Journal of Pacific Archaeology – Vol. 7 · No. 1 · 2016

– ARTICLE –

The Massim Region of Papua New Guinea – A review and proposed chronology

Ben Shaw[1]

ABSTRACT

The Massim region is an anthropologically defined cultural area that encompasses the eastern tip of the New Guinea mainland and the adjacent offshore islands. The cultural identities and social organisation of the Massim inhabitants have been the focus of international attention amongst anthropologists since the beginning of colonial pacification in the mid-late 19th Century. Archaeologically, however, the Massim islands have not been as well represented. To clarify the place of the Massim islands in Pacific Island prehistory, this paper consolidates and reviews the archaeological work that has been undertaken in the region. By doing so, a revised chronology for the Massim is put forth, as well as several interpretive themes aimed at facilitating further archaeological research in the region.

Keywords: Massim, Milne Bay, Papua New Guinea, Rossel Island, Austronesian-Papuan

INTRODUCTION

The Massim region is an anthropologically defined cultural area that encompasses the eastern tip of the New Guinea mainland and the adjacent offshore islands. It includes the entire political province of Milne Bay, as well as parts of the Central and Oro provinces of Papua New Guinea (Figure 1). The islands in the Massim region can be further divided geographically into northern and southern counterparts. The cultural identities and social organisation of the Massim inhabitants have been the focus of international attention amongst anthropologists since the beginning of colonial pacification in the mid-late 19th Century. Archaeologically, however, the Massim islands have not been as well represented. In 1991, Geoff Irwin published a short review of the South Coast prehistoric sequence, and in doing so he expanded the narrative to include a regional integration of the Massim region. At this time, the Massim was more or less viewed as a cultural extension of the Papuan South Coast, and to a certain extent the region is still viewed this way. This perspective has generally been adopted out of necessity since it was not until the late-1990s when the details of a systematic archaeological excavation on a Massim island (Woodlark) were first made available (Bickler, 1998).

Over two decades have now passed since Irwin's review. It was considered timely to reconsider the archaeological data from the Massim region for two reasons. The first is that an archaeological record has now begun to develop for the islands of the Massim. The second is that the cultural sequence for the South Coast has been more refined in recent years, with the Caution Bay project greatly expanding on the work of earlier pioneering researchers (David *et al.*, 2012; McNiven *et al.*, 2011; Summerhayes and Allen, 2007). To clarify the place of the Massim islands in Pacific Island prehistory, this paper consolidates and reviews the archaeological work that has been undertaken in the region, and proposes a more detailed chronological sequence. The major themes which have been prominent in archaeological research concerning prehistoric cultural development in the Massim are identified, revised, and where necessary, expanded. These emerging trends in Massim archaeology can then be investigated as a series of testable hypotheses, both independently of, and complementary to, the more substantive suite of archaeological data from the Papuan South Coast and other neighbouring regions.

MASSIM – A BRIEF BACKGROUND TO A CULTURALLY DEFINED REGION

Defining the Massim as a distinctive cultural area is by no means a new concept, nor is it a novel approach to understanding regional patterns of socio-economic development (Chowning, 1977, 1978; Leach and Leach, 1983). It is, however, a western social construct and so there is no equivalent use of the term amongst the local inhabitants. It appears that the term 'Massim' was first used to define the island inhabitants of Eastern New Guinea by Italian Catholic priest, Father Carlo Salerio, who resided on Woodlark

1 School of Archaeology and Anthropology, College of Arts and Social Science, Australian National University, Canberra, ACT 0200, Australia

Corresponding author: ben.shaw@unsw.edu.au

Submitted 27/8/15, accepted 28/10/15

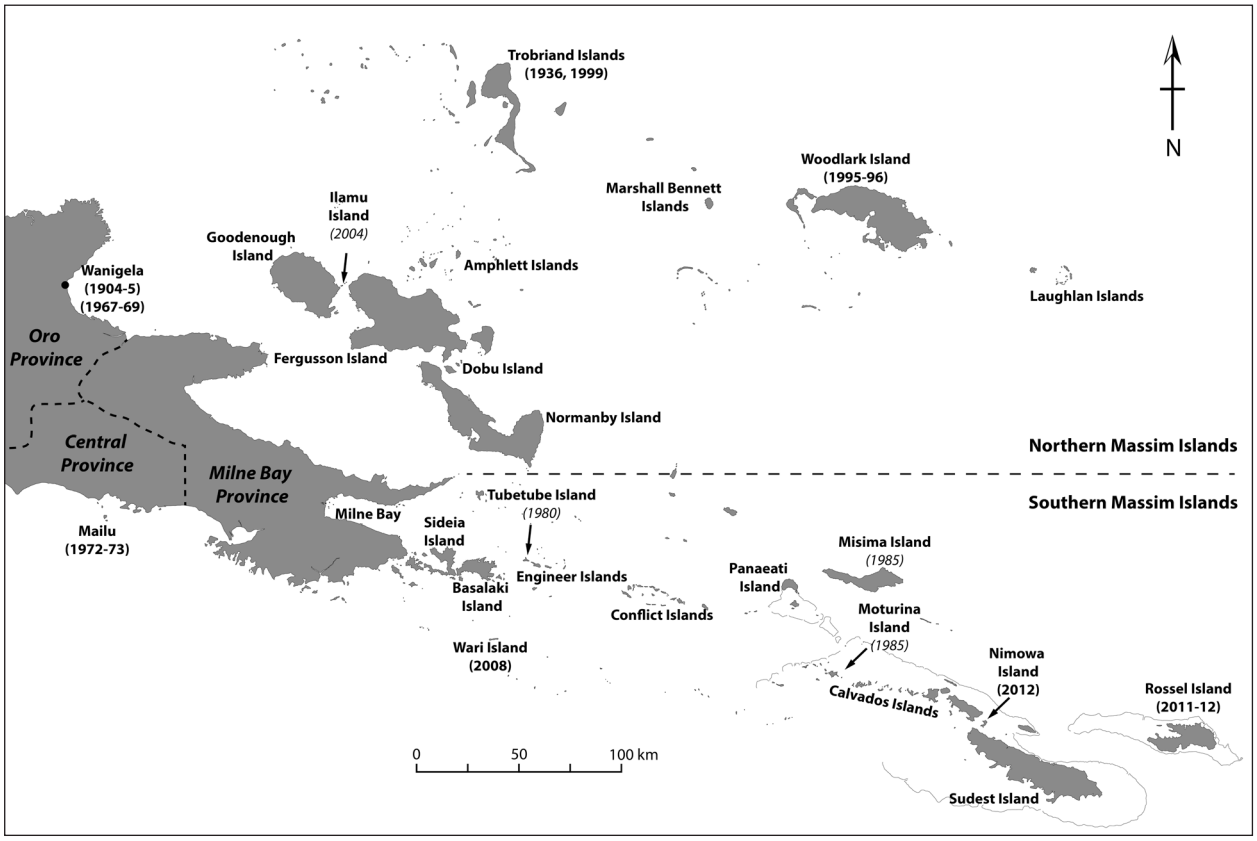

Figure 1: Map of the Massim region. Dates shown for periods of archaeological excavation undertaken at specific locations. The reef outlines are shown by a thin line. Bolded dates = published, italicised = unpublished, no details available.

Island from 1852–1855 (Salerio *et al.*, 1983; Wiltgen, 2008). The influential anthropologist Alfred Haddon later applied the term at the end of the 19th Century to collectively describe apparent similarities between populations in the islands off the eastern end of the New Guinea mainland (Haddon, 1894, 1900), and subsequently so did Charles Seligmann (1906). It was not until the early 20th Century that the Massim as a cultural region was placed in the anthropological limelight following Bronislaw Malinowski's (1922) widely cited account of the *Kula* exchange network in the Trobriand Islands. From the 1920s onwards the term 'Massim' has been used with increasing frequency in anthropological and historical texts as a reference to cultural groups in the eastern islands of New Guinea (Battaglia, 1990; Berde, 1974; Fortune, 1932; Jenness and Ballantyne, 1920; Leach, 1983; Lepowsky, 1981; Macintyre, 1983; Powell, 1957; Riesenfeld, 1950; Weiner, 1976; Young, 1971).

THE MASSIM ISLANDS AND THEIR PLACE IN PACIFIC PREHISTORY

The island of New Guinea has a diverse range of landscapes and an equally diverse range of cultural groups that inhabit them. Such marked diversity is a result of a prehistory with great time depth, which currently extends back some 50,000 years. The Massim occupies an important position in New Guinea, both physically and culturally, as it connects the northern and southern coasts of the mainland. The Massim islands can therefore be explored both as microcosms of regional cultural development, as well as providing broader insights into New Guinea prehistory. Yet, the Massim has often been overlooked or otherwise only vaguely mentioned in general discussions of Pacific prehistory since a coherent prehistoric sequence has not yet been presented for the region as a whole (See for example: Kirch, 2000). A set of emerging trends have instead been outlined in an attempt to produce a broad heuristic understanding of Massim cultural development and change in the absence of a detailed sequence (Ambrose *et al.*, 2012; Irwin, 1983, 1991; Macintyre and Allen, 1990; Negishi, 2008).

ARCHAEOLOGICAL EXCAVATIONS IN THE MASSIM (1904–2015)

In this section, all known archaeological work in the Massim is outlined (Summarised in Table 1). For the purpose of clarity, only excavations are considered in any detail, with some input from significant surface collected assemblages. Figure 1 indicates where each of these excavations

Table 1. *Archaeological excavations undertaken in the Massim region*

Site	Investigator	Year	Reference
Wanigela (Collingwood Bay)	Charles Monckton	1904	Monckton (1905, 1922)
	Rudolf Pöch	1905	Pöch (1907a, 1907b)
Trobriand Islands	Leo Austen/Francis E. Williams	1936	Austen (1939)
Wanigela (Collingwood Bay)	Brian Egloff	1967–69	Egloff (1971, 1979)
Mailu Island	Geoff Irwin	1972–73	Irwin (1977, 1985)
Tubetube/Moturina Island/Misima	Geoff Irwin	1980–85	Unpublished
Woodlark Island	Simon Bickler	1995–96	Bickler (1998)
Trobriand Islands	Göran Burenhult and students	1999	Burenhult (2002)
Ilamu Island, Goodenough	Vincent Kewibu	2004	Unpublished
Wari Island	Yo Negishi	2008	Negishi & Ono (2009)
Rossel Island	Ben Shaw	2011–2012	Shaw (2014);
Nimowa Island		2012	Shaw & Dickinson (Submitted)

was undertaken. The brief review of this work highlights the major findings and will subsequently allow a revised chronology for the region to be considered.

Charles Monckton/Rudolf Pöch, Wanigela 1904–5

It has now been 112 years since Resident Magistrate Charles Monckton, in 1904, first collected and documented material culture from an excavation in Papua New Guinea, at the Wanigela site in the Massim region (Monckton, 1905). Several mounds along a low lying strip of coastal land were levelled to form a level foundation on which to build a mission station. The details of the excavations are vague, and the extent to which any recovered material culture was recorded is unknown. Indeed, Monckton states that the excavation itself was carried out by the mission and the local inhabitants. However, it is known that substantial cultural deposits, including human skeletal remains, were encountered to a depth of four feet with several pot sherds and two engraved shells illustrated in Monckton's government report and later book (Monckton, 1905, 1922).

The following year, excavations at Wanigela were systematically continued by Austrian anthropologist Rudolf Pöch who took great interest in the work by Monckton and sought to shed further light on the antiquity of the mounds (Pöch, 1907a, 1907b). From Pöch's excavation, only a limited amount of information was able to be deduced about the prehistoric occupants of the region as the stratigraphic records and much of the material were lost in subsequent years (Allen, 1972). The excavation also occurred well before the development of radiocarbon dating so the absolute age of the site could not be established. Regardless of these difficulties, the recovered pottery was determined by Pöch as prehistoric in origin, and was considered superior in construction and design to the pottery made by the modern inhabitants.

The discovery of an earlier and relatively well made pottery tradition was argued to imply that an ancient and, in some respects, technically more advanced culture had once existed in the region (Seligmann and Joyce, 1907; Stefanson, 1908). Interestingly, pottery with triangular and rectangular cut-out motifs found throughout the Wanigela area (Figure 2), that had no ethnographically known equivalent, was suggested to have had links with Jomon pottery in Japan (Joyce, 1912), the Mediterranean (Monckton, 1922), and with Bronze Age Dong-son from Mainland Asia (Golson, 1972; Heine-Geldern, 1937). Such broad cultural connections are no longer supported by archaeological data in the Massim, but these proposed links highlight the lack of comparative data archaeologists had to draw upon across the island of New Guinea at this time.

Material culture studies of the early 20th Century

In the half century following Pöch's excavation very little archaeology was undertaken in the Massim, or indeed in Papua New Guinea generally. Despite a paucity of archaeological excavation, prolonged interest from the end of the 19th Century in the stone tool industries (Malinowski, 1934; Seligmann, 1912; Seligmann and Strong, 1906; Seligmann and Joyce, 1907), pottery industries (Haddon, 1894; Lyons, 1922; Tindale and Bartlett, 1937), petroglyphs (Williams, 1931), canoe design (Chowning, 1960; Whitehouse, 1922), tattoo traditions (Barton, 1918; Lauer, 1975) and other material culture (Austin, 1945; Barton, 1918; Seligmann, 1909, 1916; Tueting, 1935) of the Massim had led to the publication of numerous accounts on their morphology and distribution in the region.

Of particular relevance here were the material culture finds of pottery, obsidian and stone artefacts in the Massim reported by Seligmann & Joyce (1907). A dentate stamped pottery sherd collected by Monckton from the Wanigela area was illustrated, about which little is known. A similarly decorated dentate sherd has since been col-

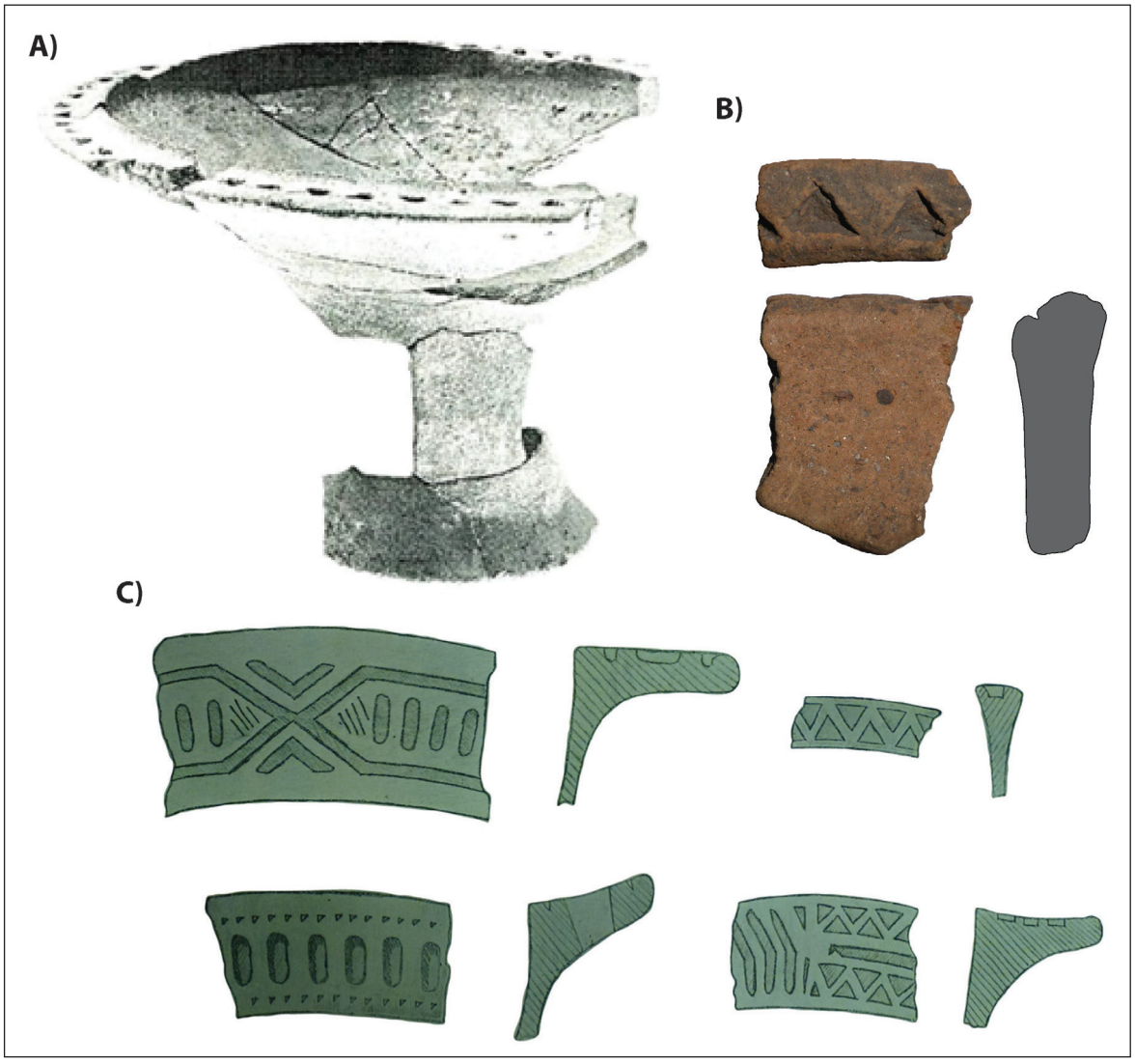

Figure 2. Unique pottery in the Massim region. A) Pedestalled vessel with triangular cut-outs, surface collected by Brian Egloff in 1967 from Wanigela, Collingwood Bay, Oro Province. B) Surface collected rim sherd with triangular cut-outs by Geoff Irwin from Moturina Island, Calvados Chain. C) Pencil drawings of various pottery collected and drawn by Resident Magistrate C. A. Monckton in 1904. Adapted from Egloff (1979) and Monckton (1905).

lected from the surface on Tubetube Island in the southern Massim; now in the Papua New Guinea National Museum and Art Gallery. Both sherds are shown in Figure 3. The dentate sherd from Tubetube is red slipped, but its age and cultural associations are currently unknown. Similarities with dentate stamped Lapita pottery and the absence of the sherds in excavated Massim assemblages suggest that they are likely of some antiquity. A flaked obsidian stemmed blade, or spear point, was also reported to have been recovered by a miner on Misima Island at a depth of 4 m while digging a shaft (Figure 4a). Although these are undated finds, stemmed obsidian tools are known from excavations in New Britain dating from at least 6000 BP through to 3000 BP, and thus are argued to be Mid-Holocene tools (Torrence *et al.*, 2013).

Further unique material cultural finds include several tanged stone tools collected by Malinowski in the Trobriand Islands. These are somewhat reminiscent of the stemmed obsidian tools and of tanged tools found in Late Pleistocene/Early Holocene New Guinea sites, but have so far not been recovered anywhere else in the Massim so little is known about them (Norick, 1976) (Figure 4b). A pestle has been reported by de Vis (1907) as coming from ~90 cm (3ft) under the ground within a dry riverbed in association with cultural material on Woodlark Island (Figure 4 c), with a mortar also recovered from Normanby (Duau) island (Figure 4d). As with the obsidian blades, pestles and mortars are known from excavation as predominantly early-mid Holocene artefacts, dating from 7500–3500 BP (Swadling, 2004). Pestles and mortars of varying morphol-

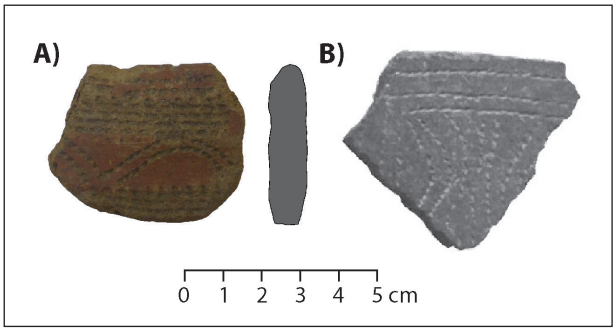

Figure 3. Dentate stamped pottery sherds found in the Massim. A) Surface collected sherd from site BQN, Tubetube Island, Southern Massim. B) Surface collected sherd found in the Wanigela area by C.A. Monckton in 1904. Adapted from Seligmann & Joyce (1907).

ogies have since been found on several Massim islands (Swadling, In press). Although the antiquity of these finds could not have been known by the original collectors, their potential antiquity has since become evident.

Leo Austen and Francis Williams, Trobriand Islands 1936

As with the material culture of the Massim, interest in the conspicuous megalithic structures on Woodlark and the Trobriand Islands since the turn of the 20th Century had led to prolonged speculation regarding their comparative function and age (Forth, 1965; Holdsworth and Ollier, 1973; Ollier and Holdsworth, 1968; Ollier and Pain, 1978; Ollier *et al.*, 1970, 1972, 1973; Riesenfeld, 1950; Seligmann, 1910; Williams, 1936b). In 1936, Patrol officer and anthropologist Leo Austen excavated four limestone megaliths on Kiriwina Island in the Trobriand group, with Government Anthropologist Francis Williams excavating a similar structure on Kitava Island (Austen, 1939a; Williams, 1936a). Williams photographed his survey and excavation of Kitava, with several of these photos illustrated in Young & Clark (2001).

Austen was able to determine that the stones were embedded in the ground to a depth of around one metre, with fragmented human bone, teeth and pottery recovered from excavations within three megalithic enclosures. He considered the presence of human remains within the confines of the structures as representing a prehistoric burial structure prior to cave burials becoming prominent in Trobriand society. The recovered pottery also seemingly had closer affiliation to the Collingwood Bay/Wanigela traditions on the New Guinea mainland than with those from the D'Entrecasteaux Islands, who today supply pottery to the Trobriands (May and Tuckson, 2000). Besides being used as a presumably privileged burial area, Austen (1939b) argued that the megalithic structures themselves were used to keep track of the constellations as they relate to the changing seasons and garden harvests. However, later surveying efforts by Holdsworth & Ollier (1973) led them to disregard this conclusion and suggest that they were built for funerary purposes only. Nonetheless, Austen's ideas were foundational to the thinking of later researchers in regard to the use of megalithic structures in

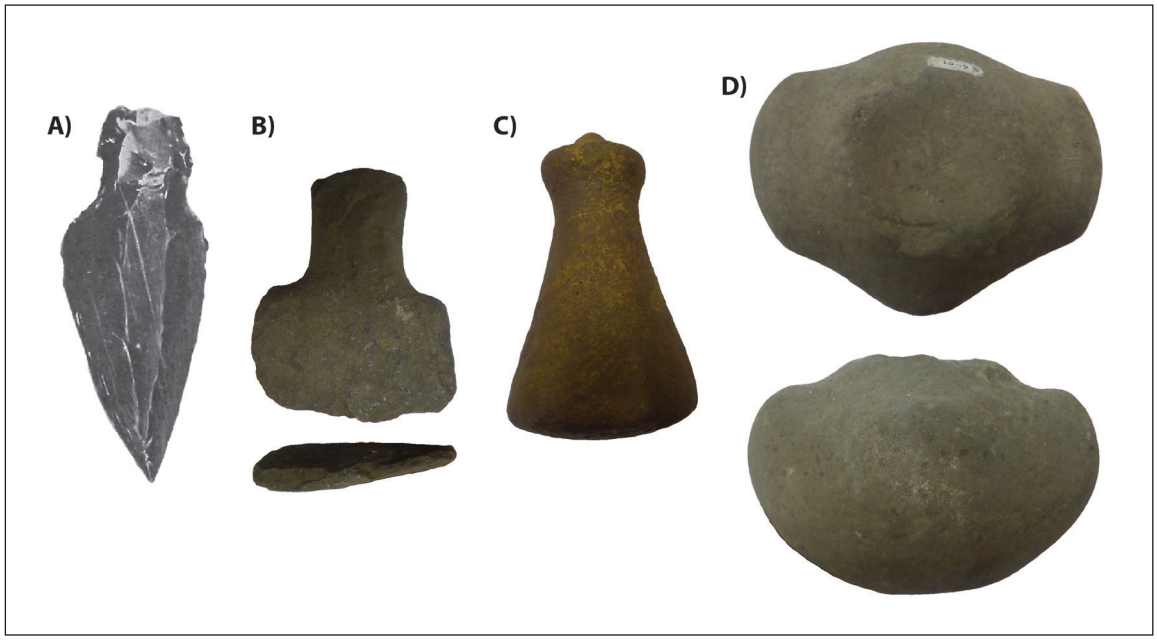

Figure 4. Potential early-mid Holocene artefacts found in the Massim region. A) Obsidian stemmed blade, Misima Island B) Stone tanged blade, Site BOI, Trobriand Islands. C) Stone pestle, Site BPP, Woodlark Island. D) Stone mortar, Site BNX, Sahulea Patrol Post, Duau Island. Stone tools not to scale.

Massim society.

Brian Egloff, Wanigela 1967

Despite Pöch and Austen's early efforts, it was not until the 1960s-70s that archaeological research in the Massim really progressed further. In part, this was a response to archaeological projects that were yielding results elsewhere in New Guinea. Attention therefore turned back to the Massim region where hints of a prehistoric culture were already known. Egloff (1971) was the first to take up this challenge when he returned to excavate Pöch's site at Wanigela in 1967. Although the site was situated on the mainland, the work was aimed at contributing towards the development of a regionally specific prehistoric sequence for the Massim islands. Three large mounds were excavated which yielded a deep stratified deposit containing large amounts of pottery and faunal remains. A chronology for human occupation from 1000–500 BP was established for the mounds, and thus also for the first time in the Massim.

It was evident that the excavated pottery was different within each of the stratigraphic layers, and also varied between the three mounds. Variation in the decoration and morphology of the pottery led Egloff to suggest that both chronological and sociological factors were influencing its production and distribution in the Wanigela area. It had become evident from similarities between the excavated Wanigela pottery and the surface collected pottery in the Trobriand Islands that the New Guinea mainland was once connected with the nearby islands in a relatively expansive exchange network; reaffirming and expanding on Austen's earlier proposition (Egloff, 1972, 1978). The Trobriands are comprised entirely of uplifted coral limestone so the local manufacture of pottery was not possible. Instead, pottery was imported to the island at this time from the mainland. The exchange network posited by Egloff (1971, 1978, 1979), and supported by prior petrographic analysis of pottery by Key (1968), was argued to have been an earlier configuration of the *Kula* exchange ring. A selection of pottery recovered by Egloff from Wanigela and the Trobriands is shown in Figure 5. Refer to Negishi (2008) for a detailed comparative description of pottery from the northern Massim.

More recently, the radiocarbon dating of four engraved *Conus* shell valuables has provided further support for the existence of this trade network connecting the northern Massim islands and the adjacent mainland (Ambrose *et al.*, 2012; Spriggs, 2013). The shells had elaborate decoration on their heavily modified surface, and remarkably many are still in circulation within the *Kula* exchange network. The valuables collectively dated to between 850–455 BP (2σ), indicating that they were manufactured during a time period that was contemporary with the occupation of the Wanigela mounds. The distribution and dating of the *Conus* valuables therefore strengthened the assertion that a large inter-island exchange network existed, stretching at least 500 km from Wanigela to the Budibudi Islands.

Peter Lauer, D'Entrecasteaux Islands, 1967–69

Lauer undertook an ethnohistoric study of the pottery traditions in the D'Entrecasteaux Islands, specifically of communities in the Amphlett group and on Goodenough (1970a, 1970b, 1970 c, 1971a, 1971b, 1973, 1974). Lauer documented the technology, style and function of the pottery, as well as the social organisation within the potting communities. The aim of the project was to develop a model regarding the social function of modern pottery which could be incorporated into archaeological studies of its prehistoric antecedents. His work on pottery manufacturing communities in the small and resource limited islands of the Amphlett group demonstrated that they largely produced pottery for trade, rather than for local use. In contrast, the neighbouring island of Goodenough produced pottery primarily for use in the local communities, with only limited external pottery trade. Through these trade connections, the Amphlett Islands had at some point in prehistory become a prominent node in the north-south movement of various goods, which was subsequently articulated as part of the *Kula* exchange network. An example of the pottery recovered by Lauer from Goodenough Island is also provided in Figure 5.

Geographic variables were found to be useful when explaining this divergent yet relatively localised pattern of cultural development. It was argued that the vulnerability of the Amphlett Islands to drought and food shortages led communities on these islands to develop a local commodity which could be traded for items that were not locally available during periods of famine. Irwin (1983) later hypothesised that the inter-relationship between resource availability and island location predisposed some islands, such as the Amphletts and the Trobriand Islands, to becoming centrally focused in regional exchange networks. Macintyre & Allen (1990) developed this view further by investigating the central position of the small but centrally located island of Tubetube in the southern Massim, which at least since colonial pacification was known to have manufactured pottery and controlled regional trade as part of the *Kune* exchange network. The continued focus on 'subsistence trading' has since proved an effective means of understanding spatial and temporal patterns in excavated archaeological data in the Massim.

Geoff Irwin, Mailu Island, 1972–73

Mailu has not typically been discussed as a Massim island since it lies on the periphery of the region. However, similarities in the pottery produced on Mailu in the last 2000 years, and certainly within the last 1000 years, indicates a close connection between the Massim and the southeast coast of the Papuan mainland (Irwin, 1977, 1978, 1985). Ir-

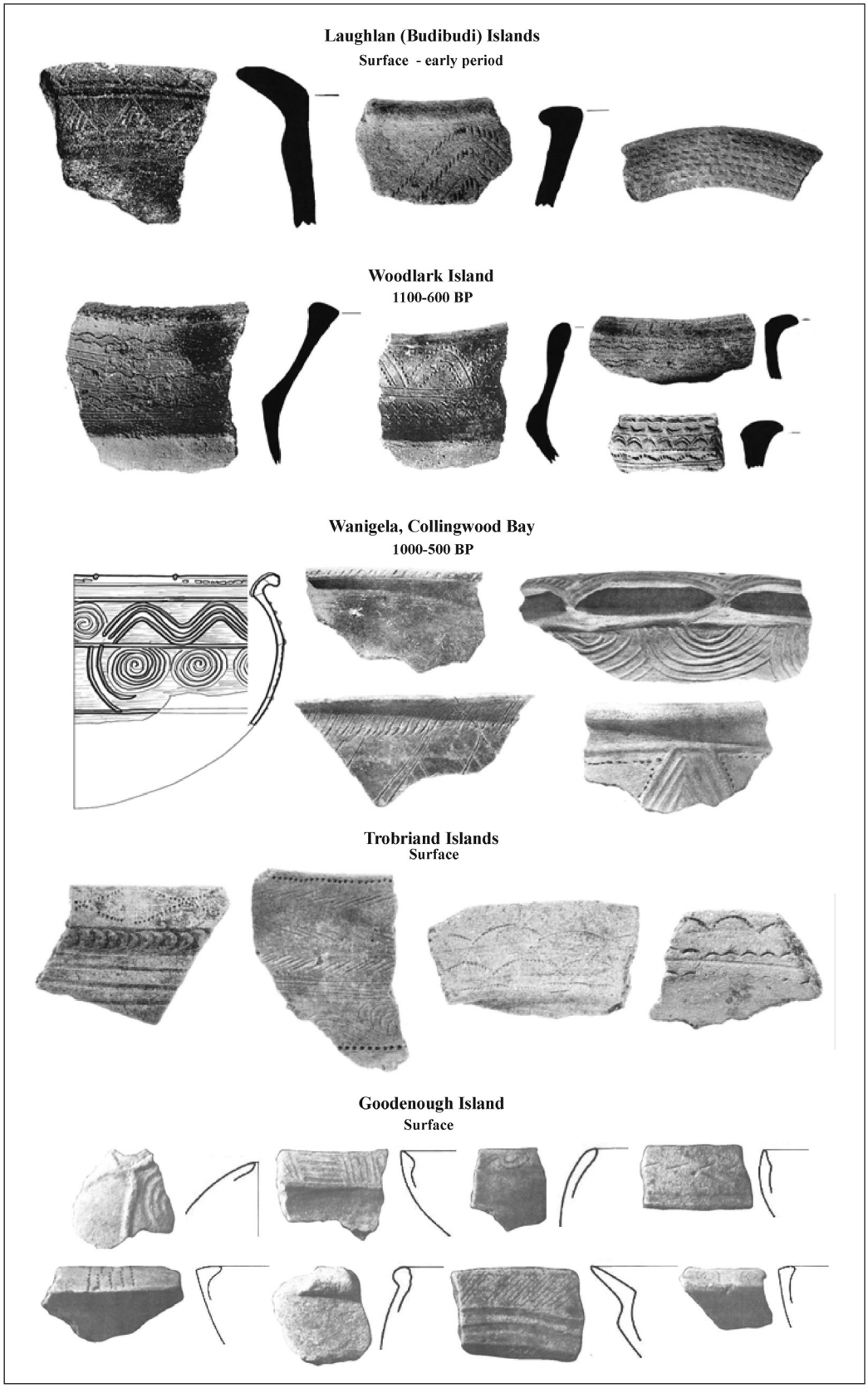

Figure 5: Pottery from the northern Massim. Dates for the pottery are indicated when known. Pottery from Budibudi and Woodlark Islands taken from Bickler (1998), Wanigela and Trobriand Islands from Egloff (1979), and Goodenough Island from Lauer (1970). Sherds not to scale.

win's foundational study investigated the development of Mailu as an entrepôt, or central trade port, and sought to identify the ecological, locational and political processes that led to the Mailu inhabitants adopting this specialised role. These seafaring people also exploited obsidian from Fergusson Island in relatively large quantities, thus Irwin argued that the Mailu Islanders and the inhabitants further to the east in the Massim were part of the same colonisation process, and were connected through trade to varying degrees since this time.

Geoff Irwin, Tubetube/Louisiade Archipelago, 1979–85

Archaeological fieldwork was subsequently undertaken in the southern Massim on Tubetube, Moturina and Misima between 1979–1985 (Geoff Irwin, pers. comm, 2014). Surface surveys were also undertaken at numerous site locations on Moturina, Panawina, Misima and Nimowa in the Louisiade Archipelago which produced large quantities of pottery to compare with the excavated assemblages. In the Massim Irwin had, among other research objectives, sought to test further the application of a 'subsistence trading' model in the southern islands. The findings of Irwin's excavations are still forthcoming, however, preliminary radiocarbon dating of the excavated sites on Tubetube indicate that they were occupied within the last 1000 years (Geoff Irwin, pers. comm, 2014) and are therefore broadly contemporary with occupation of the Wanigela mounds. Plans to publish further details of these excavations, and the implications for Massim prehistory are currently underway (Geoff Irwin, pers. comm, 2015). Figure 6 illustrates two pottery sherds collected by Irwin on Moturina Island that is representative of the pottery typically found in the southern Massim during these surveys.

Simon Bickler, Woodlark Island, 1995–6

The Woodlark archaeological project contributed to the understanding of cultural development in the northern Massim islands within the last 1200–1000 years[2]. Extensive site survey and excavation was undertaken across the eastern part of the island. The smaller islands of Budibudi, Gawa and Iwa were also surveyed, but with no sub-surface testing undertaken (Bickler, 1998). Woodlark had previously been subject to relatively intensive anthropological study (Damon, 1983, 1990), with an archaeological component aimed at providing temporal depth to the existing discourse for the development of *Kula* exchange. The prehistoric development of the renowned Suloga stone tool industry was also investigated (Bickler and Turner, 2002), and a preliminary typology of the Woodlark pottery was developed. However, only a small amount of the pottery came from excavation, with most sherds having been surface collected with no known chronological context. A selection of pottery sherds from Woodlark and the Laughlan Islands recovered during this project are illustrated in Figure 5.

The chronological sequence on Woodlark was therefore primarily focused on changes in the use of the stone structures and the associated burial traditions, as most of the dated excavations were undertaken on these megalithic complexes (Bickler, 1999, 2006; Bickler and Ivuyo, 2002). Based on eight excavated and dated stone structures as well as dated bone from cave burials, Bickler argued that the megalithic structures were initially used from 1200–600 BP as burial sites, after which time these structures began to fall into disuse as pot and secondary cave burials became more common. There was some consistency in the orientation of the stone arrangements which was suggested to have been representative of a shared regional landscape through which hierarchical social groupings must have already been established, perhaps manifested as a chiefly or proto-chiefly structure.

Goran Burenhult, Trobriand Islands, 1998–9

In the Trobriand Islands, a chiefly social structure has been evident at least since the onset of colonial pacification (Mosko, 1995; Weiner, 1988). The project, based out of Gotland University College in Sweden, was aimed at tracing the prehistoric development of the Trobriand Island culture, and to provide an insight into why such a complex social structure developed there but not in the surrounding island groups (Burenhult, 2002). Two sites were the focus of excavation (Oilobogwa and Odubekoya) where a total of 63 m² was dug. The stratigraphic integrity of the excavated sites is questionable as the depth of the deposits was only 20–30 cm before the limestone bedrock was reached, with gardening activity having disturbed the deposit to some extent.

Besides large quantities of pottery (>21 kg) and obsidian recovered from excavation, five interments were also uncovered at the Odubekoya site which contained the skeletal remains of at least seventeen individuals. Several caves and rockshelters were also documented where a number of secondary burials had been interred. From the illustrated pottery there appears to be several pottery traditions represented, although what these traditions are and where they had originated cannot be deduced from the brief report (Gustafsson *et al.*, 1999). Sourcing of the obsidian has since been undertaken by White *et al.* (2006) who had determined that most of the obsidian came from the West Fergusson outcrops, with a small proportion from the East Fergusson sub-sources. Unfortunately, only

2 Most of Bickler's (1998) and Burenhult's (2002) dates were from human bones which were evidently calibrated using the terrestrial calibration curve, instead of with a mixed terrestrial/marine curve which is more appropriate to account for carbon influences from a partial marine diet. With a mixed curve the dates were likely to be around 100 years more recent.

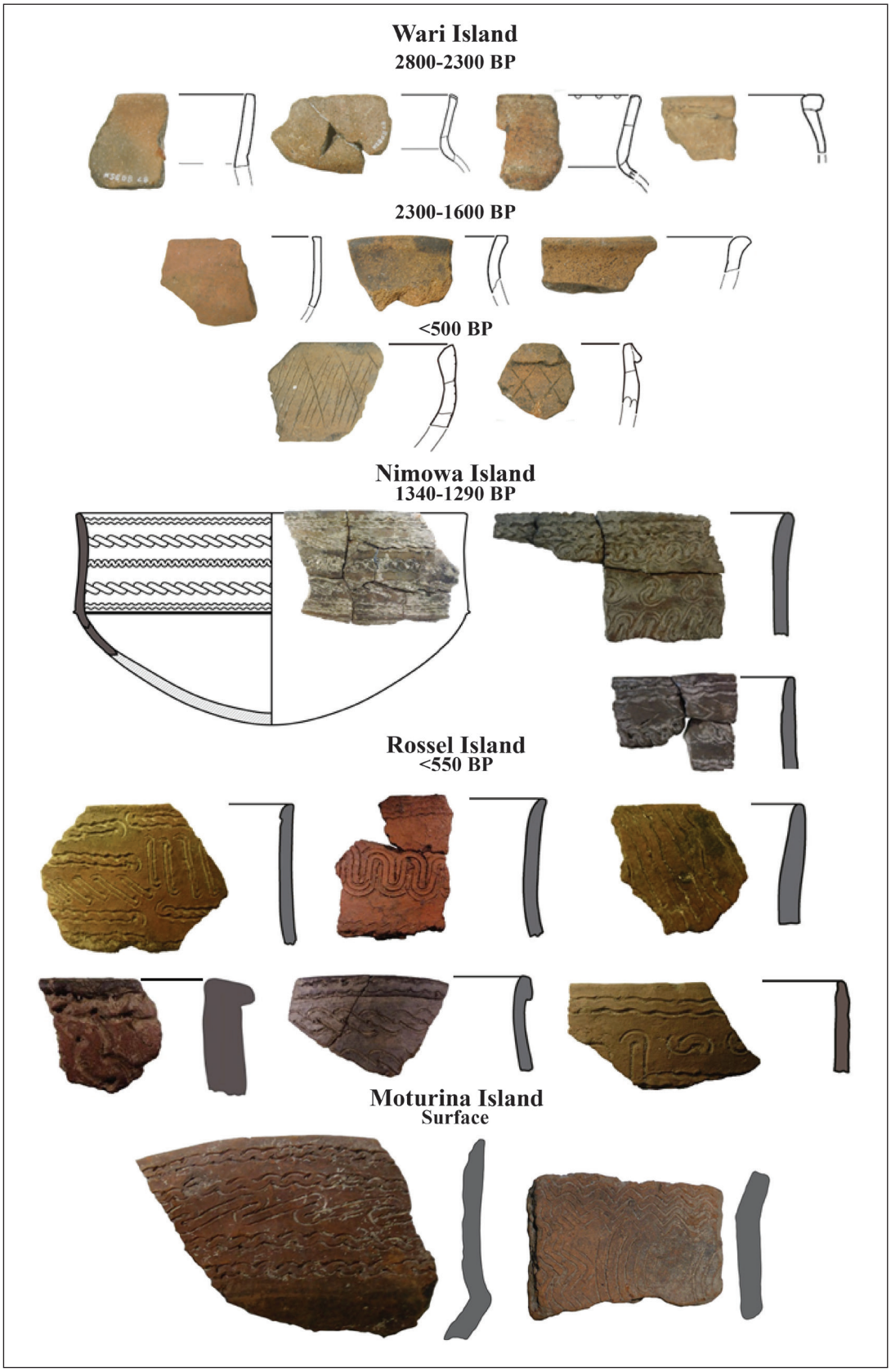

Figure 6: Pottery from the southern Massim. Dates for the pottery are indicated when known. Pottery from Wari Island taken from Negishi & Ono (2009), for Nimowa and Rossel from Shaw (2014) and for Moturina Island from the National Museum and Art Gallery of Papua New Guinea. Sherds not to scale.

the preliminary data from this project have so far been published so the full implications of the results in regard to the development of Trobriand Island society are not clear.

Vincent Kewibu, D'Entrecasteaux Islands, 2004

Kewibu surveyed and excavated several sites in the D'Entrecasteaux group with the aim of documenting prehistoric occupation on the islands near the obsidian sources that were known to have been utilised for at least two millennia. Of particular note were the excavations undertaken on Ilamu Island, situated between the islands of Goodenough and Fergusson. The earliest pottery bearing deposits from Ilamu Island dated to 1520–1320 BP (Vincent Kewibu, pers. comm., in: Ambrose *et al.*, 2012). At this time the Ilamu site was the earliest excavated site in the Massim. During the survey, several stone mortars and previously unrecorded pottery styles were documented, including the triangular cut out motifs identical to those shown in Figure 2 (Vincent Kewibu, pers. comm., 2015). A sample of obsidian recovered from excavated and surface contexts at 19 sites were all determined as coming from the West Fergusson sub-sources (White *et al.*, 2006). Unfortunately, the detailed results of the D'Entrecasteaux excavations remain unpublished, but will undoubtedly make a significant contribution to Massim prehistory.

Yo Negishi, Wari Island, 2008

It was not until several years later that an excavation was first reported for the southern Massim islands, at the Kasasinabwana midden site on Wari Island (Negishi and Ono, 2009). Yo Negishi excavated a 2 × 1 m unit with the aim of establishing the antiquity of occupation on the island, and to determine if there was evidence for the specialisation in the manufacture of pottery. Again, only preliminary results from this excavation have so far been published. The basal layers of this site revealed evidence of human occupation associated with a small number of plainware pot sherds (N=13) dating to between 2800–2300 BP (two dates, 2σ)[3]. The majority of the stone, obsidian and shell artefacts, shell refuse and the faunal bone were found in the upper undated layers, argued to date within the last 500 years. No obsidian was found in the lowest cultural layers. Based on current data, the cultural associations of the earliest pottery from the Kasasinabwana likely represent Lapita settlement on Wari Island, although the association between the dates and the cultural material has been questioned (See Irwin, 2012). A selection of pottery from each chronological period is illustrated in Figure 6. Further excavation, radiocarbon dating and analysis are now required to refine the cultural sequence, and to confirm if the pottery is associated with Lapita settlement or a post-Lapita cultural horizon. Whatever the case may be, the Kasasinabwana excavation provides evidence indicating that human occupation began in the region prior to 2000 BP, and perhaps almost one millennia earlier.

ARCHAEOLOGY ON ROSSEL ISLAND 2011–2012

The prehistory of Rossel Island was investigated by the author with the overarching purpose of investigating cultural development on the island, and within the Louisiade Archipelago. The inhabitants on Rossel are linguistically, genetically and culturally unique from the other island groups in the Massim (Levinson, 2008; Liep, 2009; van Oven *et al.*, 2014), so the objectives of the project were aimed at providing insight into how such a unique island culture developed. It was also a conscious effort to expand what is known about the prehistory of the southern Massim. Approaching the archaeological problem concerning colonisation and subsequent prehistoric cultural development in the Massim meant that it was necessary to expand the archaeological frontier to include the most distant landmass. At over 400 km from the New Guinea mainland, Rossel Island is the last island in a scattered chain of islands that form the Louisiade Archipelago. Smaller scale test excavation was also undertaken on Nimowa Island, 80 km to the west of Rossel, to develop a comparative archaeological record to which the prehistory of Rossel could be compared (Shaw, 2014).

On Rossel, ten sites were excavated totalling 19.5 m². The earliest evidence from excavation is the pre-pottery occupation of the Mt Yeme cave site, with human visitation spanning from 2500–1550 BP. Pre-pottery settlement is also evident at two coastal sites, with a subsequent transition to occupation associated with pottery in the upper deposits. Pottery is then only found in stratigraphic deposits dating from 550 BP. In contrast, on Nimowa where only one site (Malakai) was excavated, evidence indicates both pottery and people were present by at least 1340–1290 BP (Shaw and Dickinson, Submitted). The excavated data from Nimowa therefore illustrates that pottery was present on the islands adjacent to Rossel perhaps 750 years earlier. Further dating of the Malakai site is now needed to determine if earlier settlement is present along the beach, and to clarify the existing chronological sequence. Of particular significance was the discovery of six waisted stone tools on the surface along the northeast coast of Rossel Island. Despite not being found in a secure datable context, the waisted tools were heavily weathered, patinated and were morphologically similar to the robust waisted axes found in dated Late Pleistocene sites from mainland New Guinea (Bulmer, 1977; Groube, 1986; Groube *et al.*, 1986;

3 Note that the radiocarbon dates are reported to have come from layers eight and four which is an error in the reporting of the stratigraphy. The stratigraphy was re-labelled for publication and the dates appear to have come from Layers V and IIB/IIC. These details need to be clarified in subsequent reporting of the site.

Summerhayes *et al.*, 2010). The waisted tools are described and compared to other waisted tool assemblages in Shaw (Submitted), with an argument made for the Late Pleistocene colonisation of the Massim.

A PROPOSED PREHISTORIC SEQUENCE FOR THE MASSIM

With the archaeological work so far undertaken, a chronological framework for human settlement in the Massim can be suggested. Figure 7 shows the prehistoric sequences developed for each individual island/area in the Massim where published archaeological data is available, in comparison to the Caution Bay/South Coast sequence. Table 2 then provides a proposed regional chronology for the Massim region which summarises the information presented in this section.

>14–10,000 BP

The discovery of waisted stone tools on Rossel Island has prompted the Late Pleistocene colonisation of the Massim to be considered. Of course, without excavating and dating sites with secure cultural deposits from a Late Pleistocene context it cannot be determined definitively when the Massim was colonised. However, Shaw (Submitted) argues that Late Pleistocene colonisation is likely based on two lines of evidence. The first considers that during the Last Glacial Maximum when sea levels were as much as 135 m below modern levels, the now scattered islands of the Massim were joined to form a continuation of the mainland, or formed considerably larger island landmasses. Reaching Rossel Island from the mainland would not likely have involved sea crossings greater than 14 km in length, which is well within the technological capabilities of people at this time. From 14,000 BP the coastal fringes began to flood and from 10,000 BP the distance between islands in the Massim expanded rapidly and the landmasses became significantly smaller as sea levels rose.

The second point considers the relatively resource impoverished island landscapes that would have existed in the region throughout the Holocene. Modern inhabitants of many Massim islands have adapted to life in a marginal environment and even then must rely on trade connections to obtain food and water during periods of drought. Therefore, it is argued that without a fully domesticated food system it would have been difficult to sustain a population on the scattered and small Massim islands. There are few islands, of which Rossel is one, that are large enough and with abundant natural resources to sustain a pre-agricultural population. Unfortunately, little more can be said about this period of prehistory without introducing unnecessary conjecture. The presence of several tool types in the Massim islands known to be associated with Late Pleistocene-Early Holocene occupation (stemmed obsidian tools, tanged stone blades, pestles and mortars) does support an earlier timing for colonisation than is currently indicated by excavated cultural deposits (See also Swadling, In press).

3000/2800–2000 BP

Although the earliest phase of human settlement in the Massim is not well defined, subsequent occupation is supported by evidence from excavated sites. If the earliest dates from the Kasasinabwana site on Wari Island are considered to be in direct association with the cultural deposits then occupation in the Massim associated with pottery now extends back to at least 2800–2600 BP. However, further excavation and dating is needed to confirm the association. The small number of pottery sherds from this earliest cultural deposit indicates that the people who occupied this site were either manufacturing pottery on the island or obtaining it through trade from elsewhere. In any case, pottery of this antiquity is only known from elsewhere in the Bismarck Archipelago and on the New Guinea mainland in association with the Lapita Cultural Complex, from ~3300 and 2900 BP respectively (Denham *et al.*, 2012; McNiven *et al.*, 2011).

Indirect evidence from archaeological investigations in adjacent regions is mounting to support the presence of Lapita in the Massim. First, a single piece of obsidian determined as coming from the West Fergusson Island subsource was found in the SE-RF-2 Lapita site in the Reef Santa Cruz Islands, dating to 3000–2800 BP (Green, 1989; Green and Jones, 2008). Obsidian from Fergusson Island has also been identified in the Caution Bay Lapita sites from 2900 BP (David *et al.*, 2013; McNiven *et al.*, 2011), and perhaps also in the mid-late Lapita deposits from the Apalo site, Arawe Islands, New Britain (Sutton, 2014). Secondly, pottery from the Roviana Lagoon in the Solomon Islands, dating to 2600 BP, may also have come from Woodlark Island in the Massim, although sites of this age are not currently known on Woodlark (Tochilin *et al.*, 2012).

Thirdly, the two dentate stamped sherds found at Wanigela and on Tubetube are similar to dentate stamped Lapita pottery, and have not been found in excavation from the Massim so they are unlikely to belong to a pottery tradition from the last 1500–1000 years (Figure 3). Finally, surface pottery collected near Wanigela and on Moturina Island exhibits pedestalling and rectangular/triangular cut out motifs, both of which are distinctly reminiscent of Lapita vessels from the Arawe Islands (Figure 2) (See Summerhayes, 2000). It is therefore argued here that based on current direct and indirect archaeological evidence Lapita was likely to have been present in the Massim from at least 2800–2600 BP, and perhaps as early as 3000/2900 BP. Such an age is further supported by linguistic evidence which suggests that an Austronesian language shift occurred in the region around this time (Ross, 1988).

Red slipped pottery in the Massim requires mention here in regards to its posited association with Early

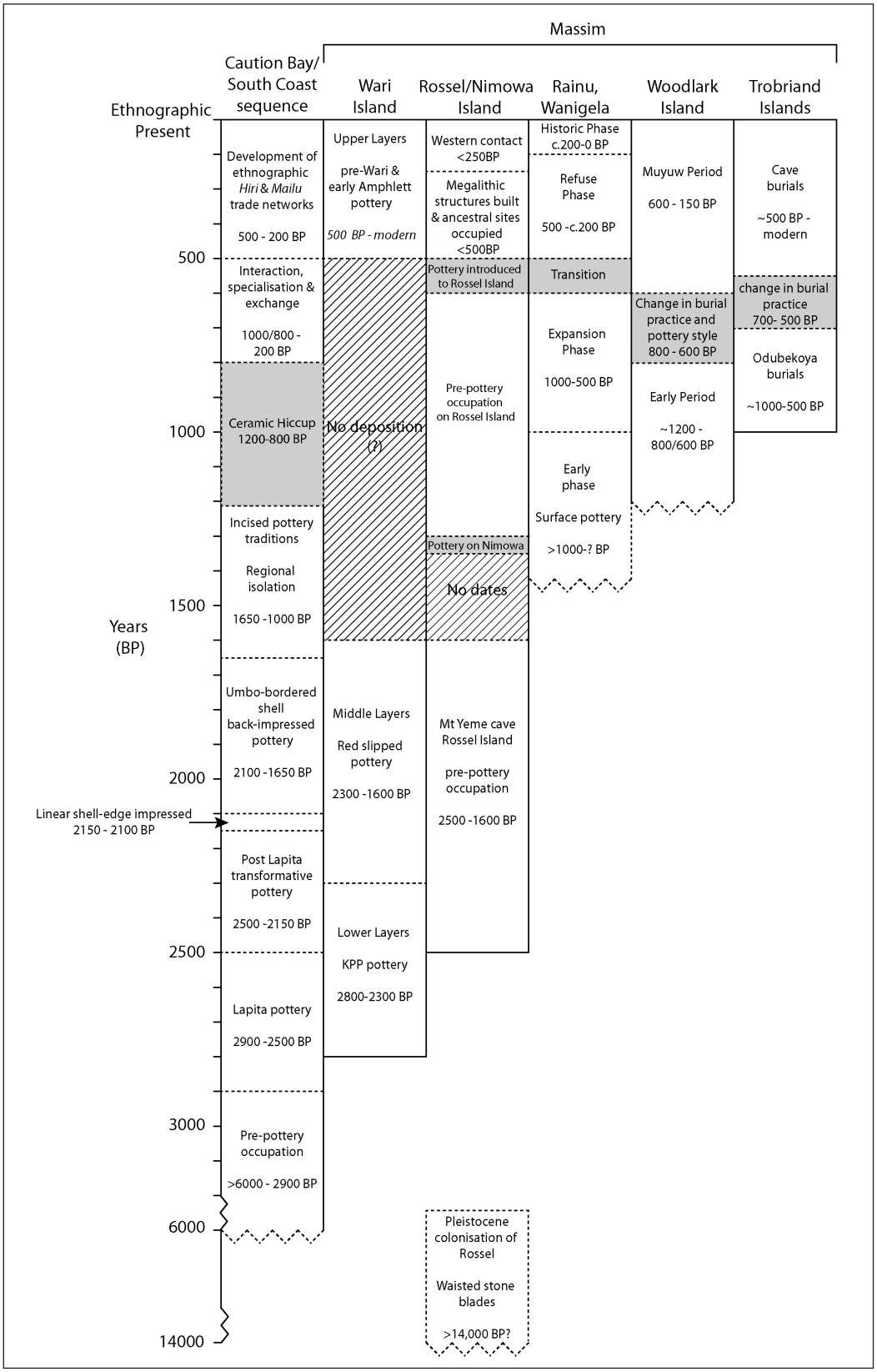

Figure 7: Comparative prehistoric sequences from the Caution Bay/South Coast (David *et al.*, 2012; Summerhayes & Allen, 2007) and the Massim regions from published sources. Data: Wari (Negishi & Ono, 2009), Wanigela (Egloff, 1979), Woodlark (Bickler, 1998) and Trobriands (Burenhult, 2002). The ceramic hiccup is highlighted, as are major periods of change in the Massim sequences. Italicised dates inferred and not based on radiocarbon dating.

Table 2. *Proposed chronology for human occupation in the Massim region*

Time period	Event
>14,000–10,000 BP?	Colonisation of Rossel Island and the southern Massim Islands
14,000/10,000–3000/2800 BP	Physical transformation of the Massim landscape and cultural adaptation
3000/2800–2500 BP	Resettlement by Lapita people
2500–≥1350 BP	Post-Lapita development and regionalisation of cultural traditions
≥1350–550 BP	Development of a southern Massim pottery tradition
800–500 BP	Transformation of social systems in the northern Massim
600–500 BP	Introduction of pottery to Rossel Island.
500–200 BP	Formation of Kula and other island networks
>200 BP	Western contact and colonial pacification

Papuan Pottery (EPP) traditions along the South Coast. There it was argued to have been found in contexts from 2000–1600 BP (Summerhayes and Allen, 2007). Red slipping first tentatively appears in the Kasasinabwana site from 2300–1600 BP (Negishi and Ono, 2009), and therefore overlaps with the EPP chronology. Aside from the Wari Island excavation, red-slipped pottery has been found in undated surface collections from Collingwood Bay, Goodenough Island, the Trobriand Islands, Woodlark Island, the Budibudi Islands and in parts of the Louisiade Archipelago (Irwin, 1991). Red slipping has more recently been identified in Woodlark Island assemblages, perhaps as recently as 600 BP (Bickler, 1998; Negishi, 2008), and on Rossel Island after 550 BP (Shaw, 2014). Although the chronological and geographic constraints of this technological introduction need to be refined in the Massim where its early appearance is currently defined within a widely bracketed timeframe on Wari, it is clear that red-slipping can no longer be argued to be solely associated with EPP. What was initially considered as a delay in the disappearance of this technology in the areas peripheral to the South Coast (Irwin, 1991) is more likely to be a technological attribute that was deliberately maintained for up to a millennia longer in the Massim.

2000–1000 BP

Little is known about Massim culture immediately after 2000 BP. The pottery obtained from excavation on Ilamu Island, dating back to 1520–1320 BP, will help fill this gap. Excavation of the Malakai site on Nimowa Island has otherwise gone some way to reduce the chronological blank in the regional sequence. The lowest deposits at this site contain dense pottery deposits dating to 1340–1290 BP. This pottery is similar in form and the decorative motifs are relatively consistent; predominantly comprised of carinated bowls with incised wave/scroll geometric motifs. Petrographic and chemical analyses indicate that the pottery comes from several different places of origin, and is argued to represent an established exchange network operating in the region (Shaw, 2014; Shaw and Dickinson, Submitted).

The pottery from Malakai had many similarities in the motifs and vessel form throughout the sequence, and with the pottery deposits from Rossel. Such consistencies indicate that the manufacture of pottery in the Louisiade Archipelago was already relatively standardised when the Malakai site was first occupied, as it still was when pottery was introduced to Rossel several centuries later. In contrast, the vessel forms seen in the earliest layers at the Kasasinabwana site are not evident at the Malakai site, and only broad similarities in vessel form are apparent with the red slipped Wari pottery. Therefore, it is argued that the progression from earlier pottery forms to a relatively standardised pottery tradition in the Southern Massim appears to have occurred sometime between 2300–1600 BP (Wari) and 1340–1290 BP (Malakai). Surface pottery from islands elsewhere in the Southern Massim are also identical to the excavated pottery from Rossel and Nimowa, suggesting that this pottery had a wide distribution in late prehistory at least in the southern part of the region.

Last 1000 years

More detailed evidence is available for the Massim in later prehistory as most of the excavated sites date to this period. Egloff's work at Wanigela has provided the basis for the chronology in the northern Massim, which has largely stood the test of time. As already mentioned, within the last 1000 years (and perhaps starting earlier than this) the New Guinea mainland was connected by exchange networks with the northern Massim islands. Evidence comes largely from the distribution of pottery, and to a lesser extent the distribution of Fergusson Island obsidian. Around 600–500 years ago, there was a shift in the trade links as they became increasingly more focused on inter-island exchange, with the mainland connection weakening. Such a connection is manifested in the widespread similarities of historic art styles between the Massim islands (Beran, 1980, 1988; Campbell, 1984; Cochrane, 1986; Hamson and Aldridge, 2009).

By 600–500 BP the Massim region had undergone

a series of major regional and localised transformations. Evidence from Woodlark Island indicates that there was also a major change in local socio-political organisation by ~600 BP, at which point pottery from the southern Massim islands begins to appear. Thick-rimmed bowls with fingernail impression typical of the northern Massim were supplemented by direct and inverted shouldered pots of the southern Massim. At this time, changes in burial practices were also evident which has been argued to reflect a breakdown of earlier hierarchical political control. From 1200–1100 BP primary burials are known to have been placed in direct association with large megalithic structures, but from 800–600 BP secondary pot burials gradually began to replace the earlier megalithic burial practices.

The same transition in burial practice was identified in the Trobriand Islands from 600–500 BP. The pottery found in the cave sites associated with the secondary burials apparently also differed from the earlier pottery found in the excavated sites (Burenhult, 2002). Bickler (1998) and Bickler & Ivuyo (2002) subsequently argued that the megalithic structures lose their symbolic importance after this time, whereby new traditions and connections were forged. Radiocarbon dates for the primary burials and secondary burials from Woodlark and Trobriand Islands indicate that the transition from one practice to another was not immediate, but rather was a gradual shift. At this stage, however, it does appear that secondary burial was a cultural practice that generally developed later in the northern Massim islands.

On Rossel Island, pottery appeared in the archaeological record for the first time by around 550 BP. The widespread construction of stone sitting platforms similar to those seen elsewhere in the Massim, as illustrated in Riesenfeld (1950), also occurred after this time on Rossel. While the late appearance of pottery is a localised phenomenon currently only recorded on Rossel, the cultural influences that resulted in the introduction were likely regional. Why then was pottery such a late introduction to Rossel? It is argued in Shaw (2014) that the island reconfiguration of the northern Massim exchange system around 600–500 BP influenced the formation of the *Kula* network and subsequently encompassed the northern and southern islands. There was likely to have been changes in the socio-political structure on several islands which influenced this transformation in the way in which power and wealth was accrued, with the Trobriands gaining political prominence. The wider sphere of influence seemingly prompted Rossel to become involved in regional interaction, probably indirectly through Sudest Island with the exchange of *bagi* necklaces for clay pots, as well as other perishable items (Liep, 1981). It is subsequently suggested that the manufacture of *bagi* necklaces on Rossel became known and were sought after by *Kula* participants at this time, who were able to obtain them through trade with other islands in the Louisiade Archipelago.

FURTHER INTERPRETIVE THEMES IN MASSIM PREHISTORY

The prehistory of the Massim islands is slowly emerging, but with many aspects of the regional sequence still needing further investigation and clarification. Locating undisturbed stratified sites in the Massim has been challenging, which has ultimately hindered efforts to present long term models of regional cultural development. This issue notwithstanding, it appears that the breakdown and regionalisation of communication networks, perhaps over the last two millennia, and certainly within the last thousand years led to the Massim as a cultural region becoming differentiated from the New Guinea mainland. Based on new archaeological evidence, several further interpretive themes can now be put forward, expanding on those initially presented in Irwin (1991), that can be addressed in future archaeological syntheses of the region.

Timing of colonisation

To suggest a Late Pleistocene colonisation for the Massim might appear somewhat counter-intuitive given the dispersed and somewhat isolated nature of the islands. Coastal changes to islands following major changes in sea level make finding sites of Early Holocene and Late Pleistocene age difficult. To increase the likelihood of finding sites of this antiquity during archaeological surveys, attention therefore needs to be focused on caves and rockshelters in areas that have 1) undergone significant uplift and/or 2) are bordered by a fringing reef rather than a barrier reef system. An extreme example of coastal uplift would be the series of large terraces on the western end of Misima Island which have been raised in excess of 400 m above sea level (de Keyser, 1961). Less pronounced uplift has also occurred along the north coast of Sudest Island (Smith, 1973) and is likely in other parts of the Massim. In terms of reef development, the outer reef deposit marks the edge of the plateau that surrounds an island before dropping off into deeper water. Fringing reefs indicate that the coast will not have shifted significantly during periods of lower sea levels as the coast in these areas is generally steeper. Therefore, in these areas there would be an increased probability of finding sites of Late Pleistocene age that were once near the coast, whereas on islands with a barrier reef only inland sites of this antiquity will have survived.

Pre-pottery occupation and the processes influencing pottery introduction

The late introduction of pottery to Rossel is likely to be an exception rather than the norm to the regional pattern. However, if the Massim was colonised during the Late Pleistocene then occupation would be expected on many islands that were habitable several millennia prior to the initial introduction of pottery and fully domesticated

food systems in the Western Pacific. The presence of the obsidian stemmed blade found on Misima and the pestle found on Woodlark (Figure 4) suggests that the Massim was within the distribution of these Early-Mid Holocene tool technologies, which have otherwise been found across New Guinea and the Bismarck Archipelago. Once the antiquity and extent of pre-pottery settlement is known then the processes which influenced the subsequent introduction of pottery in the region can be investigated.

The spread of Lapita in the Massim

It is becoming clear from recent archaeological evidence that the Lapita culture likely spread to the Massim islands, perhaps from as early as 3000/2900 BP. However, a Lapita site has not been confirmed for the Massim region as of yet. A geomorphological approach to prehistoric site location must be implemented in order to identify sites of this antiquity. Beaches with a stable geomorphological history and with evidence of recent geological uplift will greatly increase the chances for the preservation of cultural deposits dating to 3000–2800 BP, and therefore will increase the likelihood of Lapita sites being found. Sea levels reached up to two metres above modern levels in the New Guinea region during the mid-Holocene period, so Lapita age beach settlements are likely to be somewhat inland relative to the current coastline (Dickinson, 2001; Nunn and Carson, 2015). Coastal erosion and progradation of beach deposits within the last few hundred years on many Massim islands have limited the possibility of finding sites of this antiquity. However, such processes do not necessarily preclude their discovery. The cultural dynamics that then led from early pottery traditions, for which there is some evidence of on Wari Island, to the production of relatively standardised tradeware can then be explored.

The 'ceramic hiccup' in the Massim

It has long been argued that there was a transformation of pottery traditions in the Gulf Province, along the South Coast and perhaps also in the Massim, from 1200–800 BP; the so called 'ceramic hiccup' (Irwin, 1991; Summerhayes and Allen, 2007). The ceramic hiccup represents a change from the early and relatively homogenous pottery to regionally distinctive pottery traditions, and/or a break in the appearance of pottery in a site. On current evidence, *if* a 'ceramic hiccup' did occur in the Massim, at least in the southern islands, it likely happened prior to 1340–1290 BP when the Malakai site was first occupied. The number of Massim pottery assemblages that date to before this is currently limited, which prevents more detailed discussion on the matter. It would therefore be a priority to find and excavate sites that date to the immediate post-2000 BP period so this tentative sequence can be clarified and any changes in the pottery identified. Whether the pottery traditions between the northern and southern Massim diverged at this time would also be of key interest in relation to changes during the purported hiccup.

Language boundaries as it relates to prehistory

The Austronesian languages in the Massim and along the South Coast belong to the Papuan Tip group (Pawley and Ross, 1995; Ross, 1988, 2001). Rossel Island, on the other hand, is a language isolate where a non-Austronesian language is spoken (Levinson, 2006). Ross (1988) has argued that the languages spoken along the South Coast and in the Massim may have originated from a Proto-Oceanic language in the Bismarck Archipelago or the northern New Guinea mainland. Within the Massim alone, however, the linguistic diversity is highly demarcated geographically which has likely occurred as a result of various cultural isolation events interspersed with instances of interaction (Figure 8). As archaeology in the region progresses and the prehistory of each island or island group becomes better known, the distribution and sub-grouping of Papuan Tip languages in the Massim can be compared with cultural sequences investigated archaeologically.

CONCLUSION

It is argued that the Massim was colonised in the Late Pleistocene when sea levels were lower and the islands formed larger landmasses. Stone tools known from Late Pleistocene and Early Holocene contexts found in the Massim lends support for the early colonisation of the region. It is also becoming more evident that the Lapita culture likely spread through the region between 3000–2800 years ago, at much the same time as they had settled along the South Coast. Within the last 1000 years, archaeological evidence indicates that the Massim had developed into a culturally distinctive region, with trade networks linking many of the islands in the northern and southern Massim already apparent by this time. Archaeologists must now begin looking for earlier prehistoric parallels and differences between island groups in the Massim, the South Coast and other neighbouring regions to determine the extent to which they had a shared cultural history before becoming somewhat divergent in later prehistory.

Dedication

To the Late Herman Mandui, Deputy Director and Chief Archaeologist at the National Museum and Art Gallery of Papua New Guinea. With his support the project on Rossel Island was made possible.

Acknowledgements

Many thanks go to Glenn Summerhayes, Matthew Spriggs, Anne Ford and Mathieu Leclerc for reading drafts of this paper, as well as the two reviewers for providing com-

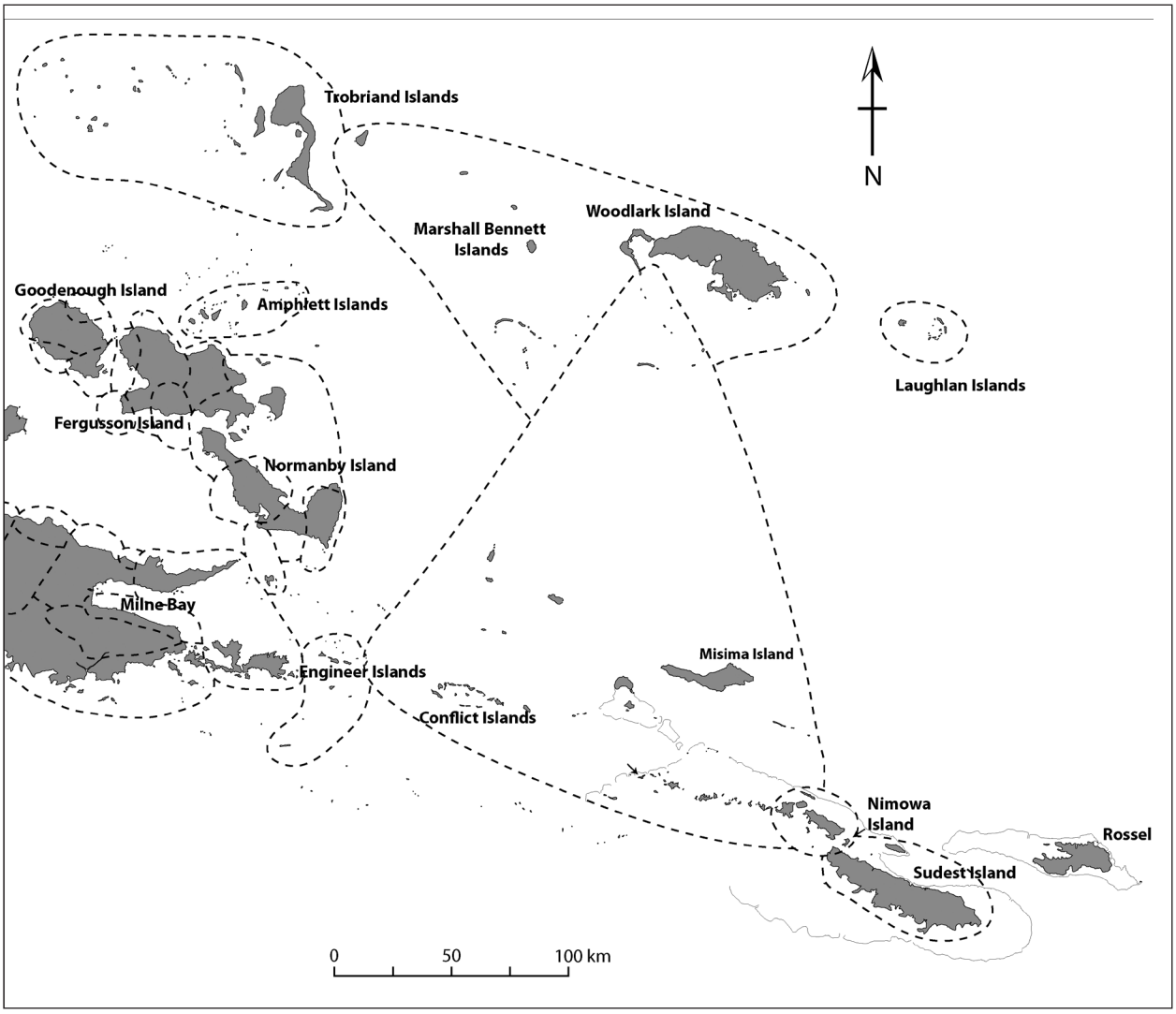

Figure 8: Distribution of Papuan Tip Austronesian languages in the Massim. Note that Rossel Island is not included since a Non-Austronesian language is spoken there. Adapted from Ross (1988: 195).

ments. Geoff Irwin and Vincent Kewibu generously providing information about their unpublished work in the Massim. Alois Kuaso and Henry Arifieae of the National Museum and Art Gallery of Papua New Guinea allowed me to document the Massim collections as part of the research for this paper. A sincere thank you also go to all the archaeologists, anthropologists and historians who have worked in the Massim, past and present, whose research has formed the foundation for this paper.

References cited

Allen, J. 1972. The first decade in New Guinea archaeology. *Antiquity,* 46:180–190.

Ambrose, W., Petchey, F., Swadling, P., Beran, H., Bonshek, L., *et al.* 2012. Engraved prehistoric *Conus* shell valuables from southeastern Papua New Guinea: Their antiquity, motifs and distribution. *Archaeology in Oceania,* 47:113–132.

Austen, L. 1939a. Megalithic structures in the Trobriand Islands. *Oceania,* 10:30–53.

Austen, L. 1939b. The seasonal gardening calender of Kiriwina, Trobriand Islands. *Oceania,* 9:237–253.

Austin, L. 1945. Native handicrafts in the Trobriands Islands. *Mankind,* 3:193–198.

Barton, F.R. 1918. Tattooing in south-eastern New Guinea. *Journal of the Royal Anthropological Institute of Great Britain and Ireland,* 48:22–79.

Battaglia, D. 1990. *On the bones of the serpent: Person, memory, and mortality in Sabarl Island society,* Chicago, The University of Chicago Press.

Beran, H. 1980. *Massim tribal art,* Port Kembla, NSW, South Coast Printers.

Beran, H. 1988. *Betel-chewing equipment of East New Guinea,* Aylesbury, UK, Shire Publications.

Berde, S. 1974. *Melanesians as Methodists: Economy and marriage on a Papua and New Guinea island.* Unpublished PhD thesis, Philadelphia, University of Pennsylvania.

Bickler, S. 1998. *Eating stone and dying: Archaeological survey on Woodlark Island, Milne Bay province, Papua New Guinea.* Unpublished PhD thesis, Charlottesville, University of Virginia.

Bickler, S. 1999. Secondary burial practices in the northern Kula ring. In*:* Boyd, M., Erwin, J.C. & Hendrickson, M. (eds.). *The entangled past: Integrating history and archaeology*. Calgary: University of Calgary Press, 98–107.

Bickler, S. 2006. Prehistoric stone monuments in the northern region of the Kula ring. *Antiquity,* 80:38–51.

Bickler, S.H. & Turner, M. 2002. Food to stone: Investigations at the Suloga adze manufacturing sites, Woodlark Island, Papua New Guinea. *Journal of the Polynesian Society,* 111:11–43.

Bickler, S.H. & Ivuyo, B. 2002. Megaliths of Muyuw (Woodlark Island), Milne Bay Province, PNG. *Archaeology in Oceania,* 37:22–36.

Bulmer, S. 1977. Waisted blades and axes: A functional interpretation of some early stone tools from Papua New Guinea. In*:* Wright, R.V.S. (ed.) *Stone tools as cultural markers: Change, evolution and complexity*. New Jersey: Humanities Press Inc., 40–59.

Burenhult, G. (ed.) 2002. *The archaeology of the Trobriand Islands, Milne Bay Province, Papua New Guinea: Excavation season 1999,* Oxford: Archaeopress.

Campbell, S. 1984. *The art of Kula: An analysis of the Vakutan artistic system and the rituals of Kula.* Unpublished PhD thesis, Canberra, Australian National University.

Chowning, A. 1960. Canoe making among the Molima of Fergusson Island. *Expedition,* 8:32–39.

Chowning, A. 1977. *An introduction to the peoples and cultures of Melanesia,* California, Cummings.

Chowning, A. 1978. Massim as a cultural area. Unpublished paper presented at First International Kula Conference. Cambridge.

Cochrane, S. 1986. *Massim art: A review of the visual arts of some socieites in the Massim area, their development, diffusion and distinction,* Wollongong, University of Wollongong.

Damon, F.H. 1983. What moves the Kula: Opening and closing gifts on Woodlark Island. In*:* Leach, J. & Leach, E. (eds.). *The Kula: New perspectives on Massim exchange*. Cambridge: Cambridge University Press, 309–342.

Damon, F.H. 1990. *From Muyuw to the Trobriands: Transformations along the Northern side of the Kula Ring,* Tucson, The University of Arizona Press.

David, B., Mcniven, I.J., Leavesley, M., Barker, B., Mandui, H., *et al.* 2012. A new ceramic assemblage from Caution Bay, South Coast of Mainland PNG: The linear shell edge-impressed tradition from Bogi 1. *Journal of Pacific Archaeology,* 3:73–89.

David, B., Mcniven, I.J., Jones-Amin, H., Connaughton, S.P., Parkinson, C., *et al.* 2013. Three reconstructed Lapita plainware pots from Caution Bay, South Coast of mainland Papua New Guinea. *University of Otago studies in Prehistory,* 25:157–170.

De Keyser, F. 1961. Misima Island–geology and gold mineralization. Canberra: Bureau of Mineral Resources, Geology and Geophysics.

De Vis, C.W. 1907. A Papuan relic. *Annals of the Queensland Museum,* 7:12–15.

Denham, T., Bronk Ramsey, C. & Specht, J. 2012. Dating the appearance of Lapita pottery in the Bismarck Archipelago and its dispersal to Remote Oceania. *Archaeology in Oceania,* 47:39–46.

Dickinson, W.R. 2001. Paleoshoreline record of relative Holocene sea levels on Pacific Islands. *Earth Science Reviews,* 55:191–234.

Egloff, B.J. 1971. *Collingwood Bay and the Trobriand Islands in recent prehistory.* Unpublished PhD thesis, Canberra, Australian National University.

Egloff, B.J. 1972. The sepulchral pottery of Nuamata Island, Papua. *Archaeology and Physical Anthropology in Oceania,* 7:145–163.

Egloff, B.J. 1978. The Kula before Malinowski: A changing configuration. *Mankind,* 11:429–435.

Egloff, B.J. 1979. *Recent prehistory in Southeast Papua,* Canberra, Australia National University.

Forth, R.L. 1965. Stone arrangements on Woodlark Island. *Mankind,* 6:257–263.

Fortune, R. F. 1932. *Sorcerers of Dobu: The social anthropology of the Dobu islanders of the Western Pacific,* Prospect Heights, Waveland Press, Inc.

Golson, J. 1972. Both sides of the Wallace line: New Guinea, Australia, Island Melanesia and Asian prehistory. In*:* Barnard, N. (ed.) *Early Chinese art and its possible influence in the Pacific basin*. New York: Intercultural Arts Press, 533–595.

Green, R.C. 1989. Fergusson Island obsidian from the D'Entrecasteaux Group in a Lapita site of the Reef Santa Cruz Group. *New Zealand Journal of Archaeology,* 11:87–99.

Green, R.C. & Jones, M. 2008. The absolute age of SE-RF-6 (Ngamanie) and its relation to SE-RF-2 (Nenumbo): Two decorated Lapita sites in the Southeast Solomon Islands. *New Zealand Journal of Archaeology,* 29:5–18.

Groube, L. 1986. Waisted axes of Asia, Melanesia and Australia. In*:* Ward, G.K. (ed.) *Archaeology at ANZAAS, Canberra*. Canberra: Canberra Archaeological Society, 168–177.

Groube, L., Chappell, J., Muke, J. & Price, D. 1986. A 40,000 year-old human occupation site at Huon Peninsula, Papua New Guinea. *Nature,* 324:453–455.

Gustafsson, S., Lindstrom, J., Malm, U. & Winter, O. 1999. The ceramics from Labai and Mwatawa. In*:* Burenhult, G. (ed.) *The archaeology of the Trobriand Islands. Milne Bay Province, Papua New Guinea*. Oxford: Archaeopress, 126–141.

Haddon, A.C. 1894. *The decorative art of British New Guinea,* Dublin, Royal Irish Academy.

Haddon, A.C. 1900. Studies in the anthropogeography of British New Guinea. *The Geographical Journal,* 16:414–440.

Hamson, M. & Aldridge, R. 2009. *Art of the Massim and Collingwood Bay,* Calif, Palos Verdes Estates.

Heine-Geldern, R. 1937. L'Art prébouddhique de la Chine et de L'Asie du Sud-Est et son influence en Océanie. *Revue des Arts Asiatiques,* 2:177–206.

Holdsworth, D.K. & Ollier, C.D. 1973. Magic stones and megaliths

of the Trobriand Islands, Papua New Guinea. *Occasional Papers in Anthropology,* 2: 135–155.

Irwin, G. 1977. *The emergence of Mailu as a central place in the prehistory of Coastal Papua.* Unpublished PhD thesis, Canberra, Australian National University.

Irwin, G. 1978. The development of Mailu as a specialized trading and manufacturing centre in Papuan prehistory: The causes and implications. *Mankind,* 11: 406–415.

Irwin, G. 1983. Chieftanship, kula, and trade in Massim prehistory. In: Leach, J.W. & Leach, E. (eds.). *The Kula: New perspectives on Massim exchange*. Cambridge: Cambridge University Press, 29–72.

Irwin, G. 1985. *The emergence of Mailu as a central place in Coastal Papuan prehistory,* Canberra, Australian National University.

Irwin, G. 1991. Themes in the prehistory of Coastal Papua and the Massim. In: Pawley, A. (ed.) *Man and a half: Essays in Pacific anthropology and ethnobiology in honour of Ralph Bulmer*. Auckland: Polynesian Society, 503–510.

Irwin, G. 2012. Some comments and questions about newly discovered Lapita sites at Caution Bay, near Port Moresby. *Australian Archaeology,* 75: 8–12.

Jenness, D. & Ballantyne, A. 1920. *The northern D'Entrecasteaux,* Oxford, Clarendon Press.

Joyce, T.A. 1912. Note on prehistoric pottery from Japan and New Guinea. *Journal of the Royal Anthropological Institute of Great Britain and Ireland,* 42: 545–546.

Key, C.A. 1968. Pottery manufacture in the Wanigela area of Collingwood Bay, Papua. *Mankind,* 6: 653–657.

Kirch, P.V. 2000. *On the road of the winds: An archaeological history of the Pacific Islands before European contact,* London, University of California Press.

Lauer, P.K. 1970a. 'Amphlett Islands' pottery trade and the 'Kula'. *Mankind,* 7: 167–176.

Lauer, P.K. 1970b. *Pottery traditions of the D'Entrecasteaux Islands of Papua.* Unublished PhD thesis, Canberra, Australian National University.

Lauer, P.K. 1970 c. Sailing with the Amphlett Islanders. *Journal of the Polynesian Society,* 79: 381–398.

Lauer, P. K. 1971a. Preliminary report on ethno-archaeological research in the northwestern Massim, T.P.N.G. *Asian Perspectives,* 14: 69–75.

Lauer, P.K. 1971b. Changing patterns of pottery trade to the Trobriand Islands. *World Archaeology,* 3: 197–209.

Lauer, P.K. 1973. *The technology of pottery manufacture on Goodenough Island and in the Amphlett group, S.E. Papua,* Brisbane, University of Queensland.

Lauer, P.K. 1974. *Pottery traditions in the D'Entrecasteaux Island of Papua,* Brisbane, University of Queensland.

Lauer, P.K. 1975. Fieldnotes on tattooing from Goodenough Island. *Occasional Papers in Anthropology,* 4: 35–40.

Leach, J.W. 1983. Introduction. In: Leach, J.W. & Leach, E. (eds.). *The Kula: New perspectives on Massim exchange*. Cambridge: Cambridge University Press, 1–26.

Leach, J.W. & Leach, E. (eds.) 1983. *The Kula: New Perspectives on Massim exchange,* Cambridge: Cambridge University Press.

Lepowsky, M. 1981. *Fruit of the motherland: Gender and exchange on Vanatinai, Papua New Guinea.* Unpublished PhD thesis, Berkeley, University of California.

Levinson, S.C. 2006. The language of space in Yélî Dnye In: Levinson, S.C. & Wilkins, D. (eds.). *Grammars of space: Exporations in cognitive diversity*. Cambridge: Cambridge University Press, 157–204.

Levinson, S.C. 2008. Landscape, seascape and the ontology of places on Rossel Island, Papua New Guinea. *Language Sciences,* 30: 256–290.

Liep, J. 1981. The workshop of the kula. Production and trade of shell necklaces in the Louisiade Archipelago, Papua New Guinea. *Folk,* 23: 297–309.

Liep, J. 2009. *A Papuan plutocracy: Ranked exchange on Rossel Island,* Aarhus, Aarhus University Press.

Lyons, A. P. 1922. Sepulchral pottery of Murua, Papua. *Man,* 22: 164–165.

Macintyre, M. 1983. *Changing paths. An historical ethnology of the traders of Tubetube.* Unpublished PhD thesis, Canberra, Australian National University.

Macintyre, M. & Allen, J. 1990. Trading for subsistence: The case from the Southern Massim. In: Yen, D.E. & Mummery, J.M.J. (eds.). *Pacific production systems: Approaches to economic prehistory*. Canberra: The Australian National University, 120–136.

Malinowski, B. 1922. *Argonauts of the Western Pacific,* London, Routledge and Kegan Paul.

Malinowski, B. 1934. Stone implements in Eastern New Guinea. In: Evans-Pritchard, E.E. (ed.) *Essays presented to C.G. Seligmann*. London: Kegan Paul, Trench, Trubner and Co., Ltd., 189–196.

May, P. & Tuckson, M. 2000. *The traditional pottery of Papua New Guinea,* Honolulu, University of Hawai'i Press.

Mcniven, I., David, B., Richards, T., Aplin, K., Asmussen, B., *et al.* 2011. New Direction in Human Colonisation of the Pacific: Lapita Settlement of South Coast New Guinea. *Australian Archaeology,* 72: 1–6.

Monckton, C. a. W. 1905. Appendix D: North-eastern division. In: *British New Guinea, Annual Report for the year ending 30th June 1904. Appendix D*: pp. 31–34.

Monckton, C.A.W. 1922. *Last days in New Guinea: Being further experiences of a New Guinea Resident Magistrate,* London, John Lane the Bodley Head.

Mosko, M.S. 1995. Rethinking Trobriand chieftanship. *The Journal of the Royal Anthropological Institute of Great Britain and Ireland,* 1: 763–785.

Negishi, Y. 2008. Comb and appliqué: Typological studies of two ceramic traditions during the last thousand years in the Eastern Papua New Guinea. *Bulletin of the Department of Archaeology (University of Tokyo),* 22: 119–161.

Negishi, Y. & Ono, R. 2009. Kasasinabwana shell midden: The prehistoric ceramic sequence of Wari Island in the Massim, eastern Papua New Guinea. *People and Culture in Oceania,* 25: 23–52.

Norick, F.A. 1976. *An analysis of the material culture of the Trobriand Islands based upon the collection of Bronislaw Ma-*

linowski. Unpublished PhD thesis, Berkeley, University of California.

Nunn, P.D. & Carson, M. 2015. Sea-level fall implicated in profound societal change about 2750 cal yr BP (620 BC) in western Pacific island groups. *Geo: Geography and Environment,* 2:17–32.

Ollier, C.D. & Holdsworth, D.K. 1968. A survey of a megalithic structure in the Trobriand Islands, Papua. *Archaeology and Physical Anthropology in Oceania,* 3:156–158.

Ollier, C.D. & Pain, C.F. 1978. Some megalithics and cave burials: Woodlark Island (Murua), Papua New Guinea. *Archaeology and Physical Anthropology in Oceania,* 13:10–18.

Ollier, C.D., Holdsworth, D.K. & Heers, G. 1970. Megaliths of Kitava, Trobriand Islands. *Records of the Papua New Guinea Museum,* 7:5–15.

Ollier, C.D., Holdsworth, D.K. & Heers, G. 1972. Stone structures of Tuma and Kaileuna, Trobriand Islands. *Archaeology and Physical Anthropology in Oceania,* 7:50–55.

Ollier, C.D., Holdsworth, D.K. & Heers, G. 1973. Megaliths, stones and bwala on Kitava, Trobriand Islands, Papua. *Archaeology and Physical Anthropology in Oceania,* 8:41–50.

Pawley, A. & Ross, M. 1995. The prehistory of Oceanic languages: A current view. In*:* Bellwood, P., Fox, J.J. & Tryon, D. (eds.). *The Austronesians: Historical and comparative perspectives*. Canberra: Australian National University, 43–80.

Pöch, R. 1907a. Ausgrabungen alter Topfcherben in Wanigela (Collingwood-Bay). *Mitteilungen der Anthropologischen Gesellschaft,* 37:137–139.

Pöch, R. 1907b. Einige bemerkenswerte Ethnologika aus Neu-Guinea. *Mitteilungen der Anthropologischen Gesellschaft in Wien,* 37:57–71.

Powell, H. A. 1957. *An analysis of present day social strucutre in the Trobriand Islands.* Unpublished PhD thesis, London, University of London.

Riesenfeld, A. 1950. *The megalithic culture of Melanesia,* Leiden, E.J. Brill.

Ross, M.D. 1988. *Proto Oceanic and the Austronesian languages of Western Melanesia,* Canberra, Pacific Linguistics.

Ross, M.D. 2001. Is there an East Papuan phylum? Evidence from pronouns. In: Pawley, A., Ross, M. & Tryon, D. (eds.). *The boy from Bundaberg: Studies in Melanesian linguistics in honour of Tom Dutton*. Canberra: Pacific Linguistics, 301–321.

Salerio, C., Lithgow, D. & Affleck, D. 1983. Manuscript XVIII—Information on customs and practices of the people of Woodlark Island. *Journal of Pacific History,* 18:57–72.

Seligmann, C.G. 1906. Anthropogeographical Investigations in British New Guinea. *The Geographical Journal,* 27:225–242.

Seligmann, C.G. 1909. A Type of Canoe Ornament with Magical Significance from South-Eastern British New Guinea. *Man,* 9:33–35.

Seligmann, C.G. 1910. *The Melanesians of British New Guinea,* Cambridge, Cambridge University Press.

Seligmann, C.G. 1912. Stone adze blades from Suloga (British New Guinea) as Chinese antiquities. *Man,* 38:72.

Seligmann, C.G. 1916. Lime spatulae from Rossel Island, British New Guinea. *Man,* 16:6–7.

Seligmann, C.G. & Strong, W.M. 1906. Anthropogeographical investigations in British New Guinea. *The Geographical Journal,* 27:225–242; 347–369.

Seligmann, C.G. & Joyce, T.A. 1907. On prehistoric objects in British New Guinea. In*:* Rivers, W.H.R. (ed.) *Anthropological Essays presented to Edward Burnett Tylor, in honour of his 75th birthday*. Oxford: Clarendon, 325–341.

Shaw, B. 2014. *The archaeology of Rossel Island, Massim, Papua New Guinea: Towards a prehistory of the Louisiade Archipelago.* Unpublished PhD thesis, Canberra, Australian National University.

Shaw, B. The Pleistocene colonisation of the Massim? Waisted stone tools from Rossel Island, Louiaide Archipelago, Papua New Guinea, (in preparation).

Shaw, B. & Dickinson, W.R. Survey and excavation on Nimowa Island, Louisiade Archipelago, Papua New Guinea: A central island in a prehistoric southern Massim exchange network, (in preparation).

Smith, I.E. 1973. An uplifted wave-cut terrace on Sudest Island, southeastern Papua. *Bureau of Mineral Resources, Geology and Geophysics Australia,* 139:67–71.

Spriggs, M. 2013. Three carved cone shells from Collingwood Bay. In*:* Bolton, L., Thomas, N., Bonshek, E., Adams, J. & Burt, B. (eds.). *Melanesia: Art and encounter*. London: British Museum Press, 7–11.

Stefanson, V. 1908. Australasia. *Geographical Record,* 40:25–26.

Summerhayes, G., Leavesley, M., Fairbairn, A., Mandui, H., Field, J., *et al.* 2010. Human Adaptation and Plant Use in Highland New Guinea 49,000 to 44,000 Years Ago. *Science,* 330:78–81.

Summerhayes, G.R. 2000. *Lapita interaction,* Canberra, Australian National University.

Summerhayes, G.R. 2007. Island Melanesian pasts: A view from archaeology. In*:* Friedlaender, J. (ed.) *Genes, Language and culture History in the Southwest Pacific*. New York: Oxford University Press, 10–35.

Summerhayes, G.R. & Allen, J. 2007. Lapita writ small? Revisiting the Austronesian colonisation of the Papuan South Coast. In*:* Bedford, S., Sand, C. & Connaughton, S.P. (eds.). *Oceanic explorations: Lapita and Western Pacific Settlement*. Canberra: ANU E-Press, 97–122.

Sutton, P. 2014. *Lapita exchange across the Solomon and Bismarck Seas: pXRF sourcing and morphological analysis of obsidian artefacts from Apalo, Arawe Islands, West New Britain.* Unpublished honours thesis, Sydney, University of Sydney.

Swadling, P. 2004. Stone mortar and pestle distribution in New Britain revisited. *Records of the Australian Museum,* 29:157–162.

Swadling, P. In press. Mid Holocene social networks in far eastern New Guinea. *Journal of Pacific Archaeology*.

Tindale, N.B. & Bartlett, H.K. 1937. Notes on some clay pots from Panaeati Island, South-east of New Guinea. *Transactions of the Royal Society of South Australia,* LXI:159–164.

Tochilin, C., Dickinson, W.R., Felgate, M.W., Pecha, M., Sheppard, P., *et al.* 2012. Using U-Pb ages of detrital zircons to source temper sands in ancient ceramics: A case study from the Southwest Pacific. *Journal of Archaeological Sci-*

ence, 39: 2583–2591.

Torrence, R., Kelloway, S. & White, P. 2013. Stemmed tools, social interaction, and voyaging in early-mid Holocene Papua New Guinea. *The Journal of Island and Coastal Archaeology,* 8: 278–310.

Tueting, L.T. 1935. Native trade in southeast New Guinea. *Bernice P. Bishop Museum, Occasional Papers,* 11: 1–43.

Van Oven, M., Brauer, S., Choi, Y., Ensing, J., Schiefenhovel, W., *et al.* 2014. Human genetics of the Kula Ring: Y-chromosome and mitochondrial DNA variation in the Massim of Papua New Guinea. *European Journal of Human Genetics*: 1–11.

Weiner, A. 1976. *Women of value, men of renown. New perspectives in Trobriand exchange,* Austin, University of Texas Press.

Weiner, A.B. 1988. *The Trobrianders of Papua New Guinea,* Orlando, Harcourt Brace Jovanovich College Publishers.

White, J.P., Jacobsen, H., Kewibu, V. & Doelman, T. 2006. Obsidian traffic in the Southeast Papuan Islands. *Journal of Island and Coastal Archaeology,* 1: 101–108.

Whitehouse, E. 1922. Canoes, Trobriand Islands, Territory of Papua. *Anthropological Report,* 2: 113–118.

Williams, F.E. 1931. Papuan petrographs. *Journal of the Anthropological Institute of Great Britain and Ireland,* 61: 121–155.

Williams, F.E. 1936a. Report on stone structures in the Trobriands–Little Stonehenge. *Pacific Islands Monthly,* June.

Williams, F.E. 1936b. Megalithic structures in the Trobriand Islands. *MSS, T.P.N.G. Archives Accession 447, Files of Government Anthropologist of Papua, Item no. 143.*

Wiltgen, R.M. 2008. *The Founding of the Roman Catholic Church in Melanesia and Micronesia, 1850–1875,* Eugene, Pickwick Publications.

Young, M. 1971. *Fighting with food. Leadership, values and social control in a Massim society. ,* Cambridge, Cambridge University Press.

Young, M. & Clark, J. 2001. *An anthropologist in Papua: the photography of FE Williams, 1922–39,* Hindmarsh, SA, Crawford House Publishing.