

Evidence of external contact between the Pacific Basin and the east coast of Australia during the Holocene: A review

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Abstract

The prospect that First Nations Australians were in contact with cultures beyond Australia prior to European arrival has fascinated theorists for over a century. Early views tended to see Aboriginal culture as too primitive to have independently developed 'higher level' cultural traits. Once this view was abandoned, further enquiry into external contact largely ceased. However, it has been gradually recognised that transformations occurred within Australia not only independently but also through external elements arriving from the north (Macassans and Papuans). This paper offers perhaps the first comprehensive overview of a less studied potential conduit: the eastern seaboard of Australia. Given the vast scale of the eastern seaboard (and its geographic position directly opposite the seafaring cultures of the Pacific Basin it is surprising that the notion of contact between these two realms has received such limited attention. The east coast is a potentially very large target for contact. Queensland and New South Wales mainland and island coastlines comprise in excess of 15,000 km. The Pacific Basin is similarly a huge potential source for contact, covering over one-third of the world's surface, and containing over 20,000 islands. Our paper first considers the contrast between studies of the eastern and western edges of the Pacific Basin, and then the means (and evidence) by which 'contact' is normally discerned. We next consider the potential for contact based on ocean currents and similar factors. The bulk of the paper assesses specific source regions and purported evidence of contact from these regions: Papua New Guinea, Island Melanesia, Polynesia and two islands between these areas (Norfolk and Lord Howe). Our study concludes that evidence for Pacific-Australian contact ought to be relatively abundant, given the size of the source area (the Pacific Basin) and the target area (the eastern seaboard). Instead, contact must have been very limited and sporadic, as most evidence has been either inconclusive or requires further substantiation. Equally, the impact of these cultures on the development of Australian First Nations seems to have been negligible. On the other hand, this review accumulated enough evidence to suggest there was considerable potential for such contacts. We conclude that archaeological frameworks should be developed to investigate purported and possible Pacific-Eastern seaboard contacts.

Introduction: Amending Our 'Northern Bias'

The 'northern' focus in the search for evidence of external influence is understandable, given that Australia was initially in sustained contact with what is now Southeast Asia. First Nations peoples reached Australia as early as 65,000 years ago (Clarkson et al. 2017) although a more conservative date of 47–48,000 years ago is also proposed (O'Connell et al. 2018). Multiple colonisation events from various entry points have recently been suggested (Kealy et al. 2018; Norman et al. 2018). It is now proposed that there was purposeful and coordinated rather than random voyaging (Bird et al. 2018, 2019), large numbers (Bradshaw et al. 2019) and even return voyaging (Norman et al. 2018:238).

Regardless of the age, direction and number of contacts, Australia and New Guinea shared as much as four-fifths of their human history, as part of the enlarged Pleistocene continent of Sahul. The two land masses were not separated by rising postglacial sea levels until 8,000 years ago (Woodroffe et al. 2000), though genetic evidence suggests Papuan and Australian populations separated 25–45,000 years ago (Malaspinas et al. 2016). A later genetic split (9–12,000 years ago) is also suggested (Pedro et al. 2020).

Changes within Australia are visible in the Mid-to-Late Holocene archaeological record. These shifts include increases in site numbers, site types and deposition rates. New environments were utilised, and new extractive technologies appeared. The transition has been mostly explained in terms of 'intensification' (Lourandos 1985), although the meaning of this term is debated (e.g. Lourandos and Ross 1994).

The earliest external contact for which we have solid evidence relates to Late Holocene specialisation in the use of marine resources and maritime technology. At least in part, this specialisation appears due to the introduction of new items of marine technology from outside Australia. Other transformations in societies across Australia centred around 3,500 years ago can be attributed to population growth, internal social changes ('intensification'), and environmental change. Even so, some external contact is evidenced, notably the introduction of the dingo (Balme et al. 2018).

As noted, it is particularly well-established that interactions occurred throughout the Holocene through Torres Strait on to Cape York and down the Queensland coast (for a recent review and references see Rowland 2018). Likewise, it is clear that dugout canoes, metal harpoon heads and other items were introduced by Macassans to Arnhem Land and to the Kimberley coast. Thus across northern Australia, Macassan fisherman had contact with various First Nations people over at least the last 400 years.

By contrast, evidence for contact with Australia's eastern seaboard appears limited, and its impact elusive. Nevertheless, it is useful to review what innovations might have reached Australia from external sources (and vice versa) as new evidence and theories arise. Arguably, sporadic visits by small groups rarely leave an archaeological signature sufficient to be detected, and whatever new elements they bring are likely to be lost within the dominant culture, but there is evidence that even limited contacts sometimes spark major transformations. For example, in a seminal paper Sharp

(1952) demonstrated the significant effect of the introduction and replacement of stone axes by steel axes on the Yir Yoront at the mouth of the Coleman River on the west coast of Cape York Peninsula.

Contrasts with the Study of Possible Pacific-American contacts

The limited investigation into the possibility of contact between eastern Australia and the Western Pacific is especially evident when compared to the long history of similar research being conducted into potential connections between Pacific cultures and the eastern flank of the Pacific Basin (i.e. the Americas) (Figure 1). Although such research cannot determine whether contact also occurred with Australia, it does highlight the potential and archaeological signature of lengthy Polynesian sea voyages, as the two most frequently postulated journeys (between Easter Island and Chile, and Hawai'i and California) represent 3,600 km and 3,970 km respectively. This is far greater than distances between Australia and New Caledonia (1,600 km) or between Australia and New Zealand (2,100 km). However, such contacts remain controversial (e.g. Anderson 2006a; Baudouin and Lebrun 2009; Gongora et al. 2008; Hurler et al. 2003; Jones and Klar 2005, 2006, Jones et al. 2011; Klar and Jones 2005; Storey et al. 2007; Terrell 1998; Wyatt 2004), though Lawler (2010) has boldly asserted that the evidence mostly supports such contact.

In this respect, it is pertinent that some arguments for Pacific-American contact pertain to purportedly ancient genetic links with Australia and Melanesia. Certain Australasian genetic traits (from Indigenous groups in Australia, Melanesia and island Southeast Asia; see Posth et al. 2018) are shared with the earliest Native Americans. Interpreting this data remains a puzzle (Moreno-Mayar et al. 2018; Raghavan et al. 2015; Skoglund et al. 2015). There are similar contentions concerning purported Polynesian-American Indian genetic connections. Cranial remains from Isla Mocha 30 km off the coast of south-central America are said to demonstrate a 'Polynesian phenotype' (Matisoo-Smith 2015), but in at least one case, Polynesian DNA found in skulls (of extinct Botocudo Indians from Brazil) has now been given a post-Columbian explanation (Gonçalves et al. 2013). On the other hand, a recent study by Ioannidis et al. (2020) claims unequivocal evidence of Native American genetic 'admixture' occurred around the Marquesas Islands c.1200 CE.

In assessing possible links between Pacific cultures and the Americas, much emphasis has been placed on supposed presence of Polynesian foods or artefacts in the Americas. Easter Island or Hawai'i are usually proposed as the conduits for these items. Thus, Polynesians are said to have introduced the chicken to South America (Fitzpatrick and Callaghan 2009; Storey et al. 2007), though there is also a contrary view (Thomson et al. 2014; Gongora et al. 2008). Linguistic and archaeological evidence for Polynesian-style sewn bark canoes in the Americas is proposed (see Jones and Klar 2005; Klar and Jones 2005), though caution is recommended by others (Anderson 2006b). The sweet potato is said to have been introduced from South America into Polynesia (Montenegro et al. 2008; Roullier et al. 2013) though there is contrary evidence that the sweet potato was already in Polynesia in pre-human times (Muñoz-Rodríguez et al. 2018).

Simulation studies of coconut transport to Central America by Ward and Brookfield (1992) concluded it was unlikely to have crossed the central Pacific by drift and remained viable, thus implying a human agency. Therefore, Baudouin and Lebrun (2009) suggested the coconut was brought by Austronesian seafarers from the Philippines to Ecuador c.2,250 BP. However, Clement et al. (2013) found no archaeological, ethnobotanical or linguistic evidence for pre-Columbian coconuts and concluded that the most parsimonious explanation was that coconuts were introduced to Panama after Spanish conquest.

Such accidental crop drift may have relevance to similar 'coconut debates' concerning Australia. The origins of the coconut in Australia continues to be disputed. There is a view that they are not native, and that the coconut owes its presence to people rather than to the ability of its fruit to float across oceans (Cribb and Cribb 1985; Dowe and Smith 2002; Foale 2003). However, there is evidence for the presence of coconuts from at least 8,000 BP on Lizard Island (Proske and Haberle 2012). A substantial old grove of coconuts has been located on the Frankland Islands (Dowe and Smith 2002:136) and there is also some evidence of pre-European use of coconuts in Australia (Hynes and Chase 1982 (Figure 2).

Means of Contact

Types of Evidence

The evidence for contact can be both tangible (objects) or intangible (language, genetics). Finds of 'foreign' (imported or adapted) items within pre-European Australian material culture constitute the most obvious indications of contact. As noted, the clearest evidence of this are items associated with Macassan seafarers in northern Australia, though the duration of contact appears to be limited to the last 400 years (Rowland 2018; Taçon et al. 2010). While Macassan impacts on Australia's Indigenous societies have yet to be fully understood, we now know it had a significant and continuing impact, manifesting in words, songs, plant foods, pipes and other influences (Ganter 2018).

The presence of the dingo in Australia is the most obvious evidence of contact. Its presence suggests contacts around 3,000 to 4,000 years ago (Balme et al. 2018). A date of c.3,500 BP was a critical time for dog movements in the Australasian region and parallels can be drawn with Lapita colonisation (with dogs) in the Western Pacific linking Australia to Melanesian maritime expansions at this time (Rowland 1987, 2018).

Genetic and morphological markers are other, less tangible, indicators. Thus far, they present a rather ambiguous picture of both the pre-and post-8,000 year period in Australia. Some studies indicate contact while other data suggest long-term isolation (Rowland 2018). Importantly, Malaspina et al. (2016:212) found that Papuans and early Australians separated genetically around 35,000 years ago, suggesting mutual isolation within what was then a single landmass. The study also found evidence for a continuous, modest gene flow, mostly unidirectional from Papuans to Australian First Nations and apparently geographically restricted to northeast Australia. Additional studies from the Queensland coast and offshore islands designed to recover ancient genomes from archaeological contexts will undoubtedly be more helpful in improving our understanding of the extent of Holocene contacts (Wasef et al. 2021).

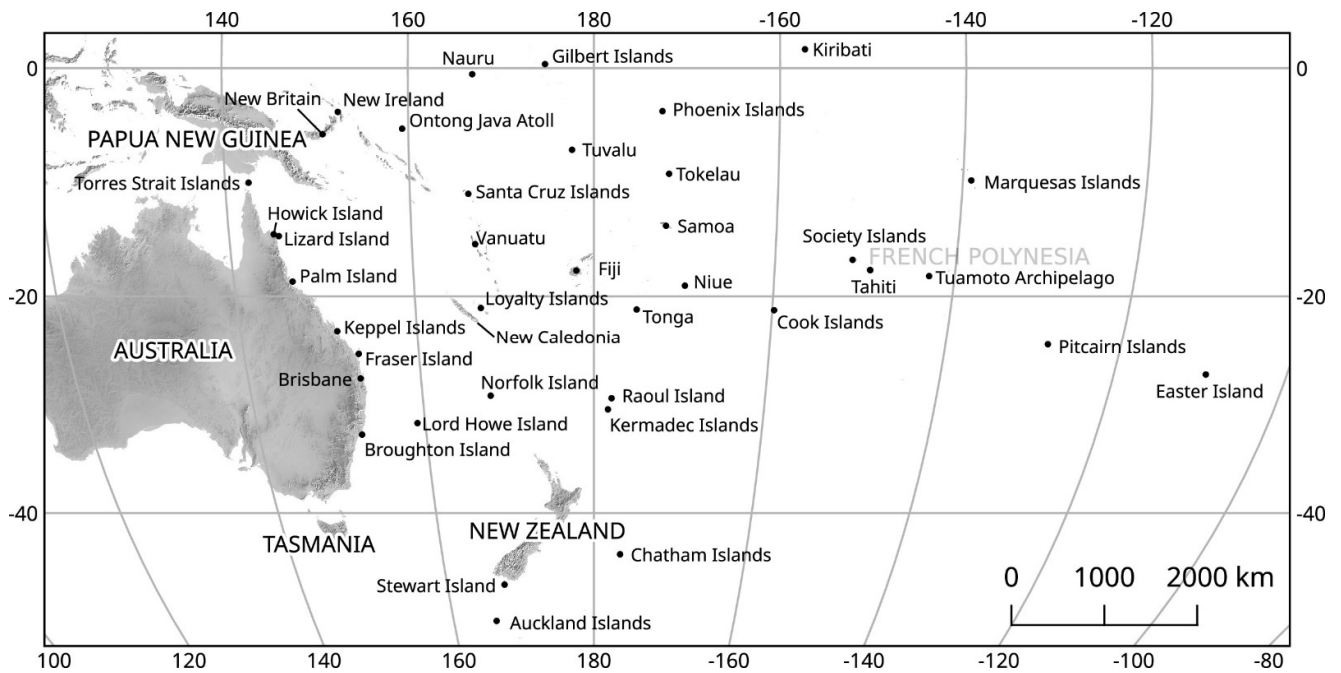


Figure 1. Pacific Basin, including islands mentioned in the paper.

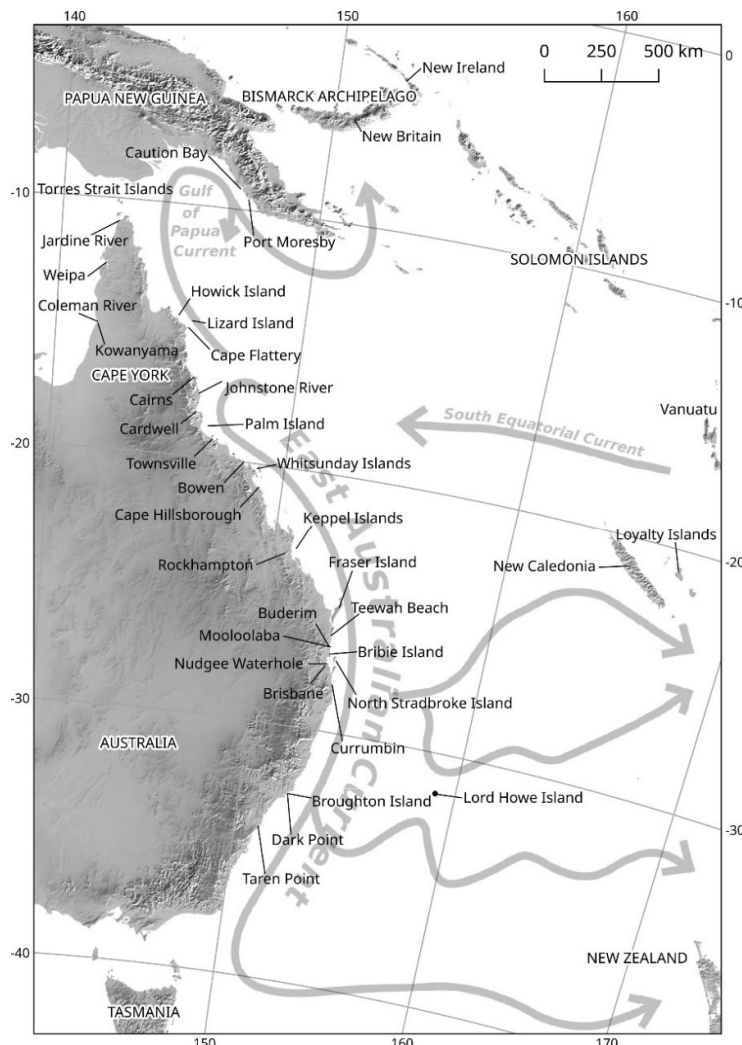


Figure 2. Australian east coast, showing places mentioned in the paper and major ocean currents.

Linguistic evidence for external contact is similarly equivocal. As expected, loanwords from Macassan contact are sprinkled around the northern coast of Australia (e.g. Evans 2008). Contact is also apparent in the languages of Eastern and Western Torres Strait. There are examples of Torres Strait cultural traits named and shared with Austronesian languages (Rowland 2018). The Pama-Nyungan language certainly appears to have spread southward from the Gulf of Carpentaria as part of a cultural package of new ideas and technologies 5,700 years ago (Bouckaert et al. 2018), but whether this 'package' ultimately derived from external contacts is unclear.

Another factor cited as proof for or against culture contact is the apparent absence or presence of horticultural/agriculture practices in Australia. There is increasing evidence for a gradient of manipulation of plants through Torres Strait, and some Australian plant exploitation practices, including forms of cultivation (for a recent review see Silcock 2018). Nascent horticultural practices may have developed in northern Australia and experimentation may have occurred before the Torres Strait was formed, or subsequently through maritime interactions across the Arafura Sea and Torres Strait (Denham et al. 2009). Denham et al. (2009) suggest we consider the possibility that the banana, yam and taro may have been grown in Australia at least 8,000 years ago while it was still joined to New Guinea. It is conjectured that geographical proximity suggests Island Southeast Asia, New Guinea and Australia, rather than being isolated from one another, developed long and dynamic histories of interaction that enabled the transfer of animals, plants and ideas. However, archaeological evidence for this exchange remains elusive (Denham 2018; McNiven 2022; Rowland 2018) though recent research indicates low-intensity forms of plant management on Mabuyag Island, Torres Strait from at least 2,000 years ago (Williams et al. 2020).

Methods of Contact: Migration and Diffusion

'Contact' can mean the direct import of persons and things (migration) or the gradual adoption of ideas and technologies (diffusion). Although migration and diffusion are essential for understanding the broad worldwide sweep of human history they are forces rarely discussed by contemporary Australian archaeologists (Bellwood 2013:113), even though the extent and direction of external contact following initial colonisation of Australia has been debated since European arrival. Divergent views remain today. McCarthy (1940:314, see also 1953, 1970, 1974) considered Australian cultures to be 'indissolubly bound up with that of Oceania'. Other researchers (e.g. Blust 2009:9; Irwin 1992:100; Keegan and Diamond 1987:72-73; Lilley 2019; Rowland 1987, 1995) have thought it paradoxical that people moved so widely throughout the Southeast Asian region and into the Pacific; yet these movements are considered to have had little or no impact on Australia. Nevertheless, as mentioned, Late Holocene changes in use of coastal resources appear to reflect an external introduction (O'Connor and Chappell 2003; Rowland 1986, 2018). Thus, the impact of external influences on Australia cannot be ignored. The challenge for archaeologists today lies in identifying such influences without relying on anachronistic diffusionist theories (McNiven 1993). This is an important consideration, as Australia's earliest research into contact (and in fact, our

earliest ethnographic studies) were unfortunately focused on documenting diffusion of so-called higher cultural traits of 'advanced' Papuans onto their 'primitive' Australian neighbours across Torres Strait (e.g. McCarthy 1940, 1970).

It is now established that ideas and material culture items moved between groups in Australia in reciprocal arrangements and interchanges rather than through one-sided derivation and adoption (McNiven 2006:103). Like all other human societies, Australia's Indigenous communities are demonstratively dynamic rather than static. They continually accept, reject, modify and invent. They do not exhibit regular isolation and stasis. Thus, the study of local invention/innovation and diffusion/migration must play complementary roles in explaining change (Rowland 1995:15).

Unlike migration, diffusion acknowledges there is sufficient natural human movement to enable circulation of goods, ideas and genes, even if numbers involved are quite small. Testing for diffusion is difficult. Researchers generally look for similarities in cultures between two areas and assume this is evidence that movement has occurred. The hypothesis is then 'tested' by compiling an additional list of similarities, even though the theory itself is not 'tested.' Rather, additional evidence of the same kind is simply added in support (Rouse 1986; for a recent review of concepts see Burmeister 2000).

The problem of determining diffusion is further complicated by evidence of invention/innovation within an archaeological sequence usually being attributed to internal development, simply by default (Rowland 1995:8-9). Innovations that did enter Australia may have spread quite easily and rapidly throughout the continent via exchange systems. Ideas and objects could have been passed from one neighbouring group (with little obvious on ground movement) to another as part of reciprocal gift giving before and after a range of intergroup gatherings (Rowland 2018).

Potential for Contact

Another consideration in this debate is whether it was possible for Pacific cultures to reach Australia. Certainly ocean currents and climate conditions within this region enhance potentials for both accidental watercraft drift and/or purposeful navigation. The major large-scale hydrodynamic features of the Great Barrier Reef (GBR) are initiated by the westward flowing South Equatorial Current (SEC), which intersects the GBR and then divides into the northward flowing Hiri Current and the stronger southward flowing East Australian Current (EAC) (Brinkman et al. 2001). The EAC is the dominant southerly current drawing oceanic water from the low latitude tropical regions of the Pacific Ocean through the region of the Solomon Islands, Vanuatu and New Caledonia. It separates from the continental margin to flow northeast and eastward into the Tasman Sea (Brinkman et al. 2001; Burrage et al. 1996; Choukroun et al. 2010; Ridgway and Dunn 2003; Ridgway and Godfrey 1997). The southward extension of the EAC reaches as far as Tasmania (Luick et al. 2007; Ridgway and Godfrey 1997; Schiller et al. 2008:357; 2015). The impact of these currents is seen in the occurrence of tropical fauna and flora in southern Australian waters at normally temperate latitudes (Poloczanska et al. 2007:409). Further evidence of directional flow can be seen in the pumice rafts which drift on to the New South Wales and Queensland coasts from the Pacific, moving north and south following the

EAC (Bryan et al. 2012; Velasquez et al. 2018; Ward and Little 2000). The nature of Pacific sailing may also have been affected by changing wind climates (Goodwin et al. 2014), but our knowledge of these changes and their impact is at this point limited. Possibly impacting both site preservation and seafaring were palaeotsunamis (Courtney et al. 2012). There is some evidence that both Australian First Nations and Māori peoples knew of such events (Bryant et al. 2007), though some researchers refute their occurrence (Hutchinson and Attenbrow 2009).

It is worth considering whether the cultures of the Pacific and Australia were aware of each other through ‘flotsam and jetsam’ they encountered on their shores, and whether such drift items impacted local material culture or technologies. Boyd (1999) argued that the arrangement of oceanic currents makes it highly unlikely artefacts from the region of Papua New Guinea could be washed up by oceanic currents onto the eastern Australian coast. Rather, he claimed the nearest non-Australian source for drift material found on the east coast would be the islands of the Solomon Islands, Vanuatu and New Caledonia. On the other hand, Rozefelds et al. (2015) propose that the southerly drift of botanical disseminules, and items such as Indigenous canoes and plastic bottles, are facilitated in floating from New Guinea to northeastern Queensland, in part, by the Gulf of Papua Current and/or seasonal southwesterly directed winds from October through to March.

Simulations and Drift Canoes

Some indication that accidental drift or planned voyaging from several locations within the Pacific Basin on to the east coast of Australia could have occurred might be inferred from historical sources. McNiven (2015b:196), for example, reports the case of a Torres Strait canoe picked up by an English sailing ship on an eastern route to China some 320 km east of Torres Strait. Also, the captain and crew of the *Saint-Paul* which struck a reef in the Louisiade Archipelago off New Guinea in September 1858 sailed in an open boat across the Coral Sea to Cape Flattery in northeast Cape York a journey of 1,200 km in just 12 days (Anderson 2009; Macklin 2019).

Since the 1970s, ‘re-enacted’ voyages have expanded our appreciation for the capacity of early watercraft. In 1970, the raft *La Balsa* reached Mooloolaba on the Queensland coast after sailing from Ecuador after 161 days and around 14,000 km (Bruce 1970). Since the *Kon-Tiki* raft sailed from the Peruvian coast to Rarōia in the Tuamotu Archipelago, seven more rafts voyaged westward from the coast of Peru. Six reached Polynesia (two going on to Australia) and one to the Galapagos (Levison et al. 1973:46). A number of simulation studies from East Polynesia demonstrated the high probability of reaching Australia (Levison et al. 1973:60) whilst other modelling simulations indicate that Australia to New Zealand had a reasonable probability of occurrence (8% and 11%) (Montenegro et al. 2006:1323).

Drift canoes found along the length of the east coast of Australia have been useful in determining the possible extent and direction of contact, though they are likely to be of recent date. The Queensland Museum has records of dugout canoes washed onto the Queensland coast from Currumbin in the south to Cooktown in the north (Table 1).

The Queensland Department of Aboriginal and Torres Strait Islander Partnerships has the following records: an outrigger portion of canoe, partly buried in sand dunes along the beach front at Seisia camping ground on the tip of Cape York Peninsula (recorded in 1984, site designation CW:A26); a dug-out canoe 5 m long, located on a beach between Cowal Creek and the Jardine River (recorded in 1984, CW:26); and a large dug-out canoe with constructed sides of thick plank joined with wooden ribs, on a beach just south of the previous find (recorded in 1987, CW:A37). Although wrecked, the presence of twine and bamboo suggest it was of recent date. A fourth drift canoe (recorded in 1987, ER:A15) is a dug-out initially noticed at Ingram Island 12 km northwest of Howick, located on a sand cay on Howick Island; its side partly decorated and lashing marks imply the use of one outrigger (Boyd 1999:96; Dr Stephen Nichols, pers. comm., 2019). A weathered canoe over 3 m in length made from a bloodwood tree has also been located on Palm Island (Hatte and Manbarra Nangarra Wangarra Aboriginal Corporation 2009:41).

On North Keppel Island, a 10 foot (3 m) by two-foot-wide (60 cm) dugout was located and photographed by Rutherford (1937). Lumholtz (1889:315) recorded in 1889 that his host, while hunting at Torilla, had only a small sailing boat, which had been given to him by some French Communists who had escaped confinement in New Caledonia and landed on his premises. Another dugout canoe was reported at Teewah beach near Tewantin (*Nambour Chronicle and North Coast Advertiser* 26 November 1926:3). It was believed this canoe was either thrown from a passing steamer or else drifted in from the islands of the Pacific. A canoe from Currumbin Beach was described as ‘about 10ft [3 m] in length and 2ft 6in [76 cm] wide, with a depth of about 2ft [60 cm], was covered with barnacles, and one end had decayed away, giving the impression that it was very old, and that it must have drifted a great distance’ (*The Brisbane Courier* 15 February 1928:7). On Fraser Island, a dugout canoe was found at Lake Boomanjin. It was determined to have been made by a forestry worker in the 1950s, but six other dugouts have also been located on Fraser Island. They have not yet been studied in detail (Marsterson 1997:10).

Similar drift canoes have been found on the New South Wales coast. A wooden dug-out canoe discovered on a mainland beach in the Solitary Islands Marine Park in early 1999 is argued to have originated in Vanuatu (Boyd 1999:97). Dugout canoes from Taren Point, Botany Bay, Richmond and Cattai National Park were considered non-Indigenous in origin but have not been further studied (Nutley and Smith 2004).

It likely that all the canoes mentioned above are of relatively recent (nineteen and twentieth century) origin. Nevertheless, it would be worth undertaking a broad comparative study to determine the species of trees and possible age of the canoes and compare them with Melanesian and Polynesian canoe types.

Conduits for Contact

There are potentially four regions from which contact with eastern Australia might have occurred: Papua New Guinea/Torres Strait; island Melanesia; Polynesia; and two temperate islands mid-way between Polynesia, Melanesia and Australia: Norfolk and Lord Howe. We examine each in turn.

Table 1. Dugout canoes from Boyd (1999) and Dr Brit Asmussen (Queensland Museum, pers. comm., 2019).

Queensland Museum Registration Number/Reference	Location	Description
E4018	Lizard Island	A carved Kanak door jamb with carved human face and geometric decoration found in 1945. Thought to be of New Caledonian origin.
E2168	North Stradbroke Island	A canoe baler recorded as being 'brought by ocean currents from New Caledonia (?)'
QE12602	Kowanyama	Dug-out canoe, outrigger missing on beach near Kowanyama.
QE12670	Weipa	Dugout canoe missing outrigger.
Boyd (1999:96)	Bowen	After a cyclone 1955.
Boyd (1999:96)	Currumbin Beach	1927
Boyd (1999:96)	Noah's Beach, Cape Tribulation	1994
Boyd (1999:96)	Hummock Beach, north of Starke River, Cape York Peninsula	1991
Boyd (1999:96)	Cape Flattery	1989
Boyd (1999:96)	Cape Hillsborough	1989
Boyd (1999:96)	Fraser Island	1979 to 1995

Papua New Guinea/Torres Strait

The Torres Strait island archipelago with 250 islands and 750 coral reefs stretching for 150 km between Australia and New Guinea was a significant point of contact during the Holocene (McNiven 2015a, 2017, 2022; Rowland 1987, 1995, 2018). A well-linked trade network between Australia and New Guinea through the Torres Strait Islands existed by the time of European contact (Lawrence 1994). Such trade networks had the potential to spread ideas and items down the Queensland coast.

It is now generally accepted that the concept of outrigger canoes spread from Melanesia into northeast Australia (e.g. Rowland 1987, 1995, 2018). It is also clear that outriggers travelled far down the Queensland coast. Indeed, on linguistic grounds, Wood (2018) has argued that the single outrigger design of southeast Cape York Peninsula may derive specifically from the Massim area of the Papuan Tip, while the double outrigger design of northern Cape York Peninsula and Torres Strait were a form derived from Island Southeast Asia via the south coast of west New Guinea.

Rowland (1986, 1987, 1995) and McNiven (2015b) reviewed the extent of canoe use down the Queensland coast. They determined that outrigger canoes were sighted as far south as the Whitsunday Islands and Cape Hillsborough (Figure 3) (see Rowland 1986, 1987 for discussion and references). It is possible that outriggers were distributed even further south in the past, but this is difficult to confirm (Rowland 1986, 1987).

The extent of canoe penetration from Papua New Guinea into Australia is obviously a related and crucial issue since canoes could have introduced other items of material culture. The antiquity and extent of such penetration can only be speculated at present (Rowland 1995). Maritime technologies cited by Rowland (1987:42-43) as indicating possible southwards transfers via Torres Strait include harpoons with detachable heads (found as far south as the Keppel Islands), fishhooks and the stone drills used in their manufacture,

stone-built fishtraps, and the hourglass technique of knotless netting. Barham (2000:233) noted that several other items of Queensland material culture and technology show affinities with southern Papua and wider Island Melanesia: cooking ovens, shell scrapers, stone and coral files, spear points and fishhooks. However, detailed comparative studies have yet to be undertaken.

Torres Strait Islanders controlled – and were selective over – which items entered and passed through their islands from further north. For example, the pig may not have reached Australia from New Guinea because islanders did not want pigs destroying their gardens (see McNiven 2008, 2022 for a fuller discussion). In a recent review, McNiven (2017), argues that Torres Strait Islander history, over thousands of years, reveals a series of significant transformative impacts. In each case, Torres Strait was incorporated into 'ancient globalizations': c.4,000 years ago (with Australia), c.3,300 years ago (with Melanesian New Guinea), and c.500 years ago (with Southeast Asia). How far ripples of these transformations echoed into Australia has yet to be fully understood. Further enquiry is important and legitimate, but new enquiry must consider what concepts or items might also have moved north from Australia into Torres Strait.

Nevertheless, the late and nearly contemporaneous appearance of outrigger canoes, fishhooks and other fishing technology in Australia, and the fact that these items had such a limited distribution within Cape York, across the northern coastline, and down the east coast, implies diffusion is a worthy candidate for consideration in explaining their origins. Such diffusion may not have required any significant population movement, yet could have occurred almost instantaneously. The great trading systems and networks of local exchange combined with frequent gatherings of groups for ceremonies and other purposes provide a simple mechanism whereby new ideas could have spread throughout Australia. The concept of fish hooks and other items could then have been adapted and modified dependent on materials available, types of fish targeted and types of coastal environ-



Figure 3. Painting of outrigger canoe at Cape Hillsborough in 1843 by Edwin Augustus Porcher (Pictorial Collection, Australian National Library - R5073) (see Rowland 1986 for discussion).

ments. Furthermore, items might be accepted or rejected in various areas depending on the importance of fishing in particular communities and the nature of their socio-economic systems. Much of the above discussion is hypothetical and does not negate the possibility that in some areas, local invention of fishhooks and other items did occur. Further archaeological research needs to be undertaken along the east coast of Australia to test the various scenarios.

Island Melanesia

Seafaring Capacity

On the basis of the reduced distance of ocean crossings possible during the Last Glacial Maximum sea-level stand, and the presence of a hypothesised substantial island between New Caledonia and the east coast of Australia, Gibbons and Clunie (1986) made a claim for purposeful Pleistocene voyaging between the Queensland coast and New Caledonia. Today, the -150 m drop they proposed for the LGM low stand is no longer accepted. At the currently-accepted low stand of -120 m to -130 m, a water crossing of at least 400 km would have been required to reach Australia rather than the mere 180 km proposed by Gibbons and Clunie (O'Connor 2010:46). Archaeological sites on the offshore islands of the Bismarck Archipelago at the northeast periphery of Greater Australia indicate that transportation and/or exchange of West New Britain obsidian over distances greater than 350 km occurred during the late Pleistocene (Fredericksen 1997). This allows us to imagine spheres of interaction that may have extended as far as the east coast of Australia. Indeed, Lilley (2019:108) has suggested it is not far-fetched to suggest that developments in Sheppard's (2015) Solomon Sea Interaction Sphere led people to follow turtles west to the coast of Queensland. It can be noted that the Solomon Sea was visited from at least 3,000 years ago by long distance voyagers (Sheppard et al. 2015).

Purported Melanesian Cultural Traits in Northern Queensland

During the earlier half of the twentieth century, there were several exponents of pre-European Melanesian-Queensland contact. For instance, Wagner (1937) postulated a New Caledonian genetic signature within Queensland Indigenous cultures. Hamlyn-Harris (1917:31-32) similarly argued cultural items from the Cairns and Johnstone River areas might have originated with populations from the southeast of New Guinea, arriving with the assistance of trade winds and ocean currents. McCarthy (1940:302) believed Papuan-Melanesian cultural traits could be discerned in the Cairns-Cardwell-Atherton district. He listed the area's bark cloth and wooden beaters, large axe blades, large bossed shields, long flattened sword clubs, and the shape of the rigid baskets. McCarthy concluded there was no evidence for trading canoes or migrants penetrating so far south from Melanesia, and that it was only possible at the time to state the similarities. He thought a plausible explanation was that trade led a colonising group of Papuans from Torres Strait, or elsewhere, to settle on this part of the coast. Unfortunately, McCarthy's caveat that we can only document apparent similarities remains true to this day. No detailed comparative analysis has been undertaken of the cultural items McCarthy discussed.

Purported Melanesian Physical Attributes in Tasmania

Several early observers have gone a step further, proposing a link between New Caledonia and early Tasmania. This seems to have originated in 1792, when the French expedition searching for La Perouse noted differences between the appearance and language of the Tasmanians and the appearance and language of other mainland Australians. Subsequently, they visited New Caledonia, and speculated that hair and skin pigmentation of Tasmanians was more akin

to that of New Caledonians. In this way, theories arose concerning New Caledonian-Tasmanian connections (Mulvaney 1958:138).

Later, Thomas Huxley (1870; see also Pulleline 1929; MacIntosh 1949) argued that Tasmanians migrated from New Caledonia over a land bridge which had subsequently been submerged beneath the Pacific (Mulvaney 1958:299, 1966:301), whilst Wood Jones (1935:11) proposed Tasmanian people journeyed to their homeland by a long canoe voyage, either from New Caledonia or some other island, across the south Pacific and the Tasman Sea. Critiquing Woods' work, Crowther (1937:230-231) considered the southern Pacific and Tasman seas were unfavourable for canoes of the Melanesian type. He argued that unless there had existed a continuous series of islands, since submerged, no long ocean canoe voyage such as postulated by Wood Jones could have been possible. Instead, he proposed that people reached Tasmania by a slow migration from Melanesia or other Pacific islands, southward along the Australian coast and finally by canoe across Bass Strait.

All these scenarios were soundly dismissed by Davidson (1937), yet the New Caledonian-Tasmanian equation spawned the 'trihybrid theory,' which dominated Australian anthropology well into the 1960s. From fieldwork over 1938–1939, Joseph Birdsell and Norman Tindale concluded that Indigenous 'pygmy' peoples of the Cairns rainforest were genetically distinct from most Australian First Nations, and closely related to Tasmanians. They placed the origins of this 'race' in southeast Asian 'negrito' populations (Birdsell 1949; Tindale 1937-1941; Tindale and Birdsell 1941-1943). There is no longer evidence supporting a 'pygmy' population as defined by Tindale (Westaway and Hiscock 2005) and detailed critiques of the trihybrid origins of Australian First Nations have been provided (Grounds and Ross 2010; McNiven and Russell 2005).

Today, any direct connection between Tasmania and New Caledonia is considered fanciful (Blench 2008). It is currently accepted by archaeologists that Tasmania was settled as part of the mainland continent of Sahul as early as 40,000 years ago and was subsequently cut off from the mainland by the flooding of Bass Strait 14,000 years ago. This isolation is considered sufficient to explain Tasmanians' cultural and genetic distinctiveness (Hiscock 2008).

Melanesian Pottery and Fish Hooks on the Queensland coast?

The Queensland coastline is extensive (c.7,000 km of mainland and c.6,000 km of island coastline). Limited archaeological research has been undertaken along its length. Significantly, however, where detailed archaeological research has been undertaken, namely on Lizard Island, the Whitsunday Islands and the Keppel Group, researchers have all concluded that there was likely some contact with areas to the north or with areas of the Pacific Basin. Research within a contact framework has only just begun and much further work is required. Melanesian impacts on the Queensland coast might only fall within the last 3,500 years though 'trickle down' impacts through Torres Strait and Cape York might be older.

The Lizard Island group off the north Queensland coast may be considered as positioned within an area of potential

contact from Torres Strait or the Coral Sea. Following recent pottery finds in Torres Strait dating back to c.2,500 years ago (McNiven et al. 2006) and Lapita pottery at Caution Bay dating c.2,600–2,900 years ago (David et al. 2011; McNiven et al. 2011) on the south coast of mainland Papua New Guinea, McNiven et al. (2011:5; see also Clark and Bedford 2008; Bedford 2012:12) have claimed that 'the presence of pottery-bearing Melanesian peoples on Australia's doorstep allows hypotheses for Melanesian cultural influences down the Australian east coast over the past 3000 years'. This hypothesised southward extension would be best justified by the discovery of ceramic sherds of possible Melanesian origin in the intertidal zone at Lizard Island (Dickinson 2006; Felgate 2007; Felgate et al. 2013; Lentfer et al. 2013; Tochilin et al. 2012). More recently, Ulm and McNiven (2021) have reported the recovery of 'dozens' of pottery sherds in excavations at South Island in the Lizard Island Group dating to between 2,000 and 3,000 years ago. Further details of these finds is yet to be published. In related research, Fitzpatrick et al. (2018) demonstrated through a comparative stylistic analysis of stone arrangements constructed on the Lizard Island Group that while most are predominately of local stylistic construction, some arrangements exhibit cultural influences from neighbouring areas such as Torres Strait and the southwest Pacific. At this point, caution is still required over such results, as it is known that the islands were visited by multicultural fishing crews, mainly Melanesian peoples from the southwest Pacific, during the colonial period (Waterson et al. 2013).

For the Whitsunday Islands, Barker (2004:148) indicates that maritime/coastal inter-regional exchange and interaction may have placed these islands on the periphery of wider dynamic systems with links to northeastern Cape York Peninsula, Torres Strait and Melanesia from about 3,000 BP. The use in the Whitsunday Islands of a range of material culture items characteristic of northern coastal peoples, such as outrigger canoes, turtle-shell fishhooks and broad-bladed and decorated canoe paddles, demonstrates these northern coastal links. Rowland (1982; for a recent summary see Rowland et al. 2015) has long argued that external contact may have occurred as far south as the Keppel Islands based on the presence of fishhooks and other cultural items.

'Melanesian' Adze Finds on the East Coast

Occasionally, artefacts of possible Pacific origin appear in Australian collections. Some have been recovered in recent decades from the Bribie Island and Sunshine Coast regions of southeast Queensland. These are adzes, used primarily for wood-working. It is probable these examples derive from indentured South Sea Islander labourers employed in sugar cane fields in the mid to late nineteenth century who came from Solomon Islands, Vanuatu and New Caledonia (Michael Strong, pers. comm., 2019) (Figure 4).

Two other adzes have an Australian connection, one with a First Nations person, the other from its find spot in a local shell midden. A third adze was found in proximity to a land fill, although in natural bushland. Another two polished basalt adzes have been reported from near Buderim but have not been physically examined. The second-mentioned adze was found in a large shell midden adjacent to a major historical campsite at Bongaree on Bribie Island. It was examined by Dr Mark Moore at the University of New England in 2014. He

found that its closest morphology was to lenticular and rectangular adzes made in the Langda area in West Papua. Cane worker origins cannot be attributed to this specific item, as it is extremely unlikely that an adze from the highlands of West Papua came into the possession of ‘black-birded’ Melanesians and then made its way into a local midden. Another adze of probable Pacific origin was donated to the Abbey Museum (Caboolture) in 2013, originally collected from a First Nations man. This specimen is similar in shape to the previously-mentioned adze, but smaller and composed of polished black basalt.

Polynesia

Navigational Capacity

The next arena of navigation worth exploring is that of Polynesian groups. Their proficiency at seafaring has long been recognised. Austronesians spread very rapidly throughout the Pacific and across the Indian Ocean, from Indonesia to Madagascar, a distance of greater than 6,000 km (Blench 2010; Fitzpatrick and Callaghan 2008). From bases on the Western Pacific rim, groups of voyagers were able to successfully cross open ocean distances of at least 2,300 km in the northwest Pacific Ocean (Hung et al. 2011) and at least 900 km into the southwest Pacific (Denham et al. 2012; Nunn 2007) to colonise unoccupied islands. Compelling evidence has accrued from the southwest Pacific that pioneer groups which initially sailed southeast against the wind subsequently returned downwind (Burley 2013; Irwin 2008; Nunn and Carson 2015).

There is now sound evidence that both planned and drift voyages occurred over very long distances (Best 1918; Finney 1977, 1995). Polynesian migration expanded beyond the Polynesian Triangle of Hawai’i, New Zealand and Easter Island. It reached Polynesian outliers in Melanesia, extremely remote specks in the temperate Pacific (Pitcairn and Norfolk), and even the subantarctic Auckland Islands, 350 km south of Stewart Island (Anderson 2005). Māori narratives suggest familiarity with sea ice, icebergs and bull-kelp fully 1000 km south of New Zealand (Wehi et al. in press).

Impressively, after initial settlement, long-distance interisland voyaging apparently continued (Johns et al. 2014). Obsidian artefacts from New Zealand have been found on both the Chatham and Kermadec Islands, indicating ‘two-way’ journeys approaching over 1600 km (Leach et al. 1986). Pacific rat mtDNA analysed by Matisoo-Smith et al. (1998) suggests that multiple contacts occurred between east Polynesia, New Zealand and Hawai’i, despite these archipelagos lying 1,000–5,900 km apart. Geochemical analysis of exotic stone artifacts from a well-dated archaeological site in the Cook Islands, matching artefacts to their geological sources, verified the existence of a geographical voyaging network beyond the Cook Islands to the Austral, Samoa and Marquesas archipelagos – up to 2,400 km (Weisler et al. 2016). Thus, Polynesians certainly had the capacity to repeatedly span distances far greater than the expanse between their islands and Australia.



Adze 1



Adze 2



Adze 3

Figure 4. Adze 1: Small basalt adze (Q03668) donated to the Abbey Museum of Art and Archaeology by Mrs Jan Heitske in 2013. The adze was given to her by a friend, Joan Francis, whose great uncle, William (‘Billy’) McPherson (c.1860s) used to run cattle on Bribie Island. The adze was given to him by an Aboriginal man (Photograph: © Abbey Museum). Adze 2: Polished basalt adze found in 1940 by Ron Mullen near the former site of a large historical Aboriginal camp on Bribie Island (Photograph: Michael Strong, Turnstone Archaeology). Adze 3: Polished basalt adze found at Sandstone Point. It possibly may have come to Moreton Bay via Maori sailors on early whaling ships and perhaps exchanged with the Aboriginal people of Bribie Island or the nearby mainland (Photograph: Michael Strong, Turnstone Archaeology).

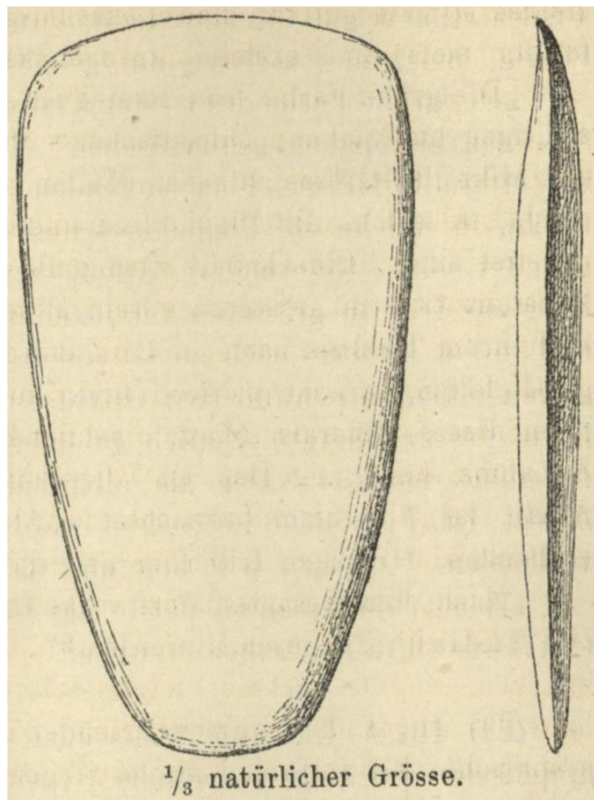


Figure 5. Whitsunday Island polished axe 21.5 cm long, 11.6 cm-wide and 1.5 cm-thick. It was identified as an ‘extremely fine-grained olivine diabase’ (Virchow 1884:590).

Polynesian Adze Finds

An adze assessed by Michael Strong is different from the other two mentioned above. It is a large highly polished adze, squarish in section. It is thought to have come from New Zealand. One possible conduit for this item could be Māori sailors – the crew of whaling ships in Moreton Bay (Michael Strong, pers. comm., 2019), although nineteenth century Māori whalers did not generally bring or make traditional artefacts during their work as they had sufficient access to Western tools. The Anthropology Museum, University of Queensland holds an adze blade (Reg No 8240) from Nudgee Waterhole, Brisbane that may be of Pacific origin, but no details are provided on its context (Jane Willcock, pers. comm., 2019).

Other Purported Polynesian Influences

Polynesian expansion was late and certainly rapid and extensive. Thus, if it had an impact on Australia, it would have been limited in time. It has been proposed that the New Zealand Māori knew of Australia (Pearce and Pearce 2011), but the issue is complex and the evidence tenuous at best (Tent and Geraghty 2012). A suggestion that Māori knew of *Taniwha* or crocodile has been dismissed (Maddock 1988).

Another ‘possible influence’ relates to dogs. The cranial morphology of a dog skeleton excavated from Pakapuka (Wale), in the Northern Cook Islands, suggested to Shigehara et al. (1993) evidence of racial or economic contact between Australia and Polynesia in late prehistory. However,

similarities between the Pakapuka dog and Australian dogs has since been dismissed by Clark (1998).

Evidence of tattooing amongst Australian First Nations could provide another possible link with the Pacific Basin, as tattooing was widely practiced in the latter region. Tattooing as commonly understood was not practiced in Australia, but body scarification and painting were widespread (Gorman 2000; Haebich 2008). Early observers assumed a relationship must have existed between tattooing and scarification, to the point that they used the two terms interchangeably. ‘Tattooing’ is still used in this fashion by some researchers (e.g. Arnold 2015:13 describes the body markings on three people at Botany Bay in a drawing by R. Cleveley of the First Fleet as ‘tattooing’). Although the two practices differ significantly, some studies have shown there is overlap in the process involved (Gorman 2000:68, 95, Figure 3.7, 2008:97; Plomley 1992:39).

Norfolk and Lord Howe Island: Cultural Crossroads

Norfolk Island sits 1397 km east of Byron Bay (New South Wales). This places it at the crossroads between Australia, Polynesia (New Zealand being 1000 km from Norfolk Island) and Melanesia (New Caledonia being 934 km from Norfolk Island). The presence of exotic plants such as bananas, the Polynesian rat (*Rattus exulans*), and Polynesian artefacts found scattered across various areas of the coast and inland alerted Norfolk’s European discoverers to the prehistoric presence of a Polynesian population (Anderson and White 2001; Hoare 1988; Specht 1978, 1993). That community was extinct by the time the island was discovered (1774 CE), but excavations and surveys by the Norfolk Island Prehistory Project (1995–1999) confirmed that it thrived for over two centuries (1200–1400 CE), attaining a population at its zenith of several hundred inhabitants. The community also persisted in a much-reduced form (perhaps as visits associated with fishing trips) until 1600 CE or later (Anderson and White 2001:138-139).

Norfolk Island’s lithic remains indicate that throughout its history, the island community was fairly isolated. However, the bulk of obsidian lithic material at the main and earliest site (Emily Bay) derived from the Kermadec Islands and also one piece from New Zealand (Turner et al. 2001). During the 1790s, various Polynesian cultivates and perishable items of Tongan and Māori design – canoe fragments, a wooden image, portion of a fly whisk – were found around the island, suggesting sporadic Polynesian visits continued until shortly before European settlement, or perhaps during the period between discovery (1774 CE) and settlement (1790s CE; see Anderson and White 2001:6).

Thus, it appears the Polynesian Norfolk Islanders had enough time (200–400 years), resources, population numbers and geographical knowledge to journey to Australia. The Kermadecs, where Norfolk Islanders sourced their obsidian, lie virtually the same distance as required to reach the nearest Australian coast. It is also clear that such voyages could be conducted even with minimal sailing craft. In 1853, eight Norfolk Island convicts stole a tiny whaleboat and sailed the entire distance to Stradbroke Island, Queensland (Thomson 1967:277).

Nevertheless, convincing proof of contact between Norfolk Island and Australia remains elusive. ‘An Australian style blade’ (Hoare 1998:13) was discovered on the island and

petrological studies indicate it was an Australian ground stone axe from the Nepean River near Sydney. This might indicate it was a curio collected in Australia, perhaps part of the cargo of the *Sirus* wreck of 1790 (McBryde and Watchman 1993). Another possibility is that it arrived with an Eora convict such as Bush Musquito or Bulldog. Both these men were incarcerated on Norfolk during the 1790s–1810s (Donohue 1986:13, 74).

Better evidence of contact with Norfolk comes from New South Wales. A quadrangular basalt adze collected at Dark Point in 1928 was at the time described as of undoubted Polynesian origin (Thorpe 1929:123). Later, it was thought to be of local origin (McCarthy 1953:256). More recently, White et al. (2014:135) compared it with a wide range of Pacific basalts, including those from New Zealand, Australia, the Bismarck Archipelago, East Polynesia and Norfolk Island. They concluded it was made from Norfolk Island basalt and that ‘it is not inconceivable that a canoe equipped with Polynesian material culture arrived either at Dark Point or Broughton Island.’ They also note that one-piece shell fish hooks began to be made along the New South Wales coast some 800–900 years ago (coinciding with the Polynesian settlement of Norfolk Island). They consider the simplest explanation is a Polynesian stimulus for appearance of these fish hooks. However, the best that can be said is that ‘No-one knows, but it remains an intriguing possibility’ (Flannery 1994:174). More recently, based on an increase in the fire regime on Broughton Island at ~600 years ago, together with evidence of the stone adze at Dark Point, Mooney et al. (2020), speculate there may be a link with Polynesian settlement on Norfolk Island which occurred at this time. However, they accept that much further research would be required to confirm this.

In examining Norfolk Island assemblages, Anderson and White (2001:140) conclude there are ‘some intriguing historical matters that are worth pursuing’. One issue is whether any of the possible East Polynesian adzes that have been found on the east coast of Australia have a Norfolk Island origin. The implications of obsidian transfer to Norfolk Island also invite further consideration through sourcing studies in the region around Norfolk Island, notably New Zealand, New Caledonia and southern Vanuatu.

Anderson and White (2001:139) consider a number of possibilities to account for Norfolk’s rapid decline, including sailing north to New Caledonia or Vanuatu. Their evidence for this is that a Māori word is used in Vanuatu for the only domestic animal there (*kuri* = dog). Another option Anderson and White propose is that the islanders sailed west to Australia, following the tradition of their ancestors in sailing west. Earthquake and tsunami activity in the 1400s might have triggered an abandonment of Norfolk Island (Bryant et al. 2007; Goff and McFadgen 2003).

Curiously, if such voyagers did travel west, they missed, or had minimal interest, in the only other island worth settling: Lord Howe, a mere 742 km east of Brisbane. It lies halfway between Norfolk and Australia. Although the island is highly visible, habitable, and difficult to bypass in most sea journeys between Norfolk and Australia, no evidence has yet emerged for pre-European occupation. It has been suggested that this anomaly may be due to the obliteration of Lord Howe’s coastal regions during the same tsunami that impacted Norfolk Island (Abbott 2003). Despite extensive excavations

(Anderson 2003; Owens 2008) no Polynesian artefacts have been located on the island. The Lord Howe Museum has never received Polynesian stone artefacts or the signature Polynesian Rat (Ian Hatton, pers. comm., 2021).

Some researchers claimed coconut groves existed on Lord Howe Island at the time of its discovery (Owens 2008:59), but this was likely another palm species, as the island lies hundreds of kilometres south of the limit at which the tree can grow (Ian Hutton, pers. comm., 2021). The abrupt and unexplained Holocene extinction of the island’s once prolific meiolaniids (horned turtle) species, may have occurred relatively recently (White et al. 2010; Hawkins et al. 2016). Elsewhere in the western Pacific, meiolanid extinction is linked to long-distance turtle-hunting expeditions by Lapita seafarers c.1000–300 BCE. However, the consensus is that Lord Howe extinctions probably occurred long before people entered island Melanesia (Ian Hutton, pers. comm., 2021).

Discussion

The impressive seafaring feats of Pacific Islanders led many researchers to assert that they would have visited Australia. However, despite this being proposed for over a century (e.g. Thorpe 1929:194; Tylor 1878:202), evidence remains inconclusive or minimal.

Various scenarios have been proposed to explain this anomaly. Keegan and Diamond (1987:72–73) thought it likely that Polynesians reached Australia but were either killed on arrival, prevented from settling, or assimilated. By contrast, Irwin (1992:100, 2008; see also Avis et al. 2007; Lilley 2019), who pioneered comprehensive simulation studies of Pacific navigation, argued that evidence either already exists or simply awaits discovery. Irwin believed Polynesians probably reached the continental limits of their island world (i.e. Australia and the New World) many times, accidentally or otherwise. Irwin claimed some Pacific artefacts had already been found on Australia’s northeastern coast, though he provides no details on their archaeological context (Irwin 1992:100). He also claimed Lapita culture had such a conspicuous material culture, that evidence will eventually be found, perhaps in areas of the northern coast on Great Barrier Reef islands (Irwin 1992:145). Recent simulation studies using a more accurate range of data seem to support Irwin’s surmise, indicating that navigation in the Coral and Solomon Seas was not only possible but likely, with links with Lizard Island highly probable (Dousset and Di Pazza, 2021).

Another reason for ‘limited evidence’ may be the very late spread of both Melanesians and Austronesian peoples throughout the Pacific, meaning their artefacts may be too recent to be readily discerned amidst post-European Polynesian materials in collections or archaeological strata. With the exception of the Solomon Islands, human presence in island Melanesia mostly dates within the last 4,000 years. The full extent of the Polynesian Triangle was only colonised in the last 1,000 years (Carson 2018). The largest source of potential seafarers close to Australia were Māori. New Zealand archaeological and linguistic evidence indicate New Zealand was only colonised 800 to 1000 years ago from islands to the north and northeast, with ‘Classic’ Māori culture not emerging until c.1500 CE (Hurles et al. 2003). Thus, contact between New Zealand and Australia may only have been possible in fairly recent centuries.

Another part of the problem of 'limited evidence' may lie in accurately locating purported Pacific artefacts within Australian collections, and fully assessing their origin or context. Surprisingly, very little investigation of this type has been conducted. For example, Irwin notes there are certainly references to foreign stone axes in early literature (e.g. Kennedy 1949; Virchow 1884), but if these items are still in collections, they have yet to be afforded modern scientific investigation. One item from Whitsunday Island was purportedly a large polished axe 21.5 cm-long, 11.6 cm-wide and 1.5 cm-thick (Figure 5). It was identified as an 'extremely fine-grained olivine diabase' (Virchow 1884:590). Attempts to locate this item in a German museum have so far been unsuccessful. From Virchow's description it appears to be an alkali basalt (phenocrysts of olivine with augite and plagioclase microphenocryst/groundmass phases). This is not a particularly diagnostic rock type (Scott Bryan, pers. comm., 2019). Ceramic sherds of possible Melanesian origin have been found on Lizard Island but, their origin has yet to be fully investigated (Felgate 2007; Ulm and McNiven 2021). Based on sand temper analysis it has been suggested the ceramics were locally produced.

Another issue blurring assessment of artefacts is the fact that escapee New Caledonian and Polynesian convicts, Polynesian whaling crews, and Polynesian castaways are known to have lived in the Queensland 'bush' since the 1820s (Clive Moore, pers. comm., 6 May 2019). At least a few of these individuals may have manufactured tools according to their accustomed technologies. More certain is the fact that the thousands of indentured Vanuatu and Solomon Island cane-workers who laboured around Queensland are known to have occasionally brought traditional adzes and other tools and weapons with them from their home islands during the 1860s–1880s (Dixon 1928). Thus Melanesian finds in Australia are not necessarily ancient.

Conclusion: Strategies for Future Research

Based on indications of potential external contacts, we might wish to develop a research strategy for the future concerning Pacific-Australia contacts. As William Halse Rivers (1926:161) long ago noted, such a strategy would be premised on the view that it is difficult to imagine 'a mass of land so vast as Australia should have been untouched by peoples who reached Easter Island, New Zealand and Madagascar.' For Rivers:

The history of Australian culture becomes far easier to understand if there has been a gradual infiltration of small bodies of seafaring peoples at many points on the coast, not merely on the more accessible western and northern shores, but all along the eastern and even the southern coasts (Rivers 1926:162).

Australian archaeologists are now open to such views. Lilley (2019:110) asserts that we can no longer assume Australia and the Pacific were entirely separate realms in the past. He suggests the Austronesian-Lapita phenomenon displays an internal dynamic strong enough to potentially link it to the Australian mainland. However, currently evidence of contact remains insufficient. If anything, as highlighted above, genetic evidence currently suggests minimal contact. We must also note that any such contact was unlikely to be a one-way process.

A key aspect of any future research strategy should include more detailed archaeological investigations along the entire east coast of Australia. Studies of museum collections containing items of apparent foreign origin need also to be undertaken, although the majority of these might belong to the contact period. This would involve detailed analysis and sourcing of existing archaeological and museum finds (i.e. raw materials exotic to a region).

An analysis of oral histories may also be revealing. For example, Fox (1899:8) noted that the Mamburra tribe of St Lawrence record that a very long time ago before the Mamburra tribe had any marriage or other ceremonies, Coorooma the good spirit came in a large outrigger canoe from a long way across the saltwater or sea (Coolorra). He was said to have stayed with them a short time and taught them many things.

Finally, as McNiven (1993:28) has noted, there are four conditions that archaeologists should consider in establishing evidence of information flow (diffusion) into a region. First, a cultural trait must be a new addition into the region, be of local manufacture, and exhibit no evidence of an in situ developmental history (though later modifications might occur). Second, an external origin for a trait must be found. The closer the potential source area to the study (adopter) region, the more plausible the diffusion hypothesis. Third, a diffused trait must exist in the potential source area immediately prior to its uptake in the study (adopter) region. Finally, some form of social linkage between a diffusion source and potential trait adopter should be identified to provide a mechanism and processual baseline for inferences concerning the transfer of information.

While the evidence for external contact across northern Australia is indisputable (McNiven 2017; Rowland 2018), evidence for contact between eastern Australia and the Pacific Basin remains minimal. This is surprising. There are over 20,000 islands in the Pacific Basin and an east Australian coastline in excess of 15,000 km. If this lack of contact is a true reflection of reality, then more research needs to be undertaken to investigate why Melanesian and Polynesian seafarers who undertook voyages over great distances in the Pacific did not reach Australia. An alternative scenario is that small scale contacts were made but the evidence was rapidly absorbed into established populations. Herein lies a future challenge for archaeologists, physical anthropologists and linguists to focus research.

It is equally possible that the inconclusive evidence for contact simply reflects a lack of sufficient research along the east coast of Australia on this specific problem. While archaeological research that focuses on external contact has increased in recent years we agree with McNiven (2006) that a younger generation of archaeologists has shown less interest in this area of study.

Archaeologists and others should continue to determine which innovations reached Australia from external sources and were incorporated into local societies. Equally, enquiry should continue into why many of the adaptations and inventions in areas in the Pacific Basin and to the north of Australia did not reach Australia. It will remain of interest to know why some of the innovations made in New Guinea did not reach Australia through Torres Strait with a pathway of many intervening islands over a distance of only 150 km (Rowland 2018). Such enquiry is important and legitimate,

but the old diffusionary views that innovations moved from an advanced area to a backward area must be rigorously avoided. New enquiry must also consider what concepts or items might have moved north and possibly west from Australia.

Archaeological research has so far contributed little to defining areas of culture contact yet may do so by establishing chronological controls on possible introduced items. It is possible that contact occurred over such a long time period and at irregular intervals that it will remain difficult to define a chronological sequence. This is especially true if contact originated from various points at different time periods and extended at different rates and directions across Australia. Much evidence, in the form of perishable items of material culture, would be unlikely to survive over long periods of time. Indeed, most of the present evidence for culture contact is based on observations of material culture in use throughout the period of European contact. This makes it difficult to separate traditional cultural items from those influenced by possible contact (Rowland 1995).

One certainty is that about 3,500 years ago, outrigger and dug-out canoes were introduced into northern Australia. This enabled a greater use of the sea and offshore islands and empowered the development of groups of marine specialists with a broad-spectrum fishing technology probably introduced with the canoes (Rowland 1995, 2018). This seems more than coincidentally related to the expansion of people in the Pacific at around the same period.

The potential of the east coast to reveal evidence of contact was recognised by Irwin (1992) among others, but the extent of archaeological investigations into this possibility has been extremely limited. Recent investigations on the Lizard Island Group, the Whitsunday Islands and Keppel Islands are offering hints of such contact but much further work has yet to be undertaken.

In sum, there remains in our view a connection between worldwide environmental changes at around 3,500 years ago (Rowland 1983), expansion of Austronesian-speaking people into the Pacific (Rowland 1980, 1987, 1995) and transformations that began to occur in Australian societies at this time. First Nations Australians encountered other peoples through Torres Strait and possibly from the Pacific Basin. This does not deny these societies their own internal dynamics. It simply shifts the focus from the population in isolation to one that was part of a larger universe of ideas and impacts. This makes the dynamics of such societies even more interesting as they accepted, rejected or modified ideas (Rowland 1995, 2018). Limited archaeological research has to date been undertaken along the extensive east coast of Australia to resolve these issues but future work offers exciting prospects.

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