

# AUSTRONESIAN CULTURE HISTORY THROUGH RECONSTRUCTED VOCABULARY (AN OVERVIEW)

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## 1. INTRODUCTION

Let us take a trip backwards in time in a very special kind of time machine. Its instrument panel has but two controls, labelled RECONSTRUCTION and SUBGROUPING, and its fuel is called DATA.

We are not the first to embark on such a voyage. The first successful one was undertaken over one hundred years ago by Hendrik Kern (1889). There were not many attempts for quite some time thereafter, perhaps because of the need for more fuel – abundant DATA had been amassed by Dempwolff (1938), which have been more than doubled by Blust (1970, 1973, 1980a, 1983-84a, 1986, 1989a). Hence, the time machine has been very active over the last two decades: Isidore Dyen (1971a, 1976), Otto C. Dahl (1976) and Blust (1977a, 1984-85).

We need not rewrite the manual on how to operate both switches. There are excellent, albeit disharmonious words on SEMANTIC RECONSTRUCTION in the works by Dyen (& Aberle), Dahl and Blust. So too for SUBGROUPING, but there is even more disagreement on this one.<sup>1</sup> The Formosan languages may represent a link with the distant past (since there may be as many as three distinct groups there) or they may be more linked to languages of the Philippines. The languages of the Philippines, Malaysia and most of Indonesia represent another group (Western Austronesian or Hesperonesian).<sup>2</sup> There are also the Central and Eastern Malayo-Polynesian groups (the latter includes some languages from eastern Indonesia and all those in the Pacific islands). If a related word (cognate form) with similar meaning is found in all four, it can clearly be posited for Proto Austronesian (PAN), the protolanguage of highest order. If it is not, then we must look carefully at its distribution. If it is found, for example, only in Formosa and the Philippines, can we safely and ineluctably assume that it represents a continuation of PAN and that it did not spread by borrowing? Would not the collection of a large number of such etyma lead us to caution or even indicate a potentially contrary subgrouping?

<sup>1</sup> In general, I follow the subgrouping proposed by Blust (1980a:10-13), with one major exception, namely my treatment of innovations shared between Formosan and Western Austronesian languages (the Philippines, Malaysia or greater Indonesia) which I label as Proto Hesperonesian-Formosan (PHF). Where the subgrouping of other scholars would reinterpret any evidence constituting the assignment of a level, I put a question mark after the protolanguage (e.g. PAN?, PMP?, etc.), although the evidence is treated herein as if the reconstruction were valid.

<sup>2</sup> Some scholars reject this as a valid subgroup, but innovations (both widespread and selective) supporting it were presented in Zorc (1986:156,165-168).

We will therefore proceed on our trip through time through thirty semantic categories on a stage by stage basis *as if* the proposed reconstructions were innovations of that period. If further research raises the level of any given etymon, then the characteristics of the respective higher level will change accordingly.

There are certain areas where this procedure leads to otiose results. For example, RICE AGRICULTURE is probably attributable to early or even pre-Austronesian. Since all signs of it have been lost in Oceanic languages, the reconstructions are here labelled (and dealt with as) Proto Hesperonesian-Formosan (PHF = Western Austronesian + Formosan). Similarly, SEAFARING may have been PAN. However, the indigenous languages of Formosa generally do not have cognates (not surprising for groups that have been pushed inland and upland by foreign invasions), so much of the boating terminology is here labelled Proto Malayo-Polynesian (PMP).<sup>3</sup> Scholars who feel that such strictness is unwarranted may accordingly interpret the appropriate statements at a higher level than that assigned here.

### 1.1 PROTO AUSTRONESIAN (PAN) GEOGRAPHY AND NATURAL PHENOMENA

Coming upon the earliest settlement, some 8,000 years ago,<sup>4</sup> we note many straightforward phenomena that give us no pause, although we appreciate that we can discern what these people call them. Thus, *stone, rock* (\*batúH)<sup>5</sup> and recurring roots for *dust* (\*+bu)<sup>6</sup> and some form of *viscous fluid* (\*+teq); *sky* (\*lájit), *star* (\*bi(n)túqen), *moon* (\*búlaN), *night* (\*Rabí?iH). In some dialects, the word for *day* (\*qal(e)jáv) may have only been distinguished morphologically from the *sun* itself (\*qa(n)jaw; but cf: \*waRiH). Meteorologically there was: *monsoon wind* (\*Sa-báRat), *rain wind (south-east)* (\*tímuR), *cloud* (\*Rabun), *rain* (\*quZáN), yielding *potable fresh water* (\*d<sub>2</sub>a+Núm), which may also be obtained from a *drip, leak* (\*túd<sub>2</sub>uq).

The sea is a point of reference for the natives (\*daya towards the interior and \*laHúd towards the sea) where there is *low tide, exposed reef* (\*ma-qaCi) and where *breakers, surf* (\*Nabek) roll upon the *sand* (\*qěnay), leaving behind *foam, bubbles* (\*bujaq). The terrain includes *hill, mound* (\*búki) and *lake, pond* (\*dánaw). There is also a clearly identified *path or trail* (\*Zálan).

<sup>3</sup> The Proto Malayo-Polynesian level is posited for any reconstruction that does not have a Formosan cognate but is otherwise distributed among the Western, Central and Eastern (Oceanic) subgroups.

<sup>4</sup> These dates are my estimates based on the migrations and the kinds of linguistic changes that have occurred and the furthest reaches of the lexicostatistical method. Blust (1984-85:54f.) proposes a time-depth of 6,500 years (c.4500 B.C.), while Bellwood (1985:106) more conservatively suggests 5,000 years ago.

<sup>5</sup> Space does not permit the presentation of supporting data for these reconstructions. However, the glossary in the appendix directs the reader to studies which contain such evidence. Conventions include the following:

(a) Consonant and vowel symbols in these reconstructions follow those proposed by Dyen (1971a:22f.), with the exception of \*d with subnumerals (\*d<sub>2</sub>, \*d<sub>3</sub>), which are based on principles outlined in Dahl (1976, 1981); see Zorc (1987) for some scepticism on my part for the distinction between \*d and \*D (or \*d<sub>2</sub>);

(b) Accented vowels are determined on the basis of conventions established in Zorc (1978, 1983);

(c) Parentheses are put around ambiguously-determined elements, usually the facultative nasal.

<sup>6</sup> A plus sign indicates a proposed submorphemic monosyllabic root, as discussed and exemplified in Blust (1988a, 1988b) or Zorc (1990).

## 1.2 EARLY WESTERN AUSTRONESIAN (PHF = PAN?)

Over the next millenium, the ecological zone has become higher (*peak of a mountain* (\*qa-pucuk)) and more active (*earthquake* (\*lɪnuR), *typhoon, storm, hurricane* (\*baRiuS), and *north wind* (\*qamɪS-an)). We can also discern early vocabulary for *lightning* (\*kilát), *open-air, outdoors, midst of* (\*CaSaw), *opposite shore* (\*Si(m)paR), and *channel, flow(ing)* (\*á+luR). At least two original words have developed alternate forms: *sand* (\*benaqi) and *foam, froth* (\*puCaq; cf: PMP \*budaq).

## 1.3 PROTO MALAYO-POLYNESIAN (PMP) TIMES

Within another millenium (c.3500 B.C.) the group dispersed and was now well aware of numerous maritime phenomena (see sections 2 - 3): *littoral sea* (\*dáRat), *island* (\*nusa), *estuary, river mouth* (\*naŋa (dbl: \*binaŋa)<sup>7</sup>), *lagoon, harbour* (\*namaw), *channel* (\*sawaq), *high tide* [cf: 'yawn'] (\*Ruab), *flow* (\*qa+liR, \*sa+liR), *current* (\*qáRus), yet another word for *wave* (\*qáluŋ), and *saltwater* (\*tasik) as opposed to *fresh water* (\*wáhiR).

These people recognised an *inhabited territory/human ecosystem* (\*banua), which included *woods, forest* (\*qútan) and very rough terrain (*mountain* (\*bulud), *mountain range* (\*qilih), *mountain peak, elevated ground* (\*bunduk)) in contrast with *plain, level ground* (\*dʒá+taR), a knowledge of *cave* (\*lian) and *echo* (\*-niŋal).

The weather was capable of being both *cold* (\*ma-diŋ+diŋ) and *warm, hot* (\*ma-panas), which yielded *fog* (\*kabut). Weather of this period or place was *windy* (\*děRes; cf: *wind, air* \*háŋin) and *overcast, darkened* (\*gu(n)+dʒem) with perhaps more than a usual amount of *lightning* (\*qu-silaq), *lightning that strikes s.t.* (\*ge+lap), *thunder* (\*du+du, \*ku+dʒug, \*le(ŋ)+gur, \*rü(ŋ)guŋ), and *flood* (\*baháq). Either these or earthquakes (encountered previously) made the world *shake, tremble, rock* (\*ninih).

There were preoccupations with *dust* (\*qa+búk, \*qa+puk, \*sa+puk, \*debu; cf: PHN \*a+búg) as well as one process that formed it, *decay, crumble* (\*+bek, \*+buk), and forms of *light: bright light* (\*ni+law), *flash, sparkle* (\*+lap), *radiance, ray of light* (\*baná?ar), *shine brightly* (\*dadʒaŋ), and the *morning/evening star (Venus)* (\*(man)talaq).

## 1.4 LATER WESTERN AUSTRONESIAN (PHN) DEVELOPMENTS

As numerous groups left on journeys to the south and east across the Pacific, those left behind continued to spread out in the west experiencing more *earthquake* (\*lindʒuR) and *thunder storm, lightning bolt* (\*lentiq), *thunder* (\*duR+duR), but perhaps with a lessening in the severity of the weather: *cloud* [not a raincloud] (\*ram+bun),<sup>8</sup> *aftermath of a storm* (\*renáy), *dew, drizzle* (\*am+bun), *drizzle* (\*ri+nis), and *south wind* (\*salátan).

Their home continued to be near the sea with new words for *high tide* (\*tá?eb), *flow* (\*sa+luR), *current* (\*seleR), *swell, waves* (\*humbak), and *deep water* (\*túbiR). However, they were drawn inland as well: *swampy ground* (\*latiq), *slime* (\*ban()lik), *valley*,

<sup>7</sup> Doublets (dbl), which Dempwolff (1938) called "Nebenformen", are reconstructions that are phonologically similar to one another (see Blust 1980a:25).

<sup>8</sup> This reconstruction (PHN \*ram+bun) is a disjunct of PAN \*Ra+bun presented in section 1.1. Like many reconstructions, it is subject to scrutiny and re-evaluation, especially given Wolff's (1974) objections against \*r; it is here taken at face value.

*watercourse between hills* (\*le(m)bak, \*le(m)baq, \*lě(m)béŋ), *river* (\*suŋay), *creek, ravine* (\*bawáŋ, open expanse of land or water), and *primary forest* (\*tuan) as opposed to *forest* (\*halás).

### 1.5 PROTO PHILIPPINE (PPH) TERMS

The following forms are mentioned here in the hopes of finding earlier etyma rather than as proposals for first encounters: *tidal wave* (\*dǎlúyun), *seashore* (\*bay+bay), *rocky ground* (\*bakúlud), *water well* (\*bubún), *waterfall* (\*běsáy), and *rainbow* (PSP \*baluŋtu, PNP \*buŋlun, which seems to have spiritual significance, see Blust 1983). It is also noteworthy that these languages replaced earlier words with the following: *island* (\*pujuq), *dew* (\*ha?+muR), *earthquake* (\*Ridu?), *heat of the sun* (\*ma-qínit), *windy* (\*dejes), *forest* (\*kǎlásan, \*gúbat).

## 2. PROTO AUSTRONESIAN BOATING AND SEAFARING TERMINOLOGY

Certainly, with the diversity of the terrain just encountered, we might well wonder how they got to these places. The Austronesians are famous for their Oceanic voyages: spreading out from Formosa in the north to New Zealand in the south, Madagascar in the west and Easter Island in the east. Alas, on our present journey, there is not a lot to see at this time-depth. While it may be simply due to the lack of fuel (cognates in the upland Formosan languages), we may genuinely have discovered a prenaautical stage in early Austronesian history. Only four terms which may relate to this sphere of activity are well-attested: *move away, transfer* (\*SaliN), *drift with current* (\*qáñud), *turn, veer to the side* (\*liu-2),<sup>9</sup> and possibly *string, rope* (\*CalíS), which would obviously have been involved in activities other than navigation. Ferrell (1969) indicates that all Formosan groups are known to use some form of *raft*; although we cannot reconstruct a word at this level, it plays an important role in subsequent stages and will be discussed in sections 2.2 - 2.4. Paul Li (pers.comm.) believes that PMP \*bangka? *canoe*<sup>10</sup> may be raised to this level on the basis of a cognate in Ketagalan (now extinct).

### 2.1 PHF

At this stage, there is one term relating specifically to *dugout canoe; boat* (\*qabaŋ). One form represents a synonym for an earlier word, *turn, veer to the side* (\*ileŋ). Another, *noose, loop* (\*sílLiw) fits nicely with *rope* (above). Lastly, an unsuccessful venture into the sea might result in *submerge* (\*te+neb), from which *swim* (\*laŋuy, dbl: \*daŋuy, \*naŋuy) would be the only recourse.

### 2.2 PMP

Ocean travel was now not only possible, but well advanced. Everything necessary for inter-insular and trans-Pacific travel was available: *canoe* (\*waŋkaŋ,<sup>10</sup> \*balútu), *load a*

<sup>9</sup> This convention indicates full reduplication; using the number two after a hyphen (-2) is followed in the orthography of Malay and Indonesian.

<sup>10</sup> PMP \*bangka? (in section 2) and PMP \*waŋkaŋ (in section 2.2) are etymologically distinct.

canoe; cargo (\*lújan), go to sea (\*pa-laHud), outrigger (\*kátíR, \*saRman), mast; post; pillar (\*tiqan), sail (\*láyaR), canoe paddle, oar (\*beRsay), paddle [v], row (\*aluja, \*paluja), punt, boat pole (\*těkén), rudder; steer (\*quliŋ), turn, veer to the side (\*biliŋ), bail, water-bailer (\*limás), cross-seat in a boat (\*seŋkar), rollers for beaching a canoe (\*lajen), board, ride (\*sakáy), join along the length, which also applied to a raft (\*da+kit), putty, caulking substance (\*+lit, \*bu+lit), float (\*a(m)puŋ), sink, disappear under water (\*tělém), fathom [measure of depth] (\*d₂ěpáh), sheltered (as from wind or rain) (\*d₂uŋ+d₂uŋ), and dive, plunge; drown (\*ke+ñej).

### 2.3 PHN

Perhaps not surprisingly, after the successful innovations of Malayo-Polynesian times, there are not many new developments. We find alternate forms for raft (\*Rá+kit) and float (\*lě(n)+táw), a term for bring up (a boat to shore) (\*u-dahik), and a name for prow, bow (\*zúlun).

### 2.4 PPH

Again, for the most part, synonyms have appeared for artefacts or actions known much earlier: oar (\*gáʔud), sink (\*lúnud), and drown (\*lěmés). In the Philippines, yet another term for raft (\*alud; PSP \*arur) has arisen, probably attesting to its importance over the canoe (xbaróto, xbarangay,<sup>11</sup> which forms are widespread, but with so many irregular reflexes that they must be taken with caution) as the basic means of navigation.

Similarly there are widespread forms in Western Austronesian languages, such as xpadáw sail boat and xkápál ship (both from Tamil), which indicate that our Austronesian seafarers were open to innovation in design and lexicon.

## 3. PAN FISHING AND SEALIFE

Given the importance of and orientation to the sea, there is abundant evidence that the earliest Austronesian people drew their subsistence from it. The generic word for fish (\*Si-káʔen) literally means *used for eating*, a morphological combination that persisted over the millenia (cf: PPH \*i-sedaʔ fish; eaten with the staple). They obtained such catches by means of derris root fish poison (\*túbaH) and the fish hook (\*kawíl). The earliest diet probably included: roe (\*biRaS; cf: PHN \*piRah), goatfish (\*Ciqaw), adult mullet (\*kaNasay), rayfish, stingray (\*páRiS), shark (\*qíSu), and freshwater eel (\*tuNa). The cowrie shell (\*tu(m)bak) was known and may have been used (e.g. as a horn or in the manufacture of fishhooks).

### 3.1 PHF

The PHF level adds but three terms to the above inventory: bait (\*paʔén), which complements hook (above), the swamp or land crab (\*kaRaŋ), and the turtle (\*qanCipa).

<sup>11</sup> The raised x indicates a spurious (invalid) reconstruction.

## 3.2 PMP

As with the growth of their boating technology, so too was there a vast increase in methods of fishing. Two roots appear in forms replacing the original word for *hook* (\*+bit, \*+wit); there is another word for *bait* (\*baŋi). Braiding techniques (see section 13) allowed the introduction of the *bamboo basket trap for fish* (\*bú+bu) and of a *fish net* (\*saruk) and *dragnet* (\*puket). The use of the *weir* (\*qem+peŋ) was accompanied by a *fish drive; churn water* (\*kebur), undoubtedly a communal activity.

Equally impressive is the knowledge of numerous species of fish: barracuda, *Sphyræna obtusata* (\*qalu), *big-eyed scad* (\*qatulay), *damsel fish* (\*mutu), *dolphinfish* (\*lajih), *grouper* (\*keRteŋ), *milkfish*, *Chanos chanos* (\*qawa?), *perch* (\*kurapu), *pilotfish*, *Remora* (\*kemi, \*gemi), *pufferfish*, *porcupinefish* (\*taRutuŋ), *sailfish* (\*saku-layaR), *Spanish mackerel* (\*taŋŋi), *squirrelfish* (\*taRaqaŋ), *stonefish* (\*nepuq), *trevally*, *Caranx* spp. (\*bilu), *tuna*, *bonito* (\*qatun), *unicornfish* (\*qumay), *wrasse*, *Cheilinus* sp. (\*mamin), *young mullet*, *Neomyxus chaptalii* (\*qaRuas), *Scomberoides* sp. (\*daRi), *marine-eel* or *fish* sp. (\*aRemaŋ), and an unidentified fish sp. (\*turiŋ). The term for *gills* (\*hásaŋ; cf: PNP \*hadaŋ) has persisted.

The Malayo-Polynesians knew of at least five species of *crab*: *coconut* (\*qayuyu), *hermit* (\*qumaŋ), *mangrove* (\*qali-máŋu, \*qali-maŋaw), *rock* (\*kaRakap) and *sand* (\*kaRuki). Other forms of sealife encountered were: *dugong*, *seacow* (\*d2uyuŋ), *starfish* (\*saŋa-2), *green sea turtle*, *tortoise* (\*pěñúh), *octopus* (\*kuRíta), *octopus tentacles or arms* (\*gaway), *squid*, *cuttlefish* (\*nuʔus; cf: PHN \*kanuʔus), *crustacean* (shrimp, lobster) (\*qud2áŋ), *oyster* (\*tiRem), *catye shell* (\*qaliliŋ), *conch shell*, *triton* (\*tam-búRi, \*buliq), *giant clam* (\*kima), *coral* sp. (\*buŋa), *snail; barnacle* spp. (\*sisi[q]), *crocodile* (\*buqáya), and, of course, *seaweed* sp., *moss* (\*lúmut, \*limut, \*lamut).

## 3.3 PHN

PHN peoples also refined fishing methods with the development of more kinds of *fishnet* (\*Rambat), *large fishnet* (\*salambaw), *fish net or trap* (\*siʔud, \*tuad2), *fish trap* (\*bak()lad), *fish pen* (\*ban()lat), or they could *catch fish/shrimp with the hands* (\*gama?).

Their waters also teemed with *pufferfish* (\*butíti), *mullet* (\*balának), *murrel*, *Ophiocephalus striatus* (\*qabu-2), *seabream*, *Sparus berda* (\*bakúku), *crab* sp. (\*qaRáma), *freshwater eel* (\*kasuli; cf: PSP \*kasíli), and several unidentified *marine fish* (\*-punti, \*maŋali) or *fish* (\*bagahak, \*baŋkulis, \*bunuR, \*katambak, \*kulambar).

## 3.4 OTHER DEVELOPMENTS

The speakers of Central Malayo-Polynesian encountered the *hawksbill turtle* (CMP \*keRaŋ), while Philippine speakers did well with *roe* (PPH \*búji?; cf: PSP \*bíhed), *tiny shrimp* (\*ajamáŋ), various *shrimp* sp. (\*pasáyan, \*hí+pun), *oyster* (\*talabá), and with *land turtle* sp. (\*pagʔuŋ) or *sea turtle* (\*pawíkan).

## 4. PROTO AUSTRONESIAN PLANTS AND FLORA

Given the terrain and the tropical or near-tropical weather these people encountered in their homeland and new settlements, numerous plants could be found. Some of these proved very useful: *bamboo* sp. (\*qauR), *rattan* (generic?) (\*quáy), *thorn* (\*Cěnék, \*dúRiH), *tree*, also the word for *wood* (\*káSiw). Some were edible or yielded *fruit* (\*buáq) in a *bunch*, *cluster* (\*+puŋ), such as the mango, *Mangifera indica* (\*Suai; PMP \*wai), *Cordia dichotoma* or *myxa* or possibly the *Anona reticulata* (\*qaNúNaŋ), *Dracontomelum edule* (\*daqu), or the fern *Athyrium esculentum* (\*pahku). From the earliest times one could find the mucilaginous plant, *Urena lobata* (\*puluC), nightshade, *Solanum nigrum* (\*SamuCf), the pandanus tree, *Pandanus tectorius* (\*paŋud2áN), the hibiscus, *Gnetum gnemon* (\*báRu), a parasitic plant, *Asplenium nidus* (\*lukuC), and sword grass, *Imperata cylindrica* (\*Riaq).

## 4.1 PHF

PHF plant life included two more species of bamboo, *Bambusa spinosa* (\*kawáyan (spiny) and \*búluq (thin)). There was the palm, *Caryota* spp. (\*qanibuŋ), the shrub *Smilax* sp. (\*baNaR, \*banaw), the plant *Diospyros discolor* (\*kamaya), and a pine tree, *Pinus* sp. (\*saleŋ, yielding *resin*, which was sometimes given the same name). Fruit trees created a greater awareness of their attributes: *ripe* (\*luʔum), *tree trunk* (\*púnuq; PMP \*púqun), *stump (of a tree)* (\*tuqed2), and another word for *thorn* (\*suqaR).

## 4.2 PMP

PMP reflects a period of absolute natural bounty. Firstly, there is a plethora of terminology relating to plants: *split open*, *blossom* (\*be(ŋ)+kar, \*be(ŋ)+kaR), *bud*; *flower*; *fruit* (\*búŋah), *leaf* (\*d2áhun), *fork of a branch* (\*pe+ŋah, \*sa+ŋáh), *branch* (\*daŋan, \*daŋ+k[ae]q), *root* (\*akad2, \*wakaR, \*wakat, \*waRet; \*Ramút, cf: PFM \*RamiC), *buttress root* (\*daliŋ; cf: PHN \*dalig, PSP \*daliR), *vine*, *aerial root* (\*waRej; cf: \*Rawej), *young plant shoot* (\*taluk), *heart (of plant)*, *pith* (\*qú(m)+buj), *sap*, *syrup* (\*ZuRúq).

Secondly, more plants became known: a fern (\*aResam), another fern, *Cyathea* sp. (\*puni), a lily, *Dracaena* or *Cordyline* spp. (\*siRi), the stinging nettle, *Laportea* (\*lateŋ, \*zalateŋ), the vine *Flagellaria indica* (\*huaR), a grass sp? (\*baliji), and an unidentified plant (\*lumbu). Some were useful: *bamboo* sp. (\*teriŋ), *Schizostachyum* sp. (\*tamiŋ), *Dendrocalamus* (\*bituŋ, \*pituŋ), *Bambusa vulgaris* (?) (\*periŋ); the fern, *Lygodium circinnatum* (\*ní(n)tuq), ramie, *Boehmeria nivea* (\*rami; cf: PSP \*qadamay), *Donax canniformis* [used for making baskets] (\*niniq), *Grewia* spp. (\*qanilaw), *Leea* spp. (\*mali), *Millingtonia hortensis* (\*taŋga), *Pipturus argenteus* (\*ad2amay), *rattan* sp. (\*naŋa). More edible fruits became accessible, such as *Citrus* sp. (\*limaw, \*muntay).

Thirdly, there was a virtual forest of PMP trees: *Alstonia scholaris* (\*ditaq), *Antiaris* [with poison sap] (\*laji), *Artocarpus* sp. [breadfruit] (\*teRep), *Artocarpus elastica* (\*kuluR, \*kulu), *Barringtonia* spp. (\*butun), *Caesalpinia* sp. [thorny tree] (\*sepaŋ), *Calophyllum inophyllum* (\*bitaquR), *Cananga odorata* (\*kanaga), *Casuarina equisetifolia* [pine] (\*qaRúhuʔ), *Ceiba pentandra* [kapok tree] (\*kabu), *Ceriops* [mangrove tree] (\*těŋéR), *Rhizophora* (\*bakhaw), *Cordia* spp. (\*kanawa), *Dolichandrone spathacea* (\*tuiʔ), *Erythrina indica* (\*d2ap+d2ap, \*d2e+d2ap), *Ficus* fig sp. (\*qaRaʔ), *Ficus benjamina* (\*nunuk), *Gnetum gnemon* (\*suka), *Intsia bijuga* (\*qipil, \*teRas), *Melochia umbellata* (\*tenu),

*Morinda citrifolia* (\*ñeñu), *Murraya paniculata* (\*kamuniñ), *Nauclea orientalis* (\*bañkal), *Palaquium* spp. for timber (\*ñañuq), *Pisonia umbellifera* (\*qanuliñ), *Pterocarpus indica* (\*náRa), *Schleichera trijuga* (\*kasambi?), *Schoutenia ovata* (\*kukun), *Terminalia catappa* (\*talísay), *Trema orientalis* (\*deRuñ), *Vitex pubescens* (\*-pa(m)pa), tree sp. (\*kanarum).

#### 4.3 PHN

PHN flora were equally abundant and prolific: *bunch, cluster (of fruit)* (\*búliR), *leaf* (\*bulún), *young shoot* (\*seli, \*semi), *undergrowth* (\*samun), *young (of vegetation)* (\*bataq). More words appear for *bamboo* sp. (\*pätún, \*telañ), large sp., *Dendrocalamus* (\*bětún), *rattan* (\*apis), and mango, *Mangifera indica* (\*pahuq). Other edible species are the jackfruit, *Artocarpus* (\*nañka?, cf: PPH \*ñañka?, \*lañka?) and a tuber, *Dioscorea* spp. (\*gaDuñ) [cf: *green*].

Other species at this level include: sword grass *Imperata cylindrica* (\*eRiq), grass (\*qalámen), *grass or rush* sp. (\*sedsed), the flowering plant, *Crinum asiaticum* (\*bákuñ), the palm trees, *Livistona rotundifolia* (\*qanáhaw) and *Pterospermum diversifolium* (\*bayuR), pandanus, *Orania* (\*báñah), plant sp. with ceremonial uses (\*taRabas), *Cassia* sp. (\*asuntiñ), a plant used for dyestuff (\*gamat), and unidentified plant spp. (\*tanduk-2 and \*lambayun); a timber tree, *Dipterocarpus* (\*balaw), the trees *Heritiera littoralis* (\*dúñun) and *Indigofera* (\*táRum), some as yet unidentified trees (\*amaRa, \*bañkiriñ, \*kendun), a timber tree sp. (\*Rihuq), and a vine from which poison is obtained (\*ziteq).

#### 4.4 DEVELOPMENTS AT OTHER LEVELS

In Southern Formosa we can find: *orchid* (PSF \*SabaR) and *camphor laurel* (\*d4akeS).

In the Philippines there is *hemp* (PPH \*Rutay) and Manila hemp, *Musa textilis* (\*abaká), the molave tree, *Vitex parviflora* (\*ha(N)-bur?aw), the tree *Dipterocarpus grandiflora* (\*apítun), another tree sp., *Lagerstroemia* (\*banabá), the *Ficus* tree considered a spirit residence (\*balíti?), and cogon grass, *Imperata cylindrica* (\*kúRun).

In the Indonesian archipelago there is: *fennell* (\*adas), a tree similar to *breadfruit* (\*medáñ), and *plants with stinging hairs* (\*amiañ).

With regard to all of these reconstructions, we must be chary. Widespread distribution alone is not necessarily a factor of legitimacy. Some of the flora are probably later introductions since the words for them are recent borrowings: witness the almost universal distribution of peanut (< Mexican Spanish \*mani?) in the Philippines.

#### 5. PAN FARMING AND AGRICULTURE

Since there was such lush vegetation, some form of *gathering, collecting* (PAN \*qalaq; PMP \*alap) must have been practised. But even the early Austronesians were not simply gatherers – they were farmers; witness *plant* [v] (\*CaNém) and *grow* [vitr]; *plant sprout* [n] (\*Cú(m)buq). There was an awareness of *undeveloped/fallow land, field* (\*Cálun), which they would then *cut away, clear vegetation* (\*tebaS), in which a *garden, cultivated field* (\*qumáH) would be established. Irrigation was provided: *dig (out); canal, ditch* (\*kálih).