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# **AUSTRONESIAN DIASPORA A NEW PERSPECTIVE**



The National Research Centre of Archaeology  
The Agency of Research and Development  
The Ministry of Education and Culture



Gadja Mada University Press

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Proceedings the International Symposium  
on Austronesian Diaspora



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**ISBN:** 978-602-386-202-3

***Publisher:***

Gadjah Mada University Press

***Address:***

Jl. Grafika No. 1 Bulaksumur  
Yogyakarta 55281  
Telp./Fax.: (0274) 561037  
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# PREFACE OF PUBLISHER

This book is a proceeding from a number of papers presented in The International Symposium on Austronesian Diaspora on 18<sup>th</sup> to 23<sup>rd</sup> July 2016 at Nusa Dua, Bali, which was held by The National Research Centre of Archaeology in cooperation with The Directorate of Cultural Heritage and Museums. The symposium is the second event with regard to the Austronesian studies since the first symposium held eleven years ago by the Indonesian Institute of Sciences in cooperation with the International Centre for Prehistoric and Austronesia Study (ICPAS) in Solo on 28<sup>th</sup> June to 1<sup>st</sup> July 2005 with a theme of “the Dispersal of the Austronesian and the Ethno-geneses of People in the Indonesia Archipelago” that was attended by experts from eleven countries.

The studies on Austronesia are very interesting to discuss because Austronesia is a language family, which covers about 1200 languages spoken by populations that inhabit more than half the globe, from Madagascar in the west to Easter Island (Pacific Area) in the east and from Taiwan-Micronesia in the north to New Zealand in the south. Austronesia is a language family, which dispersed before the Western colonization in many places in the world. The Austronesian dispersal in very vast islands area is a huge phenomenon in the history of humankind. Groups of Austronesian-speaking people had emerged in ca. 7000-6000 BP in Taiwan before they migrated in 5000 BP to many places in the world, bringing with them the Neolithic Culture, characterized by sedentary, agricultural societies with animal domestication.

The Austronesian-speaking people are distinguished by Southern Mongoloid Race, which had the ability to adapt to various types of natural environment that enabled them to develop through space and time. The varied geographic environment where they lived, as well as intensive interactions with the outside world, had created cultural diversities. The population of the Austronesian speakers is more than 380 million people and the Indonesian Archipelago is where most of them develop. Indonesia also holds a key position in understanding the Austronesians. For this reason, the Austronesian studies are crucial in the attempt to understand the Indonesian societies in relation to their current cultural roots, history, and ethno-genesis.

This book discusses six sessions in the symposium. The first session is the prologue; the second is the keynote paper, which is Austronesia: an overview; the third is Diaspora and

Inter-regional Connection; the fourth is Regional highlight; the fifth is Harimau Cave: Research Progress; while the sixth session is the epilogue, which is a synthesis of 37 papers.

We hope that this book will inspire more researchers to study Austronesia, a field of never ending research in Indonesia.

Jakarta, December 2016

Publisher

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# **SPLITTING UP PROTO-MALAYOPOLYNESIAN: NEW MODELS OF DISPERSALS FROM TAIWAN**

**Roger Blench**

## **Introduction**

The goal of historical linguistics is the reconstruction of proto-forms, i.e. words supposedly spoken when a proto-language begins to diversify. In the classical model of linguistic palaeontology, the reconstructed forms are matched against historical and archaeological evidence. Thus if 'dog' is claimed as a proto-form, we should expect to find dogs in the archaeological record. This also then allows us to calibrate accurately the splitting-up of proto-families. This appears to make sense; but what if the assumptions we adopt to reconstruct proto-languages contain significant methodological flaws? This paper looks at the example of proto-Malayo-Polynesian (PMP) a well-established subgroup of Austronesian and suggests that the textbook versions are compromised by findings from other disciplines and we must rethink our tools for assessing the status of such hypothetical entities.

The Austronesian dispersal represents one of the great prehistoric expansions of a linguistic phylum. Its inception is usually associated with the Neolithic settlement of Taiwan<sup>1</sup> by 5500 BP followed by extensive movement into Island SE Asia (ISEA) and the Pacific from around 4000 BP onwards. From the point at which the migrants reached the Bismarck Islands and formed the nucleus of the Oceanic language at around 3200 BP its further course is relatively well-charted, as is the association of Oceanic with finely-wrought Lapita pottery (Pawley & Ross 1995; Lynch et al. 2002; Pawley 2008; Sheppard et al. 2015).

According to the current model, all extra-Formosan Austronesian languages belong to a single subgroup, Malayo-Polynesian (Dyen 1963; Ross 2012; Blust 2013) and thus the reconstructions proposed for proto-Malayo-Polynesian (PMP) can theoretically tell us about the lifestyle, social organization, material culture and subsistence strategies of its speakers. Blust (1995) represents an overview of what can be inferred concerning the lifestyle of the early Austronesians based on lexical reconstruction. However, the cultural transformations that occurred in the period between the migrants leaving the southern tip of Taiwan and reaching Near Oceania is less well understood. The internal classification of the Western Malayo-Polynesian languages remains disputed (Blust 2013) and the sequence of archaeological dates is only weakly attested (cf. Spriggs 2011).

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<sup>1</sup> The paper uses 'Taiwan' to refer to the island and the modern nation-state and Formosa(n) to refer to the complex of indigenous peoples and languages still present on Taiwan.

Part of the problem arises from assumptions about the pattern of migration. According to the model promoted by Bellwood (2013 and elsewhere) the Austronesian expansion was primarily demographic and driven by agriculture. Hence it was sequential; the early Austronesians reached the Philippines, and moved on, both southwest and southeast, gradually settling Island SE Asia and the Pacific. Blust also implicitly accepts this model as it chimes with the hierarchical internal structure he attributes to Malayo-Polynesian. Nevertheless, this model has been challenged from various quarters, both from archaeology and linguistics. Donohue & Denham (2010) summarise the objections to the models of Austronesian classification, while Spriggs (2011) and Blench (2012) argue that the near-simultaneity of early dates outside Taiwan point to a rapid dispersal in different directions, presumably reflecting access to improved maritime technology. Indeed, the early settlement of the Marianas and Palau, remote and small islands in the Pacific, points strongly to this process.

If there was indeed an 'explosive' dispersal at this early period, then it might be expected to have consequences for both language and synchronic material culture. Four thousand years ago, the Formosan peoples would not yet have crystallised into the groups which exist today with numerous languages and subsistence strategies reflecting the diverse environments of the island. The absence of obvious signs of agriculture at the lowest levels in both the Batanes (Bellwood & Dizon 2014) and the site of O Luan Pi (I and II) on the southern tip of Taiwan (Kuang Ti 2000) argues that some of the early migrants were fisher-foragers rather than farmers (see also Bulbeck 2008). It would also account for the puzzling differences between the agriculture of the Philippines, the first presumed stopping point for these migrants, and Taiwan. Essentially the cereal which constitutes the focus of Formosan peoples is foxtail millet, *Setaria italica*, whereas in Luzon and points south irrigated rice is now dominant. If many of the peoples leaving Taiwan were not sedentary cereal agriculturalists, then they would not reproduce this cultural strategy in the new islands they settled.

This suggests that we have been seduced by the lure of coherence, that the desire for a tidy interpretation has made the early phases of the Austronesian expansion seem more structured than is probable. Resource extraction was revolutionised by new maritime technology, and it would have been seized on by multiple groups, often very varied in character. The boats leaving the southern tip of Taiwan are likely to have had multi-ethnic crews and to have carried a range of ideas to different locations. The seas and currents would have made movement in almost every direction possible, and since the land masses were largely unexplored, new voyages and landfalls were undertaken all across ISEA, sometimes in what may now seem unlikely places. In the light of this, it is no wonder that WMP is hard to classify; it is not the result of sequential diversification, but the fallout from an explosive

dispersal. If this is the case, then such a dispersal should also be reflected in the archaeology, as well as the material culture. Dates for early Austronesian presence in ISEA are still relatively sparse, but material culture represents a vast archive which has hardly been exploited. By plotting the distribution of distinctive items, present both among Formosan indigenous peoples and elsewhere, it is possible to get a sense of the routes and destinations characteristic of this early period.

Recent analyses of the skeletal material from the remarkable cemetery at Te Ouma on Efate in Vanuatu has cast a surprising new light on early Austronesian expansion (Valentin et al. 2014, 2016; Spriggs this conference and pers. comm.). In the light of the phenotypic characteristics of the present inhabitants of Vanuatu, it has generally been assumed that they developed a 'mixed' appearance at the earliest phase of the expansion of the Oceanic languages, i.e. presumably somewhere in the Admiralties. People of SE Asian genetic heritage would have arrived on the Admiralties, encountered Austromelanesian populations speaking 'Papuan' languages, mixed genetically and begun the expansion into Remote Oceania, in conjunction with the culture underlying Lapita pottery. However, the osteometrics from Te Ouma indicates this cannot be true. The earliest skeletons all reflect individuals of Polynesian or ISEA phenotype, connecting directly with Taiwan and the populations of Northern Luzon. Only after a couple of generations does the character of the skeletal material reflect more directly the current inhabitants of Vanuatu and New Caledonia. This in turn is associated with the rapid decline of Lapita pottery, suggesting a disruptive culture change, either from the arrival of NAN speakers implying invasive genetic admixture or the arrival of already mixed populations.

If this is so, then it may point to an arrival very rapidly after the migrations out of southern Taiwan. This in turn raises numerous questions, including why migrate such a long distance, what route was taken, what accounts for the disparity of several centuries between the settlement of Luzon and the arrival of speakers in the Admiralties? Why are there no unambiguous precursors of Lapita pottery? On the other hand this would neatly explain one long-standing enigma, the surprising similarities between PMP and Proto-Oceanic. If indeed Oceanic had been the end-product of a complex nesting process in the Austronesian 'tree' then it should surely be more differentiated from PMP than is in fact the case. Related to this is the problem of the SHWNG (South Halmahera-West New Guinea) languages, usually claimed to be a primary split with Oceanic (Blust 2013; Kamholz 2014). SHWNG populations do not generally show mixed phenotypic characters, and certainly do not have Lapita pottery or other cultural features of Oceanic. Where and when could this split have taken place? This paper cannot answer all these questions; the data is too fresh for an interpretation to be fully developed. Nonetheless, it will try and model the early history of PMP to account for it.

The metaphor which can be invoked to characterize the Luzon Strait four thousand years ago is a boiling pot. Numerous different ethnic groups, with differing languages, cultures and objectives, but with access to new types of boat, began to disperse outwards, carrying with the innovative culture and technology. Although the Austronesian world was subject to numerous later episodes of cultural levelling, for example on Java and the Malay peninsula, evidence for this early period can be detected around the periphery, where dominant cultures failed to penetrate.

This paper<sup>2</sup> combines linguistic and material culture data to develop a preliminary model of the early period of dispersal of PMP. Whether PMP can be regarded as a coherent proto-language spoken at a particular time and place remains an open question. While some linguistic roots are very widely attested across the Austronesian world, others have very restricted distributions. It may also be the case that there was substantial back influence to Taiwan, especially from the Philippines. Iron-working, for example, must have been a later introduction from further south, and whatever group was responsible for introducing it would have brought other associated cultural practices and presumably their language. Much of the innovation in the extra-Formosan zone can be attributed to continuing contact with the mainland at this period, although the disappearance of non-Sinitic languages on the Chinese coast makes this difficult to prove from a linguistic point of view. In terms of material culture, it accounts for the high diversity of extra-Formosan repertoire, and why so many widespread PMP lexemes have either only a single or a few scattered Formosan reflexes. One interpretation is that these are not inherited from PAN, but borrowed back into Formosan languages as part of the interaction sphere.

## Linguistics

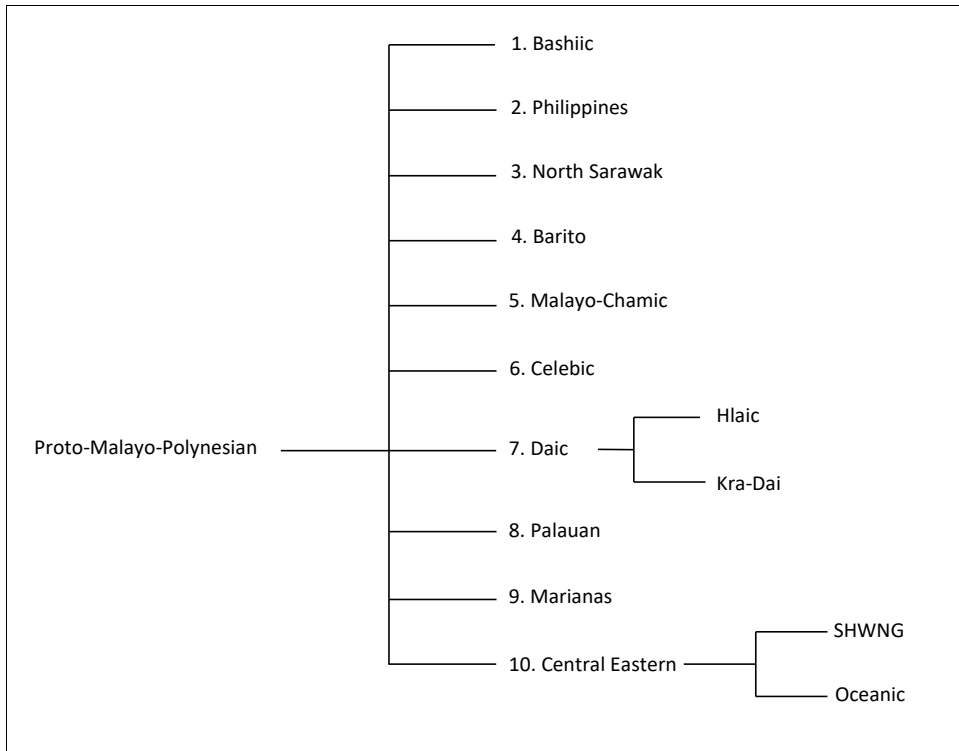
The ethnic chaos in the Luzon Strait is reflected in the linguistic uncertainty concerning Western Malayo-Polynesian. WMP is divided into a number of primary subgroups, which have so far resisted hierarchisation. The discussion will no doubt continue, but PMP divides into the well-characterized Oceanic and the rest, i.e. Western Malayo-Polynesian (WMP) whose internal divisions remain disputed (e.g. Blust 1993; Donohue & Grimes 2008). Figure 1 presents a version of the early splits in PMP, bringing together these various proposals. The composition of the subgroups is as follows:

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<sup>2</sup> A very preliminary version of some of these ideas was presented at the National Museum of Prehistory (國立臺灣史前文化博物館) Taitung on the 28th September, 2014. My thanks to the Museum and Tsang Cheng Hwa for supporting my presence, and the audience for discussions. Thanks to Frank Muyard and to Matthew Spriggs for subsequent discussion of the Te Ouma materials.

1. Bashiic languages are Ivatan, Itbayat and Tao [Yami]
2. Includes all languages of the Philippine Archipelago except the Sama-Bajaw (or Samalan) languages spoken by traditionally nomadic 'sea gypsies' of the central and southern Philippines and various parts of Indonesia-Malaysia
3. Includes languages of northern Sarawak in Malaysian Borneo
4. Includes Ngaju Dayak and Ma'anyan of southeast Kalimantan, as well as Malagasy
5. Includes the Malayic languages of insular Southeast Asia, and the Chamic languages of mainland Southeast Asia, and
6. Includes all languages of Sulawesi south of Gorontaloic, except the South Sulawesi group (whose best-known members are Buginese and Makasarese).
7. Includes all the languages that fall within Tai-Kadai. This is not accepted or even discussed by many linguists
8. Palau only
9. Chamorro and other languages of the Marianas only
10. Blust (2013) defines an 'Eastern Malayo-Polynesian' branch, which divides into SHWNG and Oceanic proper.

It is remarkable that even the subgroup in the immediate area of the Luzon Straits, Bashiic, cannot easily be fitted into the WMP substructure. The Bashiic [=Batanic] languages consist of a small group of the northernmost PMP languages, spoken on Lanyu island and by the Ivatan and Itbayat in the Luzon Strait. They have been characterised in Ross (2005) but their placing remains problematic. The languages are very close to one another, which confirms the oral traditions on Lanyu that some villages were founded from the Batanes a few centuries ago. However, the Batanes were settled 4000 years ago (Bellwood & Dizon 2014) and Lanyu has also been occupied for a lengthy period (Tsang 2005). It must be that there were former languages on Lanyu which have disappeared or been assimilated, while the Batanes were in relative isolation from other PMP languages for a long period. The Yami in particular have a strikingly idiosyncratic material culture, including large paddled canoes, which do not resemble any others in the Austronesian world. Green Island, further north, was uninhabited at the time of the first European incursions, but has a long archaeological history, and most likely was settled by the same populations as the earliest inhabitants of Lanyu (Mike Carson pers. comm.).



**Figure 1.** Primary subgroups of Proto-Malayo-Polynesian

Bashiic is not the only isolate apparently dating from this early period. Although the languages of the Barrier Islands, west of Sumatra, have links to languages on the Sumatran mainland (Nothofer 1986), it has not been demonstrated either that these languages are related to one another, or that the cognates with mainland Sumatran languages are other than loans. Nias, Mentawai and Enggano in particular seem to have a wide scatter of ‘rogue’ vocabulary with either no Austronesian cognates, or parallels in remote branches much further east, in Sulawesi and Oceanic. This is also reflected in their material culture, which reflects Formosan practice (see the sub-chapter “*the leg-xylophone*” for the distribution of the leg-xylophone, for example).

In the Pacific, Chamorro and Palauan are also primary branches of PMP (cf. Reid 2002 for Chamorro), but somewhat surprisingly are the results of parallel eastwards migrations. In the case of the Marianas, the archaeological evidence for the first settlement by at least 3500 BP is strong. There are convincing similarities with the ceramics of the Northern Philippines, which show dentate stamping and lime infill. Carson *et al.* (2013) provide a comprehensive view of the evidence connecting the Northern Philippines with Remote Oceania. Unfortunately much of the other material culture of the Marianas has been displaced by the Cultural Revolution brought about by the early presence of the Spanish and other occupiers.



Early settlement dates for Palau remain somewhat contradictory, with archaeology suggesting a date of around 3000 BP and palaeo-environmental dates, somewhat older at 4500 BP (Clark 2005). Since these earlier dates would put settlement beyond the range of Austronesian migration, they are probably to be discounted. The earliest settlement can be identified with flaked stone tools, rather indistinct brown and some painted pottery, and human burials. The Palauan language has undergone numerous rather exotic sound-changes and morphological shifts, so it has not yet proven possible to identify its nearest relative.

Trees of the WMP languages do not usually include Daic (Tai-Kadai) although a relationship between Austronesian and Daic has long been posited (Benedict 1942). Ostapirat (2005, 2013) has argued for a genetic affiliation between Daic and PAN which is supported with regular sound-correspondences. Norquest (2007:413) points out that the Hlai branch of Daic shares some striking lexical items with proto-Austronesian which do not occur in the other branches. Sagart (2004, 2005) proposed Daic was a branch of PMP and Blench (2013) supported this with further linguistic and cultural data, including dental evulsion, tooth-blackening and multi-tongue jews’ harps. It is unresolved as to whether Daic is a sister-language to PAN or to PMP. Sagart (2005) posits ‘an early Austronesian language called here ‘AAK’ (Austronesian Ancestor of Tai-Kadai). This was a daughter language of PAN, and a close relative of PMP: it shared some innovations with PMP, but was more conservative in other respects.’

Daic itself is divided into two major branches, Hlaic and Tai-Kadai, with Hlai spoken on Hainan island and Tai-Kadai spoken inland in China and in the region further south. It is striking that Austronesian shares a relationship with Hlaic distinct from Austronesian in general, as evidenced in Table 1.

**Table 1.** PAN-Hlaic relationship

Gloss	Pre-HI	Proto-Hlai	PAN
slap	*pi:k	*phi:k	*pik
weave	*bən	*pʰən	*bəl+bəl
pinch	*ti:p	*tʰi:p	*a-tip (PMP)
seven	*tu:	*tʰu:	*pitu
three	*tʰu:ʔ	*tʰʰu:ʔ	*təru
sharp	*jə:m	*tʰə:m	*tʰajəm
five	*ma:	*hma:	*rima
six	*nɔm	*hnom	*ʔənəm

Source: adapted from Norquest (2007)

An intriguing piece of evidence is provided by the word for ‘bird’ (Table 2). The PMP form *\*manuk* appears to be cognate with Tai-Kadai, whereas Hlaic languages have innovated.

Tai-Kadai languages usually delete the prefix of Austronesian forms, but Lakkia preserves the m- prefix inherited from Austronesian.

**Table 2.** ‘Bird’ in Austronesian and Daic

Language	Form
PAN	*qayam
PMP	*manuk
Proto-Hlai	*səc
Proto-Tai Kadai	*-nok
Lakkia	mlok

This is likely to mean that there was a primary split in the migrants from the southern tip of Taiwan, with some reaching Hainan and others settling Guangdong and moving inland as pressure from Sinitic peoples intensified.

South and east of Taiwan are a variety of subgroups of PMP, which cover most of the islands now within Indonesia. Some Formosan words, in particular animal names, seem to show strongly split distributions, occurring in the West and Central parts of ISEA and noticeably absent in the Eastern Indonesia. Blust (1995) who carefully notes the distribution of cultural and biological terms, does not draw the conclusion that this is a consequence of the skewed patterns of early voyaging but re-analysis of the data suggests this. §3 presents evidence from a brief sample of animal name and maritime terms which reflect the dispersal of PMP.

**Lexical evidence**

*Sharks and crocodiles*

The name of the shark represents an interesting case. PMP has *\*buqaya* for ‘saltwater crocodile’ and this has a single Formosan reflex, Puyuma *buaya* ‘shark’. Formosan generally has *\*qisu* for ‘shark’ which is lost outside Taiwan. Blust (1995) assumes there was once PAN *\*buqaya* ‘crocodile’ reflecting a now disappeared species, and that the remaining Puyuma reflex has been transferred to ‘shark’. However, in the continuing absence of Taiwanese crocodiles, a simpler solution is that the Puyuma word is simply a borrowing from a nearby PMP language, reflecting intensive contact across the straits.

*Pangolins*

A curious piece of direct evidence from zoogeography supports a direct link between Taiwan and Borneo. Blust (1995) puzzled over the name for the pangolin;

‘Perhaps the best illustration of such a case is \**qaRem* "pangolin", reflected in Taiwan and in Borneo (where it applies to another species of the same genus, *Manis javanicus*), but with no evidence that the animal was ever found in any part of the Philippines except Palawan and the adjacent Kalamian and Cuyo Islands, which, like Borneo, rest on the now submerged Sunda Shelf.’

Table 3 presents an abbreviated version of the linguistic evidence for the name of the pangolin<sup>3</sup>.

**Table 3.** Austronesian names for pangolin

Branch	Language	Form	Gloss	Scientific
Formosan	Seediq	ʔaruŋ	pangolin, anteater	<i>Manis pentadactyla</i>
	Thao	qalhum	pangolin, scaly anteater	<i>Manis pentadactyla</i>
	Amis	ʔalem	anteater with long tongue	<i>Manis pentadactyla</i>
Borneo	Kiput	arem	pangolin, anteater	<i>Manis javanica</i>
	Katingan	ahem	pangolin, anteater	<i>Manis javanica</i>
	Ma'anyan	ayem	pangolin, anteater'	<i>Manis javanica</i>

Blust assumes that ‘Austronesian speakers moved south rapidly enough to encounter the new species of pangolin before they had lost their recollection of the *Manis pentadactyla*’, assuming that the migrants were first resident in the Philippines. This is unnecessary; there is no reason to think the voyages from Taiwan did not reach Borneo directly.

### *The jellyfish*

The Malayo-Chamic languages are spoken in Borneo, on the Vietnamese mainland and have been carried widely across the region in the form of Malay. The proposed PAN term for ‘jellyfish’ is shown in Table 4, which has a curious distribution, since apart from a single Formosan reflex in Kavalan, the cognates are entirely restricted to Borneo languages. Although it is sometimes tempting to analyse Formosan reflexes as late borrowings, the distance between Borneo and the Kavalan area makes this unlikely.

**Table 4.** Austronesian names for ‘jellyfish’

Subgroup	Language	Form	Gloss
	PAN	*bubuR	<u>jellyfish</u>
Formosan	Kavalan	bubur	jellyfish
Borneo	Miri	bubur	jellyfish
	Bintulu	buvu	jellyfish
	Iban	bubur	jellyfish, sea nettle, swimming bell, <i>Medusa</i> spp.
	Bimanese	bubu	jellyfish

<sup>3</sup> Further cognates can be found in the ACD online version

Perhaps also Malay *ubur-ubur* ‘bell-shaped jellyfish with a fringe of feelers’. Jellyfish are found throughout the region, so this may be additional support to a direct link between Taiwan and Borneo.

*The cowry*

The name for the cowry, *Cypraea mauritiana*, demonstrates an interesting pattern. Although reconstructed to PMP on the basis of Northern Philippines cognates, these all refer to a manifestly modern technology, the use of lead balls as sinkers. They are therefore most likely to be recent semantic transfers, not ancient inherited cognates. The nearest form meaning ‘cowry’ to the presumed homeland of PMP is in Palau. Otherwise, the distribution of the root is confined to Eastern Indonesia and Oceanic (Table 5). Given that cognates are spread widely in Micronesia, it is most likely that Palauan is a loan *from* Oceanic, as is the case with certain other maritime terms.

**Table 5.** ‘Cowry’ in Eastern Indonesia and Oceanic

Language	Form	Gloss
PMP/POC	*buliq	<u>cowry shell: <i>Cypraea mauritiana</i></u>
Isneg	bulí	lead; lead sinker of a fishing net
Ilokano	bulí	lead; wharve, whorl; sinker
Palauan	búi?	cowry shell: <i>Cypraea mauritiana</i>
Ngadha	vuli	large cowry shell used for war necklaces; the necklace itself
Rotinese	fuli	kind of shell; shells or bits of lead used as sinkers for a fishnet
Yamdena	fuli	kind of shellfish
Fordata	vuli	porcelain shell, egg cowry
Yapese	wul	type of shell, large cowry
Nggela	mbuli	generic for all cowries
Lau	buli	white cowry, <i>Ovula ovulum</i> , ornament for canoes and men
Sa'a	puli	cowry shell, used as sinkers for nets
Pohnpeian	pwili	cowry, any species of sea shell
Puluwat	pwiiil	cowry shell scraper, as for green breadfruit
Woleaian	u-bili	white shell, cowry
Fijian	buli	cowrie shell <i>Cypraeidae</i>
Tongan	pule	shellfish, the cowry; be marked with spots or coloured patterns
Niue	pule	cowry shell
Samoaan	pule	Molluscs belonging to the genera <i>Cypraea</i> (cowries) and <i>Ovulum</i> . Cowrie shells are used as sinkers and for making squid lures.
Tuvaluan	pule	shellfish sp. <i>Pila conica</i>
Maori	pure	bivalve mollusks: <i>Notovola novaezelandiae</i> and other <i>Pectinidae</i>

Although this root is attested in Oceanic it is not found in SHWNG which again is suspicious. The data suggests that this term is in fact not PMP at all but was innovated somewhere in Eastern Indonesia and, was carried into the Oceanic area and then back into Micronesia as part of the backscatter which created Yapese. The apparent cognates in the Northern Philippines are then simply borrowings reflecting the introduction of lead sinkers in a much later era.

*Typhoons, cyclones and winds*

The name for ‘typhoon’, ‘cyclone’, ‘strong wind’ also shows a highly skewed distribution. Typhoons are extremely common on Taiwan, and it is no surprise they are attested in Formosan languages. The earliest settlers of the Marianas must have been familiar with typhoons, as were the seagoing peoples of the Philippines. However, the word was clearly only transmitted along the west coast of the Philippines, as it becomes ‘strong wind’ in the languages of Borneo and is not attested elsewhere and strikingly not in the open seas east of the Philippines (Table 6). The term is completely replaced by the Oceanic term *mana*, ‘storm’, ‘big wind’, which has strong spiritual connotations throughout much of the Pacific. In SHWNG this has the cognate *wana*, spread across the entire branch.

**Table 6.** Austronesian names for ‘typhoon/big wind’

Branch	Language	Form	Gloss
Formosan	PAN	*baRiuS	typhoon
	Saisiyat	bal'yoʃ	typhoon
	Favorlang	bayus	storm
	Amis	faliyos	typhoon; monsoon winds and rain
	Puyuma (Tamalakaw)	vaRiw	typhoon
Micronesia	Chamorro	pakyo	typhoon, storm, tropical cyclone
Philippines	Ilokano	bagió	typhoon
	Tagalog	bagyó	storm
	Bikol	bagyó	typhoon, hurricane, gale, storm, tempest
	Hanunóo	bagyú	strong wind, storm, typhoon
	Aklanon	bágyo(h)	hurricane, storm
	Cebuano	bagyú	typhoon
	Samal	baliw	wind
Borneo	Miri	baruy	wind
	Kelabit	bariw	strong wind, storm wind
	Kenyah	baloy	air, wind
	Kayan	bahuy	strong wind, storm
	Bintulu	bauy	wind

Another intriguing piece of evidence comes from the changing wind directions in Austronesian. A Formosan root which applies to the east wind in Kavalan (in the north of the island) becomes a south wind in Amis. The Amis are the population on the east coast which

supposedly represent a back migration from the Philippines. When speakers move southwards into the Philippines, the same lexeme applies to a south or southwest wind. Moving south again into ISEA the wind comes from the west, including the SHWNG speakers. However, in Oceania, this is now a northwest wind. Madagascar reflects the inversion of directionality, as the Austronesian cognate now becomes a north wind.

**Table 7.** Changing wind directions in Austronesian

Language	Attestation	Gloss
PAN	*SabaRat	wind
Kavalan	sbalat	east wind
Amis	safalat	south wind
PMP	*habaRat	southwest monsoon
Tagalog	habágat	west or southwest wind; monsoon
Bikol	habágat	south wind
Hanunóo	?abágat	southwest monsoon; or, indefinitely, any very strong wind; year
Hiligaynon	bagat-nan	south
Aklanon	habágat	south wind
Ngaju Dayak	barat	west; west wind; storm
Malagasy	avaratra	north
Iban	barat	west, western, westerly
Kambera	waratu	west, west wind
Rotinese	fa-k	seawind, west wind
Hawu	wa	west, the island of Sumba
Leti	warta	west, west wind
Selaru	harat	west, westward
SHWNG		
Buli	pāt	west, west wind
Numfor (Biak)	wam-barek	west wind, west monsoon

The changing referent of the name of this wind in Austronesian tells the same story of seaborne populations coming out from Taiwan, initially an east wind becoming south, then southwest, then west, then northwest as they expand out in different directions.

**Boats and Maritime Vocabulary**

The model depends strongly on the assumption that innovative maritime technology drove the PMP dispersal. There is no evidence that the initial settlers of Taiwan had anything other than bamboo rafts which are still in use today in modified form (Ling 1956; Rolett et al. 2002). However, the peoples leaving Taiwan four thousand years ago had access to more sophisticated watercraft, as they were able to reach the Marianas and return (Hung et al. 2011). The populations in the Luzon Strait today have no such boats; the large seagoing

canoes of the Yami of Lanyu Island could reach the Batanes, which is around 150 kilometres, but certainly not survive a 3000 km voyage. Similarly the peoples of the Northern Philippines do not today have large outriggers although these must surely have been constructed in the past.

If indeed the Luzon Strait was a ‘boiling pot’, this should also be reflected in the terminology for boats (e.g. Pawley & Pawley 1994). The root *\*[q]abaŋ* applied to ‘boat’ has a striking distribution (Table 8 Table 8). Isolated reflexes of *\*qabaŋ* and *\*baŋkaʔ* are found in Formosan languages as ‘canoe’, but the term was subsequently applied to much larger vessels. Based on phonological irregularities, Wolff (2010/2:947) argues the Formosan cognates are secondary introductions from Malayo-Polynesian languages. In proto-Bashiic, this root applied to a large boat of some type, presumably resembling the large surf-boats of the Yami. Blust (1995) links this word to the verb *\*qabaŋ* ‘to float’ which gave rise to the more common Austronesian root for canoe and eventually the large outrigger. However, the same root is also widely attested in the languages of mainland SE Asia, both in proto-Tai-Kadai as *\*baŋ*, and as perhaps a direct loan into Austroasiatic as Monic *kban*.

**Table 8.** An Austronesian term for ‘boat’ borrowed into Austroasiatic

Phylum	Branch	Language	Attestation	II	Gloss
Austronesian	PAN		<i>*qabaŋ</i>		boat, canoe
	Formosan	Siraya	avaŋ		canoe
	Formosan	Favorlang	abaŋɯ		boat
	Bashiic	Tao	avaŋ		large boat
	Philippines	Magindanao	kaban		boat
	Philippines	Tagalog		baŋkaʔ	canoe
	Philippines	Sulu	guban		boat
	Ibanic	Iban	boŋ, buuŋ		long, shallow boat,
	Malayic	Moken	kabaŋ		boat
	Malayic	Malay	kəbaŋ		vessel
	Malayic	Sekah	gobaŋ		boat
	Chamic	PC	<i>*bɔɔŋ</i>		coffin
	Barrier	Nias	owo		boat
	Barrier	Sichule	ofo		boat
	Bima-Sumba	Sawu	kowa		boat
	CMP	Komodo		waŋka	boat, canoe
	CMP	Manggarai		waŋka	boat
	CMP	Rembong		waŋka	boat
	PHSWG			<i>*wak[a]</i>	outrigger, canoe
	Oceanic	proto-Oceanic		<i>*waŋka</i>	outrigger, canoe
Daic	Tai-Kadai	proto-Tai-Kadai	<i>*baŋ</i>		boat
Austroasiatic	Aslian	Jahai	kupon		boat
	Bahnaric	Biat	baŋ		coffin

Phylum	Branch	Language	Attestation	II	Gloss
	Aslian	Semai, Temiar	kapal <sup>4</sup>		boat
	Monic	Old Mon	kɔaŋ		ship
	Mangic	Mang	ɓaaŋ		ferry, boat
	Nicobaric		kopòk		boat

Table 8 includes terms for ‘coffin’ in some languages, since the distribution of boat-coffins throughout the region makes this a likely polysemy. The meaning in both SHWNG and Oceanic is both outrigger and canoe, but not apparently prior to this. Almost certainly, *qabaŋ* underwent metathesis to *baŋka* ~ *waŋka*, either independently in Tagalog, but certainly in Eastern Indonesia where it was applied to large outriggers. As part of the interaction between the Luzon Straits and the SE Asian mainland, the Austronesian term was borrowed into Mon and thence into other Austroasiatic languages. Mangic (isolated in China among Daic languages) could be a direct borrowing from Tai-Kadai rather than inherited from its apparent Austroasiatic relatives. This suggests that when the large sailing boat was introduced, it rapidly spread across the region, and was adopted and adapted by speakers of different language phyla, perhaps reflecting the busy trade in nephrite and other trade goods around the region (Hung et al. 2007). However, once in contact with the mainland the term would be applied to the smaller river boats, without outriggers.

The issue of exactly what technical innovation allowed for the explosive dispersal of PMP speakers has been widely discussed. Some form of outrigger is the most credible hypothesis, but the absence of large seagoing outriggers in the Northern Philippines today makes this difficult to test. The PMP reconstruction *\*saReman* ‘outrigger float’ is only supported by reflexes in Eastern Indonesian languages, with no Philippines cognates. Interestingly, Chamorro does have a reflex, *sakman*, but this only applies to a large boat, not an outrigger. PMP *\*katiR* ‘outrigger float’ is supported by Philippines reflexes and is otherwise attested in Western ISEA. This suggests that outriggers were present in the Luzon Strait at an early period, but that the boat builders set off in two distinct directions, southwards down the west side of the Philippines towards Borneo and directly towards Eastern Indonesia and onwards to the Bismarcks and Vanuatu.

Blust (1995, ACD) suggests that the sail was already present in PAN. However, this is unlikely. The two Formosan potential cognates supporting PAN *\*layaR* are given in Table 9. Only one, Kavalan, applies to the sail, suggesting that this is either an independent transfer of the word from ‘cloth’ to sail by analogy, or simply a borrowing.

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<sup>4</sup> ? < Malay or Tamil.



**Table 9.** Evidence for a PAN term for ‘sail’

Language	Form	Gloss
PAN	* <i>layaR</i>	<u>sail</u>
Kavalan	RayaR	sail of a raft or boat; cloth around a threshing machine
Paiwan	La-laya	a flag, banner

However, \**layaR* is omnipresent in PMP, attested from Nias to Polynesia, surely pointing to a highly visible innovation. As Table 4 for ‘jellyfish’ reminds us, Kavalan is sometimes the only evidence for PAN forms, which makes borrowing more than a possibility.

**Material Culture**

Austronesian material culture is wonderfully various and has been enriched by influences from every direction over five millenia. Nonetheless, it is some ways highly conservative, with iconography which is preserved from Luzon to New Zealand (Blench 2012). This section focuses on a few examples of Formosan material culture, which have a patchy distribution in the Austronesian world, pointing to the opportunistic nature of the early dispersal from the Luzon Straits.

*The leg-xylophone*

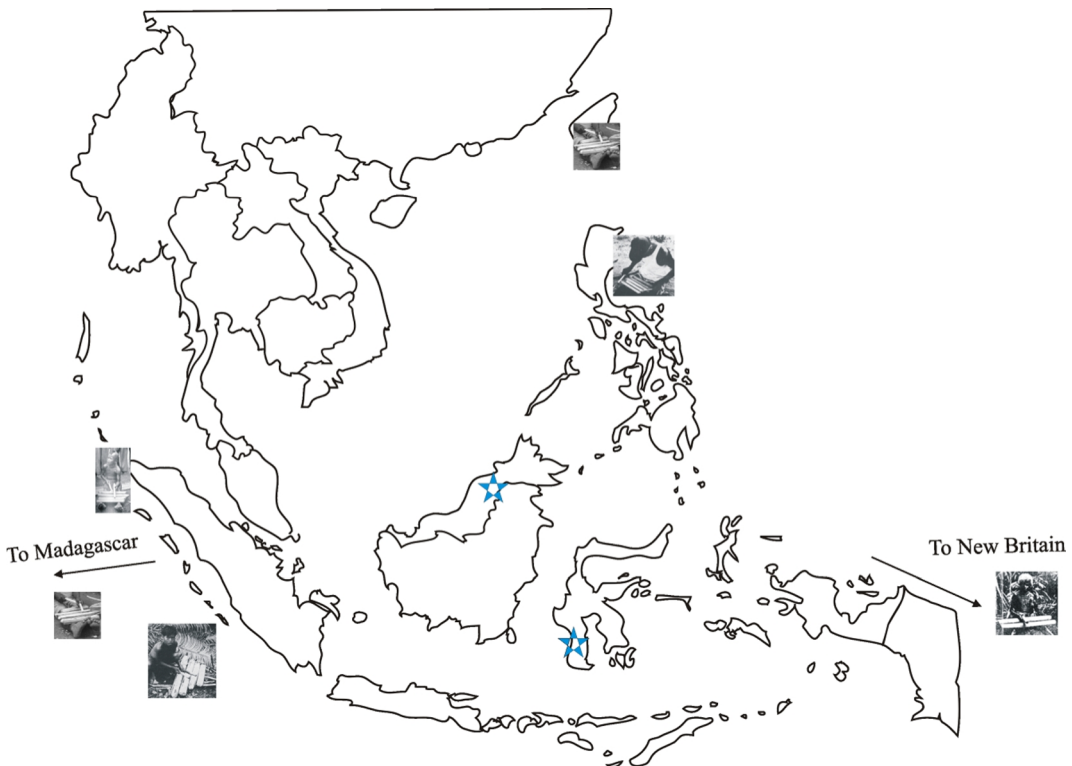
One of the simplest forms of the xylophone is the leg-xylophone, where the player simply lays a number of bars across his or her legs and beats them with one or two sticks. The leg-xylophone is found in two regions of the world, Africa and the Austronesian region, occurrences that are probably unconnected. The leg-xylophone is known from the Amis people of Taiwan. A photo on display in the Shun Ye museum in Taipei shows the keys laid transversely across the player’s legs (Photo 1). Kunst (1940) mapped the leg-xylophone (he calls it ‘thigh-xylophone’) in insular SE Asia as far as the information was available to him at the period, recording it in Nias, Mentawai<sup>5</sup>, Borneo and south Sulawesi. However, it also occurs in the Northern Philippines. The Itneg people in the Northern Cordillera play a five-key leg-xylophone, *talongatiŋ*, probably forming a pentatonic



**Photo 1.** Amis leg-xylophone  
Source: Author photo, Shun Ye Museum

<sup>5</sup> Philip Yampolsky points out the Mentawai instrument is not a true leg-xylophone as it has been transferred to bars resting on the ground.

scale (Maceda 1998: 226 and image). Otherwise it is found only at the margins of the primary expansion of PMP, on the barrier islands of Sumatra, in Madagascar and in New Britain, New Ireland, the Duke of York islands, Tami and Morobe province in Eastern Papua New Guinea, although there it is reduced to only two keys (Sachs 1928; Collaer 1965: 102; Fischer 1958: 12; Kunst 1967: 41). Map 1 shows the Indo-Pacific distribution of the leg-xylophone. This suggests that it was carried from Taiwan, but only directly across the Luzon Strait, but otherwise to Oceania, and to western Sumatra. This highly selective distribution is characteristic of the early dispersal period, where individual vessels may have reached remote locations directly.



**Map 1.** The leg-xylophone in the Austronesian area

### *The shark rattle*

We do not usually look to sharks as typical audiences for musical performance, but in one case this is an opportunity that may have been overlooked. Scattered across the Austronesian world, is a very distinctive sound-producer, shaken underwater in a performance intended to 'call' sharks. The shark rattle is made of a curved rattan with dried fruit-shells attached by cords, as in the example from the coast of North Papua. The record nearest to the Austronesian heartland is in the Sulu archipelago, among the Sama (Maceda

1980). Similar implements are found in New Ireland (Photo 3), in Samoa (Hiroa 1930) and probably across much of Polynesia. No records of anything similar are found in either Eastern or Western ISEA, suggesting that these originated with the seagoing populations of the Philippines and were carried directly to the Oceanic/SWHNG area (Photo 2).



**Photo 2.** Shark-calling rattle, North Papuan coast.  
Source: Author photo, Museum Loka Budaya,  
Abepura



**Photo 3.** Shark rattle, New Ireland Source: CC

### *Bamboo bird-scarers*

A characteristic item of material culture found in certain parts of the Austronesian world is the split-bamboo bird-scarer. It consists of a bamboo internode with a rectangular hole cut through one half of the tube. The tube is split lengthways so that the two halves rattle against one another when it is shaken, either by the wind or by hand. Several may be mounted in a frame or a single instrument held in the hand. In most places, this instrument is used to scare birds from the fields. Photo 4 shows some examples of these bird-scarers, collected among Formosan peoples. The same use is recorded in Sulawesi (Photo 6) and more surprisingly in Madagascar (Sachs 1938). However, in the Northern Philippines the same instrument is used by Ifugao priests to 'cleanse' houses annually of residual evil spirits (Photo 5). Part of the interest of the split-bamboo bird-scarer is its highly distinctive morphology; such sound-producers are found nowhere else in the world. Since the noise is intended to deter birds from growing millet or rice, it is a characteristic product of a cereal-growing society, evidence that there were some cereal cultivators present among the earliest voyagers in the Luzon Straits.

## Austronesian Diaspora



**Photo 4.** Formosan bird-scarers.  
(Source: Author photo, Shun Ye Museum)



**Photo 5.** Ifugao priests with bamboo split-rattles. (Source: Maceda Archive)



**Photo 6.** Sulawesi bird-scarer (Source: Author photo, La Galico Museum)

### *Shell discs*

The Philippines and the Solomons in particular are connected by a tradition of incised circular shell discs. All the peoples of the highlands of northern Luzon make bandoliers from shell discs with incised patterns (Photo 7). The shells are marine shells and therefore must be imported from the coast, which provides a hint to their original context. In Santa Cruz and some other islands in the Solomons, these type of incised shells are used as brow ornaments (Photo 8). The remarkable similarity of these two traditions (and an apparent absence of similar ornaments in the region between them) provides a neat illustration of the early rapid dispersal as far as Oceania.



**Photo 7.** Ifugao shell discs. (Source: Author collection)



**Photo 8.** Santa Cruz incised shell ornament. (Source: Author photo, Honiara Museum)

#### *Rattan and coconut fibre armour*

The concept of using armour (and helmets) to protect individuals in warfare may seem obvious but is characteristically Eurasian and is unknown in Africa and Melanesia (except in Austronesian-influenced areas). In the Americas, it is only found in the Pacific Northwest. Rattan armour was made in Taiwan (Photo 9) and versions of it are found across much of the Austronesian region, sometimes evolving through the use of different materials and in particular refashioned in metals when these were introduced. The broader concept of this type of armour was known in the Philippines, although by the time of European contact, the fibres had been replaced by metal sheets. Armour extremely similar to the Formosan type is found along the north coast of Papua (Photo 12). The Toraja in Sulawesi used cuirasses which also correspond to the Formosan type, but made of leather (Photo 10). Among the Nias people it was developed into thin metal sheet armour (Photo 11) and in Micronesia fish-skins were used, for example among the Gilbertese.



**Photo 9.** Rattan armour, Taiwan.  
(Source: Author photo, Shun Ye Museum)



**Photo 10.** Toraja leather cuirasse.  
(Source: CC, Yale University Art Gallery)



**Photo 11.** Nias metal sheet armour.  
(Source: CC, Tropenmuseum, Amsterdam)



**Photo 12.** Rattan armour, North Papua. (Source: Author photo, Museum Loka Budaya, Abepura)

### *The foot-braced backstrap loom*

An intriguing piece of evidence supporting early dispersal to Hainan island comes from a subtype of the loom. The backstrap loom is known over much of the Austronesian world, although it is lost in Oceania. However, the form of the backstrap loom in Taiwan is foot-braced (Photo 13), a rare and inconvenient type of loom which has been displaced elsewhere in the region by various types of frame-loom (Buckley in press). The only other place the foot-braced backstrap loom also survives is on Hainan island, among the Hlai speakers and in a small zone of the Vietnamese-Laos borderland. The most likely

interpretation of this distribution is that the foot-braced loom was carried to Hainan and the mainland as part of the earliest PMP dispersal. An innovative frame-loom from the mainland rapidly displaced it everywhere but Hainan, which was inaccessible in the same way as the interior of Taiwan.



**Photo 13.** Taiwan, foot-braced loom (Source: Author photo, National Museum of Taiwan)

### **Interpreting New Genetic Data**

Four thousand years ago both the island of Taiwan and the Chinese mainland opposite would have been extremely ethnolinguistically diverse, with many more languages present than are spoken today. Most probably those languages could be described in present-day terms as Austronesian. Subsistence strategies would have been comparably varied, ranging from cereal agriculture to specialised fisheries and a foraging lifestyle. At this period, Austromelanesian hunter-gatherers were presumably still present and this may be the source of some of the 'Formosanisms' not attested elsewhere in Austronesian. The only maritime technology would have been bamboo rafts, suitable for crossing protected seas, but dangerous in open oceans subject to cyclones.

In the Luzon Strait, an innovative maritime technology developed which allowed long-distance navigation, and certainly involved the use of outriggers and sails. Seeking natural resources and new fishing grounds, a mix of populations set off in different directions both to explore the open ocean, the islands and to reconnect with the mainland. The technology allowed them to range widely, and rather than settling the Philippines and proceeding sequentially to other locations, they rapidly reached a scatter of different

destinations, hence the near-simultaneity of archaeological dates. The multi-ethnic nature of the crews ensured that both different lexical and material culture was dispersed along the routes being newly pioneered. New traffic with the mainland brought innovative cultural practices to the region displacing practices brought from Taiwan, which survived only in peripheral sites.

Excavations at the cemetery of Te Ouma in Vanuatu are now producing striking results, in terms of both phenotypic characteristics and genetics (Skoglund et al. 2016; Reepmeyer et al. 2015). Te Ouma dates to the earliest settlement of Vanuatu. Both physical anthropology and genetics suggest that the earliest burials resemble closely the populations of the Luzon Straits and not the Bismarcks or another intermediate location, such as is suggested by linguistics. It must be assumed that future archaeology will produce similar results in the Admiralties and other islands within both Remote Oceania and in Fiji. The interpretation must be that at least part of the early dispersal from the Luzon Straits included individuals of ISEA phenotype. After the primary migrations to the Batanes, they travelled down the east side of the Philippines and Sulawesi, with one group possibly diverting westwards to Sulawesi, if preliminary reports on dentate-stamped ceramics are confirmed. Somewhere north of New Guinea, one group split from the flotilla of canoes and travelled westward, becoming the ancestors of the SHWNG languages. The main body travelled on towards the Admiralties. Although they must have encountered Austromelanesian populations there, they did not immediately mix with them genetically, but instead sailed on in different directions, reaching the Solomons, Vanuatu, Fiji etc. extremely rapidly. This phenotypic separation may reflect economic divisions; the ISEA component may have been specialised in fishing from offshore atolls, while the Austromelanesians cultivated vegetative crops on the land.

After a couple of generations, these social barriers began to break down, intermarriage began, the impulse which created the Lapita ceramics eroded and mixed phenotype individuals began following the routes pioneered by the initial migrants. They then rapidly breached the genetic isolation of the first settlers, leading to the current pattern. Presumably, however, the migrants had reached Samoa and Rotuman and the 'second wave' migrants did not quite reach those places, hence the Polynesians retained the ISEA phenotype. This is not to say there was no mixing, since genetic studies persistently show that Polynesians have some Austromelanesian components, although expressed quite differently from Fijians. Similarly, the 'aberrant' languages of South Vanuatu and New Caledonia reflect a distinct phase of the 'second wave'.

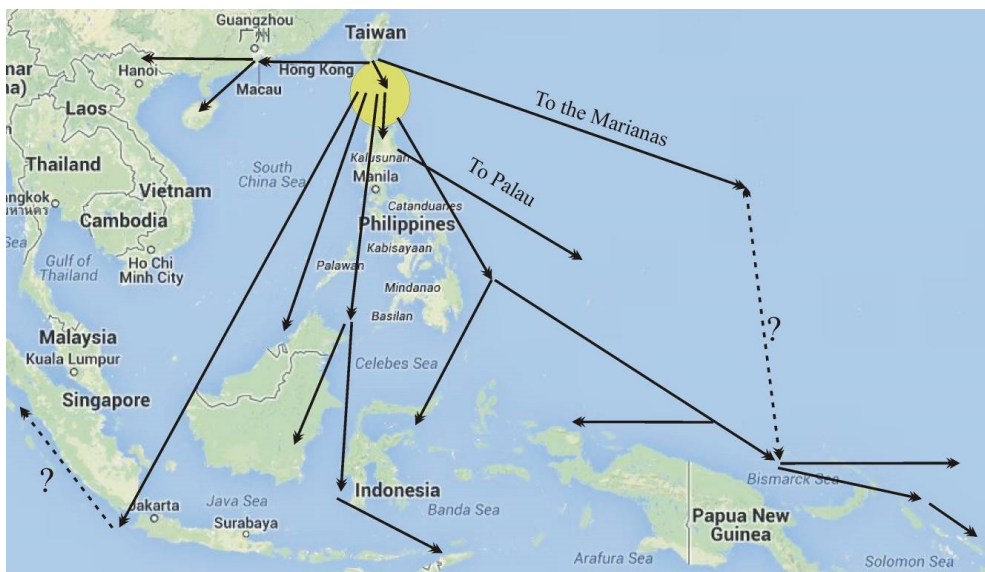
It cannot be underlined too strongly that this re-analysis is at the earliest stage of rethinking the Austronesian expansion, and much more work needs to be undertaken on both material culture distributions and the history of individual lexemes. With these caveats,



Map 2 presents an extremely tentative scheme of the routes that may have been established in the early period when PMP was developing.

Two important conclusions inevitably follow from these new findings;

- a) The Austronesian settlement of ISEA and the Pacific are not divisible events which can be studied separately and they do not occur in a tidy sequence, but rather reflect a chaotic expansion characterised by rapid movement across vast distances, cross-cutting and turning back
- b) The genesis of the typical ‘mixed’ phenotype of Vanuatu, New Caledonia and Fiji also emerged in a complex process subsequent to the major wave of migration, not at the root of it.



**Map 2.** The dispersal of early Malayopolynesian

### Rethinking the Historical Linguistics of Austronesian

This has important implications for the historical linguistics of Austronesian, but also perhaps more generally for how we reconstruct prehistory more generally. The PMP hypothesis, analogous to PAN and Oceanic, assumes a unitary culture and language in the Luzon Strait, around 4000 years ago. This would appear to be supported by phonological and lexical innovations characterising PMP. However, it has been shown on archaeological grounds that some PMP reconstructions simply cannot be correct (Blench 2012a,b). This is because the reflexes of proto-forms which are supposed to support the reconstructions have been transformed by analogy with the prevailing phonological environment. Unfortunately this may well be true of many more PMP forms which we cannot test archaeologically. On the basis of the typically intercultural nature of sea-voyages, the evidence from both the

lexicon and the distribution of material culture supports a more complex picture. The paper suggests that if the patterns of roots in Austronesian are analysed, many PMP roots have a distinct geography, arguing that they reflect the opening up of sea routes by different groups.

Figure 2 represents this contrast graphically. In an ideal version of PMP, reflexes of a proto-form in modern-day languages lead tidily back with regular correspondences and crucially are dispersed in an even fashion geographically. In version 2, PMP is a chain of overlapping lects, representing populations speaking different although related languages, sometimes travelling together, sometimes setting off with a monoglot crew. Different reflexes go back to different early forms, cross-cutting one another and being regularised by analogy. This much harder to analyse and characterise, but closer to the real world we can reconstruct.

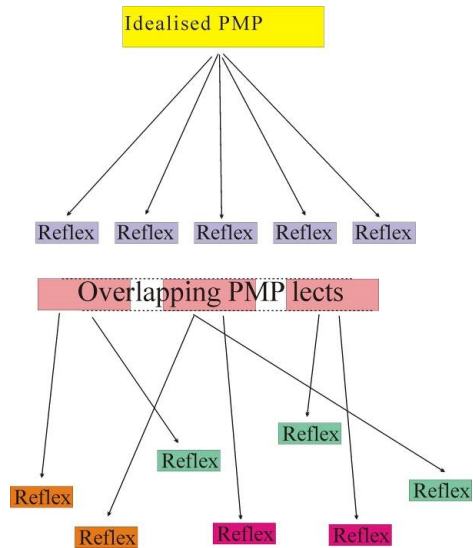


Figure 2. Idealised and Realworld PMP

Different reflexes go back to different early forms, cross-cutting one another and being regularised by analogy. This much harder to analyse and characterise, but closer to the real world we can reconstruct.

If so, this leads to the inevitable conclusion that there was never a unified culture in the Luzon Strait, to be identified with a reconstructed PMP language. Rather there was a ‘common PMP’ a nexus of related lexemes and related lifestyles which reflect a zone of interaction between Taiwan, the Northern Philippines and unknown languages on the Chinese mainland. This ‘boiling pot’ in the Luzon Straits was the starting point for exploratory voyages carrying ‘words and things’ in all directions round ISEA, the mainland and Oceania. A flexible, nomadic seagoing culture with no necessary return to a starting point created a series of independent branches of a proto-language, characterised by a variety of contact phenomena. Hence the distribution of material culture with its regional biases, the odd distribution of faunal names noted by Blust and the difficulties in classifying WMP.

These new results also have consequences for our understanding of Oceanic. Oceanic has always been the most well-supported of Austronesian subgroups, with an elaborate series of reconstructions reflecting every aspect of the lexicon (e.g. Ross *et al.* 2008, 2011). Nonetheless, the branches which compose it are more and less well-behaved. Those which show rather irregular or few correspondences with proto-Oceanic forms, including Vanikoro, Utupuan, Reefs/Santa Cruz and some languages of New Britain, are classified as ‘aberrant’. Utupuan languages in particular show so few resemblances to proto-Oceanic that to try and account for this by normal erosive processes over 3000 years strains all credibility. However, if we assume that many of these islands were the subject of multiple subsequent

waves of migration, in part composed on individuals deriving from non-Austronesian cultures and languages, then the aberrancy becomes far more explicable. But we must then assume complex processes of levelling over millennia which have led us to construct a uniformity in the proposed proto-language and its reflexes which simply do not reflect attested history.

This also points to a more general conclusion, that we have to be wary of placing excessive trust in reconstructed proto-forms. Historical linguists are in many ways idealists, imposing a tidy picture on prehistory in the quest for a science-like approach to reconstruction. However, any informed image of early human societies suggests that it was characterised by mobility and complex mixing thousands of years ago as much as they are today and that this will be reflected in modern-day languages if we know where to look.

A great deal of publicity has recently been given to ‘new mathematical methods’ for classifying languages and Austronesian has been in the front line. Purportedly innovative Bayesian phylogenies currently in fashion are applied to language history (e.g. Greenhill et al. 2010). Published in hard science journals they are a triumph of style over substance and have typically succeeded by simply not answering the objections of their opponents, an approach associated with the grandly-named Institute for the Science of History in Jena. Their methods produce trees based on a series of binary splits, and by their very nature *cannot* result in the type of model proposed in this paper. This is not an argument for the correctness of this model but *if* such a model of the past is plausible, then these methods exclude it structurally. This would appear contrary to scientific method as usually conceived. Archaeology and genetics are beginning to impose a far more nuanced approach to linguistic stratification than has previously been the case. At every level, Austronesian reconstruction may have to be rethought.

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ISBN 978-602-386-202-3



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