

# Why do Polynesian island groups have one language and Melanesian island groups have many? Patterns of interaction and diversification in the Austronesian colonization of Remote Oceania

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## 1. The puzzle of different language densities in Polynesia and Melanesia

The islands and seas of the southwest and central Pacific are conveniently subsumed under the heading 'Oceania'.<sup>1</sup> In the anthropological and geographic literature Oceania is generally divided into three regions: Melanesia, Polynesia and Micronesia. This division, based on 19<sup>th</sup> century perceptions of racial and cultural groupings, is unsatisfactory especially because 'Melanesia' is not a coherent entity of the same order as the other two, but it remains a standard frame of reference.<sup>2</sup>

The prehistoric human settlement of Oceania has left many complex and sometimes puzzling cultural, linguistic and biological patterns. This paper investigates one particular puzzle – the striking differences between Polynesia and Fiji, on the one hand, and almost all of Island Melanesia, on the other, in the density of languages per island group. ('Island Melanesia' is that part of Melanesia that excludes the 2400 km long island of New Guinea.) In Polynesia the norm is one language per island group; in Island Melanesia it is many languages. Thus, Samoa, Tonga, the Tokelaus, Tuvalu, the Southern Cooks, the Societies, the Marquesas and Tuamotus at first European contact each had a single language, generally with no more than modest regional variation. The large Fijian archipelago can be said to have just two distinct languages, though each 'language' is a dialect chain of considerable diversity.

How different the situation in Island Melanesia. There the norm is many languages per island group. At first contact Vanuatu had over 100 indigenous languages, the main Solomons group about 70, New Caledonia and the Loyalties about 25, the Admiralties about 25, and so on. Of course island groups vary considerably in land mass and in distances between islands as well as in environmental conditions, but allowing for these

variations the general trend remains clear and consistent: languages in Polynesia are spoken over much larger geographic areas than in Island Melanesia. Why this marked difference?

It has long been recognised that the many islands and archipelagos of Oceania are a virtual laboratory for comparing the long term effects of different environmental variables on related cultural systems. In such a region one can search for repeated outcomes arising from one class of conditions, contrasting with different repeated outcomes reflecting other conditions.

This insight was, for example, behind Jeff Marck's observation that in Micronesia and West Polynesia the position of boundaries between languages and dialects correlates closely with the length of voyages by canoe (Marck 1986, 2000). He found that if two islands are within overnight voyaging range (that is, a sailing canoe can set off in late afternoon, follow a star path and have the target island in sight during the next day) they will generally speak dialects of one language. If the nearest island is two or more days sailing away the inhabitants will speak more profoundly distinct dialects or mutually unintelligible languages.

The overnight voyaging rule does not, however, work for most of Island Melanesia, where 10 or 20 different languages may be spoken on the same large island and nearby small islands typically have different languages.

The constants and variables provided by the geography of Polynesia also underpinned Marshall Sahlins's well-known study of social stratification in this region (Sahlins 1958). He sought to correlate different environmental and technological conditions with degrees and forms of stratification in Polynesian societies. Sahlins observed that the search for such correlations makes sense because

The Polynesian cultures derive from a common source; they are members of a single cultural genus that has filled in and adapted to a variety of local habitats. (Sahlins 1958:ix)

Implicit in his 'single genus' framework were two assumptions: (i) that Polynesian societies were very largely isolated from outside influences in the period between first settlement and historic times; (ii) that the different islands or regions of Polynesia have been settled for about the same length of time. Sahlins noted that there was some variability in time depth of settlement. He also acknowledged that the variables affecting social stratification were not confined to ecology. In particular, an economic variable, intensification of production, affected the correlation.

The Austronesian diaspora of the last four millennia, from which has stemmed a family of more than 1000 languages and countless distinct social and cultural entities, dominating Island SE Asia and Oceania, with outliers on the SE Asian mainland and

Madagascar, can be viewed as a mass of experiments in colonising and adapting to different physical and social environments.<sup>3</sup>

My concern here will be specifically with how very different language densities have come about in different regions that were settled at about the same time by people speaking closely related languages. I will compare three island groups in ‘Southern Melanesia’, a convenient name to encompass Vanuatu, New Caledonia/Loyalties and the Eastern Outer Solomon Islands, and the three large groups in the West Polynesia/Fiji region: those of Tonga, Samoa and Fiji.<sup>4</sup>

This area of the SW Pacific, encompassing as it does adjacent sections of Melanesia and Polynesia, is culturally much more diverse than the Polynesian Triangle but it resembles Polynesia in this essential feature: we know that the languages have a common origin and that with but a few exceptions they have diversified *in situ*.

From archaeological and linguistic research we can be fairly confident that differences in time depth of settlement played no more than a very small part in bringing about the contrast between these two regions. The six island groups being compared all lie in Remote Oceania, and were first colonised about 3000 years ago by the bearers of the archaeological culture known as Lapita. The Lapita settlers all spoke what must have been mutually intelligible Oceanic dialects, not far removed from Proto Oceanic. (I will say more about the Lapita colonisation of Oceania and the dispersal of the Oceanic languages in due course.) The subgrouping evidence indicates that in each island group, all or almost all the languages have arisen as the result of local diversification of a single foundation language. Multiple colonizations introducing different languages are not, except in a small way, a contributor to the linguistic diversity of Southern Melanesia or Polynesia.

So the question is, what factors made sister speech communities widely dispersed over an island group continue to speak one language for 3000 years in some cases, and to fragment into dozens of languages in others? It seems the answers must be sought in the developments in demography, social and political organization, technology and economy.

But before tackling this question let us briefly review the record on the colonization of Near Oceania and the origins and dispersal of the Austronesian language family.

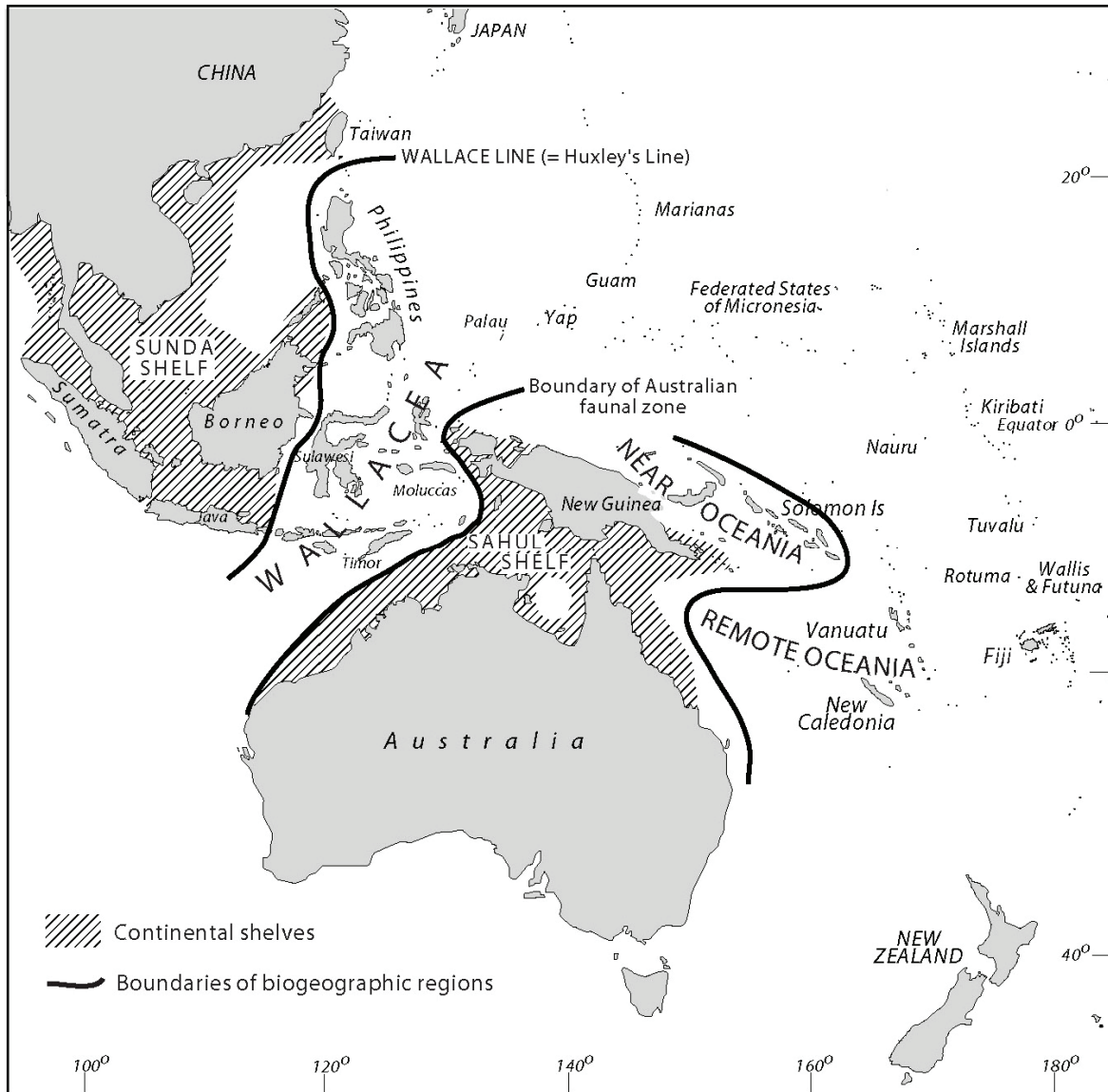
## **2. Notes on the colonisation of Near Oceania**

### **2.1 Pleistocene colonisers**

Two main phases of human colonisation of Near Oceania show up in the scientific record. The first began more than 40,000 years ago when modern humans reached Australia and Near Oceania – some time before they settled Europe, north Asia and the Americas. Near Oceania is the complex of closely spaced islands – principally New Guinea, the Admiralties, New Britain, New Ireland and the Solomons islands – that form a

series of stepping-stones from the Indo-Malaysian archipelago in the west. Beyond it lies Remote Oceania, a region of widely dispersed island groups often separated from their nearest neighbours by many hundreds, even thousands of kilometres.

People spread rather quickly over the main islands of Near Oceania. They reached New Britain and New Ireland by 40-35,000 BP. However, until just over 3000 years ago they got no further east into the Pacific than the main Solomons group, which ends at the island of Makira (San Cristobal).



**Fig. 1** Major biogeographic boundaries of Island SE Asia and the Pacific: Sundaland, Wallacea, Near Oceania and Remte Oceania

Materials from pre-20,000 BP sites in Near Oceania indicate that the people were broad-spectrum foragers, hunting and gathering a range of animals and plants. There were no truly sedentary settlements, only camps and seasonal bases. The basic social groups must

have been small, mobile bands of close kin who ranged over a territory. Language communities would seldom have exceeded a few hundred speakers.

This first phase in the colonisation of Near Oceania can be associated with the Papuan speaking peoples of the region, where 'Papuan' refers to non-Austronesian indigenous languages. According to Ross (2001, 2005) there are some 23 Papuan families and nine isolates (single language families) in Near Oceania that on present evidence cannot be related to each other.<sup>5</sup> The many families of Papuan languages that are present today in Near Oceania are almost certainly continuations of languages that were spoken by the Pleistocene colonists (Dunn et al. 2005, Pawley 2007).

Early in the post-glacial period climate changes brought major shifts in patterns of vegetation, in sea levels, and available resources. In the New Guinea highlands landscapes begin to be modified by humans after 10,000 BP with a marked increase from about 5,000 years ago. There is evidence for agriculture as early as 10,000 and certainly by 7000 BP at Kuk in the Upper Wahgi Valley (Denham 2005, Denham et al., 2003), evidenced by extensive drainage systems and the pollen record. The main cultivated plants are thought to have been *Colocasia* taro, gourds and bananas.

As to how fast agriculture spread in New Guinea the archaeological evidence at present says rather little, though there is evidence from the Baliem Valley, in the highlands of Irian Jaya, of progressive human impact by way of agriculture from about 8000 BP.

Where the shift to intensive agriculture did occur (and eventually most societies in Near Oceania became farmers, while continuing to supplement food production by hunting and gathering) it must have brought radical changes in patterns of social organization and material culture. Agriculturalists are sedentary, tied to the land they have cleared, tilled, planted, and fallowed. There is potential for faster population growth, larger social units and social hierarchy and for the making of artefacts that are not easily transportable, such as substantial houses, elaborate carvings, and heavy containers. Language communities tend to become larger.

However, there is no sign that stratified societies developed in Near Oceania in the pre-Austronesian period. At first contact social and political groups in the non-Austronesian speaking societies of New Guinea never exceeded a few hundred people. They consisted of kin-based groups, with no hereditary leadership positions. 'Big-man' leaders emerged through force of character and political and fighting prowess but their influence was restricted to kin and residential groups.

## **2.2 The Austronesian diaspora**

Around the middle of the 2<sup>nd</sup> millennium BC a new population entered northwest Melanesia. These were pottery-making fishermen-farmers from SE Asia who by 3500-

3300 BP had settled in several parts of the Bismarck Archipelago (Green 2003, Kirch 1997, 2000, Spriggs 1997).

They brought a Neolithic culture quite different from any which preceded it in the record for any part of Melanesia. It was strongly maritime adapted and the material culture was characterised by sturdy rectangular houses, sometimes on stilts, domesticated animals (pig and chicken), pottery, a range of fishing gear, a characteristic stone adze/axe kit, shell ornaments and evidence of long distance exchange of obsidian. The most conspicuous items in the archaeological record are earthenware vessels with red-slipped surface, made in a characteristic variety of shapes, with some vessels having very elaborate geometric motifs imprinted by toothed implements. The pottery tradition is known as Lapita, after which the archaeological culture as a whole is named.<sup>6</sup>

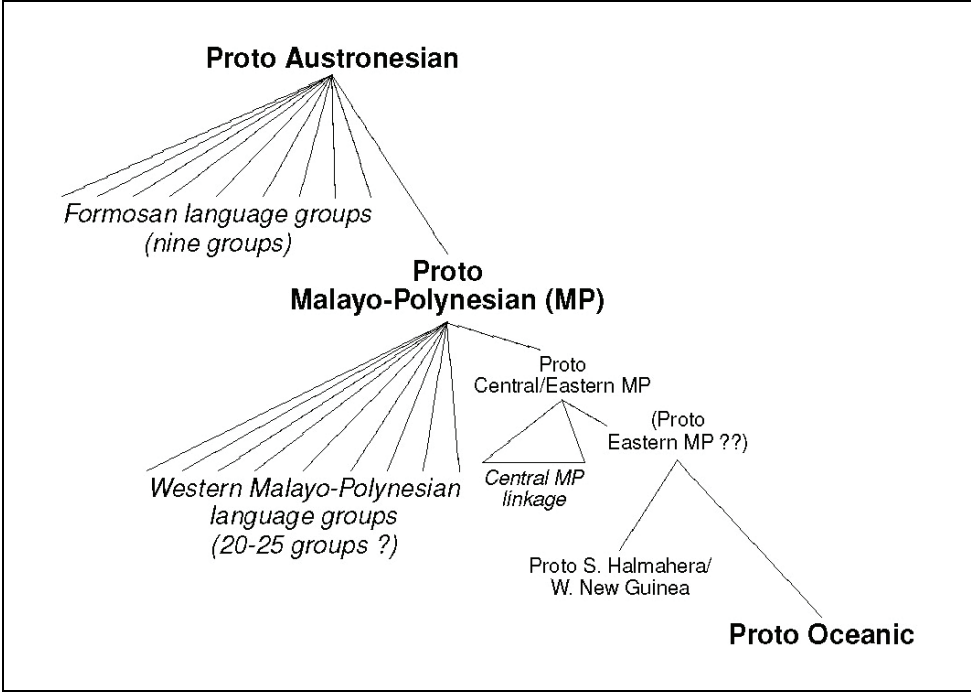
The Lapita people quickly established footholds in various parts of the large Bismarck Archipelago. They typically settled on small islands, offshore from the main islands of the Bismarck group. Settlements were situated facing passages in the reef through which canoes could come and go. Most were in areas where there is either a broad fringing reef, or a lagoon and barrier reef, or both. They were usually also adjacent to identifiable fresh water sources and every site has arable land nearby. Small islands generally offered the further advantage that they were only lightly wooded so that gardens could be planted without first clearing primary forest.

From about 3300 to 3000 BP widely dispersed Lapita communities in the Bismarck Archipelago maintained social and economic ties with each other (Kirch 1997, 2000, Summerhayes 2000). After about 3000 BP there appears to have been less interaction between widely separated communities and more regional specialisation, indicating a weakening of social ties between farflung communities, and the build-up of denser local populations.<sup>7</sup>

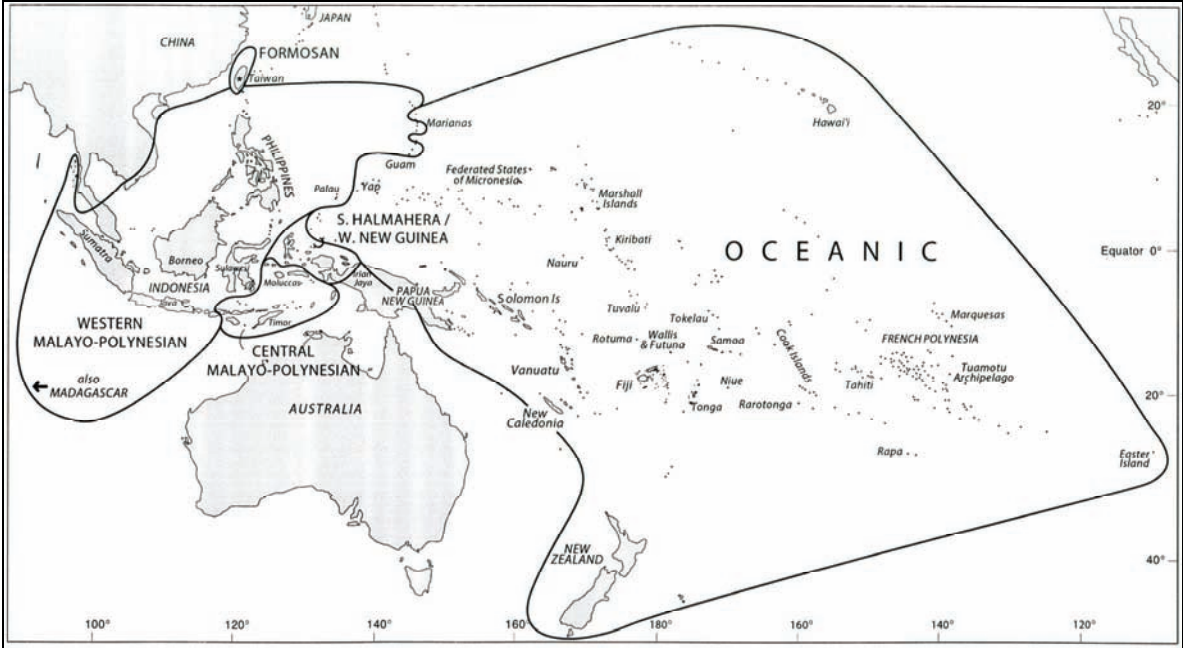
The maritime mobility of the Lapita people indicates that they had sailing craft capable of successfully completing open sea voyaging. Although remains of canoes have not survived in archaeological sites comparative linguistic evidence (see Appendix 1) makes it clear that they had cargo-carrying outrigger canoes with mat sails and steering oars.

Where did the Lapita culture come from? It is very plainly associated with Austronesian speakers who entered northwest Melanesia from eastern Indonesia but whose initial dispersal centre was Taiwan. In the last few decades it has become clear that Taiwan was the primary dispersal centre of the Austronesian language family (Bellwood 1995, 1997, Blust 1995a, Kirch 1997, 2000, Pawley 2003). Today Austronesian is a family of around 1200 languages, which extends from Taiwan and Hawaii in the north to New Zealand in the south and from Madagascar in the west to Easter Island in the east. The generally accepted classification of Austronesian language recognises several,

possibly as many as ten primary subgroups. Of these all but one are confined to the island of Taiwan. The single exception, known as Malayo-Polynesian, contains all Austronesian languages spoken outside of Taiwan. This subgrouping strongly points to Taiwan as the place where Proto-Austronesian was spoken. Fig. 2 gives the standard high order subgrouping, after Blust (1995, 1999).



**Fig 2** High-order subgroups of Austronesian (after Blust 1995a,b, 1999)



**Fig. 3** Distribution of major subgroups of Austronesian

In spite of its large size and distribution, the Austronesian family is a fairly young one. This is indicated by (among other things) the fact that it is easy to find a good many cognates (words inherited from a common ancestor) between the most widely separated members of the family. Table 1 gives some examples of Proto Austronesian forms and their ‘reflexes’ (descendant forms) in daughter languages.

**Table 1 Some Austronesian cognate sets**

	‘eye’	‘liver’	‘louse’	‘rain’
Proto Austronesian	*maCa	*qatay	*kutu	*qudaL
Paiwan (Taiwan)	maca	qatsay	kasiw	qudal
Tagalog (Philippines)	mata	atay	kuto	ulan
Toba Batak (Indonesia)	mata	ate-ate	hutu	udan
Manam (N. New Guinea)	mata		kutu	ura
Kwaio (Solomons)	maa	lae-fou	‘uu	uta
Lolomatui (Vanuatu)	mata	ate	kutu	uhe
Puluwat (Micronesia)	maah	ya-ya	uuw	wut
Bauan (Fiji)	mata	yate	kutu	uca
Tongan (Polynesia)	mata	‘ate	kutu	‘uha

Archaeological research over the last few decades has provided a rather precise indication of the direction and chronology of the Austronesian dispersal.

Until a few thousand years ago all human populations in East Asia, as elsewhere, lived exclusively by hunting and gathering. The archaeological assemblages show a complete absence of artefacts and settlement patterns associated with agriculture – there is no pottery, no fully ground and polished adzes, no signs of permanent villages (Bellwood 1997). When Neolithic cultures do appear in this region they do so as a sharply defined horizon.

Taiwan was the source of the Neolithic cultures that appeared in the Philippines, much of Indonesia, and the Bismarck Archipelago between 4000 and 3000 years ago. Neolithic cultures appear in Taiwan at around 5500 BP. The earliest Taiwan Neolithic tradition, known as Corded Ware or Ta-p’en-k’eng (TPK), is named for its distinctive pottery vessels with thickened rims and ring feet, cord-marked on their bodies and incised on their rims. The pottery is associated with rice and with polished stone adzes with quadrangular cross-sections but generally without marked steps or shoulders, stone net sinkers and polished slate points. The antecedents of this culture are to be found in sites in Fujian and Guangdong Provinces on the Chinese mainland, dating to the 5th millennium BC. In Taiwan the TPK tradition evolved and diversified over the next two millennia into a number of regional traditions.

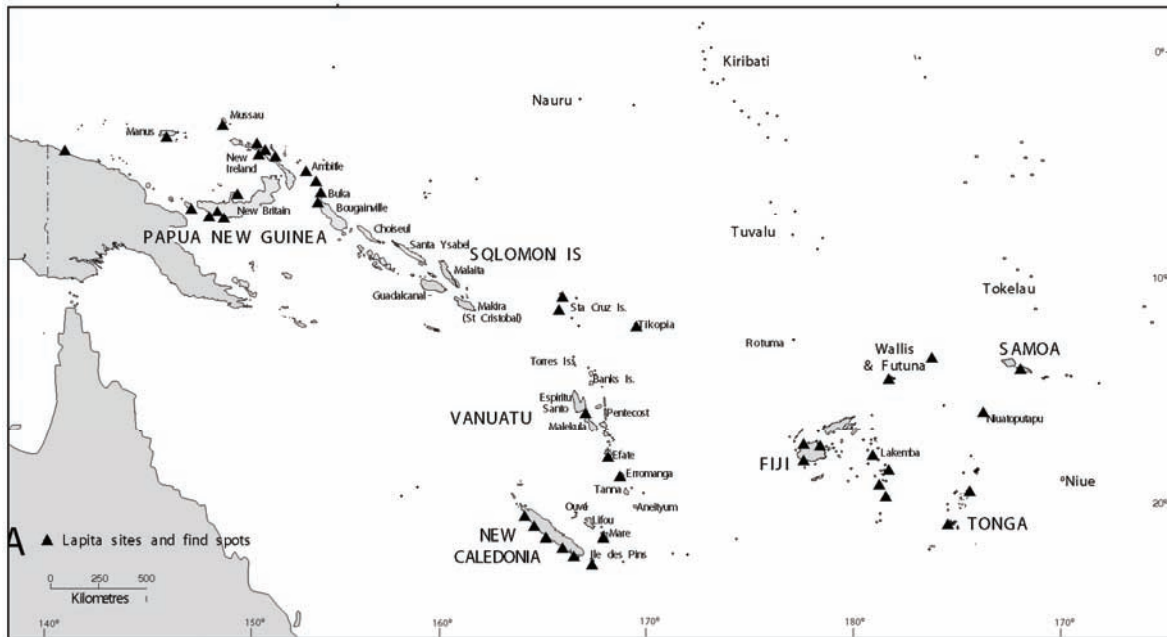


There was a pause of around 1500 years before variants of the Taiwan Neolithic were carried south of Taiwan to the Philippines. Taiwan is separated from northern Luzon, in the Philippines, by a 350 km stretch of ocean, the Bashi Straits, often rough but containing several small, habitable islands. About 4000 BP cultural assemblages similar to contemporaneous cultures of East Taiwan appear in the Batanes Is. of the Bashi Straits, and Luzon.

These earliest Neolithic societies of the Bashi Straits and the Philippines can be associated with the Proto Malayo-Polynesian language, ancestral to all Austronesian languages spoken outside of Taiwan. In the 2<sup>nd</sup> millennium there was a spectacular spread of Neolithic settlements into the southern Philippines, north Borneo, Sulawesi, Halmahera, Timor and the Bismarck archipelago, all possessing slip pottery with globular vessels and dishes on stands, some with incised or stamped decorations, and a characteristic suite of shell and stone tools and ornaments (Bellwood 1997:232-3). These colonists spoke Malayo-Polynesian languages.

The arrival of the SE Asian Neolithic in NW Melanesia can be equated with a linguistic bottleneck that produced a well-defined interstage, Proto Oceanic, whose descendants subsequently came to be spoken across Oceania. It is a striking fact that all but a few of the 500 or so Austronesian languages of the Pacific Islands fall into a single subgroup, Oceanic. (The exceptions are some 30 languages spoken at the western end of New Guinea and two languages spoken on the western margins of Micronesia: Chamorro and Palau.) The members of Oceanic all share a considerable number of diagnostic changes to the sound system, morphology and lexicon apart from other members of Austronesian, indicative of a few centuries of unified development before dispersal (Lynch et al. 2002). The subgrouping evidence indicates that the bearers of the culture immediately ancestral to Lapita reached the Bismarcks from the Moluccas and the north coast of New Guinea. The immediate relatives of Oceanic are a group of languages spoken in South Halmahera and around Cenderawasih Bay, near the western end of New Guinea.

Around 3200-3100 BP bearers of the Lapita culture began a remarkable phase of colonisation beyond the Bismarck Archipelago, past the Solomons and into uninhabited regions of Oceania. Within a span of about 300 years they established settlements on all the major island groups between New Britain and Samoa, some 4500 km to the east. Their earliest attested colonies in Remote Oceania are in the Reefs/Santa Cruz group (3200-3100 BP), closely followed by settlement of Vanuatu and New Caledonia, and then Fiji and Tonga (3000-2900 BP) and Samoa (2900-2800 BP). (Bedford 2003, Burley et al., 2001, Burley and Connaughton 2007, Clark and Anderson 2001, Green 2003, Sand 2001).



**Fig. 4** Distribution of important Lapita sites

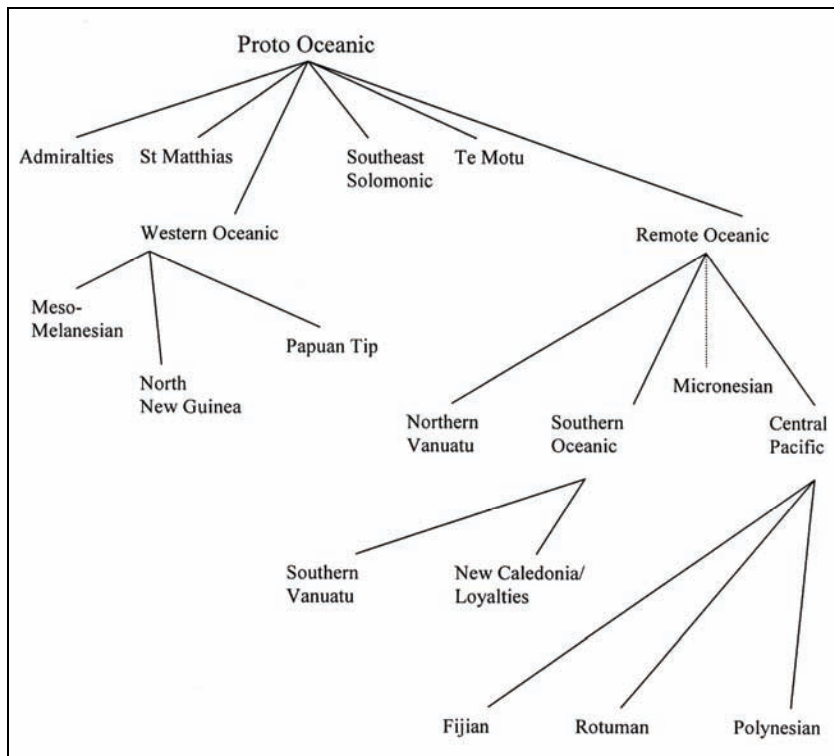
The easternmost limits of the rapid Lapita expansion were in Tonga and Samoa, the largest island groups of West Polynesia. In time the cultural descendants of the Lapita people of West Polynesia colonised the major island groups of Central East Polynesia: the Societies, Southern Cooks, Marquesas and Tuamotus. But before this happened there was a very long pause, at least a millennium and perhaps as long as 1500 years. Although serious sampling deficiencies in the archaeological record for Central East Polynesia leave room for change, there is at present little archaeological evidence for first permanent settlement of this region before the 8th century AD (Spriggs and Anderson 1993). The long West Polynesian pause is marked linguistically by an immense body of innovations accumulated by the ancestral Polynesian language after it separated from its nearest relatives (Pawley 1996).

Why was there such a lengthy standstill in West Polynesia? Several factors seem to have been operating. Whereas the Fiji-Tonga-Samoa area is a natural voyaging corridor, the two major island groups of Central East Polynesia – the Society Is. and the Marquesas – lie 1500-2000 km to the east of Samoa and the small scattered Southern Cooks are about 1000 km to the southeast. There has been debate as to whether the Lapita people had vessels suitable for successfully carrying colonising expeditions, with people, animals and plants, on voyages of thousands of kilometres. As early Oceanic canoes could not sail against the wind, they would have had to wait for El Niño periods when the prevailing SE trade winds give way to westerlies. Anderson (2002) has suggested that long term episodes of wind reversal, associated with changes in changing position of the Inter Tropical Convergence Zone enhanced the chances of successful colonisation of East Polynesia. At first European contact large double-hulled canoes were used by Polynesians

and Fijians for long ocean voyages. It has been suggested that that this vessel design was a key element in the Lapita colonisation of Remote Oceania. However, the linguistic evidence is non-committal on this issue. It may be the double canoe was not developed until after well after the initial colonisation of Fiji and West Polynesia.

The rapid spread of Lapita from the Bismarcks to West Polynesia between 3200 and 2900 BP had a linguistic correlate. The speech of the Lapita colonists in the different island groups must have been relatively homogeneous, little differentiated from Proto Oceanic. This inference is supported by evidence from subgrouping and reconstruction. The high-order subgrouping of Oceanic has proved quite hard to establish but the more we learn the more it appears that the top of Oceanic family tree has a rake-like appearance. Fig. 5 represents my own current view of the high-order subgroups, a fairly conservative view. It can be seen that several branches come off the POC node more or less simultaneously, reflecting a paucity of evidence for combining any of them into a larger subgroup. Each of the putative first order branches belongs to a separate island group or larger region containing a number of island groups.

When we reconstruct the basic lexicons of the proto-language of each of the putative first order branches they are little differentiated from Proto-Oceanic and only a little more differentiated from each other. This fact, together with the spatial distribution of the subgroups suggests a rapid initial spread of early Oceanic speakers across several island groups, leading to separate dialects developing in each group, with these quite soon beginning to break up into more localised dialects.



**Fig. 5** A classification of Oceanic languages into high-order subgroups

### 2.3 Explaining the Austronesian diaspora

What forces powered the rapid dispersal of Austronesian languages between 4000 and 3000 BP? Peter Bellwood has in many works (e.g. 1995, 1997, 2005) argued that the existence of large, widely dispersed language families can seldom if ever be explained in terms of the diffusion of new prestige languages across existing populations. Rather, the languages are for the most part carried by migrating populations, and successful, rapid, large-scale migrations are enabled by cultural advantages. Bellwood (1995:101-3) suggests the following factors as driving the Austronesian diaspora.

1. Continuous population growth based on an agricultural food supply, allowing a continuous generation-by-generation “budding off” of new families into new terrain.
2. The inherent transportability of the agricultural economy to support colonising propagules.
3. The presence of a deep and absorbent “frontier zone” available for colonisation, i.e. habitable lands that were empty or only lightly populated.<sup>8</sup>
4. A predilection for rapid coastal movement and exploration, probably to find the most favourable environments for cultivation and sheltered inshore fishing. This promoted a colonisation pattern of wide-ranging settlement that was followed, often not until some centuries later, by territorial infilling.
5. A developing tradition of sailing canoe construction and navigation. To colonise a vast island world so rapidly must have required quite sophisticated watercraft and navigational abilities.
6. A culturally-sanctioned desire to found new settlements in order to become a revered (or even deified) ancestor in the genealogies of future generations.
7. A desire to find new sources of raw materials for ‘prestige goods’ exchange networks.

It can be seen that factors 1-7 divide into (a) economic and technological preconditions for the dispersal and (b) motives for exploration and colonisation.

Factors 1-3 and 5 fall into the first category: circumstances that made it possible for people to migrate and establish colonies but did not, by themselves, cause people to do so. One critical element in the spread of the Austronesian-speaking societies must have been the capacity to grow crops, which enabled immigrants to dominate and marginalize or absorb non-farming populations throughout Island Southeast Asia and to survive on islands in the central Pacific where there were few edible native plants and no terrestrial animals of any size.

Factors 4, 6 and 7 belong to the second category: values, attitudes and ambitions that got people moving. Factors 6 and 7 represent cultural values whose existence in the distant past can only be inferred from ethnographic parallels which can help to make sense of the data from archaeology and historical linguistics.

Bellwood comments that not all of these factors were present from the beginning of the expansion. Factors 5-7 probably evolved as part of the process.

Lexical reconstructions tell a good deal about the way of life of early Austronesian speakers. More than 1000 words have been reconstructed to the level of Proto Austronesian (PAn), more than 4000 to Proto Malayo-Polynesian (PMP), around 2000 to Proto Oceanic (POc), perhaps 1500 to Proto Central Pacific (PCP) and 3000 to Proto Polynesian (PPn). For Proto Austronesian, a rich array of terms for farming is present, including an extensive vocabulary associated with rice and millet (Blust 1995a, Pawley 2003). Terminologies indicating the keeping of pigs, dogs and water buffalo were present as well as others indicating substantial wooden houses raised on stilts, pottery manufacture and weaving. Linguistic evidence concerning Austronesian material culture and environment is largely consistent with archaeological evidence, as far as the latter goes (Bellwood 1997, Kirch 1997).

PMP lexical reconstructions show both retentions and additions to the PAn cultural inventory, reflecting adaptation to new, tropical environments and a world of large, closely-spaced islands. Reconstructions of the PMP plant vocabulary show the addition of names for various cultivated tropical plants, especially taro (*Colocasia esculenta*) and *Dioscorea* yams, and for a number of trees that were not present in the cooler environment of Taiwan. Chickens, whose presence in the early Taiwan Neolithic is uncertain, were certainly known to PMP speakers. The outrigger canoe complex is well attested in PMP, though not in PAn.<sup>9</sup>

Widespread agreements across the Austronesian world in sibling terminology and social status point to a society where seniority of birth was important. Blust (1980) has argued that unilineal descent groups, allied by a system of preferential or prescriptive cross-cousin marriage, were the core corporate and political units of early Malayo-Polynesian society. His views have not been widely accepted by social anthropologists who are impressed by the predominance among Western MP societies of bilateral kindreds, which in contrast to a stable descent groups, are egocentric and allow the individual to make shifting alliances. A strongish case has been made that Proto Oceanic society had landholding unilineal descent groups, probably matrilineal in most communities, and that descent groups and their leaders were ranked by seniority of ancestry (Hage 1999).

Appendices 1-4 list terms for several semantic domains terms that can be attributed to part or the whole of a sequence of stages, beginning with PAn or PMP and continuing (in some cases) to POc, PCP and PPn. The domains represented are sailing craft and sailing (Appendix 1), fishing (2), gardening activities, (3) root and fruit crops and other useful plants (4). It can be seen that the sailing, fishing and horticultural components of

the culture are well represented and that in each of these domains there is a good deal of continuity between stages as well as some losses and additions.

For example, POc retained PMP terms for three root crops (*Colocasia taro*, *Alocasia taro* and the greater yam), *Musa* bananas and sugar cane. It also retained PMP terms for a good many useful trees and other plants. A very large set of POc terms is reconstructable for useful trees (Tryon 1994, Ross 1996, f.c.) pointing to the importance of tree crop culture in the economy. A major change in POc was the loss of the PMP rice and millet terminology, including terms for granary, pestle and mortar. This is consistent with the widely accepted view that the Austronesian speakers who entered NW Melanesia in the second half of the 1st millennium BC had abandoned the cultivation of grain crops.

### **3. A comparison of language densities and diversity in six island groups of Remote Oceania**

Three millennia have passed since first settlement of the six island groups that form our historical laboratory. Let us compare the language densities and language diversity that have come about in that time. By ‘language density’ I mean the number of languages per geographic unit. ‘Language diversity’ refers to how different the languages are from one another, measured, say, by cognate percentages or structural criteria.

**3.1 Tonga.** (18-22 S) The Tongan archipelago contains some 36 inhabited islands, which fall into three clusters, the Vava’u, Ha’apai and Tongatapu groups, spread over some 550 km north-to-south. Today the isolated islands of Niuatoputapu and Niufo’ou, respectively situated some 320 km N and 370 NE of Vava’u, are also part of the Kingdom of Tonga but they are equally close to the Samoan group and for our purposes they fall outside of both these archipelagos. Most of the islands are small, much the largest being Tongatapu (400 sq. km). The total land area is about 700 sq. km. Most islands are uplifted limestone, some are limestone overlaying a volcanic base.

Lapita people settled Tongatapu at about 2900 BP and within about 50 years they had moved up the chain to settle parts of the northern, Vava’u group (Burley and Connaughton 2007). At first contact one language was spoken over the whole of the core Tongan group and it is clear that this is a continuation of the language spoken by the first settlers. There is modest dialectal variation. Niuatoputapu and Niufo’ou had a different language (or languages), more closely related to Samoan. The earlier Niuatoputapu language, fragments of which were recorded by European voyagers in 1616, was replaced by Tongan some time after that date.

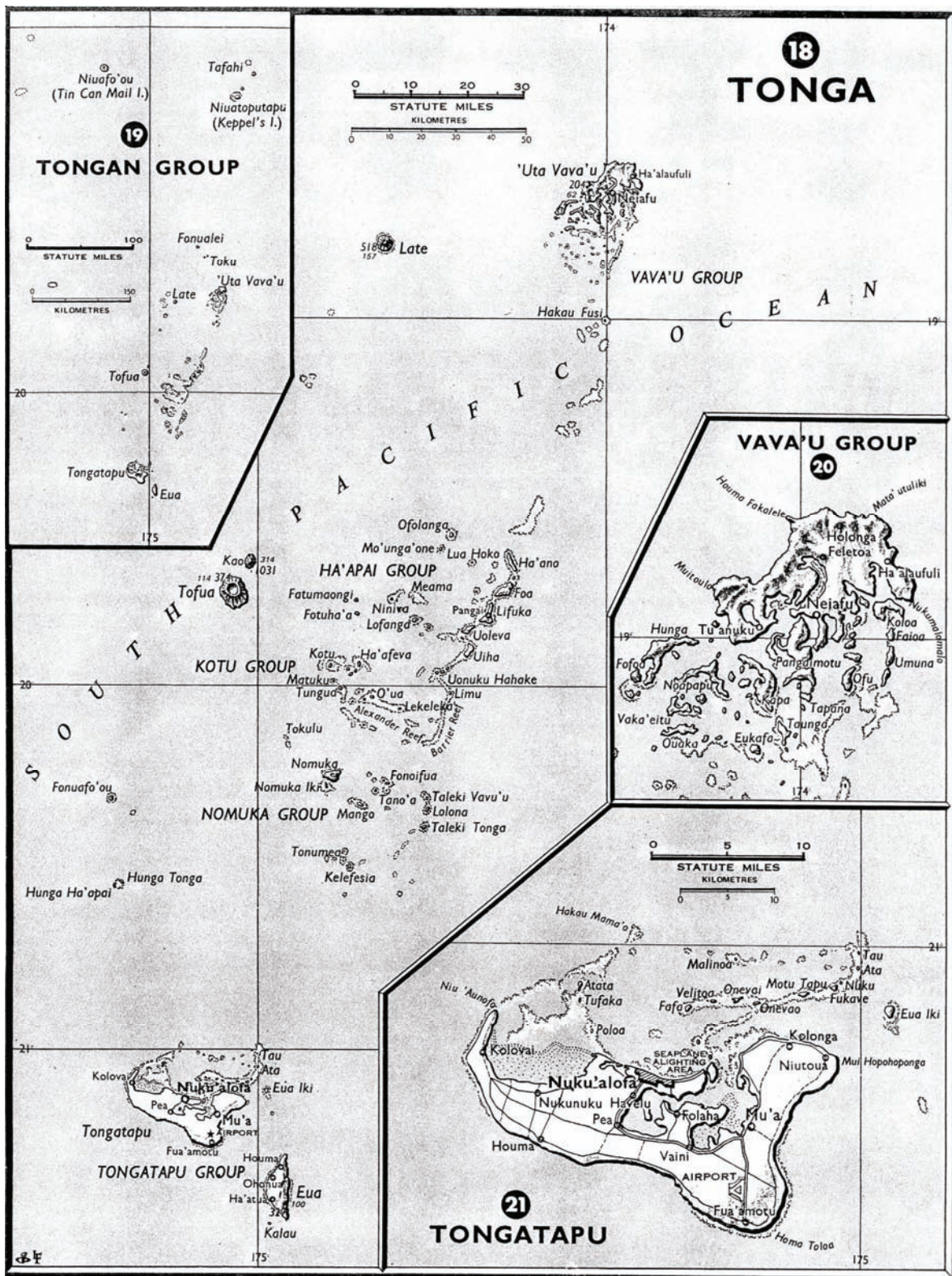
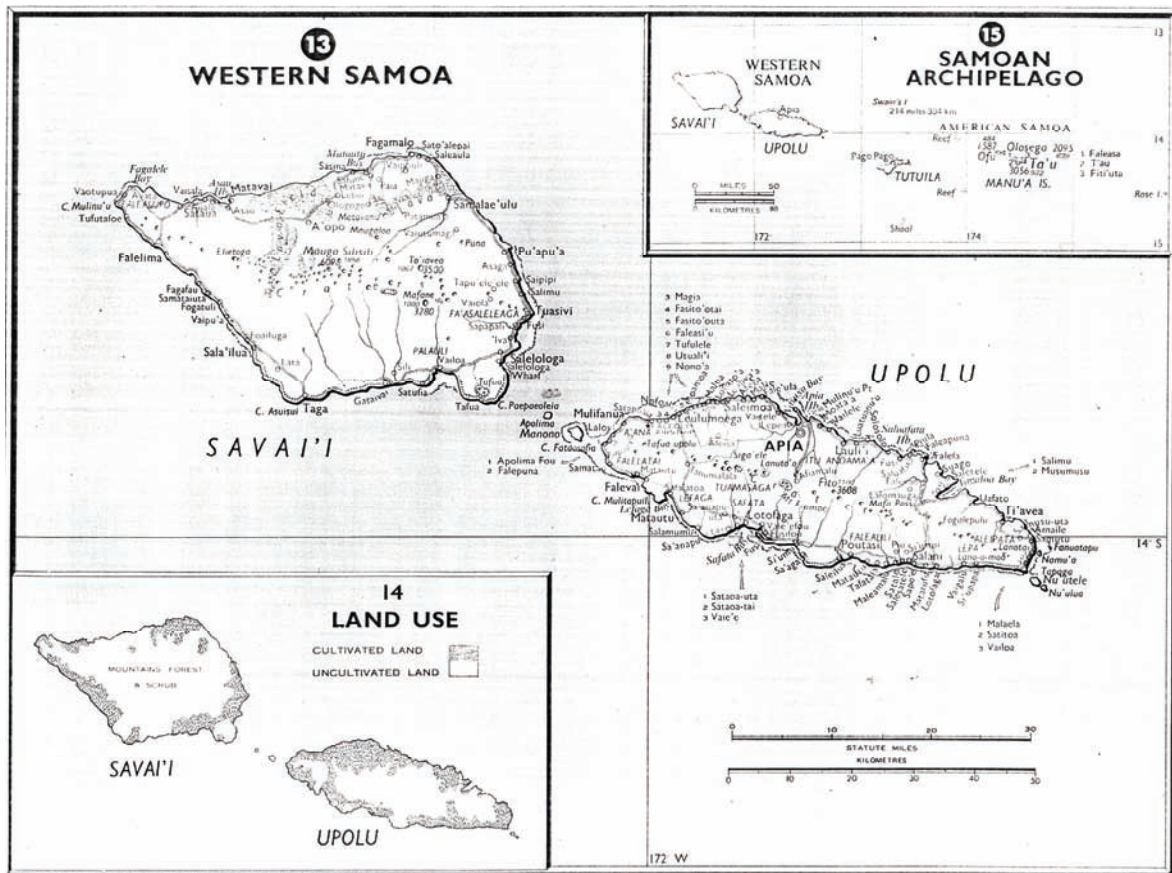


Fig. 6 The Tongan archipelago

**3.2 Samoa.** (13-14 S) The Samoan group is dominated by two large mountainous, volcanic islands, Upolu (1115 sq km) and Savai'i (1814 sq km). These, together with 8 small islands, form a close-knit western cluster. 100 km east of 'Upolu lies Tutuila and east of that the small Manu'a group. Savai'i lies 600 km NE of the northernmost islands in the main Tongan group, and 800 km E of Vanua Levu, in Fiji.

The total land area, about 3100 sq. km, is considerably more than that of Tonga but the Samoan group is more compact, extending over about 400 km east to west. The total areas of coastline in the two groups are fairly similar because Tonga has many more inhabited and uninhabited islands.

Samoa was first settled at about 2900-2800 BP by Lapita people. On 'Upolu a substantial inland population began to build up by 2000 BP but distances to the sea were never great. A single language is spoken over the whole island group with little regional variation.



**Fig. 7** The Samoan archipelago

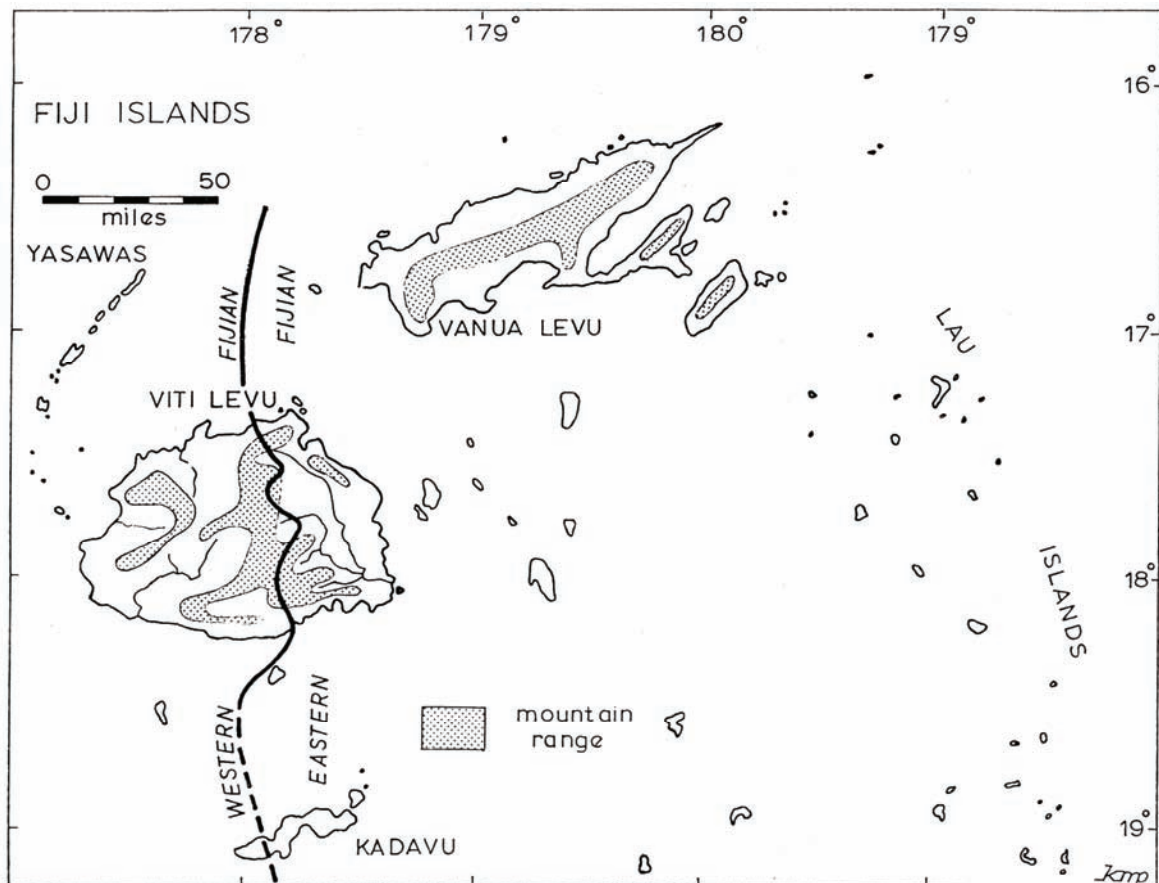


**3.3 Fiji.** (16-20 S) The Fiji group contains about 106 inhabited islands. Its land area, 18,200 sq. km, is 50 percent larger than Vanuatu's and about the same as that of New Caledonia/Loyalty group. Fiji is dominated by two very large islands, Viti Levu and Vanua Levu, which make up 87 percent of the land area. To the east of Viti Levu are two substantial clusters of islands. The Lomaiviti group lies 30-100 km away. Another 150-250 km further east, situated about half-way between Viti Levu and Tonga, lies the widely-scattered Lau group. To the south of Viti Levu is the large island of Kadavu and to the west are the Yasawa and Mamanuca groups. (For present purposes the small isolated island of Rotuma, some 400 km north of Vanua Lava, is not considered part of the archipelago.) A case can be made for treating Fiji as consisting of two archipelagos: the main group and the Lau group.

Fiji was first settled about 3000 years ago by Lapita colonists who at first occupied small islands and parts of the Viti Levu coast. The largest island, Viti Levu, has some large rivers and by 2000 BP a large inland population was building up in the fertile river valleys, shifting the balance of trade and communication in Viti Levu.

Fijian speech traditions fall into two main subgroups, Eastern and Western Fijian. Eastern dialects generally share about 60% of basic vocab. with Western dialects (about the same as English and German). The sharp division between Eastern and Western Fijian (see map) was largely due to the central mountain range that runs north-south down the centre of Viti Levu, the largest island, and was a major barrier to communication between inland populations. Innovations spread upriver and downriver but not across the central mountain range.

Eastern and Western Fijian each consists of a complex network of dialects. Depending on the measure used, each network can be regarded as one language or several. The argument for one language is that neighbouring dialects intergrade, forming a continuum. The argument for several languages is that distant dialects have low mutual intelligibility and in some cases share less than 70 percent of basic vocabulary. At any rate, one can say that each subgroup is close to breaking up into several languages.



**Fig. 8** The Fijian archipelago

**3.4 Vanuatu.** (13-21 degrees S). Vanuatu contains some 65 inhabited islands and extends more than 600 km from north to south. The total land area is 12,200 sq. km. There is a central core of closely-spaced, large islands, with the small islands of the Banks and Torres group lying to the north. Most islands are mountainous with narrow coastal strips. In some regions there has been considerable violent volcanic activity, displacing human populations. There is a 150 km gap between Efate and Erromanga, the northernmost of the three small southern islands.

Vanuatu was first settled between 3200-3000 years ago by Lapita people who entered from the north but rapidly colonised some central and southern islands (Bedford 2003, etc.). As in Fiji, the number of languages credited to Vanuatu varies a good deal according to how one defines language boundaries. Tryon (1976) assigns to the same language speech traditions that share 81 percent or more cognates in a basic vocabulary list of 200-250 words, and by this measure there are today about 105 indigenous languages in Vanuatu. If we exclude the three Polynesian Outliers, which are fairly recent intruders, there are at present about 102 languages that appear to have diversified *in situ*. Ninety-four of the languages are in central and northern Vanuatu and just eight survive on the three small southern islands (where a few died out in the post-contact era). The large islands of Espiritu Santo and Malakula each contains more than 25 languages. Efate, on the other

hand, has two clearly distinct languages, each with diverse dialects. The Central and North Vanuatu languages form one large subgroup (Clark 1985) and the South Vanuatu languages another (Lynch 2001).

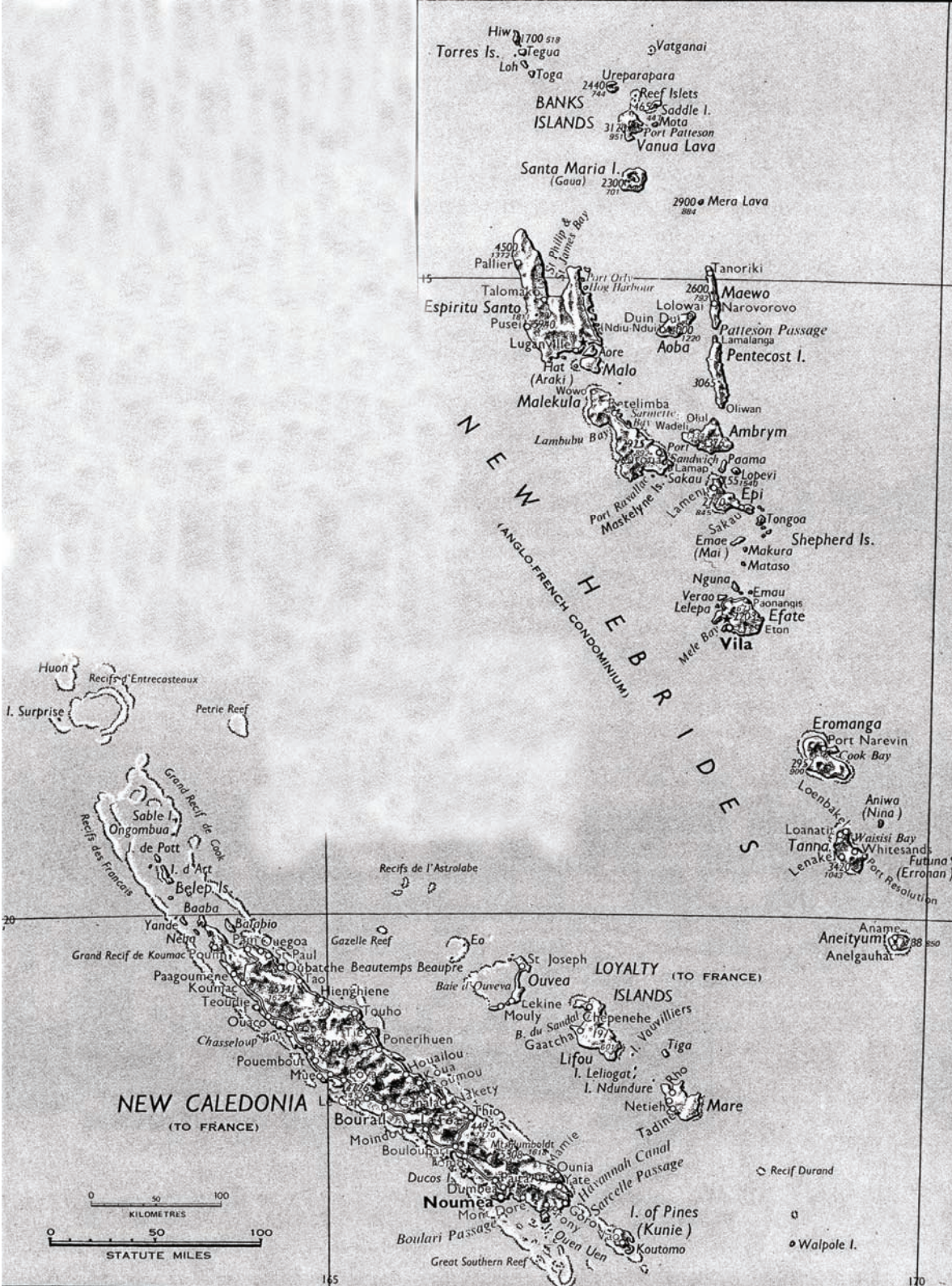


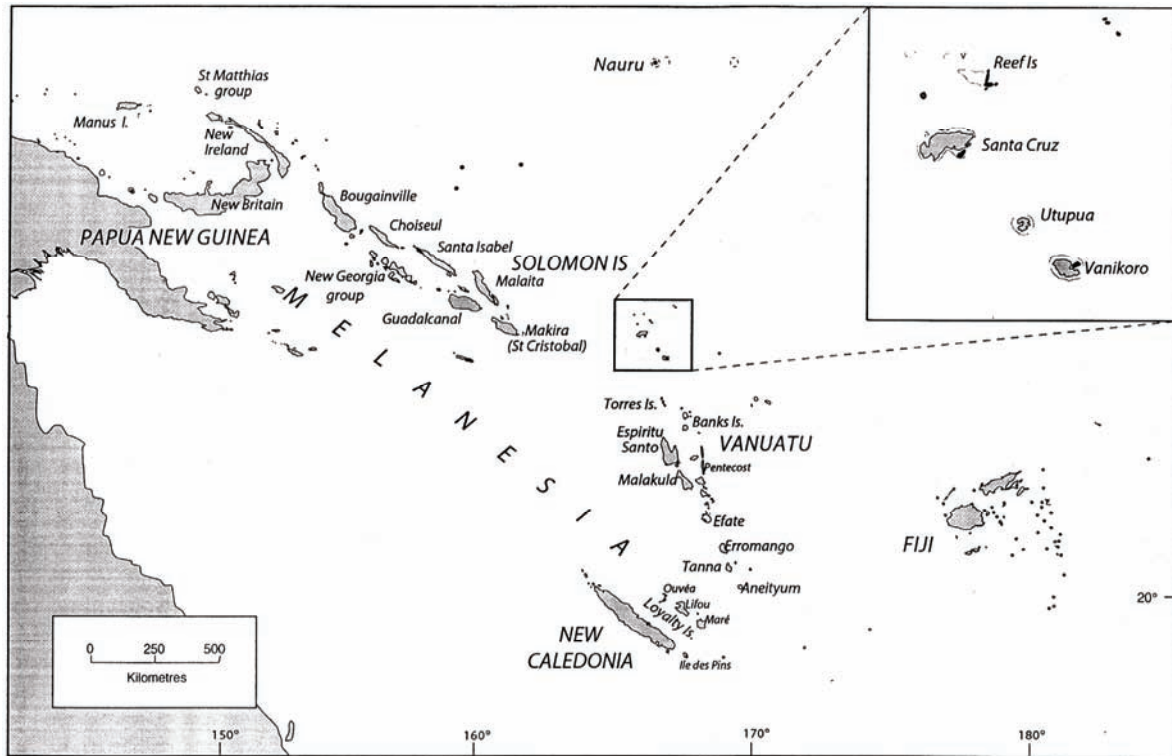
Fig. 9 The Vanuatu archipelago

**3.5. New Caledonia/Loyalties.** (19- 23 degrees S) This group consists of one very large island (Grande Terre), 350 km long and 50-70 km wide, totalling about 16,000 sq. km, plus the three islands that make up the Loyalties, and several smaller islands, giving a total area of 18,500 sq. km. The Loyalties lie some 300 km SW of southern Vanuatu.

New Caledonia was first settled at about 3050 BP (Sand 2001) by Lapita people. There were about 25 languages present at first contact, of which 24 belong to the New Caledonia-Loyalties subgroup. The other is a Polynesian Outlier, West Uvean. We do not have precise measures of the lexical diversity of New Caledonian languages but there is a sharp division between a northern and southern subgroup and between these and the Loyalties.

**3.6. Eastern Outer Islands or Te Motu Province, Solomon Is.** (11-12 degrees S). This group is a scatter of small islands lying east of the main Solomons archipelago and north of the Torres Islands in Vanuatu. The largest is Santa Cruz or Nendo (505 sq km). The Reefs group, 80 km north of Santa Cruz, is made up of 16 small islands, all low coral limestone terraces or atolls. Between Santa and the Reefs is a small active volcano, Tinakula (no longer inhabited). The small high island of Utupua (73 sq. km) is 70 km SE of Santa Cruz and Vanikoro (173 sq km) is another 50 km further south. The low islands of the Duff group, situated about 150 NE of Nendo and 110 km from the Reefs, are occupied by speakers of a Polynesian language.

The Reefs/Santa Cruz was settled by Lapita people at 3200-3100 BP (Green 2003 etc). At first contact Vanikoro (173 sq km) had three languages spoken by probably no more than 1000 people in all. The even smaller island of Utupua likewise had three languages. Santa Cruz had two languages and the Reef Is. two, one being a recent Polynesian Outlier invader. FN. Some 400 km east of Santa Cruz, and scarcely part of the group, lie the isolated islands Tikopia and Anuta, which are but 125 km apart. Tikopia and Anuta, both Polynesian Outliers, can be regarded as dialects of one language.



**Fig. 10** The Eastern Outer Islands of the Solomons

#### **4. Patterns of interaction and diversification**

The migration histories of the six island groups can be divided into two main phases. The first is the initial period of colonisation, when small populations of foundation settlers arrived and dispersed over the group. The second is the subsequent period of population growth in each region and cultural change within the island group.

##### **4.1 Lapita colonisation strategies**

In each new island group that they colonised, from the Bismarcks eastwards, the archaeological record indicates that the Lapita pioneers quickly made scouting voyages, searching for scarce resources, such as habitable islands, rich reefs and lagoons, obsidian sources, suitable stone for quarrying adzes, suitable clay and temper for pottery, etc. Rather than expanding their range of settlements by small increments, they spread thinly over the whole region, establishing widely scattered settlements which kept in close contact. At first these settlements must have had close kin ties and exchanged spouses as well as trade and prestige goods.

What is known about the circumstances and strategies of the Lapita colonisation of island groups in Remote Oceania is consistent with points 3-5 in Bellwood's list. However, it seems likely that, for the first generation or two, agriculture played only a modest supporting role in population growth and rapid spread of settlements, though in the longer run it played a critical role in sustaining populations. Some scholars have argued

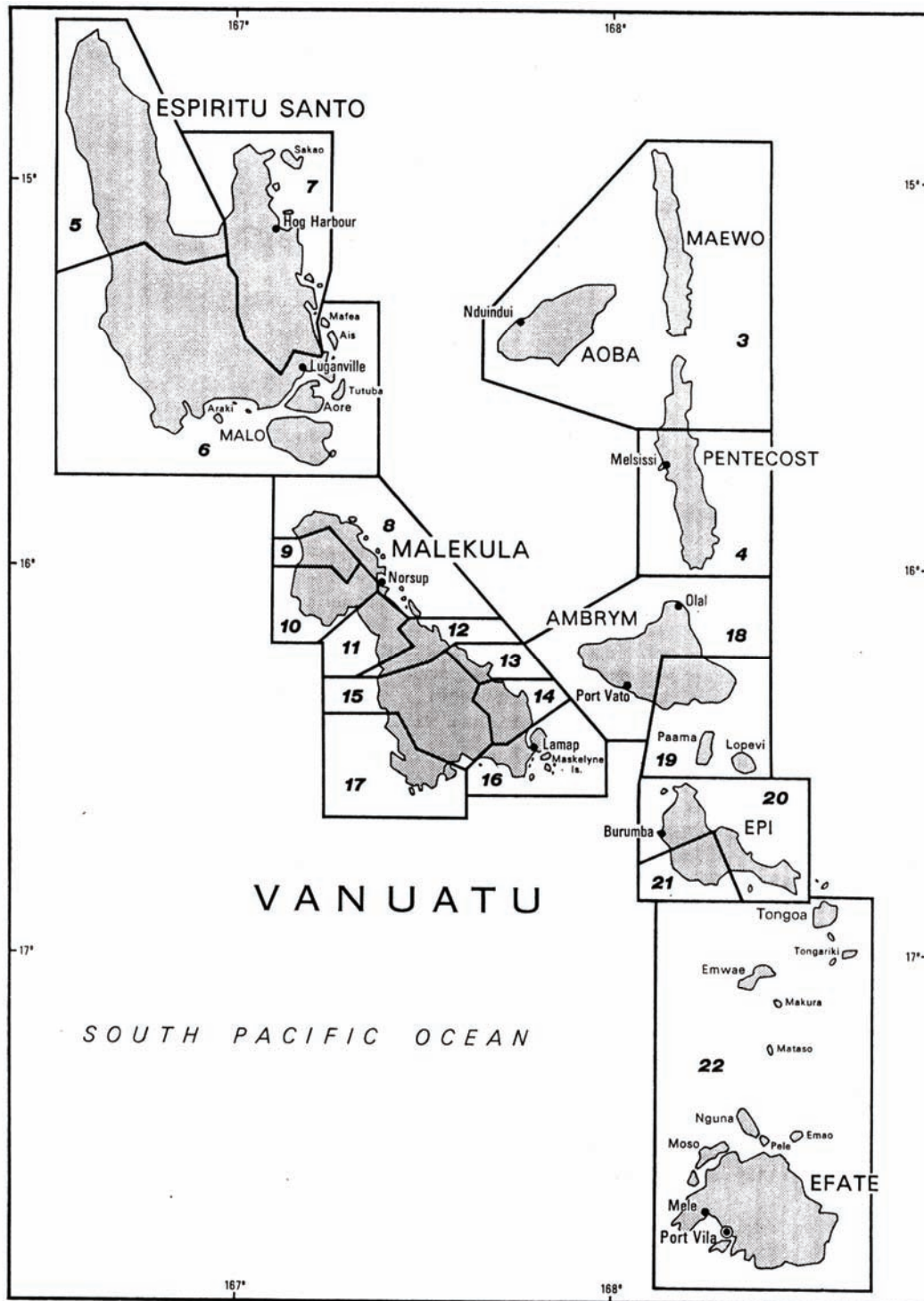
that the first generations of Lapita colonists in Remote Oceanic islands behaved like strandloopers. They found a pristine environment where hunting and gathering provided a rich supply of food, with little or no dependence on agriculture and arboriculture, and were able to maintain this lifestyle until they had markedly depleted the supply of reef food and terrestrial game. The suggestion is that there may have been a delay of many generations before the major subsistence crops became established and before pigs and chicken were introduced. Others think that agriculture and tree crops were present virtually from the beginning but agree that intensive agriculture, showing up in the archaeological record as extensive burning of cleared inland forest, did not happen until local populations had become substantial.

#### **4.2 What happened after the colonising phase in the Island Melanesian archipelagos?**

After the first phase of colonisation, the archaeological and linguistic record indicates that in the Southern Melanesian archipelagos a sequence of demographic and cultural changes occurred which led to weakening or loss of communication between distant sister communities.

1. Local populations became denser and people settled inland on larger islands and filled up vacant coastal niches.
2. Kinship ties between distant sister communities weakened as marriages became predominantly local and long distance trade could be done using intermediaries.
3. Long distance seafaring technology and sailing skills declined.
4. Most linguistic innovations spread only short distances and the speech traditions of distant communities diverged.

In the case of Vanuatu, it is possible to roughly estimate the rate at which languages diverged and multiplied. The extreme proliferation of discrete languages in this archipelago is relatively recent. There was an early divergence between the speech of the three Southern Vanuatu islands and the central and northern islands. Comparisons of their basic lexicons suggest that 500-1000 years ago the number of Vanuatu languages was probably around 30 and that 1000-1500 years ago it was probably closer to 10.



**Fig. 11** North Central Vanuatu: the 22 local groups or chains (after Clark 1985:200)

Clark (1985) analysed the cognate percentages for the 94 Central and North Vanuatu languages given in Tryon (1976) (who used a 258 item word list) and found that these fall into 22 local groups (which he calls 'chains') of very similar languages linked by critical percentages of 69-80. Assuming an average replacement rate of 2 percent per century in individual languages (if a pair of sister languages are compared this translates into a loss of

3.4 percent cognates per century), we can infer that 500-1000 years ago members of each of the 22 chains would have been dialects of one language, by virtue of sharing at least 81% of basic vocabulary. The 22 chains themselves are linked by critical percentages of 50-68. This indicates that 1500-1000 years ago, most of these 22 languages would have been part of a single dialect complex.

After reviewing the distribution of innovations as well as lexical agreements Clark comments that

A relatively gradual differentiation of NCV [North & Central Vanuatu] into regional dialects is suggested by the existence of sub-NCV innovations...which leave relic areas in the north (Banks and Torres), the south (Efate-Shepherds-Epi) and the centre (Aoba and neighbouring islands). Compare the comments by Pawley (1981) on the NCV area as a sort of hyper-Fiji, where regional languages have further split into chains of closely related languages. (Clark 1985:220)

We lack comparably precise data on New Caledonia/Loyalties and Eastern Outer Islands regions but we know that (a) the languages of each of these two regions form a closed subgroup, and (b) there was quite rapid dispersal of Lapita settlements across each region in the initial colonisation phase. Thus the inference can be drawn that for a time these dispersed settlements maintained a single language. The subsequent history of the Eastern Outer Islands appears to have been quite complex (Green in prep., Green and Cresswell 1976, Ross and Naess 2007). An unexpectedly sharp divergence between languages spoken on the same island in the cases of Utupua and Vanikoro points to secondary settlements on these islands from other parts of the group.

If time had allowed I would have extended the sample of Island Melanesian regions to include the Southeast Solomons, consisting of the three large islands of Guadalacanal, Malaita and Makira and some smaller islands. Although they are in Near Oceania, the 20 or so Oceanic languages of this region, which form a fairly well-defined subgroup, appear to have had little contact with Papuan languages. The language density of the Southeast Solomons is about mid-way between Fiji and Vanuatu. I would say it is about 500 years behind Vanuatu in the diversification sequence and 500 years ahead of Fiji. Why has diversification proceeded faster in Vanuatu than in the Southeast Solomons? Vanuatu has many more islands and is more spread out, and no doubt these geographic factors are part of the difference. But on the two largest islands of Vanuatu, Malakula and Espiritu Santo, cultural changes seem to have speeded up the divergence of local languages.

### **4.3 What happened in Fiji and West Polynesia after the colonising phase?**

The archaeological record points to a continuing exchange of ideas and materials between at least eastern Fiji and West Polynesia in the centuries following first settlement.



A parallel sequence of ceramic changes occurs across Fiji, Tonga and Samoa, up to about 2200 BP, and Davidson 1979:91) comments that the changes are “so similar that the resemblances must be result of contact and exchange of ideas”.

The linguistic evidence suggests that soon after the Lapita settlement of Fiji and West Polynesia, people living in the western parts of the Fiji group, including Viti Levu, ceased to have regular contact with people in Tonga. This was not the case for the eastern parts of Fiji, particularly the Lau group, which sits between Fiji and Tonga. For a time Lau was probably linguistically closer to Tonga and Samoa than to western Fiji but later was reabsorbed into the main Fijian dialect complex.

There is a little evidence for a Central Pacific subgroup consisting of the Fijian and Polynesian groups together with Rotuman. Proto Central Pacific evidently was not a homogeneous entity but existed for a time as a chain of dialects centred in Viti Levu and Vanua Levu but probably at first extending to the Lau group and Tonga. However, the innovations that unite Polynesian with the entire Fijian region (and with Rotuman) are few. Instead there are a number of innovations that link eastern Fijian dialects, especially those of Lau and parts of eastern Vanua Levu, with Polynesian (Geraghty 1983).

After Polynesian diverged, the Fijian rump of the Central Pacific dialect complex gradually diversified, with a major subgroup boundary developing in Viti Levu, between western and eastern dialects, following substantial inland settlement of the major river valleys, as was outlined in 3.3. But the rate of divergence was a good deal slower than that in Vanuatu. After 3000 years there are clearly at least two languages, Eastern and Western Fijian, and on grounds of cognate percentages and degree of mutual intelligibility one can make a case for distinguishing five or six Eastern Fijian languages and at least a couple of Western languages. But this still falls well short of Vanuatu's 100.

### **The long West Polynesian pause and the development of Proto Polynesian**

Given that the Samoa group lies some 600 km northeast of the nearest islands of main Tongan group, one might also have expected the speech of Tonga and Samoa to diverge steadily after each was settled and substantial local populations had built up, and to become mutually unintelligible after a millennium or so. However, this did not happen. All the indications are that, for at least 1000 years, a single Polynesian language was maintained in the Tonga–Samoa area, including the small islands and island clusters that lie between Tonga and Samoa (Niufo'ou and Niuatoputapu) or to the west of Samoa (Futuna and Wallis (Uvea)). Within this period quite well-marked southern and northern regional dialects developed in Tonga and Samoa. Each dialect region exhibited a couple of regular sound changes and a number of irregular changes in pronouns and other grammatical elements and some lexical innovations. As these dialects were ancestral to the two primary branches of Polynesian, Tongic (consisting of Tongan and Niuean) and

Nuclear Polynesian (consisting all other Polynesian languages) we may call them the Tongic and Nuclear Polynesian dialects.<sup>10</sup> But against these modest differences, a great mass of phonological, lexical and grammatical innovations are shared by Tongic and Nuclear Polynesian. These are the innovations that define the Polynesian subgroup. They point to a very long period of common development after their separation from Fijian and Rotuman. Lexicostatistical comparisons indicate this to be roughly 1300 years.

Given that Tonga and Samoa, and the other smaller islands in their vicinity were settled by 2800 BP, one has to suppose that unity was maintained by a regular voyaging within the Tonga- Samoa region. The decisive break-up of Proto Polynesian probably only came after Nuclear Polynesian speakers settled parts of Central East Polynesia (perhaps around AD 500) and/or after Tongic speakers permanently settled the isolated uplifted limestone island of Niue, some 400 km east of Tonga and/or after Nuclear Polynesian speakers permanently settled Pukapuka, an atoll some 450 km east of Samoa (both probably on the order of 1500 years ago).

The question arises as to whether this long period of Polynesian unity was a product of linguistic replacement rather than continuous unified development. Could the languages of Tonga and Samoa have diverged markedly by say 2000 BP, only for invaders from, say, Tonga, to have colonised Samoa (or vice versa) and imposed their language so that the original local language disappeared? We know that such a replacement happened in Niuatoputapu after about AD 1620, and it nearly happened in ‘Uvea after 1400, when the ‘Uvean language became partly Tonganised after the island came under Tongan hegemony. But for West Polynesia as a whole replacement is not a viable alternative hypothesis. It is unlikely on demographic grounds and linguistically, replacement would surely have produced a much messier distribution of Tongic vs Nuclear Polynesian innovations among contemporary languages than the rather neat one we find.

In due course the languages of Tonga and Samoa did diverge to the point where they ceased to be mutually intelligible, and the same fate befell the languages of Futuna and ‘Uvea.

### **The role of social stratification in promoting inter-island and inter-archipelago voyaging**

Plainly the sailing craft and navigational skills were available to allow regular communication between the islands in the Tonga-Samoa area. But there must also have been social and economic forces that kept a network of distant communities in contact and maintaining a single language for a much longer time than was the case in any other Oceanic region with a comparably long settlement history. What were these forces? We can only make a speculative case, based on a combination of ethnographic, archaeological and linguistic clues. Among the factors seem to be increasing social stratification,

underpinned by intensification of food production and population increase, and leading to out-marriage of women of chiefly families to distant places and to frequent voyages of ceremonial exchange, and regular trade in scarce goods. The construction of large ocean-going canoes and the outfitting of expeditions carrying ceremonial goods to distant lands, requires a high level of organization and food production as well as diverse specialist skills. It points to the presence of influential leaders directing a range of specialists, such as was observed by early European visitors to Tonga, Eastern Fiji, Samoa, Tahiti and Hawaii. In Tonga, Tahiti and Hawaii large quantities of food were invested in support of large chiefly establishments and the construction of major public works and in support of craft specialists.

In his study of the evolution of the Polynesian chiefdoms Kirch (1984) give special attention to the case of Tonga. There a system developed that he calls 'maritime chiefdoms' or 'empires' – where there is a central place, the seat of the paramount chief, head of the senior descent group, which dominates a much larger region through alliances to local ruling chiefs in various islands. Paramounts chiefs sought to place heads of junior lineages of ruling lines at critical points in the outer islands of their 'empire' and to encourage these chiefs to cement their position by marrying local chiefly women in these provinces. The aristocracy, jealously guarding their genealogies through appropriate marriages, were a separate class from the commoners. Tribute flowed inwards towards the paramount chief, who held a monopoly over prestige goods in his domain. The source of these prestige goods was long distance exchange with Fiji and Samoa.

Chiefs also sought to marry out 'elder sisters', of daughters of ruling patrilineal, to chiefs in other island groups, so that these high-ranking women would not marry local chiefs who might become rivals, either themselves or by producing their high-ranking offspring. Fiji and Samoa were spouse givers to high-ranking Tongan women. Thus, there were a variety of reasons for maintaining regular contacts between island groups, including marriage alliances and obtaining prestige goods.

Following Sahlins, Kirch (1984:159-60) regards intensification of agriculture and population growth as going along with the rise of powerful chiefdoms, being both a precondition for this and a consequence. Competitive chiefs, dependent for their prestige on successful production and distribution of food and status goods, *drove* production of a surplus. The control and distribution of food led in turn to larger social and political relations and groups.

We are left with the question: When did highly stratified societies arise in West Polynesia and Fiji? Now it is clear that seniority of birth was important in early Austronesian society and there is some linguistic and distributional evidence that Proto Oceanic society had hereditary leaders of descent groups (Pawley 1982, Hage 1999, with Lichtenberk 1986 entering a caution). But we have no reason to think that in Lapita times

Oceanic societies had anything like the degree of stratification found in Tonga at first contact. More likely, chiefs were simply senior kinsmen who played an important role in the ritual and religious affairs of the lineage, who had mana, or the power to make things happen, and who had the prestige to organise their kinsmen to perform certain works in the communal interest. However, some time ago Sahlins (1963) pointed out that a system of lineages ranked by seniority of birth – the ‘conical clan’ system – carries with it the potential to develop into a highly stratified, feudal system where chiefs are ever more powerful and eventually became a class apart.

## **5. Conclusions**

In this paper we have reflected on the patterns of movement, interaction, and linguistic and social diversification associated with the first human colonizers of the islands of Remote Oceania, asking what we know of the culture and society of the first colonists of Remote Oceania, what enabled them to successfully colonize so many island groups so rapidly, and what halted their movement eastwards for 1000 years after they settled western Polynesia.

We then turned to the central concern of the paper: why is there such a marked contrast in the number of languages per island group in West Polynesia/Fiji and Southern Melanesia two regions that were first settled at about the same time by Lapita people, who shared a similar culture and language? The argument was made that when they found a new island group the Lapita colonists rapidly explored and lightly settled it. This initial colonising phase was typically followed by a sequence of demographic, economic and technological developments. Population growth led to a denser distribution of settlements, more intensive agriculture, more local marriage and trade, weakening of kin ties with distant communities, and linguistic divergence. This sequence of events happened in both Southern Melanesia and West Polynesia and Fiji but it happened more slowly in West Polynesia/Fiji. In the latter region the maintenance of long distance voyaging, both within island groups and between neighbouring island groups, can be attributed in large part to the rise of powerful chiefs. These chiefs had political, economic and social motives for maintaining long distance connections and were able to use their authority to drive the production of a food surplus which in turn could be used to support specialist craftsmen who could, among other things, build and sail large ocean-going canoes.

## **NOTES**

1. Acknowledgements.
2. Green (1991) explains why ‘Melanesia’ is a problematic construct.

3. A wider examination of the Austronesian family as a whole shows that parallels to the Melanesian pattern of language density are common while parallels to the Polynesian pattern are fewer, occurring only in regions of Western Austronesian where highly stratified societies have emerged. The Philippines is an island group just slightly larger than New Zealand. It has about 140 different languages, which have all emerged in the last 4000 years from a common proto-language (Blust 1991). A few 'major' languages with millions of speakers have emerged, partly as a result of social and political developments within the last millennium.
4. The pattern of language density found in Southern Melanesia is pretty typical of island groups in the rest of Melanesia, i.e. in Near Oceania. However, at least some of the Near Oceania cases are not strictly comparable because Oceanic speakers were not the first colonisers of this region. The farflung island groups of East Polynesia were all settled much later than those of West Polynesia. Language densities in the island groups of Micronesia approximate the Polynesian pattern.
5. Ross (2001, 2005) used cognation and innovations in pronoun forms as the main basis for recognising language families and for subgrouping among the 605 languages compared. His is the most extensive classification of Papuan languages based on a single systematic class of evidence. Earlier classifications of 'Papuan' languages presented in Wurm ed, (1975) and Wurm and Hattori (1981-83) are problematic in many respects.
6. Surprisingly, no early Lapita settlements have yet been found on the islands close to the north New Guinea coast (though catastrophic volcanic activity may have buried these) or on the mainland. However, cultures clearly descended from Lapita appear widely on offshore islands and coastal pockets in various parts of New Guinea after about 2000 BP.
7. The dentate-stamped decorated pottery that was the most emblematic component of early Lapita material culture lasted for just a few centuries. In almost all regional sequences it disappeared by 2600-2500 BP. However, for some centuries after this date many features of the Lapita cultural complex continued with little change, including, as a rule, the plain ware ceramic vessel forms. Still later, within the last 2000 years, many Oceanic communities gave up pottery-manufacture.
8. Although they came to dominate the Philippines and the Indo-Malaysian Archipelago, Austronesian languages have had much less impact in mainland New Guinea. Today, Austronesian languages in New Guinea are, except for two or three areas, confined to scattered coastal pockets and offshore islands and island groups. An initial distribution of this nature is consistent with the strong maritime adaptation of early Malayo-Polynesian colonists. However, the fact that in most regions of New Guinea Austronesian languages have remained largely confined to the coast suggests that many of the non-Austronesian

societies there were already practising agriculture when the Austronesians arrived and had population numbers sufficient to hold their ground.

9. In the course of moving from temperate/sub-tropical Taiwan into the wet tropical islands of Southeast Asia and on into the islands of northwest Melanesia, speakers of what was to become Proto Oceanic lost a number of elements of material culture (Blust 1995a). Grain crops disappeared. They brought pigs and chickens to the Bismarck archipelago but not the water buffalo. It is unclear whether they brought dogs or whether these were introduced later. There is no linguistic evidence that weaving was retained. Bark cloth had become the favoured material for garments.

10. The following are a few of the innovations defining Nuclear Polynesian and Tongic, respectively. PPn \*l and \*r merged as Proto Nuclear Polynesian (PNP) \*l, and \*h was lost. In certain words PPn \*ui became PNP \*iwi. PPn \*m was lost in 2<sup>nd</sup> person dual and plural pronouns, e.g. PPn \*k(a,o)mutou ‘2<sup>nd</sup> plural independent’ > PNP \*koutou, PPn \*mutou > PNP \*utou ‘2<sup>nd</sup> plural preverbal subject’.

In the Tongic branch PPn \*r was lost, \*h and \* merged as PTo \*h. PPn \*-tou ‘plural’ was replaced by PTo \*-utolu, thus \*komutou > \*kimutolu, \*koulua > \*(ki)mua.

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## APPENDICES

### Appendix 1: Terms for canoes and sailing

#### 1. *Terms continued from PMP*

	PAn	PMP	POc	PCP	PPn
prop, post, mast	*tuku	*tuku	*tuku	*tuku <sup>1</sup>	*tuku
boat rollers		*laŋen	*laŋon	*laŋo	*laŋo
outrigger canoe or hull <sup>2</sup>		*katiR	*kati(R)		
outrigger float		*(c,s)a(R)man	*saman	*ðama	*hama
sail	*layaR	*layaR	*layaR	*laða	*laa
steering oar, steer		*quli(n, ŋ)	*quliŋ	*quli	*quli
canoe paddle		*be(R)(c,s)ay	*pose	*voðe	*fohe
to paddle		*pa-luja	*paluca		
punting pole		*teken	*tokon	*(i)toko	*toko
bailer		*limas	*(l,n)ima(s)	*(i)nima	
anchor		*sauq	*jau(q)	*jau	*tau
channel in reef		*sawa(ŋ,q)	*sawaŋ	*sawa	*awa
make a sea voyage		*pa-lahud	*palau(r)	*volau	*folau
load a vessel; cargo		*lujan	*lujan	*uja	*uta
embark, ride on a vessel		*saŋkay	*sake	*ðake	
raft		*dakit	*raki(t)		

#### 2. *Terms continued from POc, without known antecedents in PMP*

	POc	PCP	PPn
canoe, sailing canoe	*waga	*waga	*waka
topstrake	*(q)oRa	*(q)oa	*(q)oa
outrigger boom	*kiajo	*kiajo	*kiato
sticks attaching float	*patoto	*vatoto	*fatoto
side opposite outrigger	*katae	*katae	*katea
boom/yard of sail	*jila	*sila	*tila
bow of boat	*muqa	*muqa	*muqa
proW, end-piece of proW	*(i,u)cuŋ	*isu	*isu
stern	*muri	*muri	*muri
landing place	*mata-sawaŋ	*mata-sawa	
boat owner	*tau (ni) waga	*tau (ni) waga	*tau
waka			

#### 3. *PAn/PMP terms without known reflexes in Oceanic*

	PAn	PMP
boat, canoe	*qabaŋ	*qabaŋ

Appendix 2: Terms for fishing methods and technology

1. *POc terms continued from PAn and/or PMP*

	PAn	PMP	POc	PCP	PPn
fishing line		*hapen	*apon	*avo	*afo
fishhook	*kawil	*kawil	*kawil	*kau	*kau
bait, trolling lure	*paen	*paen	*bayan	*baya	*paa
bait		*banj	*banj	*banj	*panj
basketry fish trap	*bubu	*bubu	*pupu	*vuvu	
seine net		*puket	*pukot		
fish net , ? dip net		*lawa(n,q)	*lawa(n,q)	*lawa	*lawa <sup>1</sup>
cowrie shell sinker		*buliq	*buli(q)	*buli	*pule
fishnet float		*apuŋ	*apu-apuŋ		
fish drive		*kebuR	*kopu(R)	*kovu <sup>2</sup>	*kofu
derris fish poison		*tuba	*tupa	*tuva	
torch, fish with torch		*damaR	*(d)ramaR	*rama	*rama
spear		*saet	*sao(t)	*jao	*tao
fish corral		*belat	*polat	*vola	

2. *POc terms without known antecedents in PMP*

	POc	PCP	PPn
fish hook	*ta(g,k)o	*ta(a,o)ko	*t(a,o)ko
fish net	*reke	*dreke <sup>3</sup>	*reke
fish net , ? with handle or frame	*kup(w)ena	*kub(e,n, )a	*kupuŋa
float of fishnet	*utoŋ	*uto	*uto
mesh of fishnet	*mata	*mata	*mata
netting needle	*sika	*sika	*sika
dragline	*rau(n)	*rau	*rau
stone fish weir	*baRa	*baa	*paa
fish spear	*kuj(i,u)r		
spear with prong	*tara	*tara	*tala <sup>4</sup>
spear retained in hand	*sua	*sua(k)	*sua
gather seafood on reef	*paŋoda	*vaŋoda	*faŋota
seafood gathered on reef	*p-in-aŋoda	*vinaŋoda	*finaŋota
torch, fish at night with torches	*(d)rama(R)	*rama	*rama

**Notes:** 1. PPn \*lawa ‘wrap in sennet’. 2. PCP \*kovu ‘wrap up fish, etc. 3. PCP \*dreke ‘pocket in a net’. 4. Tongan *tala* ‘spike, barb’, Samoan *tala* ‘spike, prong’

Appendix 3: Terms relating to gardening activities

1. *POc terms continued from PAn/PMP*

	PAn	PMP	POc	PCP	PPn
garden, swidden	*qumah	*quma	*quma	*uma	
bushland, hinterland	*quCaŋ	*qutan	*qutan	*quta <sup>1</sup>	*quta

land cleared for garden	*tebaS	*teba	*topa	*tova	*tofa <sup>2</sup>
fence	*qa(l,R)ad	*qalad	*qaRa(r)	*qaa	*qaa
fallow land		*talun	*talun	*talun	*talun-talun
burn fields		*zeket	*soko(t)		
pull weeds	*buCbuC	*butbut	*pupu(t) <sup>3</sup>	*vuvu	*fufu <sup>4</sup>
weed garden		*babaw	*papo	*vovo	
plant in holes		*hasek	*asok		
sow seed		*kambuR	*kabu(R)	*kabu	*kapu <sup>5</sup>

## 2. POC terms without known antecedents in PMP

hoe, adze		*salu	*saru	*salu
strip vegetation		*sani	*sani	*sani
clear rubbish		*sara	*ðara	
digging stick		*waso		
bury, plant tuber		*tanum	*tanum *tanu	
make yam mound		*(p,b)uk(i,e)	*buke	*puke
break up ground		*suar	*sua	*sua
garden fence		*kaRi		
fence, boundary marker		*bayat	*bai	*pae

**Notes:** 1. PCP \*quta ‘land, as from the sea; inland, as from the coast’. 2. PPn \*tofa ‘open up something new’. 3. POC \*pupu(t) ‘pluck fruit’. 4. PPn \*fufu ‘strip off, as leaves, fibre’. 5. PPn \*kapu ‘spread over, surround, envelop’.

## Appendix 4: Terms for root and fruit crops and other useful plants

### 1. POC terms continued from PAn/PMP

	PAn	PMP	POc	PCP	PPn
giant taro, <i>Alocasia indica</i>	*biRaq	*biRaq	*piRaq	*via <sup>1</sup>	
sugar cane	*CebuS	*tebu	*topu	*dovu	*too
yam, <i>Dioscorea alata</i>		*qubi	*qupi	*quvi	*qufi
taro, <i>Colocasia</i>		*tales	*talo(s)	*talo	*talo
banana, <i>Musa</i> hybrids		*punti	*pudi	*vudi	*futi
breadfruit, <i>Artocarpis atilis</i>		*kuluR	*kuluR	*kulu	*kulu
sago, <i>Metroxylon</i> sp.		*Rambia	*Rabia	*abia <sup>1</sup>	
cordyline		*siRi	*jiRi	*jii	*sii
coconut		*niuR	*niuR	*niu	*niu
pandanus		*paŋdan	*padran	*vadra	*fara
coastal pandanus		*kiRay <sup>2</sup>	*kiRe	*kie-kie	*kie-kie
Barringtonia		*butun	*putun	*vutu	
mango, prob. <i>Mangifera indica</i>		*pahuq	*pau(q)		
mango, generic		*wai	*wai		
Indian almond, <i>Terminalia</i> sp.		*talisay	*talise	*taliðe	*talie
chestnut, <i>Inocarpus</i> sp.		*(q)ipi	*qipi	*ivi	*ifi
Canarium almond,					

<i>Canarium indicum</i> <sup>3</sup>	*kanaRi	*kaŋaRi		*makari <sup>3</sup>
<i>Burckella obovata</i>	*natu	*(n,ñ)atu		
citrus spp.	*limaw	*molis	*moli	*moli
ginger, <i>Zingiber</i> sp.	*laqia	*laqia	*laya	
curcurbit	*[ka]timun	*[ka]timun	*timo	*timo
chew on sugar cane	*ququs	*ququ(s)		

2. POC terms without known antecedents in PMP

potato yam, <i>Dioscorea bulbifera</i>		*pwatik		
taro, <i>Colocasia</i>		*mwapo(q)	*mavu	*mafu
taro seedling		*upea		
prepare yam for planting		*sopu		
cut seed yams for planting		*paji	*vaði	
banana ( <i>Australimusa</i> group)		*joRaga	*soaga	*soaka
k.o. cooking banana		*sakup		
breadfruit		*baReko		
core of breadfruit		*malo	*malo	*malo
<i>Abelmoschus manihot</i>		*was(i,a)		
Paper mulberry, <i>Broussonetia papyrifera</i>		*m(w)ase	*masi	
Malay apple, <i>Syzygium malaccense</i>		*kapika	*kavika	*kafika
Polynesian plum, <i>Pometia pinnata</i> <sup>4</sup>		*tawan	*tawa	*tawa
Indian mulberry, <i>Morinda citrifolia</i>		*ñoñum	*ñoñu	*nonu
Indian mulberry, <i>Morinda citrtifolia</i>		*kurat	*kura	
Vi apple, <i>Spondias dulcis</i>		*quRis	*uRi	*wii
Canarium almond, <i>Canarium indicum</i>		*qalip		
turmeric		*yaŋo	*yaŋo	*aŋo
large pandanus		*p(w)asa	*vasa	*fasa
edible wild cane		*pijo	*viðo	*fiso

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**Notes:** 1. Bauan Fijian *abia*, arrowroot. 2. PCEMP \*kanaRi. 3. PPn \*makari ‘*Canarium samoensis*’. 4. PEMP \*tawan.