40 grinding grooves were recorded, including two basalt boulders that also displayed grooves. From *Nem* to *Terker* approximately 20 carved bedrock designs were photographed including fish, sharks, turtles, headless anthropomorphic figures, vulva and various geometric designs including four-rayed clubheads called *seuriseuri*. As mentioned previously, unlike *gabagaba* that were used as weapons, *seuriseuri* were symbolic implements worn for ceremonial purposes (Wilson, 1988: 82). Importantly, this archaeological evidence supports the previous suggestion by McNiven (1998: 106) that the manufacture of *gabagaba* and/or *seuriseuri* did occur in the Eastern Torres Strait, including Mer.

Along the sloping terrace around the east and south-eastern side of Mer, *zogo* sites were recorded. The *mukeis* (rat) *zogo* consists of a carved basalt boulder figure surrounded by a 1-2m roughly circular arrangement of basalt boulders and several large *Tridacna* valves, *Lambis lambis* and *Strombus luhuanus* shells. Haddon (1935: 143) interpreted *mukeis zogo* as symbols which promoted garden productivity and also served to deter trespasses or thieves from gardens. On the south-western side of Mer on a ridge overlooking *Terker* to the east and *Werbadu* to south-west, a small discrete concentration of *Polymesoda erosa* (known previously as *Geloina coaxens*) shells scattered among rounded basalt cobbles was recorded. Significantly, this species (known across Torres Strait as *Akul*), lives in muddy, upper tidal mangrove substrates and is not found today around the reefs and sands of the Murray Islands.

On the northern side of Mer, adjacent to the rockshelter at *Kurkur Weid*, two smaller rock overhangs were located. The overhang closest to *Kurkur Weid* is decorated with small *Strombus luhuanus* shells, which had been inserted into natural circular voids in the scoria of the rock wall. The surface deposit included several large *Anadara antiquata* valves, a species that is uncommon to the Murray Islands today. The symbolism and significance of this shell decoration is unknown.

TABLE 1. Description of stratigraphic units (with radiocarbon date) at *Kurkur Weid* (Mer). * Approximate average depth below surface level (bsl).

Stratigraphic Unit (SU)	Depth (cm)*	Description
1/KW	<1	Very fine layer of powdery dark brown organic topsoil. Some charcoal. Surface shells includes *Strombus luhuanus* and *Tridacna* sp.
2/KW	4	Fine, light brown sandy soil mottled with coarse, white carbonate sand. Shells include *Strombus luhuanus*, *Lambis lambis*, *Hippopus hippopus*, *Turbo argyrostomus* and *Tridacna* sp. Weathered vesicular basalt boulders appear at base of this unit.
3/KW	4	Discrete unit of coarse white carbonate sand with many small pieces of rounded coral
4/KW	8	Coarse white carbonate sand matrix with coral and shell grit. No whole shell
5/KW	9	Fine grey sandy matrix containing SU6/KW and SU7/KW. Whole shells present include *Cypraea tigris*, *Strombus luhuanus*, *Trochus niloticus* and *Tridacna* sp.
6/KW	10	Small pocket of ash containing small fragments of charcoal. Unit within broader grey sand matrix of SU5/KW
7/KW	10	Small lense of carbonate sand speckled with basaltic inclusions. Unit within broader matrix of SU5/KW.
8/KW	12	Fine lense of white carbonate sand speckled with basaltic inclusions
9/KW	18	Rich brown, well sorted sandy soil interspersed among several large angular basaltic clasts
10/KW	20	Small lense of poorly sorted, yellow sandy soil with black basaltic inclusions
11/KW	25	Small cavity infill of poorly sorted, pale brown sandy silt with angular pebbles
12/KW	25	Discrete pocket of orange coloured, moist sandy soil with apparent organic (root?) matter
13/KW	30-110	Light to dark brown sandy matrix with some clay inclusions interspersed among extremely numerous, medium to large (some immovable) angular basalt boulders. Large whole shells recovered, mostly *Trochus niloticus*, also *Lambis lambis*, *Tridacna* sp., *Hippopus hippopus* and *Strombus luhuanus*.
14/KW	130	Basal SU. Well sorted, moist dark brown, loosely consolidated silty-sand. Very little shell including a single *Strombus luhuanus* specimen, and several fragments of *Syrinx aruanus*. Radiocarbon date: 1290 ± 50 BP

Eroded sections of stratified shell and bone deposits were observed along most of the coastal regions of Mer and Dauar. Most of the interior of Mer was not systematically investigated, however, as these regions comprise extensive garden plots owned by numerous patrilineal descent groups. Observations of the interior regions were limited to road sections and cuttings, and demonstrated only very sparse, sporadic surface scatters of shell. Interestingly, our investigations did not locate the large linear ridges on Mer or Dauar recorded and observed by Laade (1969) and Vanderwal (1973). This is not to say that the ridges do not exist. However, large areas of the islands have been heavily disturbed due to housing and road development, and there is the strong possibility that these archeological features have been significantly modified beyond their original form.

In summary, the archaeological survey suggested that stratified archaeological contexts from which reliable archaeological radiocarbon chronologies might be derived fell into three site categories: 1) rock shelter deposits, 2) midden stratigraphies visible in eroding shorelines, and 3) midden material associated with areas known historically to have been horticultural gardens and residential sites. One example of each site category was selected for excavation, analysis and radiocarbon dating. They were 1) *Kurkur Weid*, a small rockshelter on the northern coast of Mer, 2) *Pitkik*, a stratified midden exposed by contemporary shoreline erosion 40m from the *Kurkur Weid* rockshelter, and 3) *Sokoli*, a patrilineally-owned former garden plot on the northern side of Dauar, where surface shell and bone debris suggested the possibility of midden stratigraphy at depth.

THE EXCAVATIONS

KURKUR WEID. A small rockshelter at the northern end of Mer (Fig. 1). The shelter is 1-2m above the level of the modern storm MHWS datum, and protected from extreme storm wave action by a basaltic rock outcrop. The site has formed through weathering and erosion of a weakly lithified volcanic clinker rock, interstratified within massive lava units. The structure, lithology and location of the site are similar to a small cave recorded by Haddon et al. (1894: 429-430), which they named *Werisweris-kur*, at *Wed*, also near *Pitkik*. Immediately seawards of the shelter, a small sand beach is enclosed within the cove formed by 2 lava flows forming minor rock promontories. The sand beach overlies a partially cemented basalt boulder beach deposit, which forms a narrow intertidal fringe to the junction

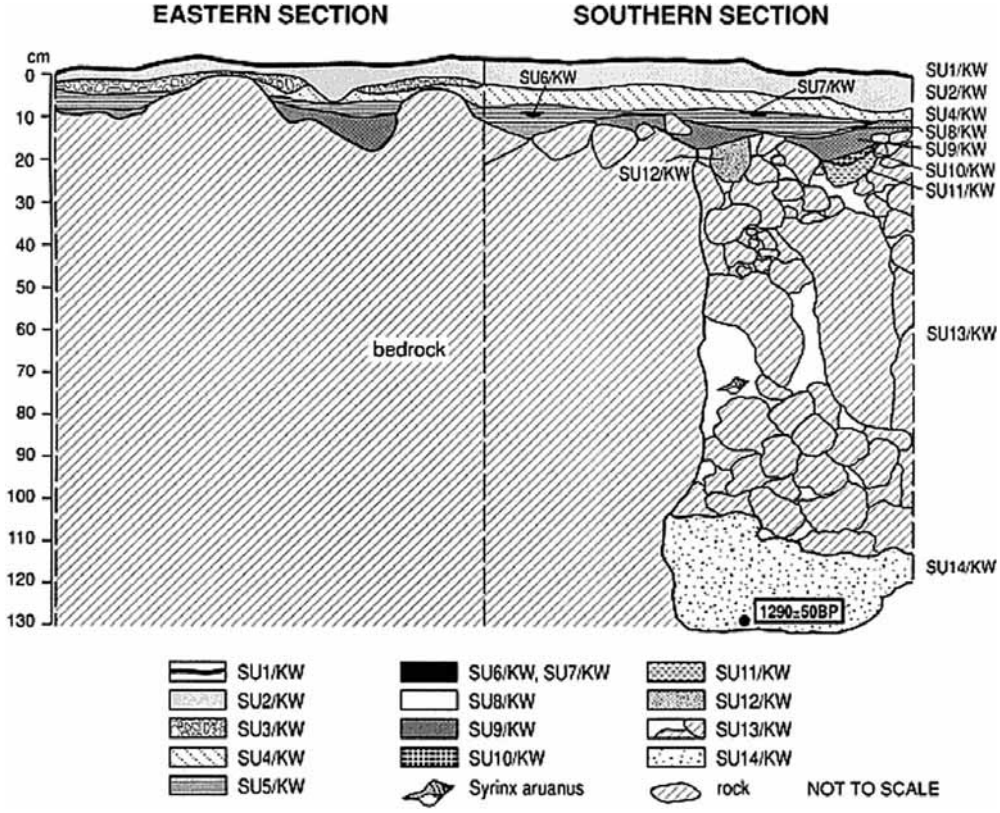

FIG. 2. Eastern and southern section profiles of the excavation at *Kurkur Weid*.

with the reef-flat, approximately 20m seawards. At the reef-flat edge, silty sand-flats extend 15-20m over, and obscure, the coralgal cemented reef-flat, grading seawards for 100m into sea-grass beds developed on the silt-flat facies. The reef-flat is protected in this area by numerous stone fishtraps (*sai*) that surround the entire N, E and SE margins of the island. The live coral edge of the modern fringing reef is approximately 150m beyond the seaward margin of the fish traps, over 250m north of the rockshelter.

Surface deposit at *Kurkur Weid* includes numerous shellfish species present today on the fringing reef, including Spider conch (*Lambis lambis*), Cowry (*Cypraea tigris*), Red-lipped conch (*Strombus luhuanus*) and several small valves of giant clams (*Tridacna* sp.). A modern shell hearth, constructed upon a layer of white beach sand, is located in the SW corner of the shelter. The 1 × 1m excavation square was placed immediately adjacent to the shell hearth. As Table 1 describes, the stratigraphy (Fig. 2) consists of a number of small units containing coarse sandy sediments and interspersed with lenses of ash. Archaeological shell deposit occurred throughout the excavation including whole specimens of *Tridacna* sp, *Strombus luhuanus*, *Lambis lambis*, *Trochus niloticus* and *Cypraea* sp. Sand content decreased with depth, with the sediment becoming finer and siltier. Shell content decreased markedly with depth, the lower excavation unit containing only a single *Strombus luhuanus* shell and small shell fragments. The square contained a large number of angular basaltic boulders that made excavation increasingly difficult (Fig. 2). The excavation continued to 130cm below surface level (bsl) and ceased due to lack of room in the square.

PITKIK. The excavation at *Pitkik* comprised a small section of the lowest part of the NE facing slope located approximately 50m along the beach from the main excavation at *Kurkur Weid* (Fig. 1). At the junction of the slope base with the upper storm beach gravel berm, erosional storm wave

TABLE 2. Description of stratigraphic units (with radiocarbon date) at *Pitkik* (Mer). *Approximate average depth below surface level (bsl).

Stratigraphic Unit (SU)	Depth (cm)*	Description
1/PK	0-40	Rubbly colluvium composed of large gravel clasts, and isolated boulders within a loosely consolidated brown soil matrix. Extensive root penetration. Large whole shells, mostly *Trochus niloticus* specimens. Small pieces of charcoal throughout matrix.
2/PK	40-49	Thin bed of very light yellow to pale brown, loose, very well sorted, coarse carbonate (shell and coral) sands. Only shell fragments present, small pieces of rounded and rocky clasts throughout. Continued root penetration.
3/PK	49-63	Discrete unit of yellow sands diffused throughout a brown sandy-clayey matrix. Some root penetration. Some whole shells including *Nerita* sp. and *Strombus* sp. Few rocky clasts.
4/PK	50-68	Very poorly sorted, irregular and subangular cobbles and small boulder clasts of weathered vesicular basalt within a matrix of slightly clayey, fine sandy silts. Shell fragments present include burnt mussel (*Trichomya* sp.). Burnt coral and pumice also present.
5/PK	70-85	Moderately sorted, brown, slightly sandy clayey silts with a high frequency of 0.5-1.0cm sub-rounded pellets and pebbles (possibly water sorted). Shells include several burnt, whole *Strombus* sp. and fragments of *Tridacna* sp. and *Trochus niloticus*.
6/PK	80-85	Discrete unit of fine gravel interspersed with numerous, moderately to well sorted sub-angular and rounded volcanic clasts. Burnt shell fragments also present.
7A/PK	85-110	Highly compact, poorly sorted sandy, clayey-silt matrix containing numerous sub-angular and rounded cobbles of basalt 1-4cm in diameter. High frequency of burnt and/or fractured stone and charcoal with red flecking within a very firm over-consolidated clay-silt matrix. Some whole *Turbo argyrostomus*, *Nerita* sp. and *Strombus* sp. present. Evidence of in situ firing of a *Strombus* specimen displaying thermal fracturing of body whorl.
7B/PK	90-95	Discrete unit on northwards dip. Brownish red compacted gravely matrix diffusing into matrix of SU7A/PK
7C/PK	100-110	Discrete layer of coarse carbonate (shell and coral) sands 2-6 cm in thickness, which dipped and thinned northwards along the section.
8/PK	110	Lowest excavated stratigraphic unit. Large rounded and smoothed cobbles of basalt, sub-horizonally bedded with some shell (*Lambis lambis* and *Tridacna* sp.) and underlain by well-sorted shelly medium sands (archaeologically sterile). Radiocarbon date: 1270 ± 50 BP

undercutting exposed a 1.5m high section. Within the section dense shell formed an undulating but continuous stratigraphic unit that could be traced 5-10m along the shore E and W of the area excavated. Contemporary erosion at the site is probably caused by high tide storm action during the NW monsoon (wet season). Cyclone activity is minimal in Torres Strait, and the reef-flat on Mer exhibits no features suggesting higher cyclone frequencies in the late Holocene (Mayer, 1918: 7).

Above the section, the hillslope is steep (ca. 20-28°), but vegetated. The slope comprises rock debris and colluvial sediments derived from the weathering of vertical exposed sections of both vesicular basalt and weakly welded volcanic scoria bedrock. Small 3-6m wide rock overhangs are commonly associated with bedrock exposed as cliffs along this part of the shoreline. The lower slope consists of large gravel clasts, isolated boulders and large shells (e.g., *Trochus* sp.) derived from eroding archaeological contexts upslope. A 1m wide section was cleaned of vegetation and cut back to expose a vertical section 120-130cm high and 50cm wide (Fig. 3).

The stratigraphy (Table 2) consists of several large distinct units of brown soil matrix with coarse sand inclusions. The surface Stratigraphic Unit (SU1/PK) consisted of a mixture of rubbly colluvium containing some shells, obviously the cumulative product of debris and deposit from the above hill slope. Shell species recorded throughout the excavation included *Lambis lambis*, *Trochus niloticus*, *Tridacna* sp. and *Turbo* sp. The sediment became more clayey and compact with depth, but archaeological shell deposit continued, with a burnt and heat fractured *Strombus luhuanus* shell in SU7A/PK. At approximately 110cm bsl a layer of large basalt cobbles was reached (presumed to be part of the basalt boulder deposit observed at the junction of the reef flat, approximately 20m seawards of the excavation). Excavation ceased at this point as archaeologically sterile coarse beach sands underlay these boulders.

SOKOLI. The excavation site is on the N side of Dauar, the second largest of the 3 islands. This site forms part of the N coastal extremity of a low saddle that separates the hills of Kebi Dauar to the west and smaller Au Dauar to the east (Fig. 1). *Sokoli* is a small patrilineally-owned garden plot located 10m inland of the modern beach, and approximately 4m above MHWS tide datum. The archaeological deposit overlies unlithified beach sands. The adjacent beach comprises eroding

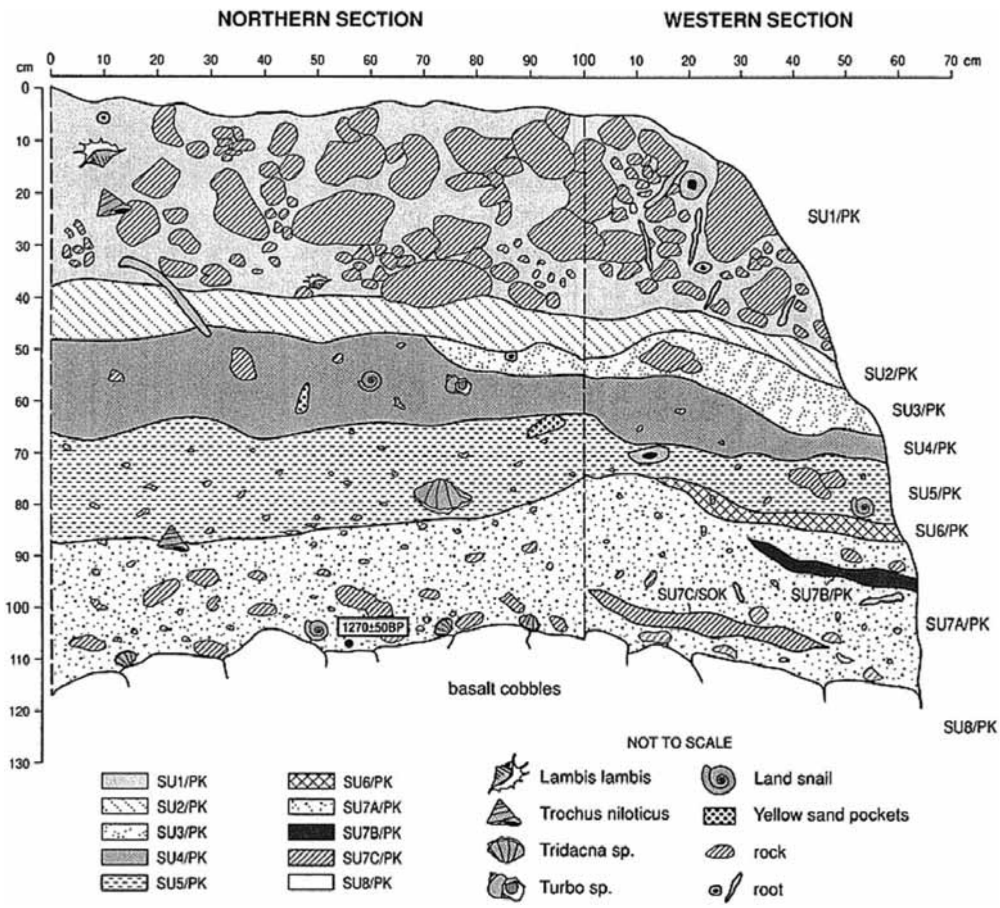

FIG. 3. Northern and western section profiles of the excavation at *Pitkik*.

beds of conglomerated beachrock, dipping seaward, consisting of coarse sand, coral and numerous water-worn shells including *Lambis lambis*, *Strombus luhuanus*, *Tridacna* sp. and *Trochus niloticus*. This beachrock lies immediately seawards of an eroding low section between the excavation area and the modern beach, forming a 2-3m high erosional profile across the eastern end of the beach. The reef-flat at this site is narrow (<80m) and comprises carbonate sands and silts, coralgal lithified debris, and sparse seagrass overlying the cemented reef-flat with a narrow band of live acroporid corals at the reef-edge.

Several months before the archaeological survey commenced, an area of *Sokoli* was bulldozed and cleared for the construction of a house. Construction had not gone ahead and the area had partially re-vegetated. At the time of the survey, the site was densely vegetated with native shrubs and vine thicket, interspersed with edible species including sweet potato, pumpkin, yams and tomatoes. Where soil was visible, a sparse surface veneer of shell was observed. The 2 × 1m excavation trench was carefully located in an undisturbed area of the site, approximately 5m behind the erosional beach profile.

The excavation at *Sokoli* reached a depth of approximately 230cm bsl and revealed 14 Stratigraphic Units. The upper stratigraphy (Fig. 4, Table 3) consisted of a complex system of brown soil colluvium containing coarse sand inclusions and significant quantities of archaeological shell deposit including *Tridacna* sp., *Lambis lambis*, *Strombus luhuanus*, *Cypraea tigris*, *Turbo* sp., *Hippopus hippopus*, and *Nerita* sp. Turtle and fish bone was also observed

TABLE 3. Description of stratigraphic units (with radiocarbon dates) at *Sokoli* (Dauar). * Approximate average depth below surface level (bsl).

Stratigraphic Unit (SU)	Depth (cm)*	Description
1/SOK	0-5	Loosely consolidated brown sandy soil with white sand inclusions, becoming more consolidated with depth. Organic matter includes leaf, grass and twigs. Root penetration extensive. Surface deposit includes *Trochus niloticus*, *Lambis lambis* and *Nerita* sp., and turtle and possible dugong bone. Shell and bone continued with depth.
2/SOK	10-30	Brown sediment with white sand inclusions, more compact than SU1/SOK. Less shell and bone present also. Root penetration continues.
3A/SOK	30-55	Sandy brown soil with less sand inclusion than SU2/SOK. Whole and fragmented shell including large numbers of *Strombus luhuanus*, some *Tridacna* sp., fragments of *Melo amphora*, *Nerita* sp. and several bivalve species including *Asaphis violascens* and *Codakia* sp. Small pottery sherd recovered. Radiocarbon date: 1180 ± 45 BP
3B/SOK	45-55	Transitional unit between brown sandy matrix and dense grey ash layer. Unit is mottled throughout with very fine, powdery grey ash sediment. Whole shell present, mostly fragments in lower section of SU.
4A/SOK	50-65 and 55-100 (west section)	Very dense sloping horizon of extremely fine, grey ash. Matrix contains burnt shell fragments and large quantities of burnt fish and turtle bone. Several stone flakes and flaked pieces also recorded (raw materials unknown).
4B/SOK	55-65	Fine grey ash horizon faintly mottled with brown sandy matrix from both SU4/SOK and SU6/SOK. Burnt shell and bone remains throughout matrix.
4C/SOK	100-160	Linear extension of fine grey ashy matrix at depth. Ashy sediment is mottled with yellowy brown sandy matrix from adjacent strata. Burnt shell and bone fragments present.
5/SOK	65-80	Brown sandy sediment mottled with fine grey ashy matrix and white sand inclusions. Some shell and bone. Intricately carved hollowed bone recovered. Radiocarbon date: 2280 ± 50 BP
6/SOK	80-105	Compact yellowish brown sandy matrix with some clay inclusions, roots, whole and fragmented shell and bone.
7/SOK	100-120	Brown sandy sediment with white sand inclusions, some rootlets, whole and fragmented shell and bone.
8/SOK	120-140	Finely sorted yellowish red sand with whole shell and bone fragments occurring throughout. Rootlets present.
9/SOK	125-135	Small pocket of grey, ashy sand matrix.
10/SOK	115-135	Loosely consolidated coarse yellow sand with some red sand inclusions. Dense whole and fragmented shell including *Lambis lambis*, *Trochus niloticus*, *Strombus luhuanus*, *Tridacna* sp., *Nerita* sp. and *Turbo* sp. Some fish and turtle bone present, possibly also dugong bone.
11/SOK	135-155	Poorly sorted grey sandy matrix mottled with yellow, tan coloured sands. Some charcoal present.
12A/SOK	155-170	Intermixed grey and yellow sands with dense shell and bone deposit.
12B/SOK	150-175	Intermixed matrix of grey and yellow sands (though with less yellow sand inclusions than SU12A/SOK) with dense shell deposit and some bone.
13/SOK	170-185	Reddish grey sandy matrix interspersed with small grey sandy pockets containing charcoal. Shell deposit dense throughout both whole and fragmented specimens, with some bone.
14/SOK	185-235	Basal unit comprising homogenous moist reddish-brown sandy soil, with upper and lower sections of unit containing dense shell deposit including large whole and fragmented specimens of *Turbo argyrostomus*, *Tridacna* sp., *Nerita* sp., *Lambis lambis*, *Strombus luhuanus* and *Trochus niloticus*. Several specimens displayed processing fracturing. Middle of unit virtually sterile, containing no shell, bone or other remains. Burnt and fragmented fish and turtle bone also identified in upper and lower deposits. Sterile sediment was not reached, excavation ceased at this level due to time restraints and difficulties caused by depth. Radiocarbon dates: (dense upper deposit) 2230 ± 50 BP; (dense lower deposit) 2840 ± 50 BP

throughout the upper excavation, and continued throughout the lower half of the site though decreasing in quantity with depth. SU4/SOK was uncovered at a depth of approximately 50cm bsl and formed the most intriguing stratigraphic feature in the excavation. Consisting of very fine grey sediment, SU4/SOK continued across the entire excavation and continued in the western half of the site to a depth of 160cm bsl. This feature will be discussed in detail below. The lower half of the excavation consisted of more sandy sediment than the upper units, grading into yellow to red coarse sands from approximately 100cm bsl. The quantity and density of archaeological shell dramatically decreased in the basal Stratigraphic Unit (SU14/SOK), at approximately 180cm bsl. SU14/SOK contained virtually no archaeological deposit until the lower part of the unit, where some shell including *Lambis lambis* and *Tridacna* sp. was recorded (Fig. 4). As a result of time constraints and difficulties due to the depth of the square, the excavation was terminated at this point. Although archaeological shell was initially suspected to continue below this depth, augering (to a depth of approximately 65cm below the base of the excavation) revealed only small fragments of waterworn shell and coral within a

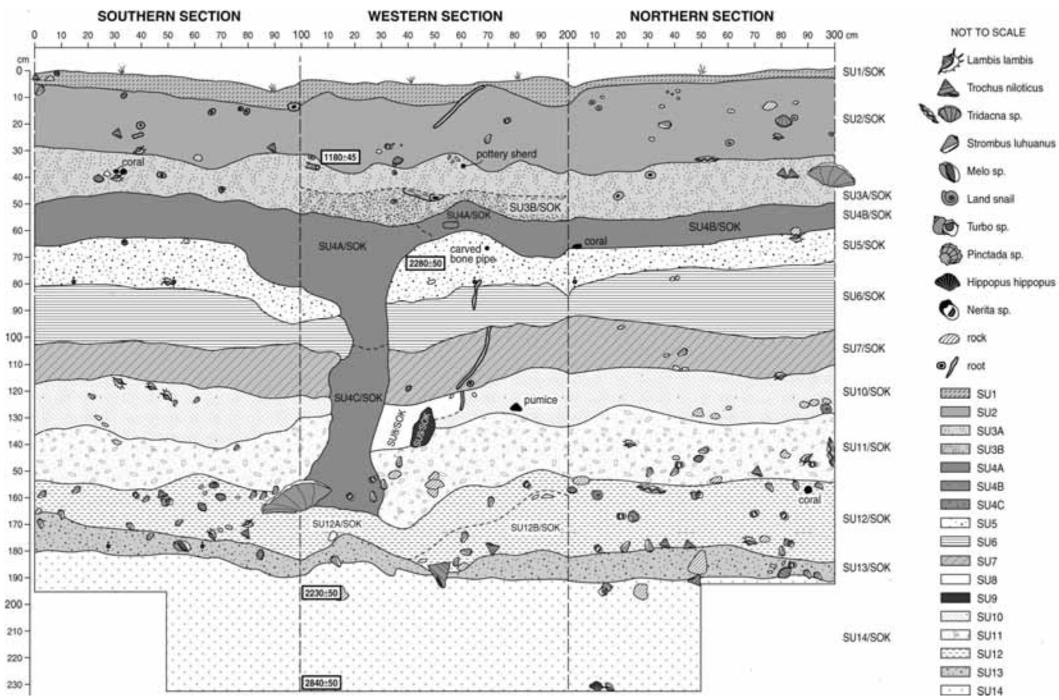

FIG. 4. Southern, western and northern section profiles of the excavation at *Sokoli*.

matrix of dark red coarse sand. It was concluded that the results of augering did not provide any material that indicated the continuation of archaeological deposit below the level reached by excavation.

RESULTS

All excavated deposits were sieved in the field through 6mm and 3mm meshes and sorted by hand into separate components at the site (i.e. shell, bone, pumice, charcoal, stone etc). Due to the bulk of the 3mm residue produced, only a sample from each excavation unit (approx. 40-50%) at each site was retained and kept for future analysis. Bulk sediment samples were also kept from each excavation unit at each site.

In the laboratory shell remains were wet sieved to remove sediment, paying particular attention to material within the interior cavities of intact specimens. The dried shell was sorted by taxa and according to the number of diagnostic measurements (length, width, thickness) obtainable, was subdivided into whole shells, half shells and fragments, which were then measured, quantified and weighed. (For details on the results of analyses of archaeological faunal remains: Carter, unpubl. data; Bird et al., 2002).

RADIOCARBON DATES. The radiocarbon dates from *Ormi* and *Sokoli* (Table 4) were run by the University of Waikato, and reported as Conventional Ages BP (Stuiver & Polach, 1977) with the results corrected for measured values of isotopic fractionation. Determined delta C-13 values ($\delta^{13}C$) average 2.33±0.8‰ for all *Lambis lambis* specimens and 2.55±0.33‰ for *Strombus luhuanus*. Ages are reported both as uncalibrated conventional Years BP and as dates corrected for oceanic reservoir effect (ORE). Though there is some uncertainty about the appropriate correction factor for the radiocarbon dating of marine shells from northern Australian tropical nearshore waters (compare Bowman et al., 1985; Woodroffe et al., 1988; Woodroffe & Mulrennan, 1993 for NW Australia), a correction gap of minus 450±35 years is applied here as the recommended correction factor (Table 4). The discussion of results will be in terms of the ORE corrected ages (approximate).

Two samples taken earlier in 1998 were dated prior to the submission of the excavated samples. This was done to make a preliminary assessment

TABLE 4. Results of radiocarbon dating of archaeological (shell) samples from Mer and Dauar. * Approximate depth of sample from below surface level (bsl).

Lab Number	Site/Location	Sample	XU	Depth (cm)*	Context	$\delta^{13}C$‰ wrt PDB	ORE Result	Conventional C^{14} result
Wk 6096	*Ormi*, beach section	*Lambis lambis*	NA	-	Beach section on southern side of Dauar	1.4 ± 0.2	1420 ± 50 BP	1870 ± 50 BP
Wk 6098	*Sokoli*, beach section	*Strombus luhuanus*	NA	-	Beach section on northern side of Dauar	2.0 ± 0.2	1470 ± 50 BP	1920 ± 50 BP
Wk 6749	*Kurkur Wei*d Sq SE (1,2.7)	*Strombus luhuanus*	17	130	Basal shell sample SU14/KW	2.8 ± 0.2	840 ± 50 BP	1290 ± 50 BP
Wk 6750	*Pitkik* 1	*Lambis lambis*	8	110	Basal shell sample SU8/PK	3.1 ± 0.2	820 ± 50 BP	1270 ± 50 BP
Wk 6751	*Sokoli*, upper beachrock	*Lambis lambis*	NA	NA	Sample from beachrock closest to foredune	1.9 ± 0.2	2610 ± 60 BP	3060 ± 60 BP
Wk 6752	*Sokoli*, lower beachrock	*Strombus luhuanus*	NA	NA	Sample from beachrock furthermost from foredune	2.9 ± 0.2	2700 ± 70 BP	3150 ± 70 BP
Wk 7444	*Sokoli* Sq SE (1,21)	*Strombus luhuanus*	7	33	Sample from SU3A/SOK where pottery sherd recovered	2.8 ± 0.2	730 ± 45 BP	1180 ± 45 BP
Wk 7445	*Sokoli* Sq SE (1,21)	*Strombus luhuanus*	25	235	Basal shell sample, lower SU14/SOK	2.3 ± 0.2	2390 ± 50 BP	2840 ± 50 BP
Wk 7480	*Sokoli* Sq SE (1,21)	*Strombus luhuanus*	11	70	Sample from SU5/SOK where carved bone recovered	2.6 ± 0.2	1830 ± 50 BP	2280 ± 50 BP
Wk 7481	*Sokoli* Sq SE (1,21)	*Strombus luhuanus*	23	195	Sample from dense deposit of shell and bone, upper SU14/SOK	2.8 ± 0.2	1780 ± 50 BP	2230 ± 50 BP

of the dating potential of the sites and to assess their likely antiquity. These included marine shells from eroding beach profiles on the N coast of Dauar at *Sokoli*, and on its S coast at *Ormi* (Wk 6096 and Wk 6098). From the 3 excavations conducted in 1998 6 marine shell samples were dated. Two shell samples from the beachrock at *Sokoli* were also submitted for dating (Wk 6751 and Wk 6752).

The initial dates from *Ormi* and *Sokoli* indicated exploitation of marine resources on Dauar from at least 1400 years BP. The excavation at *Sokoli* produced an extensive archaeological assemblage of economic faunas, with a basal archaeological shell sample obtained from 235cm (bsl) returning a date of approximately 2390 years BP (Wk 7445), significantly increasing the antiquity of occupation. Two further dates obtained for *Sokoli*, based on samples extracted from depths of approximately 200cm (Wk 7481) and 70cm bsl (Wk 7480), confirm the earlier dates for exploitation of marine resources, and suggest a very rapid accumulation of shellfish and other macrofaunal remains at the site around 1800 years ago. The most recent date for *Sokoli*, from approximately 30cm (bsl) (Wk 7444), indicates that deposition may have slowed in the upper section of the site, some time after 1500-1000 years ago.

An immediate issue that emerges from the radiocarbon chronology of the excavations is the significant age difference between the earlier dates for *Sokoli* and *Ormi* on Dauar, and the later dates obtained for sites excavated on Mer. The results from *Pitkik* (Wk 6750) and *Kurkur Weid* (Wk 6749) on Mer suggest initial use of both sites at approximately 800 years BP. We suggest that the likelihood of slumping and removal of deposits at the sites excavated on Mer, particularly *Pitkik*, make the radiocarbon determinations for these sites an estimate of minimum age only. The dates therefore do not imply a late occupation of nearby Mer, but merely reflect local geomorphology and archaeological characteristics. A fuller understanding of site formation processes at each of the excavations, however, must await the results of further assemblage and contextual analysis (Carter, unpubl. data).

SOKOLI BEACHROCK. *Lambis lambis* and *Strombus luhuanus* shells were sampled and radiocarbon dated from the eroding surface (Wk 6751)

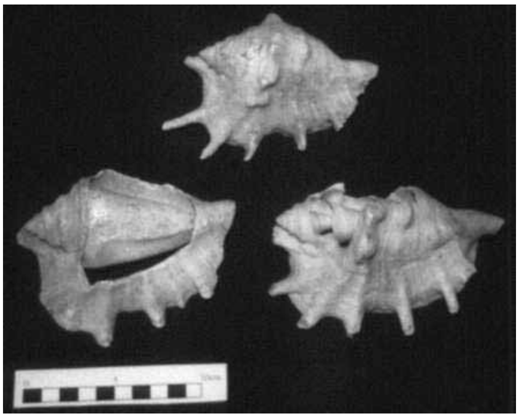

FIG. 5. Archaeological shell (*Lambis lambis*) with sample on the left displaying fracturing diagnostic of processing strategies.

and basal unit (Wk 6752) of the beachrock outcrops at *Sokoli*. The *Lambis lambis* specimen was collected from the upper surface of the beachrock (Wk 6751), and returned a date of approximately 2600 years BP. The specimen also exhibited fracturing characteristic of human processing of the shell (Fig. 5). Several shells exhibiting this type of fracturing were noted on the surface of the cemented beach deposit and have been observed on numerous shells of various species from each of the excavated archaeological sites. During their work with the Meriam, Bird & Bliege Bird (1997: 42) recorded contemporary shell processing and the process by which this shell damage occurs. They noted that *Lambis* specimens are roasted in-shell on small hearths prepared on the foreshore, whereby 'heating the shell causes it to become brittle and makes it easier to crack' (1997: 42). Bird & Bliege Bird (1997) also observed that this process often occurs on the foreshore's supratidal fringe at 'dinner-time' camps near the procurement area. This observation offers explanation for the occurrence of specimens cemented into the landward upper surface of the beachrock at Sokoli.

The beachrock facies are steeply dipping and very coarse textured, indicating intertidal high wave energies and sorting. It is therefore unlikely that the upper shell sample is from a strictly in situ processing assemblage. It is possible, however, that it represents shell derived from a processing site within the extreme upper tidal area of a beach, which was then incorporated into the beach stratigraphy by wave action and/or stratigraphic mixing. Subsequently the material lithified through post-depositional cementation at depth, as the beach surface prograded. The *Strombus luhuanus* beachrock sample (Wk 6752) was extracted from within a boulder conglomerate 1-1.5m lower in the beachrock sequence and immediately above the erosional unconformity that forms the basal contact of the Holocene beach conglomerate over volcanic bedrock. The sample returned an age of approximately 2700 years BP, and dates the onset of beach formation in the sequence. Thus, the interpretation of the upper sample as archaeological is partly supported by independent stratigraphic evidence of rapid accumulation (and progradation) commencing around 3000 BP, which might favour incorporation of archaeological material discarded on the beach shoreface, or in the immediate vicinity.

SOKOLI ARTEFACTS. Two significant artefacts from *Sokoli* on Dauar, further testify to the antiquity of use and occupation of the site. A single pottery sherd was found approximately 33cm bsl, displaying a square, flattened rim, a smoothed tempered texture, and a red slip on a small area of its interior surface (Fig. 6). Using a standard rim chart it has been estimated that the vessel orifice may have been approximately 20cm in diameter. The slight curvature of the sherd also suggests a restricted vessel form (i.e. not a bowl). Sample Wk 7444 indicates the sherd was likely to have been deposited at Sokoli prior to 730 years BP.

Wk 7480 is a shell sample dated from close to the point in the *Sokoli* stratigraphy where an intricately carved bone artefact was recovered (Fig. 7). The piece is approximately 7cm long and displays the finely carved anthropomorphic face of a man (indicated by the beard) on the rounded side of a hollow bone. The artefact is highly polished and appears to be a spatula of some sort as indicated by the broadening and flattening of the shaft beneath the carved head. The date of deposition of the bone artefact is currently estimated at around or prior to 1830 years BP (Wk 7480).

SOKOLI STRATIGRAPHIC UNIT SU4/SOK. Stratigraphic Unit 4/SOK represents an anomalous stratigraphic feature at *Sokoli* and may offer evidence for prehistoric horticulture. This SU was revealed at approximately 50cm bsl and consisted of extremely fine, grey ashy sediment across the entire surface of the 2×1m trench. In the SW corner of SQ SE(1,21), it continued as a vertical linear intrusive feature,

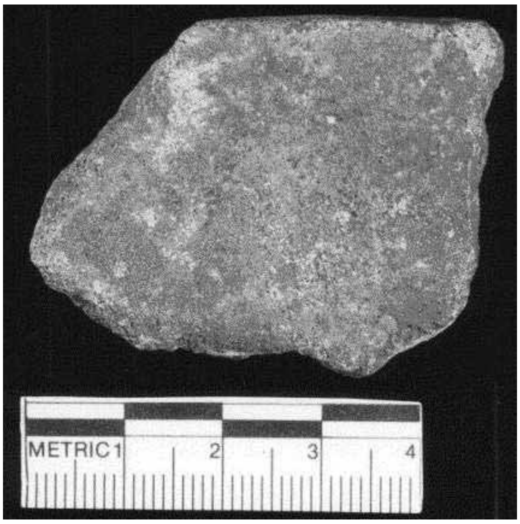

FIG. 6. Pottery sherd recovered from the excavation at *Sokoli*.

varying in thickness, to a depth of approximately 160cm bsl (Fig. 4). Though the upper units (SU4A/SOK and SU4B SOK) consisted entirely of ash, the sediment appeared to become less ashy with depth, with the matrix of SU4C/SOK comprised mostly of the surrounding brownish yellow sands.

One possible explanation for this stratigraphic feature is found in the notes of MacGillivray (1852, II: 26), where he described the preparation of a yam garden, observed on Mer sometime between 1846 and 1850:

> The principal yam … is the most important article of vegetable food as it lasts nearly throughout the dry season. Farming a yam garden is a simple operation. No fencing is required — the patch of ground is strewed with branches and wood, which when thoroughly dry are set on fire to clear the surface — the ground is loosely turned up with a sharpened stick, and the pieces of yam are planted at irregular intervals, each with a small pole for the plant to climb up. These operations are completed just before the commencement of the wet season, or in the month of October.

On the Murray Islands large *usari* yams were traditionally grown by men for competitive feasting and display (D. Bird pers. comm.). These yams could reach up to 2m in length, but were inedible due to their tough, stringy texture. The ashy matrix of SU4/SOK may have been produced by traditional yam garden preparation as described by MacGillivray (1852) and the linear feature may be the remnant of a yam hole, created by the backfill of ash and sediment after the extraction of a large yam. Phytolith and starch

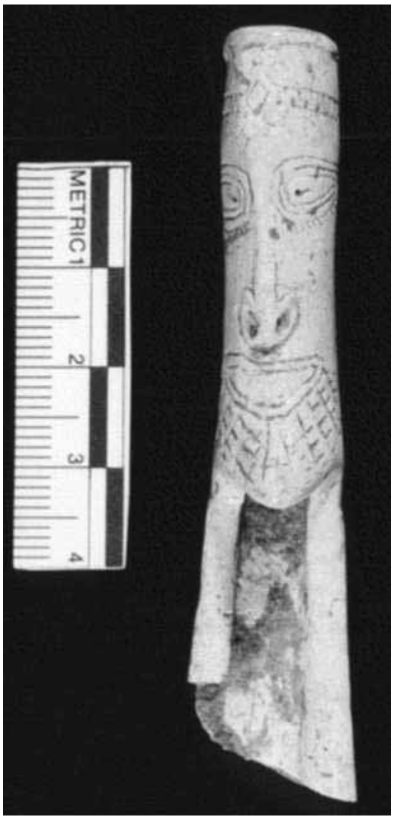

FIG. 7. Carved bone artefact showing anthropomorphic facial design recovered from the excavation at *Sokoli*.

grain analysis of a sediment sample from SU4/SOK was undertaken. Although the results did not reveal any microfossil yam remains, they confirmed that SU4/SOK is the likely product of horticultural activity at the site, including clearing and burning (see Parr & Carter, 2003).

DISCUSSION

The preliminary results of MIAP have produced new exciting data concerning the antiquity of human occupation in Torres Strait. Radiocarbon dating produced unequivocal evidence for human occupation on the Murray Islands, and of a prehistoric maritime subsistence economy, from around 2500-3000 years ago. At *Sokoli* on Dauar, this evidence consists of continuous stratified archaeological contexts with extensive deposits of shellfish remains and other macrofaunal material such as fish and turtle bone. Importantly, the four radiocarbon dates from *Sokoli* represent the first series of dates from a deeply stratified archaeological sequence anywhere in Torres Strait. Furthemore, the excavations revealed a number of rare and significant artefacts, including a pottery sherd. The significance of this sherd is as follows:

Firstly, although there were several observations of pottery in the Torres Strait Islands during the 19th Century (Carter, 2001), it is widely accepted that earthenware has never been manufactured in the region, nor is it considered an item of traditional Torres Strait material culture. Radiocarbon dating suggests that the pottery sherd recovered from *Sokoli* is perhaps greater than 730 years old. Significantly, this date concurs with the period for local and long distance pottery trade along the southern PNG coast from 1900-850 years BP (Bickler, 1997). The evidence suggests therefore that pottery was a commodity of prehistoric trade or exchange between Torres Strait and PNG, and of the cultural links and affinities between the 2 regions, so well documented ethnohistorically and by the myths and legends of Torres Strait.

Secondly, another critical issue raised by the pottery find is horticulture. Pottery, along with the bones of domesticated animals, is regarded as the principal archaeological signature for horticulture in many early Melanesian and Polynesian sites (Golson, 1972: 553). Major theories concerning the origins and timing of horticulture for the Torres Strait cannot be generated from a single sherd. Its presence, however, does support early ethnographic observations of the Murray Islands as a population heavily involved with gardening (Jukes, 1847, I: 198; MacGillivray, 1852, II: 25; Sweatman ca. 1850 in Allen & Corris, 1977: 25) and the ritual and magic associated with cultivation, growth and harvest (Haddon, 1908: 202-213).

Unlike the pottery sherd, however, we have no direct archaeological evidence that suggests the bone artefact recovered from *Sokoli* was produced in New Guinea. Carving was a prolific practice throughout the Torres Strait, and remains an important cultural activity today (refer Wilson, 1993). Meriam traditionally carved many artefacts, including stone garden and rain charms, bone and shell pendants and ornaments, and wooden models and figurines (Haddon, 1908; Wilson, 1988). Bone in particular was fashioned and used as arrowheads and points, husking implements, pendants, and musical instruments (Cambridge, 2001; Moore, 1984). Haddon's records and collections indicate that turtle bone, and less commonly fish bone, was used for these items (Cambridge, 2001). Artefacts of cassowary bone were also collected by Haddon, and described as ground spatulate tools for coconut husking and imported from New Guinea (Cambridge, 2001).

SUMMARY

The investigations conducted on Mer and Dauar as the initial phase of the Murray Islands Archaeological Project, have demonstrated the rich and complex archaeological potential of the eastern Torres Strait Islands. Where earlier archaeological investigations in the Torres Strait failed to produce evidence of longterm human occupation and subsistence, these investigations have succeeded in establishing cultural sequences in the Eastern Torres Strait dating from around 3000 BP. Evidence for possible trading links between the Murray Islands and New Guinea have also been recovered, provided by an in situ earthern pottery sherd and an intricately carved bone artefact. Although few details have been provided here, recent analyses of the excavated archaeological contexts have also confirmed the possible emergence of horticulture on Dauar by 2000 cal BP, providing the earliest evidence for the development of horticultural subsistence in the Torres Strait.

POSTSCRIPT

A second field season of the MIAP was undertaken in 2000, while this paper was in preparation. Two excavations on the southern coastline of Dauar at *Ormi* were conducted. At one site approximately 2.3m of economic marine fauna, including shell, fish and turtle bone, was excavated. A number of pottery sherds were also recovered from the excavation, ranging in depth from 40cm to 180cm below surface level. Radiocarbon dating of excavated shell and charcoal samples from the *Ormi* excavation confirm human use and occupation of the island from 2500 years BP, and extend the chronology for earthenware on Dauar to around 2000 years BP. Results of the 2000 field season on Dauar and details of pottery composition analysis and phytolith and starch grain analysis (Carter, unpubl. data) are detailed in recent publications including Carter, 2002a, 2002b, Carter et al., in press and Parr & Carter 2003.

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