LEXICAL EVIDENCE FOR THE PROTO-POLYNESIAN HOMELAND

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INTRODUCTION

In these intellectually austere days professional prehistorians rarely allow themselves the luxury of going into print on that fascinating question : where did the Polynesians come from ? Amateurs, however, are still freely permitted to do so, and this paper adds a linguistic contribution to the long list of studies of Polynesian origins and culture history.[1]

We first look briefly at the ways in which comparative-historical linguistics can, in theory, elucidate the prehistory of a region. Then we ask whether it is realistic to expect linguistics to provide information about the prehistory of Polynesia of a more precise and detailed kind than the fairly general kinds of indications it has yielded to date. Some reconstructions of the lexicon of Proto-Polynesian (PPN) will be considered, and a number of inferences drawn about the dialect diversity, location and culture of the PPN speech community.

Morris Swadesh once wrote that linguistics can be of service to prehistory in at least three ways. First, it can establish the nature of the relationship between the languages of a region or regions : the languages may be genetically related (derive from a common ancestor), show signs of past contact in the form of borrowings, or show no evidence of any past connection whatsoever. Second, it can determine the order of splits or branchings within a family of related languages, by establishing that some members of the family are more closely related to each other than to the rest. The subgroupings thus obtained, in conjunction with geography, allow certain inferences to be drawn about the likely location of ancestral languages. The theory is that the region which now harbours the genetically most diverse members of a family or subgroup is the likeliest dispersal centre for that family or subgroup. Third, by reconstructing the languages ancestral to each family and subgroup, linguistics can inform about the dialect diversity, culture and environment of earlier speech communities.

Swadesh might have added that the glottochronological method, which he originated, provides a technique for subgrouping and for dating the break-up of proto-languages. The method is based on the hypothesis (tested against languages with historical documentation going back some 2,000 years) that basic vocabulary changes in all languages at a constant

1. We are grateful to the authors of *Proto-Polynesian Reconstructions* ... for allowing us to use their data file, and to Donn Bayard, Bruce Biggs, Roger Green, K.J. Hollyman, D.S. Simmons and Kendrick Smithyman, who read a draft of this paper and contributed many valuable suggestions. Regrettably, shortage of time stopped us from making full use of these. The assistance of K.J. Hollyman in supplying and up-dating many of the botanical and zoological names is greatly appreciated. Errors which remain are our responsibility.

rate of about 19 percent each thousand years.[2] Glottochronology is not particularly trustworthy for dating the divergence of a single pair of languages (i.e. the break-up of the proto-language ancestral to just that pair). But it does seem to give very credible approximate dates for the dissolution of proto-languages ancestral to large numbers of languages, at least to a time depth of around 3,000 years.

Glottochronology indicates that the dissolution of PPN – into the language ancestral to Tongan and Niuean, on the one hand, and the language ancestral to all other Polynesian (PN) languages, on the other – took place between 500 B.C. and A.D. 200 (cf. footnote 7). The dates for the break-up of Proto-Eastern PN cluster about A.D. 500. The glottochronological subgrouping and sequence of dates are fairly consistent with other evidence we have about the subrelationships of PN languages and their rates of change. And while archaeological evidence from the various island groups of Polynesia cannot be correlated directly with linguistic splits, in general the pattern of cultural relationships and dates for first decisive settlements indicated by archaeology and carbon dating is extraordinarily consistent with the theory of prehistoric settlement that one might base on linguistic subgroupings and glottochronological dates (see Green 1966, 1967, 1968, and Pawley 1970, in press, for some discussion).

Several writers, most recently Bruce Biggs (in press), have entered caveats concerning the use of linguistic evidence to draw inferences about first settlements and later contacts, and about the cultures and locations of the communities speaking reconstructed languages. It must be admitted that culture historians have often been guilty of drawing unjustified conclusions from linguistic materials. However, there are legitimate uses of such materials. It would seem that the crucial question is this : are the linguistic results obtainable from a given region sufficiently precise, detailed and trustworthy, and the methods of interpretation sufficiently rigorous, to allow reliable inferences to be drawn about the culture history of that region that go beyond a very general and superficial level ?

Some Recent Studies

Comparative study of the languages of Oceania (by which we mean the geographic regions known as Melanesia, Micronesia and Polynesia) was begun over a century ago. However, systematic and extensive application of the comparative method has only been in progress for some 20 years in Polynesia, and with a few notable exceptions, has hardly begun at all in Melanesia and Micronesia. Among earlier comparative studies of Oceanic languages which remain valuable because of their high standard or the broad extent of their coverage (or for both reasons), those of Codrington, Ray, Capell (still an active contributor), and Dempwolff stand out.

In the Polynesian field Elbert's important 1953 paper initiated a chain of studies dealing with the external and internal relationships of Polynesian languages and the reconstruction of PPN and its immediate descendants. Roger Green (1966, 1967) has recently explored the implications for prehistory of various subgrouping studies, and here we will touch on these only in passing. As yet however, no one has examined the implications for

2. The estimate of an 81 percent retention rate applies to the list of 200 meanings devised by Swadesh and others. The rate for the 100 word list, also in common use, in some 5 percent higher. See Gudschinsky (1956) for a discussion of the methods of glottochronology and lexicostatistics, and Dyen *et al* (1967) for discussion of differing replacement rates for individual items on the test list in Austronesian languages. Cf. also fn. 7.

culture history of the extensive lexical reconstructions made by Walsh and Biggs (1966) and Biggs, Walsh and Waqa (1970). The earlier work, *Proto-Polynesian Word List I,* contains about 1,000 reconstructed lexical items (together with supporting evidence), of which perhaps 600 are PPN and the rest attributable to intermediate stages (sub-proto-languages) between PPN and the present. This initial set of reconstructions was based on comparison of 11 PN languages and one Fijian dialect (Bauan). The 1970 work draws on over 20 PN languages (all those for which adequate data are available) and a number of external (non-PN) witnesses. In this revision the number of PPN reconstructions has been more than tripled to about 2,000. Supporting evidence from the contemporary PN languages is unfortunately not supplied with the 1970 reconstructions, although we understand a further revision with such evidence will appear shortly.

The prime interest of reconstructions to the linguist is as a base for the study of linguistic change. For the culture historian, linguistic reconstructions may bear on several problem areas. As noted earlier, there is the possibility that the reconstructed expressions will tell a good deal about the way of life and the environment of the proto-language speech community, including some information not recoverable by any other techniques, and will thus serve as a base for the study of cultural evolution in the daughter speech communities. Several writers, most notably Sahlins (1957, 1958), have presented interesting hypotheses about cultural evolution in different social and ecological settings in Polynesia. To some extent, however, the testing of such theories suffers from the lack of a base line of the sort which archaeology and linguistics might help to provide.

Again, there is the possibility that, by assisting in the location of earlier speech communities, reconstructions may testify to the population movements of peoples speaking given languages. And by sorting out directly inherited features from borrowings, both in proto-languages and their descendants, work on reconstructions can give indications as to the sources of later secondary contacts as well as the primary origins of the languages of a given region. (Biggs (1965) contains an excellent illustration of comparative procedures applied to distinguish borrowings from inherited features in Rotuman and to identify the two main sources of borrowings.)

The following pages list reconstructions from Biggs, Walsh and Waqa which are directly relevant to the interests of the culture historian. For ease of comparison the vocabulary items are assigned to various domains : fishing, sailing and navigation, land fauna, flora, gardening, etc. A few reconstructions of our own have been added to those of Biggs, Walsh and Waqa. These additions carry our initials, as e.g. *makari, *Canarium* sp. (*Burseraceae*) [AP/KG]. We have also added family names for some species where these were not supplied by the authors.

In the case of terms for flora and fauna, Biggs, Walsh and Waqa often reconstruct only a very general meaning, e.g. **lai,* fish sp.; *pa?aua,* marine creature. In such cases we have sometimes enclosed, in square brackets after the authors' gloss, more specific information about the meanings which reflexes of the reconstructed term have in present-day PN languages. This information was obtained from the authors' card file. The square-bracketed material is not a reconstructed meaning, however. For example, in the entry which reads **lai,* fish sp. [*Scomberoides, Chorinemus* (both *Carangidae*)] the bracketed material indicates that certain contemporary PN languages possess a reflex of PPN **lai* denoting species of the family *Carangidae.* But as the precise meanings of reflexes of **lai* are unknown for many PN languages, it would not be justified in this case to assume that the PPN term had a meaning

equatable with any or all of the bracketed referents. After **paʔaua,* marine creature, the bracketed [clam, haliotis, *Perna* sp., rabbit fish, small fish sp.] indicates the diverse range of referents denoted by reflexes of this term in various contemporary languages. The abbreviation 'etc.' indicates a number of additional referents denoted by reflexes of the reconstructed term.

Clearly, to extract the full value from the reconstructions one would need to work intensively on each domain of vocabulary in conjunction with specialists in the corresponding sciences, checking the meaning and distribution of each term in all PN languages. We hope that such specialised studies will be forthcoming. With a few exceptions, however, we do not examine single terms in any detail here, but concentrate on the kinds of inferences that can be drawn directly from the data given by Biggs, Walsh and Waqa.

PPN Reconstructions

1. Inanimate Environment

awa	channel
feo	coral
huʔa	high tide
hafu	falling water [waterfall]
hakau	coral reef
kalaa	kind of stone [volcanic stone, dark basaltic stone]
fatu	stone
lanu	fresh water
lase	coral, lime
kele	dirt, earth
kilikili	gravel
lili	rough, stormy (of sea)
lipo	whirlpool
lolo	flood
loto	lagoon, lake
maka	rock
mato	cliff, precipice
maʔuŋa	mountain
mataliki	the Pleiades
motu	island
nuku	earth, land [delimited region, district, island, etc.]
muriwai	mouth of river
peau	wave (of sea)
puŋa	coral
pu(u)lewa	kind of stone
puke	flood
rano	lake, swamp
sasake	east [AP/KG]
sisifo	west
solo	landslide
sou	agitated (of sea)
tahi	sea
tokelau	north, northerly wind
toŋa	south, south wind
tuŋasiwi	ridge
wai	water
waitafe	river, stream
wasa	open sea
ʔone	sand
ʔuta	inland (from shore)

2. Land Fauna

(a) *Birds*

akiaki	bird sp. [fairy tern, *Gygus alba rothschildi* (*Laridae*)]
ka(a)kaa	parrot sp. [*Acrulocercus* spp. (Hawaiian Honeyeater), (*Muscicapidae*) *Nestor meridionalis*]
ka(a)lewalewa	bird sp. [*Eudynamis tahitiensis,* and other cuckoo spp. (*Cuculidae*)]
kalae	bird sp. [*Porphyrio* spp. (*Rallidae*), crane (*Gruidae*), red-billed gull]
kio	bird sp. [poss. call of bird]
kiu	bird sp. [migratory bird, curlew (*Scolopacidae*), plover (*Charadridae*), albatross (*Diomedidae*)
kula	bird sp. [red-plumaged]
lupe	pigeon [*Ducula pacifica* (*Columbidae*)]
matuku	heron (*Ardeidae*) [*Demigretta* now *Egretta* sp.), blue/white/grey heron, bittern]
miti	bird sp. [Polynesian starling, *Aplonis* (*Sturnidae*), etc.]
moa	domestic fowl [*Gallus gallus* (*Phasianidae*)]
moso	bird sp. [usu. *Rallus* spp.; *Apolonis opacus*]
pekapeka	*Collocalia esculenta,* swiftlet, cave swallow [AP/KG]
seku	bird sp. [*Rhipidura* spp. (fantail) (*Muscicapidae*)]
seŋa	parakeet sp. [*Coryphilus* spp. (*Psittacidae*)]
tawake	Tropic bird [*Phaethon* spp. (*Phaethonidae*)]
weka	bird sp. [*Rallus* spp. (*Rallidae*)]

(b) *Mammals*

kulii	dog
kumaa	rat, mouse
peka	bat [prob. fruit bat]
puaka	pig

(c) *Reptiles*

fonu	turtle
moko	lizard
ŋata	snake

(d) *Insects*

ane	white ant, termite
fonu	beetle sp.
kakalu(u)	cockroach sp., cricket sp.
kalewelewe	spider
kelemutu	earthworm, grub
kutu	louse [head-louse]
laŋo	fly
liha, lisa	nit, eggs of lice
liṇolino	cricket
loo	ant
looʔata	large ant sp.
muu	moth
namu	mosquito
nufe	caterpillar
ŋata	snail, sea-snail
pepe	butterfly
seʔe	grasshopper, mantis, locust
toke	worm

(e) *Others*

manu	bird (generic), quadruped

3. Land Flora

ake	tree sp. [banana tree var. (*Musaceae*), *Dodonia* spp. (*Sapindaceae*), *Olearia* spp.]
ano	turmeric (*Curcuma longa* (*Zingiberaceae*))
asi	sandalwood (*Santalum* spp. (*Santalaceae*))
falafala	plant sp.
fara	pandanus (*Pandanaceae*)
fao	tree sp. [*Ochrosia* spp. (*Apocynaceae*)]
fau	hibiscus (*Pariti tiliaceum* (*Malvaceae*))
fisoʔa	*Columbrina asiatica* (*Rhamnaceae*)

fue	creeper; vine; gourd [*Lagenaria vulgaris* (*Cucurbitaceae*)]
fune	core of breadfruit
futu	*Barringtonia asiatica* (*Barringtoniaceae*)
futi	banana [*Musa* spp., (*Musaceae*); prob. tree and fruit]
ifi	chestnut tree sp. (*Inocarpus edulis* (*Leguminosae*))
kafika	Malay apple (*Eugenia malaccensis* (*Myrtaceae*))
kaka	fibre round base of coconut leaf
kanume	tree sp. [*Diospyros*; *Maba* spp., (both *Ebenaceae*); *Metrosideros* (*Myrtaceae*)]
kape	Alocasia sp. [A. macrorrhiza (*Araceae*)]
kaso	reed
kata	sprig of kava (Piper sp. (*Piperaceae*))
kawa	kava, *Piper methysticum* (*Piperaceae*)
kea	breadfruit sp. *Artocarpus* (*Moraceae*)
kiekie	pandanus sp. (*Freycinetia* spp. (*Pandanaceae*))
kisikisi	Oxalis spp. (*Oxalidaceae*)
kofe	bamboo sp. (*Bambusa* spp. (*Gramineae*))
koka	tree sp. [*Bischoffia* (*Euphorbiaceae*)]
kulu	breadfruit [*Artocarpus* (*Moraceae*), prob. tree and fruit]
ku(u)mala	sweet potato (*Ipomoea batatas* (*Convolvulaceae*))
kuta	reed sp.
lala	tree sp. [shrub spp.]
lekileki	puzzlenut tree (*Xylocarpus*)
lewa	tree sp. [*Cerbera lactaria, C. odollam, C. manghas* (*Apocynaceae*)]
loholoho	spathe of coconut palm
maele	fern or sedge sp.
maile	scented plant [*Alyxia* spp. (*Apocynaceae*), *Polypodium* spp.]
makari	*Canarium* sp. (*Burseraceae*) [AP/KG]
mala	tree sp. [*Dysoxylum* (*Meliaceae*), *Cordia subcordata* (*Cordiaceae*), *Neonauclea forsteri* (*Rubiaceae*)]
mati	tree [*Ficus* (*Moraceae*)]
mei	breadfruit (Artocarpus sp. (*Moraceae*))
milo	tree sp. [*Thespesia populnea* (*Malvaceae*)]
moli	citrus (*Rutaceae*)
mosemose	tree/plant sp.
mosokoi	Cananga odorata (*Anonaceae*) [native of Philippines, introduced?]
nau	plant sp. [*Lepidium piscidium* (*Cruciferae*), *Scaevola frutescens* (*Goodeniaceae*)]
nawa	*Cordia* (*Boraginaceae*) [AP/KG]
niu	coconut palm (*Cocos nucifera* (*Palmae*))
nonu	*Morinda citrifolia* (*Rubiaceae*)
nukanuka	*Decaspermum* (*Myrtaceae*) [AP/KG]
paLa	fern sp. [prob. tree fern]
pele	plant sp. [*Hibiscus manihot* (*Malvaceae*)]
pia	arrowroot, starch [*Tacca* (*Taccaceae*)]
piu	palm sp. [*Pritchardia pacifica* (*Palmae*)]
polo	plant [*Solanum* sp. (*Solanaceae*)]
poʔa	tree fern sp.
pua	plant with showy flowers [*Fagraea betheriana* (*Loganiaceae*)]
puka	tree [*Hernandia pisonia* (*Hernandiaceae*)]
pulu	coconut husk; gum, resin
reŋa	turmeric [see aŋo]
sea	tree [*Parinarium insularum* (*Chrysobalanaceae*)]
siapo	paper mulberry plant [*Broussonetia papyrifera* (*Moraceae*)]
salato	tree-nettle (*Laportea harveyi* (*Urticaceae*))
suni	shrub sp. [*Drymisperum bernattianum, Cestrum* (*Solanaceae*), *Phaleria* (*Thymclaeaceae*)]
taLi(a,e)	shrub/tree sp. [*Terminalia littoralis, T. catappa* (*Combretaceae*)]
talo	taro (*Colocasia esculenta* (*Araceae*))
tamanu	*Calophyllum* (*Guttiferae*) [AP/KG]
tapakau	coconut leaf
tawa	tree (edible nut) [*Pometia* spp. (*Sapindaceae*)]
tewe	plant sp. [*Smorphophallus* spp. (*Araceae*), *Tacca fallifera* (*Taccaceae*)]

tiale	flower [*Gardenia* spp. (*Rubiaceae*)]
tii	*Cordyline* sp. (*Liliaceae*)
toa	*Casuarina* sp. (*Casuarinaceae*)
toi	*Alphitonia* (*Rhamnaceae*) [AP/KG]
toŋo	mangrove [*Rhizophora* spp. (*Rhizophoraceae*)]
tou	*Cordia* (*Cordiaceae*) [AP/KG]
wao	forest
wii	*Spondias dulcis* (Tahitian apple, (*Anacardiaceae*))
ʔufi	yam (*Dioscoraceae*)
ʔulu	grove of trees
ʔuto	sprouting coconut
ŋase	tree fern sp. [*Geniostoma rupestre,* giant fern (*Loganiaceae*)]
ŋatae	tree sp. [*Erythrina indica* (*Leguminosae*)]
ʔe(e)ʔe(e)	shrub sp.

4. Sea Life

(a) *Fish*

alelo	fish sp.
ali	flatfish, flounder (*Pleuronectidae*)
fai	stringray (*Dasyatidae*)
faapuku	fish sp. [*Epinephelus guernas* Seale (sea bass) (*Serranidae*), *Polyprion oxygeneios* (groper)]
faimanu	stingray (*Dasyatidae*)
faʔamea	fish sp.
foʔo	small fish sp.
haku	swordfish (*Xiphiidae*); garfish
hapi	fish sp. [*Acanthunus guttatus* (*Acanthuridae*); surgeon-fish (*Hepatidae*)]
foto	barb of stingray
huli	fish sp. [*Caesia, Scomber japonicus* (*Scomberidae*) red-bellied fusilier]
ika	fish [generic]
ise	fish sp. [pipefish, half-beak, gar-fish (*Hemirampitiidae*)]
kanahe	mullet (*Mugilidae*)
kaloama	goatfish, surmullet (*Mullidae*)
kawakawa	fish sp.
kiokio	fish sp. [*Albula vulpes* (*Abdulidae*) *Elagatis bipinnulatus* (*Carangidae*), shark sp.]
lai	fish sp. [*Scomberoides, Chorinemus* (both *Carangidae*)]
laumea	gills of fish
lupo	fish sp. [small skipjack, *Caranx* spp., trevally (*Carangidae*)]
malau	fish sp. [*Priacanthus* (*Priancanthidae*); *Myripristis* spp., *Holocentrus* spp. (*Holocentridae*)]
malolo	flying fish (*Gempylidae*)
manini	striped sturgeon [*Hepatus* spp. (*Hepatidae*)]
manaa	fish sp. [*Promethichthys, Thyrsites atun, Mustelus anatarticus*]
manoo	shark
moa	fish sp. [cowfish, boxfish (= trunkfish) (*Ostraciidae*), *Zanclus cornutus* Herre (*Zanclidae*)]
muu	fish sp. [usu. *Monotaxis grandoculis*; also *Aphareus flavwaltus* Jenkins (*Lutjanidas*) *Collybus drachme* Snyder, duckbilled Lethrinus]
mutumutu	fish sp. [*Abudefduf,* damsel fish; trigger fish ?]
n(e)iufi	shark sp.
nofu	Scopion fish (*Scorpaenopsis gibbosus* (*Scorpaenidae*))
nue	fish sp. [Rudder-fish (*Centrolophidae*), topsail drummerfish]
palani	surgeon fish sp. [*Acanthurus* (*Acanthuridae*)]
palu	fish sp. [*Aphateus,* etc.]
papa	fish sp. [*Epinephelus* (*Serranidae*), swordfish sp., bonito shoal, tuna]
pelupelu	small fish sp. [*Sardinella* sp. (*Clupeidae*)]
rufi	fish sp. [shark sp., kind of fish]
sakulaa	swordfish
sipa	fish sp. [Flying fish, usu. small (*Gempylidae*)]
ta(a)kana	shoal
tanifa	fish sp. [large shark, mythical water monster, etc.]
tanutanu	fish sp. [buries itself in sand]
tifitifi	butterfly fish spp. [*Zanclus* (*Chaetodontidae*)]
toke	sea eel

tonu	fish sp. [groper, sea bass, *Anthias amarui* (*Dulidae*), *Serranidae, Stereolepoides thompsoni*]
tuna	freshwater eel (*Muraenidae*)
ʔaso	fish sp. [shark sp.]
ʔatu	bonito (*Thunnidae*)
ʔatule	fish sp. [*Trachurops* (*Carangidae*)]
ʔono	barracuda (*Sphyraenidae*)
ʔulua	Cavally (*Caranx* spp. (*Carangidae*))
ʔufu	parrot-fish (*Callyondontidae*)
ʔume	fish sp. [Leatherjacket, *Naso* spp. (*Hepatidae*)]
ʔutukao	fish sp.
(b) *Mollusca*	
faasua	tridacna clam sp.
feke	octopus, squid
kasi	bivalve shellfish spp. [*Capsula rugesa, Asaphidae, Tellinidae, Veneridae, Nuculidae, Areidae*]
kawe	tentacle [cf. feke]
kuku	mussel (*Mytilidae*)
ŋuu	mollusc; squid
paa	shellfish sp.
paʔaua	marine creature [clam, haliotis, *Perna* sp., rabbit fish, small fish sp.]
pipi	shellfish sp. [*Anadara, Glycymerodae, Pectinidae,* etc.]
pule	cowry shell (*Gypraeidae*)
puupuu	shellfish sp.
sisi	mollusc sp. [*Neritidae, Naeticidae,* etc.]
tifa	pearl oyster, *Pinctada* spp. (*Pteriidae*) [AP/KG]
tio	oyster sp. (*Ostreidae*)
(c) *Crustacea*	
ami	crustacean roe
kalamisi	small crab sp.
kamakama	crab sp. [rock/reef, usu. *Grapsidae*]
kawiki	small crab sp.
paka	crab [poss. both generic and for a kind]
tupa	land crab
ʔuŋa	hermit crab sp. (*Paguridae*)
ʔura	crayfish (*Palinuridae, Penaeidae*)
(d) *Echinodermi*	
kina	sea urchin
loli	seaslug, *Holothuria* (*Holothuridae*)
wana	sea egg [sea urchin, usu. with spikes]
(e) *Others*	
fonu	turtle
fiŋota	marine spp. other than fish
kekeso	marine sp. [shellfish, fish sp.]
limu	seaweed (*Algae*)
mama	marine sp. [shellfish, Chiton, seaslug sp.]
masimasi	dolphin (*Coryphaena*)
palolo	balolo worm *Leodice viridis* (order *Polychaeta*)
ʔuu	marine creature

5. Sailing and Navigation

fana	mast
fohe	paddle
folau	fleet of vessels; navigation, sea travel
fouLua	sea going craft
hama	outrigger
haukafa	lash canoe
kauwaka	crew of boat
kaweina	that which is steered for
kaokao	side of canoe
katea	side of boat opposite to outrigger

kiato	outrigger boom
laa	sail
laŋo	roller under canoe; support under canoe
lepa	lie to (of boat); flap (of sail)
liu	bilge
mono	plug; caulk
oʔa	side boards of canoe
ʔalo	paddle
taulaŋa	anchorage
tere	sail
tila	mast; yardarm
uta	cargo, freight (of canoe)
waka	canoe
ʔuli	to steer

6. Fishing

afo	fishing line; cord esp. fishing line
faaŋota	to fish, search for shellfish
fiinaki	fish trap
heʔe	drive into net
kupeŋa	net
ma(a)taʔu	fish hook
ma(a)unu	bait
paa	fish hook
rama	fish with torches
rau	net
saʔo	draw a net around
sii	fish with line
tili	fish with casting net

7. Gardening

faki	pick (esp. of fruit)
kano	seed
kau	stalk; stem
leu	ripe
lito	shoot, plant, sprout (of plant)
lohu	fruit picking pole
makulu	fall when ripe
maʔala	garden
mata	raw; unripe; green
muku	young shoot of tree, etc.
osi	young shoot of plant
palatuʔu	tree ripened; over ripened
peʔe	over ripe; soft
pulapula	seed; seedling
ʔota	raw
utu	harvest
too	to plant [AP/KG]

8. Garden products

futi	banana
kawa	drink made from kava plant
ku(u)mala	sweet potato [prob. not of PPN antiquity]
lolo	coconut milk or oil
kulu	breadfruit
kafika	Malay apple
pia	arrowroot
talo	taro
wii	mango
ʔufi	yam

9. Domestic Animals

kulii	dog
moa	domestic fowl
puaka	pig

10. Cooking and Food Preparation and Storage

	bottle like vessel
faŋu	mix
firo	grater, remove skin or rind
fohi	food served with kava
fono	grate; grind
holo	drink
[i,u] nu	container for liquid
ipu	strip; peel
hisi	food; eat
kai	wooden bowl
kumete	cooking pot
kuLo	half cook; cook lightly
lala	boil
lili	fermented food
maa	fermented (of food)
mara	fermented (of food)
masi	cooked
moso	knead; mix
nane	knead, mix
natu	mashed fruit or vegetable paste
poʔoi	knead, mashed
o(o)ʔi	grate; mash
roʔi	bowl for kava
taanoʔa	cook
tafu	cook in earth oven
taʔo	

11. Houses and Structures

afu	'raised place, made for house or religious structure' [AP/KG]
faaliki	'floor (covering)'
fale	'house'
fata	'shelf'
fatuŋa	'rafter, beam'
folau	'canoe shed'
hoka	'rafter(s)'
kaso	'rafter
kolo	'enclosed fortress'
loki	'inner room'
malaʔe	'public meeting place'
paa	'enclosure, fence'
pou	'post'
rau	'thatch'
ʔaa	'wall, fence'
ʔato	'thatch'

12. Tools

faŋo	'file, scrape'
kana	'grater, polisher'
kili	'saw, file, rasp'
toki	'adze, aze'
toŋi	'engrave, carve'

13. Clothing and Adornments

faʔu	garland of head; headband
kafu	clothing
kiekie	waistband

lei	neck ornament
malo	loin garment
pale	headdress
puulou	head covering
siapo	bark cloth
tapa	bark cloth
mama	ring
niko	ornament

14. Sewing and Weaving

faʔu	to tie
fatu	weave
fenu(u)	strand; fibre
filo	thread; to make thread [AP/KG]
hau	needle
kaalawa	line; strand
kafa	sennit
milo	twist by hand
pola	plaited coconut leaf
pona	knot
pookai	coil
sika	net needle
tia	to weave; sew
tui	sew

15. Hunting, Weapons

fana	shoot with bow
fuata	spear, spear haft
maka	sling
ŋasau	arrow
sele	snare
seu	catch flying creature with net snare
tao	spear, lance

16. Other Material Culture Items

fala	mat [poss. fara AP/KG]
fue	fly whisk; fan
ike	tapa beater
kali	wooden pillow
kawei	carrying cord
kete	bag; basket
kiekie	mat

Reliability of the Reconstructions

Before drawing any inferences from the reconstructions it is as well to ask about their reliability. A number of questions may be asked concerning any reconstructed language. First, did the language that we seek to reconstruct ever exist ? This is equivalent to asking whether the contemporary languages which we assume to constitute a family or subgroup do constitute a genuine family or grouping. Often such a question is by no means capable of a straightforward answer, because opinion is divided as to the validity or the exact membership of the group in question. But in the case of PN languages there is complete agreement that they form a valid subgroup of Austronesian. There is, then, no doubt that PPN did exist. We return later to the question of the degree of dialect variation within PPN.

Second, supposing that the proto-language did exist, has the linguist reconstructed it correctly ? In particular, has he attributed to it any words or features which were not actually present, but which represent say, innovations of certain daughter languages ? Or

did all the reconstructed items actually occur in the proto-language ? There is rarely any problem when a given reconstruction is reflected by every single daughter language, or by at least one member of each minor (low-order) subgroup within the group. The question normally arises only when a particular feature has a more restricted distribution among contemporary languages. It is essentially equivalent to asking whether the linguist has correctly identified the primary and other high-order subgroups within the group, and whether he has taken adequate precautions against reconstructing features likely to have been borrowed by one major subgroup from another subgroup or from language outside of the group.

Many examples of questionable reconstructions occur in the major work on Austronesian comparative linguistics, that of Otto Dempwolff (1934-38). In a study remarkable for its scope and (for the most part) its sound technique, Dempwolff initially reconstructed a Proto-Indonesian (PIN) sound system and over 2,000 PIN roots. Later he equated these same reconstructions with Proto-Austronesian (PAN). However, many of the reconstructed items do not satisfy the criteria that would be imposed today on a reconstruction of PIN, The main reason for this is Dempwolff's questionable assumptions about AN subgrouping.

Any large family of languages will divide into two or more primary (first-order) subgroups. Usually these subgroups will be distributed over quite a wide geogrpahic area or a number of discontinuous areas. It is customary to attribute to the proto-language only items which are reflected in at least two first-order subgroups. Furthermore, it is customary to avoid reconstructing, or to label as possible borrowings, items which although they occur in at least two first-order subgroups, have a suspiciously narrow geographic distribution, or which occur only in languages which are known to have borrowed extensively from one another. If the primary subgroups of a family are unknown, one is justified in attributing to the proto-language only those features which are retained in all or almost all lower-order subgroups.

The major subgroups among the Indonesian (IN) languages were unknown when Dempwolff wrote, and in fact are still in dispute. Yet Dempwolff reconstructed as PIN terms for 'elephant', 'cattle', 'goat', 'pineapple', 'rhinoceros', 'orangutan', 'civet', 'flying dog', 'scaly ant-eater', 'porcupine' and other natural objects which have a highly restricted distribution within the Western Austronesian region or which were probably introduced into this region long after the break-up of PIN, or which were named only in languages which are contiguous and probably rather closely related (form a subgroup within IN). If the reconstructions for flora and fauna were reliable we could probably locate PIN somewhere within the Sumatra-Java-Borneo area, for some of the species referred to are confined to this region. Dempwolff also reconstructed as PIN a number of words which he knew to be borrowings from Sanskrit, and which were probably borrowed by IN languages long after the dissolution of PIN. Clearly, then, quite a high proportion of Dempwolff's reconstructions cannot (on present evidence) be reliably attributed to PIN.

A still higher proportion cannot be attributed to PAN. Many scholars believe that the Oceanic languages comprise a primary subgroup of Austronesian, and that some or all the IN languages form a second primary subgroup. Dyen (1965) has argued that more than one major

subgroup may be represented among Oceanic languages.[3] In either case, it is unthinkable to attribute to PAN any item not reflected in *both* IN and Oceanic languages. But over 60 percent of Dempwolff's reconstructions have no known reflexes in Oceanic languages.

Biggs, Walsh and Waqa have taken particular care to avoid these pitfalls. It must also be admitted that conditions in Polynesia are extremely favourable for comparative work. The time depth is relatively shallow. Not only is PN an obvious subgroup, but most of its Triangle members were geographically isolated from all non-PN languages, so that borrowing from outside has been minimal. Borrowing within PN itself presents a greater problem, but here the linguist is aided by the large number of relatively isolated languages spoken in marginal areas – more than 20 PN languages are compared by Biggs, Walsh and Waqa, and only a few of these show signs of extensive borrowing from other PN languages. Again, most of the major subgroupings within PN now seem clear. Finally, numerous quite closely related external (non-PN) witnesses exist to testify on matters where the internal PN evidence is incomplete or ambiguous. If PN languages disagree with respect to some form or meaning, it is likely that other AN languages will provide decisive evidence for choosing one alternative as the correct reconstruction.

Two further questions, to some extent independent of the preceding one, concern the accuracy of the precise forms and meanings reconstructed. Sometimes, while one can be sure that a particular item existed in the proto-language, its exact form (or forms) is unclear. This is most likely to be the case when the languages concerned exhibit complex morpho-phonemic processes. PN languages, however, are "isolating" languages with very straight-forward and conservative phonemic systems. Often the reconstructed PPN phonemic shape is retained without any change by its daughter languages. In this respect PN languages are like Italian (which often retains Proto-Romance forms with little or no change) rather than, say, French (which has drastically modified most Proto-Romance forms as a result of complex morphophonemic changes).

Reconstruction of meaning is beset with traps and snares. A standard comparative method of proven value is lacking. The raw data are rarely adequate – for example few of the dictionaries available for PN languages give adequate definitions of the meanings or terms for flora, fauna and many other sections of vocabulary. Here, Walsh and Biggs have not sought or attained the precision they have achieved in the reconstruction of forms. When in doubt as to the meaning of a reconstructed form they have not tried to choose between specific alternatives but have instead supplied a gloss which covers all possibilities (such as 'marine creature' where daughter languages may vary between the meanings 'shell-fish', 'crustacean', 'small fish'). Often no more specific gloss is justifiable, but there appear to be some cases where even on present data the range of possible reconstructed meanings could be much more severely restricted.

A number of other kinds of impreciseness in the glosses are largely attributable to the dictionary sources. For example, there are many reconstructions like **fohe* 'paddle' where

3. Neither the Western Austronesian (sometimes called Indonesian) nor the Eastern Austronesian (Oceanic) groupings can be said to rest on strong evidence at present. However, there seems to be general agreement that most of the languages of Madagascar, West and Central Indonesia, Malaysia and the Philippines belong to a subgroup. Dyen (1965) has suggested the name Hesperonesian for a similar grouping. The position of the Formosan and Southeast Indonesian languages is less certain, but many scholars would include them in a wider group along with those which Dyen calls Hesperonesian. The Oceanic subgroup is not indicated by Dyen's lexicostatistical results, but appears to be supported by a certain amount of qualitative evidence (see Dempwolff 1934–38, Milke 1958, 1961, 1968, Grace 1959, 1964, 1969, Pawley and Cashmore n.d.)

it is not indicated whether the term can be used both verbally and nominally, and if used nominally, whether it can refer only to an action (paddling) or an object (a paddle) or to either. The source dictionaries frequently fail to give this sort of information.

Finally, we may ask how exhaustive the reconstructed word list is. With some 2,000 PPN roots in the 1970 work it is certainly one of the most extensive ever compiled for a prehistoric language other than Proto-Indo-European. There are, however, indications that the authors have barely scratched the surface of the available resources. Most of their comparisons deal with roots of (C)V(C)V shape. A glance at any dictionary of a contemporary PN language will show that, while this is the commonest shape, there is a high proportion of forms containing three or more vowels which are not capable of analysis into more than one productive morpheme. There are, in addition, many derived forms with idiomatic meanings. Each of the major PN languages appears to have a lexicon of upwards of 10,000 roots and idiomatic derived forms.

As well as almost 2,000 PPN items, Walsh and Biggs have so far reconstructed about 600 items which are attributed only to interstage languages (such as Proto-Eastern PN). (These reconstructions are made when the known cognates are confined to one subgroup of PN.) A goodly number of these sub-proto-forms will probably turn out to be PPN, once the comparison is extended to include more PN and non-PN witnesses. Indeed, it seems likely that the authors may expect eventually to at least double the number of PPN reconstructions in their 1970 work, even with present resources (adequate dictionaries exist for less than half of the 25–30 PN languages and for very few other Oceanic languages).

Location of the Proto-Language : Postulates

We now turn to the kinds of inferences that may be drawn from the data. In so far as a certain amount is already known about the PPN speech community on independent grounds, some of the discussion which follows is purely an academic exercise. Let us pretend, however, that we come fresh to the problem, first, of locating the community.

In interpreting the data a number of postulates are followed, which we discuss here informally but at some length. The purpose of discussing these postulates is to make explicit the assumptions on which our hypotheses are built. It must be emphasised that each postulate is an assertion about what is highly *probable,* not about what is *certain.* The discovery of a single counter-example does not necessarily invalidate a postulate or all the inferences based on it. On the other hand, the discovery of a very large number of examples conflicting with a postulate would, obviously, make any hypothesis based on it highly suspect.

Postulate 1. PPN was the language *immediately* ancestral to the PN languages, and which existed at the point of time immediately prior to the separation of the Tongic and Nuclear PN branches of PN. This is the subgrouping hypothesis followed by Biggs, Walsh and Waqa.

Clearly, an earlier stage of PN was spoken in the period before the break-up of PPN. However, this earlier period of development is not to be confused with the PPN stage, which occupied a point in time rather than a period. The term Pre-Polynesian (Pre-PN) may be applied to the period between the divergence of the language ancestral to the PN group from all other Austronesian languages and the dissolution of PPN itself.

Pre-PN need not have been spoken in the same place as PPN, and indeed the earlier stages of Pre-PN were probably not. There is evidence that the PN group had differentiated

from its nearest relatives by about 1,500 B.C. The closest relatives of PN appear to be the Fijian dialects, and it is likely that the immediate common ancestor of the two groups was spoken in Fiji.[4] It is thus at least possible that Pre-PN was initially spoken in Fiji, and that at a later stage some of its speakers moved into Polynesia, where their speech evolved into PPN. We return to this point later, particularly in discussing postulates 14 and 15.

Postulate 2. The homeland of PPN (or any other proto-language) lies within that area which is bounded by its most widely spread descendants. In the case of PPN, this principle asserts that the homeland lies within the area of the "Polynesian Triangle" and the "Outlier Wedge", i.e. the region which is roughly delineated by drawing the shortest possible line linking points at 4 degrees North and 20 degrees South in longitude 155 degrees East, 22 degrees North and 30 degrees South in longitude 109 degrees West, with an extension south to embrace New Zealand in the region of longitude 170 degrees East, latitude 34–48 degrees South. This vast area includes most of the island groups in the southwest, central and eastern Pacific. We know of no cases where a proto-language is believed to have been spoken outside the area occupied by its descendants at time of first European contact.

Many writers (particularly Dyen 1956) have argued that the most likely dispersal centre for a group of languages is that subregion where the genetically most diverse members are found today. The first linguistic splits are likely to have involved movements to other localities near the homeland, with more distant areas being settled as the result of later splits and movements. Dyen argues this on grounds of economy, the principle of least moves. Bruce Biggs has pointed out to us that economy of movement needs to be defined not only in terms of *number* of movements but also in terms of *distance* of movements. A single movement from southeast Asia to Polynesia would not significantly increase the number of movements involved in the dispersal of PN languages, but it would be an unlikely move on grounds of distance (as well as violating postulate 2).

Some caution must be exercised in applying the diversity principle. On the one hand, there is always the possibility that the diversity of a given subregion has been increased by recent intrusions into the area of languages from outside (the present diversity of Fiji is an example, with Rotuman, Tongan, Samoan and Gilbertese as well as many Indo-European and Oriental languages having been added to the indigenous languages over the last century or so). Such recent movements are often easily detected, provided that the intruders have left immediate relatives in their region of origin. There are no known cases in pre-contact Polynesia of recent movements from outside having increased the diversity of any one of the three major subregions (East, West and Outlier Polynesia), with the possible exception of the Outlier region. Bayard (1966) has suggested that the Ellice Islands and Futuna may have been the sources not only of the primary Outlier settlements but of several more recent settlements of Outlier islands. This suggestion remains linguistically unproven.

On the other hand, there is the chance that the diversity of a region has decreased following the obliteration of some languages and the expansion of others. (The disappearance of aboriginal languages in America and Australia following settlement by Europeans are two instances of this kind.)

Again, there may be geographic factors working to restrict diversification in the region of the homeland. Fiji is an example. The Fijian archipelago is a sizeable area which, on the

4. Pawley 1970 : 309–16, in press; Groube 1971. Cf. also fn. 7.

archeological evidence, has been settled for over 3,000 years — longer than any part of Polynesia. But diversification within Fiji has been restricted by the dialect chain situation. Continuing contact has maintained some degree of mutual intelligibility between many dialects which probably first separated thousands of years ago.

The principle elaborated by Dyen indicates that West Polynesia is the most likely original dispersal centre for Polynesian languages. Both the marginal areas — East and Outlier Polynesia — are linguistically quite homogeneous. All 14 or so Outlier languages fall into a single second-order subgroup of PN (Samoic-Outlier). East Polynesia is even more homogeneous. All of its languages fall into a low-order subgroup (Eastern PN) which, according to glottochronological estimates, derive from a common ancestor spoken no more than 1500 years ago.

On the other hand, the West Polynesian area, although much smaller and containing fewer languages than either of the other regions, is genetically much more diverse. There are apparently just two major subgroups of PN : Tongic (containing Tongan and Niuean) and Nuclear PN (containing all other PN languages). Both subgroups are represented in West Polynesia, and the Tongic group is represented nowhere else. Apart from Tongan and Niuean, the languages of West Polynesia (Samoan, Uvean, Futunan, Ellice and Tokelauan) all fall into the Samoic-Outlier division of Nuclear PN. However, they are fairly diverse in that (with the possible exception of Tokelauan and Ellice) no two of them appear to form a subgroup within the Samoic-Outlier grouping.

Postulate 3. The region occupied by PPN (or any language descended from Proto-Oceanic) was no larger than that occupied by any Oceanic language at the time of initial European contact, i.e. at most a single archipelago or island group.[5]

If we exclude post-contact movements, no Oceanic language is spoken over a very wide area, by Indo-European standards. The largest land mass occupied by speakers of a single language was probably New Zealand, where at first contact Maori was spoken over most of the 103,000 sq. miles of the country. It is not clear, however, just how different South Island speech forms were from North Island dialects, for South Island Maori was obliterated before any substantial records were made, following conquest by European colonists and North Island Maoris in the early post-contact period.[6]

The language covering the next largest land area was probably Hawaiian, spoken on islands totalling some 7,000 sq. miles. Fiji, which embraces a similar land area, probably contains two indigenous languages, Eastern and Western Fijian, each with many dialects.

However, many languages in the central and eastern Pacific are spread over extensive archipelagoes consisting for the most part of very small islands. The most widespread are probably Ellicean and Tuamotuan. Both are spoken over a chain of tiny atolls, in each case extending over some 400 miles southeast to northwest. Among other PN languages, Samoan Tongan, Tahitian, Marquesan, Hawaiian, Rarotongan-Southern Cooks and several other

5. We have not here faced up to the question of partial mutual intelligibility between the speech codes of different island groups in Polynesia. It is customary to label the speech tradition of each distinct island group in Polynesia a separate 'language'. It is clear, however, that a reasonably high degree of mutual intelligibility obtains between certain of these 'languages' e.g. Sikaiana and Luangiua, Ellice and Tokelauan, Tongan and East Uvean. But see later discussion of evidence for absence of marked dialect variation in PPN.
6. D.S. Simmons (pers. comm.) regards South Island Maori as dividing into two main areas : an area centred on Banks Peninsula where a dialect of East Coast North Island origin was spoken, and the Murihiku region. The Murihiku dialect probably differed quite considerably from North Island Maori.

languages occupies a single archipelago of widely dispersed islands. The same situation prevails in certain Micronesian archipelagoes.

It is significant that the most dispersed languages are found in Fiji, Triangle Polynesia and Micronesia, which are the most recently settled of the major subregions of Oceania. In Melanesia, other than Fiji, each major archipelago contains not one but many many languages. It seems likely that at an earlier stage in the dispersal of Oceanic languages, individual languages in Melanesia commonly occupied much vaster territories than is typical today.

Postulate 4. The presence in any proto-language of a term denoting a category of objects is taken as indicating that the referents were familiar to the speakers of the language, either as part of their own immediate environment or as part of a nearby environment. Conversely, the proto-language could not have been located in a region where these objects are not found. (A definition of 'nearby environment' is given under Postulate 5 below.)

Acceptance of these assumptions requires us to conclude that the PPN community occupied or lived near an environment where, for example, mountains, cliffs, rivers, lakes, landslides and, probably, volcanic rock were found. That is, the community lived on or near a high island or large land mass, rather than on a remote atoll. Similarly, the presence in PPN of many terms for plants characteristic of the Indo-Pacific tropical zone indicates that the location lay within this zone.

Notice, however, that we have not stated that an object known to the PPN's must have occurred *naturally* in their environment. A qualification will sharpen the principle stated earlier; if the proto-language contains a term for a category of objects *not likely to have been introduced by man,* then the location of the proto-language must have been a region where these objects are indigenous.

The relevance of the qualification is obvious. Most of the evidence for pinpointing the PPN homeland consists of terms for types of plants and animals and features of the inanimate environment. In most cases, their distribution was probably not affected by the coming of man — at least prior to European contact — but some natural forms were transported deliberately by man, or otherwise accompanied his expansion into new regions. Domesticated plants and animals provide the clearest examples of the first category; the rat and some kinds of mosquito are two obvious instances of accidental transportation. Some authorities contend that the only species of land snake found in Triangle Polynesia, the Solomon Islands boa (*Enygrus*) of Samoa can only have arrived there through man's unwitting agency. In some parts of Oceania trade goods are known to be carried over several hundred miles, passing through a chain of communities, and such artefacts may include natural objects such as shells and stone.

An illustration of the west-east diminution in variety of indigenous species is provided by the following figures for native land bird species : about 127 in the Solomon islands, 77 in New Caledonia, 54 in Fiji, 33 in Samoa, 17 in the Society Islands, 11 in the Marquesas Islands, 4 on Henderson Island and none on Easter Island (Fisher and Petersen 1964:12). In a few cases man has killed off native species.

Postulate 5. No hard and fast definition can be given of the notion 'nearby environment'. Andrew Sharp has argued persuasively that deliberate two-way voyaging over distances exceeding two or three hundred miles across open sea, and using indigenous craft, is not documented anywhere in the Pacific, and is unlikely to have occurred. Deliberate two-way

voyages exceeding even a hundred miles were rare in most regions. It seems that no pre-contact Pacific island communities had a reliable knowledge of any places separated from them by distances greater than these. We thus postulate a radius of three hundred miles around any point as the upper range of 'nearby environments'. In some circumstances the range may be much more severely restricted, as indicated in (6) below.

Postulate 6. Where a proto-language contains a very extensive and specialized terminology for a class of objects or activities, it is inferred that these objects and activities occurred in the *immediate* environment of the speech community. In the case of PPN, extensive and specialized terminologies exist for marine life and conditions, and for sailing activities and artefacts. It seems highly unlikely that such elaborate lexical distinctions would be made by a speech community which did not itself directly exploit a marine environment. Evidently, PPN speakers were coastal-dwelling fishermen-sailors.

Similarly, an extensive array of terms for montane and inland forest flora and fauna, and for hunting and gardening, would be taken to indicate that the community made extensive use of inland resources, as well. Such a combination would indicate occupation of a high island of moderate size, where both marine and inland environments were readily accessible. Here, however, specialist study of the PPN reconstructions is needed. A fairly elaborate terminology exists for gardening (just as extensive as for fishing, in fact), but it is not clear how many of the plants and animals named in PPN are confined to inland montane locations. So far, relatively few terms for hunting activities have been reconstructed. It would be interesting to compare the PPN vocabularies with those of specialized coastal fishermen-horticulturalists (such as the Motu of the Port Moresby area) and those of contemporary PN communities dwelling on high islands of moderate size, and exploiting both marine and inland resources intensively.

Postulate 7. If a sub-proto-language retains a term from an earlier stage (as e.g. PPN from Proto-Austronesian), then the referent must have been present both in the homeland of the sub-proto-language and that of the earlier stage. It follows, moreover, that the intermediate stages must also have been spoken in a region where the referent occurs.

PPN retains many words for flora and fauna categories from Proto-Austronesian (PAN) and/or Proto-Oceanic (POC). Many of these are native to most regions within the Indo-Pacific tropical zone, while others are species indigenous to the Southeast-Asia-Indonesia-New Guinea region which have been transported by man into the Pacific. Examples include taro (PPN, POC **talo,* PAN **tales*); yam (PPN **ʔufi* POC **ʔupi,* PAN **qubi(h)*); banana (PPN **futi,* POC *puti,* PAN **pu(n)ti(h)*); sugar cane (PPN **too,* POC **topu,* PAN **tebuh*); citrus (PPN, POC **moli,* PAN **limaw*); turmeric (PPN **reŋa,* POC **deŋa*); coconut palm (PPN **niu,* POC **niu(R),* PAN *ñiuR*); pandanus (PPN **fara,* POC **panda,* PAN **panDan*); hibiscus (PPN **fau,* POC *paRu,* PAN **baRuh*); *Barringtonia asiatica* (PPN **futu,* POC **putu,* PAN poss. **bu(n)tun*); and perhaps the pig (PPN **pu* – in **puaka* is just possibly cognate with POC **mpoRo,* PAN **babuy*).

The retention of this particular set of words tells us little about the possible locations of PPN and its earlier stages, except that they must have been tropical and Indo-Pacific. Of more interest are terms for plant types which occur on high islands but not on atolls. Such PPN terms retained from POC include : mangrove (*Bruguiera, Rhizophora* spp.) (PPN, POC **toŋo,* PAN **(t)eNe(r)*); *Spondias dulcis* (PPN **wii,* POC **ʔuRi*); Polynesian chestnut (*Inocarpus edulis*) (PPN **ʔifi,* POC **ʔipi(l)*); tree-nettle, *Laportia* spp. (PPN **salato,* POC **lato*); Malay apple, *Eugenia malaccensis* (PPN **kafika,* POC **kapika*).

Postulate 8. Suppose that a proto-language contains a term X for a category of natural objects Y, and a sub-proto-language retains X but applies the term to a different category Z. In this event, the inference is drawn that the sub-proto-language was spoken at a location where objects of category Y were not present, but objects of category Z were, at least at the time of first settlement by the speech community.

A case discussed by Biggs (in press) illustrates. The POC word for mosquito (**namu*) is retained by PPN, with the same referent. However, in several Eastern PN languages *namu* refers not to the mosquito, but has another meaning such as 'biting pain' or 'sandfly'. In Maori and Marquesan, specifically, *namu* means 'biting midge' while the terms for mosquito are *wae-roa* (Maori) and *nono* (Marquesan).

Biggs discusses the belief of some biologists that at the time of European contact "there were no mosquitoes of any great nuisance value in the Marquesas, Hawaii, and perhaps Tahiti" and suggests that perhaps "man has outdistanced the more pestiferous species in his eastwards migrations ... When they finally caught up with him, he had, perforce, forgotten their name." At any rate, postulate 8 requires the conclusion that the homeland of the Maori-Marquesan subgroup was an area where biting midges were present but mosquitoes were not. This implies a location somewhere east of the Cooks.

The probability that some less troublesome species of mosquito were present in Central Polynesia from the time of first settlement suggests that postulate 8 should be modified slightly, with the phrase "at a location where objects of category Y were unknown or inconspicuous" replacing "at a location where objects of category Z did not exist".

A second example concerns the PPN term *kiekie*. Fijian *kiekie* refers to certain species of pandanus, including *P. caricosus* and *P. thurstoni* (but not *P. odoratissimus* (=*P. tectorius*) which is *vadra* in Fijian and **fara* in PPN). Most PN languages retain **fara* for *P. odoratissimus,* and have a term *kie* which applies to certain other pandanus species. The term *kiekie,* however, is applied in PN languages to various species of *Freycinetia,* a group of plants belonging to a different genus within the *Pandanaceae* family. It seems likely that the PPN homeland contained *Freycinetia* but not *P. caricosus, P. thurstoni* or similar Pandanus species.

Postulate 9. Where a proto-language has no term for a referent found in some of the regions occupied by its daughter languages, the inference is drawn that the homeland was in a region where the referent did not occur. An example (provided by Bruce Biggs) is the seal, which is named in such widely dispersed languages as New Zealand Maori, Easter Island and Hawiian, but which has no common name in Polynesia. The inference is that there is no PPN etymon, and therefore there were no seals in the PPN homeland.

Postulate 10. In some cases the proto-term for a particular referent is not retained by a sub-proto-language, nor is any other term substituted for that referent, even though the referent is named in most contemporary daughter languages. The inference drawn here is that the sub-proto-language was spoken at a place where the referent was unknown.

Sometimes it is difficult to be certain whether the sub-proto-language actually lacked a term for the object in question, or whether there is some other explanation for the failure to reconstruct such a term. It may be that a term was present in the sub-proto-language, and was independently changed by most of the daughter languages. A choice between this explanation and the one offered above may be made by reference to various factors, particularly the

'retention rate' of the proto-term. Individual terms vary greatly in hardiness. Some PAN words are retained by a large majority of contemporary Austronesian languages, others by only a few percent (Dyen et al. 1967). Ann Chowning (1963) observes that in Melanesia the words for sugar cane, *Derris* and putty nut are very stable, a situation which correlates with their almost universal occurrence and use for refreshment, fish poison and caulking, respectively. The terms for taro, yam and pandanus, on the other hand, are much less stable. This instability is correlated with the existence of many terms for varieties of these plants, and with their importance as food staples and consequent association with magico-religious beliefs and taboos.

Two interesting cases from Polynesia concern the PPN words for owl (**lulu*) and bat (**peka*). Owls occur on most high islands of Polynesia, exceptions including Tahiti, the Marquesas and Easter Island. The PPN word **lulu* has cognates in Melanesia, and is reflected everywhere in Polynesia where owls are found, with the exception of Hawaii. The absence of the term *lulu* in Hawaii is of interest because owls *are* found there, and because of Green's (1966) arguments for including Hawaiian in a subgroup with Southeast Marquesan, apart from all other PN languages. The non-occurrence of a hardy form such as *lulu* in Hawiian, then, suggests that the linguistic ancestors of the Hawaiians came from a place where there were no owls. The Marquesas meet this requirement. On this reasoning, neither Hawaii nor the Marquesas are possible locations of Proto-Eastern PN or PPN.

Bats are found in West Polynesia, but in East Polynesia are absent from the Society Islands, the Tuamotus, the Marquesas, Easter Island and possibly Rarotonga (where it is thought that the bat may be a post-European introduction). The PPN term **peka* is yet another old and relatively stable word, derived from POC **mpekwa.* Hawaiian *pe'ape'a* and Maori *pekapeka* 'bat' look like reflexes of **peka,* but in fact probably derive from PPN **pekapeka* 'cave swallow, swiftlet' (a term which does not occur in Walsh and Biggs' list, but which we have reconstructed here after Roger Green drew our notice to its distribution). The cave-dwelling swiftlet is bat-like in habits, and it seems likely that on their arrival in Hawaii and New Zealand from Central Polynesia the settlers applied the term *pekapeka* to the bat.

Two postulates for which counter-examples were found, but which are probably correct in a majority of instances, are the following :

Postulate 11. If a given meaning is not reconstructable for the proto-language the referent cannot have been known to its speakers. A contradictory case is provided by the disappearance of pottery-making from all PN communities after the breakup of PPN. Archaeological excavations reveal pottery as having been present in early habitations in Samoa, Tonga and the Marquesas, and it may be noted that the PPN word **kuLo* is cognate with the generic term for earthenware pots in many Oceanic languages and with PAN **ku[d,D]en* 'kitchen pot'; it almost certainly had the same meaning in PPN. After knowledge of pottery disappeared the term **kuLo* was retained by some PN languages, but apparently took on a meaning like 'kitchen vessel'. Since the meaning 'earthenware pot' was not present in a sufficient variety of PN languages at time of first contact (though it may have been retained by Tongans, who at this time obtained pottery from Fiji), it cannot be attributed to PPN.

Postulate 12. The above case also provides a counter-example to the postulate that if a term has the same meaning in all daughter languages it must necessarily have had this meaning in the proto-language. In all PN languages which retain the term **kuLo*, its meaning has been

recently modified to embrace 'metal pots and pans'; several other old words have had their meanings extended or changed in similar ways by different PN languages to refer to objects and concepts introduced by Europeans. Again, however, the principle will provide the correct conclusion in a majority of cases.

Postulate 13. The possibility that the application of any given postulate will, in a proportion of cases, result in false inferences, requires the formulation of a safeguard principle : the greater the number of independent bits of evidence which require a given conclusion, the higher is the probability that that conclusion is correct. No single piece of evidence, then, is decisive, but where many bits of evidence lead to the same inference, that inference is very likely to be true.

Further Evidence for the PPN Homeland

We now turn to further evidence relevant to the problem of locating the PPN community. In discussing postulate 7 it was noted that PPN retains many PAN and/or POC words for plants found on high islands but not on atolls. There are also a number of cases in which the PPN word is not known to be a retention from PAN or POC, but where the plant referred to is characteristic only of high islands and larger land masses. These include : sandalwood (PPN **asi,* with cognate *yasi* in Fijian); casuarina (PPN **toa*); *Cananga odorata* (PPN **mosokoi,* Fijian *makosoi*); *Canarium* (PPN **makari*); Alphitonia (PPN **toi*); *Callophyllum* spp. (PPN **tamanu,* Fijian *damanu*); *Bischofia* (PPN **koka,* Fijian *koka*); *Pometia* (PPN **tawa,* E. Fijian *dawa,* W. Fijian *tawa*); puzzlenut, *Xylocarpus* (PPN **lekileki*); *Cerbera odollam* (PPN **lewa*); *Erythrina* (PPN **ŋatae*), *Parinarium* (PPN **sea*). In discussing postulate 4 it was observed that PPN also contains terms for various features of the inanimate environment which indicate familiarity with a high island or large land mass. The fact that many of the terms are cognate with forms in languages of Melanesia indicates that not only PPN, but also Pre-PN was located on or near a high island or island group.

An East Polynesian homeland for PPN is precluded on a number of counts, some of which also restrict the range of possible locations in West and Outlier Polynesia. One interesting case concerns in the distribution of terms for the *balolo* worm. This 'sea-worm' lives in the crevices of coral reefs in certain regions of the Pacific. The egg-swollen tail segments of the *balolo* rise to the surface around dawn on the 8th or 9th day after the first full moon in October or November (sometimes in both months), and are taken in hand-nets as a highly prized food.

In Polynesia the *balolo* apparently occurs no further east than Tonga, Samoa and East Uvea. In fact, it is not known to occur elsewhere in West Polynesia. We do not know it it is present in any of the immediate localities occupied by Outlier languages. A PPN term for *balolo* can be reconstructed : **palolo,* retained by Tongan, East Uvean and Samoan, with a cognate *balolo* in Fijian. Cognates occur in some other PN languages, but with a different meaning, to be discussed below. Provided that we may discount undetected borrowing, this distribution of terms indicates that both the Proto-PN-Fijian and PPN communities were located in a region where the *balolo* is present. On this reasoning East Polynesia and marginal regions of West Polynesia can be ruled out.

Of course, it might be argued that the term *palolo* has been borrowed by Tongan, Samoan and Uvean from Fijian, and did not necessarily occur at all in PPN. There are several convincing arguments against this theory. First, it is unlikely that all three PN languages

would have borrowed the term, even if it is conceded that one might have. In fact none of the three languages concerned show other indications of borrowing from Fijian, with the possible exception of Tongan.

Second, the term *palolo* is extremely widespread in Polynesia, not in the meaning *'balolo* worm' but in meanings which appear to be related to or derived from this. In the Ellice Islands, for instance, *palolo* is the term for a small marine insect, eaten by birds. In many Eastern PN languages the word refers to the first and second months of the year. This calendrical usage also occurs in several languages of West Polynesia where the rising of the *balolo* worm apparently marked the beginning of the new year. Iven's description of the Sa'a calendrical system also shows the term for the *balolo* worm as initiating the 13 months of the year in this Southeast Malaitan community. The Sa'a word is not cognate with the Fijian and PPN, but it is evident that the calendrical usage of the term for the *balolo* is a very ancient one in Oceanic languages, and must also be reconstructed as PPN.

The PPN word for land snake, **ŋata,* is another item of interest. The PPN term reflects POC **Nwata.* Of contemporary PN languages only Tongan, Samoan, and possibly Uvean, Futunan and Tokelauan within East Polynesia, together with a few Outliers located in Melanesia, retain the term in the meaning 'snake'. It is noteworthy that within the Polynesian Triangle, Samoa is the only island group where snakes are present and that Fiji is the only nearby region containing snakes. This does not imply that Samoa is the only possible homeland within the Triangle region, for snakes were evidently known by reputation to the inhabitants of some of the other island groups near to Samoa or Fiji. It does, however, indicate that East Polynesia and the more remote regions of West Polynesia are unlikely homelands. The retention of the POC word also suggests that Pre-PN, also, was spoken in a region where snakes were known.

Another term of possible significance is PPN **tifa,* which referred both to the mother-of-pearl oyster (probably to several varieties) and to the breastplate ornament made from the shell. Roger Green (pers. comm.) has argued that the fact that PPN retains this term (cognates occur in Nggela, Bugotu, Sa'a and San Cristobal dialects, indicating that it is at least as old as Proto-Eastern Oceanic suggests that the Pre-PN and PPN communities occupied a region or regions where the pearl oyster was present, and indeed present in workable quantities and accessible locations. Although it is a widely distributed Indo-Pacific species, the pearl oyster is absent in some parts of Polynesia (New Zealand, Easter Island, the Southern Cooks) while in other island groups it occurs in locations not easily exploited by Polynesian techniques of collection. In West Polynesia the pearl oyster is present in workable quantities in East Uvea, the Tokelaus, Pukapuka and some of the Ellice Islands. In Samoa and Tonga easily accessible supplies were less common and alternative shell materials were employed and the pearl shell was probably imported.

The type of the PPN term **tifa* has been retained in most PN languages in the West Polynesian region. In Tonga, however, the pearl oyster itself is called *tofe,* while *sifa* is used only of the ornament and may be a borrowing. The Fijian equivalent, *civa* is almost certainly a borrowing from a Polynesian source (see discussion of borrowings below). So too is the Rarotongan *ti'a*, used of the ornament; the pearl oyster is not present in the Southern Cooks, and no other Eastern PN language has retained PPN **tifa*. The source of the borrowing, then, was probably a language in the West Polynesian region. Elsewhere in East Polynesia a variety of terms are used for the oyster and the ornament, but in the absence of any one set of

widespread cognates no Proto-Eastern PN word can be reconstructed for either object. Postulate 10 requires the conclusion that Proto-Eastern PN was spoken at a location where pearl oyster species were unknown or inconspicuous. Postulate 7 requires us to conclude that the pearl oyster was present in the environments of the PPN and Pre-PN communities.

The absence of one or more of the domestic animals named in PPN (pig, dog and fowl) from several island groups suited to them counts against these places as possible homelands. At the time of European discovery the pig was absent from Niue, Easter Island, Mangaia Aitutaki and New Zealand, as well as from a number of atoll groups. The fowl was not present in New Zealand. The dog was absent in a number of islands, but Sharp (1963:96) warns against attaching too much significance to the distribution of this animal, since it is more likely than the others to be killed off in time of famine.

Barrau (1963:63) observes that *Pometia pinnata* (PPN **tawa*) was present in Central West Polynesia in pre-European times, but has only recently been introduced into East Polynesia. Other plants apparently native to Samoa and certain other nearby West Polynesian islands, but absent from pre-contact East Polynesia include *Metroxylon* (the sago plam, present in Fiji, Rotuma, Samoa and Tonga, according to Barrau, pp.59–60), the wild legume *Pueraria lobata* (Fiji, Samoa and possibly other regions of West Polynesia), and *Dioscorea esculenta* (a yam species which Barrau found no further east than Samoa and believes to be a recent introduction where found in East Polynesia). No PPN terms have been reconstructed for the last three plants, but it is likely that careful comparison of the relevant terms has not yet been carried out. As with most other terms for natural history types, we cannot draw firm conclusions until linguists and natural scientists have jointly made thorough investigation of the field.

The absence or paucity of tropical plants disqualifies certain regions of Polynesia as possible homelands; principally, New Zealand and Easter Island. The latter also lacks a sufficiently rich native fauna.

So far, the lexical reconstructions indicate that the PPN speech community were fishermen-horticulturalists, familiar with a typical tropical Indo-Pacific high island environment and also with certain objects found natively only on certain islands of this category, including the *balolo* worm, the pearl oyster, such land animals as snakes, pestiferous mosquitoes, bats, owls, rails, pigeons, parrots, and the moderately diverse land flora specified in section 3 of the list. Many separate pieces of evidence combine to make it highly unlikely that the homeland lay anywhere in East Polynesia, or in marginal regions of West Polynesia (the Ellice and Islands and, probably, Niue). If PPN was spoken in a region within the Polynesian Triangle, that region was almost certainly the central area of West Polynesia, i.e. the area bounded by Samoa, Uvea, Futuna and Tonga.

What of the possibility that PPN was spoken somewhere within the region occupied by the Outliers — the large wedge-shaped area bounded by Nukuroro and Nukuria in the northwest, Rennell-Bellona in the southwest, Anuta-Tikopia in the northeast and the West Futuna in the southeast ?

Many atoll groups within this region are ruled out by virtue of their being some hundreds of miles from the nearest substantial land mass : Nukuoro, Kapingamarangi, Nukuria, Nukumanu, Luangiua, Takuu and Sikaiana. However, it must be conceded that a few Outliers lie within the New Hebrides-Banks archipelago and the Santa Cruz group.

Several facts count against any of these island groups as likely homelands. First, there is the relative homogeneity of the Outlier languages as a whole, and the still greater homogeneity of those of any Outlier subregion. This, together with the strong probability that all Outliers fall into a subgroup together with certain languages of West Polynesia (Pawley 1967), and certain non-linguistic arguments (such as the direction of the prevailing winds and currents) point to the ultimate derivation of all Outlier languages from West Polynesian locations.

No PPN words have been reconstructed for objects found in the Solomon Islands but not in Triangle Polynesia, for example, such animals as the crocodile (which occurs as far east as Santa Cruz), the dugong, and various marsupials and smaller reptiles.

There are other kinds of evidence relevant to this problem, but not concerned with features of the environment, which are yielded by the reconstructions. From them we can draw dertain conclusions about the length of time during which Pre-PN developed in isolation from other Austronesian languages, about the degree of isolation it enjoyed, and about the dialect diversity of PPN, and about its possible location.

Evidence for the Isolation of PPN

First, the PPN reconstructions show a very large number of innovations, which PN languages share apart from all other members of the Austronesian family. If we accept the following principle :

Postulate 14. The larger the number of innovations characterizing a language, the longer the period during which it has been separate from other languages.

then it is clear that PPN was the end-point of a long period of isolated development. If the rate of change observed in daughter PN languages over the 2,000 or more years since PPN dissolved is any indication, then the period could scarcely have been much less than 1,000 years. Glottochronology gives an independent estimate of around 1,000–1,500 years as the likely duration between the separation of Pre-PN from the nearest relatives of PN (estimated to have occurred at about 1,500 B.C.) and the breakup of PPN itself (estimated to have occurred at around 200 B.C.)[7]. The closest relatives of PN languages are, by almost all measures, the languages of Fiji, Rotuma, the Southeast Solomons and certain languages of the New Hebrides-Banks Islands.

Where did this period of separate evolution take place ? It should be noted that the use of the terms 'isolated' and 'separate' do not imply complete isolation from all other languages, but only a sufficient degree of isolation from sister dialects to allow the speech community to gradually evolve a quite distinct language. If Pre-PN was almost completely

7. There have been many lexicostatistical and glottochronological studies involving PN languages, including Elbert (1953), Grace (1961, 1967), Goodenough (1961) Walsh (1963), Emory (1963), Carroll (1965), Dyen (1965) and Bayard (1966). The results obtained are difficult to compare because many of the studies deviate from the standard methodology : several studies used dictionaries rather than informants, and lists of synonyms rather than the single most common word for each meaning. In some cases the regular sound correspondences were not known and there were difficulties in determining cognacy. Some studies included separate calculations for 'definite' and 'possible' cognates; others halved the difference. It seems reasonable that estimates of the antiquity of PPN should be based on percentages obtained by the standard method, and on comparison of pairs of languages which (a) belong to different subgroups of the highest order, and (b) are geographically widely separated. The percentages shared by Tongan and Niuean with Eastern PN and Outlier languages seem to be in the region of 35 to 45 percent on the 200 word list, using only the most common word for each meaning and excluding all doubtful cases. Cognacy between PN and all other AN languages seems to fall below 30 percent, if uncertain cases are excluded. The highest figures seem to be shared with East and West Fijian and with Central New Hebridean languages (Nguna and Efate) and are in the region of 25–27 percent.

isolated, we should expect the differentiation from sister dialects to occur rather faster than if contact with them were maintained. Furthermore, according to :

Postulate 15. The greater the degree of isolation from other languages over a given period, the smaller the amount of borrowing that will occur.
we should expect that very few lexical borrowings from or into Pre-PN would occur.

Conversely, if Pre-PN was in close contact with other languages over a lengthy period, we should expect to find signs of a good deal of borrowing, either in PPN, in other languages or both. The direction and extent of the borrowing are likely to be determined by a number of other factors, including the relative size and status of the speech communities in contact, and the degree of similarity between their languages and between their socio-economic systems.

If Pre-PN was a linguistic enclave in, say, the northern New Hebrides, PPN should show a number of words which are marked as borrowings by (a) irregular sound shifts and (b) a distribution confined to PN and the northern New Hebrides languages. There are in fact several present-day PN languages which are spoken by small communities in the New Hebrides-Banks Islands (Mele-Fila, Mae, Futuna-Aniwa) and others which lie near other Melanesian islands (West Uvea in the Loyalties, Pileni in the Santa Cruz Islands, and Rennell and Bellona south of Guadalcanal). Most of them show quite substantial and easily recognizable borrowings from neighbouring languages. If Pre-PN was itself spoken by a fairly large and politically dominant community, it might not have borrowed so extensively, but adjacent languages should exhibit many PN loan-words.

Detection of borrowings by or from Pre-PN is of course not as simple as sorting out loan-words and their sources in present-day languages. If borrowing had occurred between Pre-PN and New Hebridean languages the events would have taken place more than 2,000 years ago. The languages involved would not have been as clearly differentiated then as they are now, and the loan-words would often be difficult to distinguish from directly inherited forms. In the course of two or three millenia some of the borrowings would have disappeared from contemporary languages, while others would have spread far beyond their original geographic distribution and subgroups as a result of subsequent population movements and linguistic contacts. The presence of intrusive modern PN languages in the New Hebrides complicates the picture still further. In view of such problems it is perhaps questionable whether a residue of discernable borrowings would remain, even if the original borrowing was on a fairly massive scale.

The matter has yet to be thoroughly investigated. We have however, scanned dictionaries of PPN, Rotuman, East Fijian, Wayan Fijian (a Western dialect), Mota in the Banks Islands, and Sa'a and Nggela in the Southeast Solomons for signs of borrowings datable to the Pre-PN period. While some possible loans have been unearthed, most are obviously recent. The only well documented non-PN languages which show some indications of ancient borrowings from a PN source are Rotuman, Gilbertese and East and West Fijian. Rotuman borrowings evidently post-date the differentiation of PPN (Biggs 1965); the Gilbertese borrowings, we believe, will prove to be derived from Ellice and Outlier sources.

There are many obvious recent Tongan loans to be found in the Eastern Fijian dialects spoken in the Lau Group between Tonga and the main islands of Fiji. There are other words which are clearly or possibly of PN origin to be found in most or all of the dialects of Eastern Fijian, e.g. *talanoa* 'to tell stories' (analysable into two PPN words **tala* and **noa,* neither of which occur alone in Fijian dialects), *vuaka* 'pig', *vasu* 'mother's brother's son'. Most of

these, too, are probably loans of limited antiquity, because of their restricted distribution within Fiji.

Another class of words embraces the likeliest instances of borrowings between Pre-PN and contemporary Fijian speech traditions. We refer here to words uniquely shared by *all* Fijian dialects with PN. Some of them are discussed in Pawley (in press). So far only one really clearcut borrowing has been noted among this category of words : Eastern and Western Fijian *civa* 'pearl oyster spp., breastplate ornament of pearl shell'. This word shows an irregular correspondence with PPN **tifa* (a word discussed earlier in this paper) and with Solomon Island cognates *tavi, dahi,* etc. A true cognate would have the form *tiva* or *diva* in Fijian. *c* represents a voiced interdental fricative [ð] in Fijian and the obvious source of the loan is a language which has a fricative [s] or [š] or affricate [č] as an allophone of *t* before *i*. Among present-day PN languages spoken in the West Polynesian region, Futuna, Uvean, Tongan and Niuean each have such a variant.

No cases have been discovered of PPN words which were clearly borrowed from another language.

While further study is needed, the absence of any indications of a significant amount of borrowing between Pre-PN and other Oceanic languages, together with the other evidence that Pre-PN enjoyed a long period of isolated development, may be taken as consistent with the hypothesis that Pre-PN was not in regular contact with any other languages during most of the period of its evolution.

The Dispersal of PN Languages

In their expansion over the central and eastern Pacific, the Polynesian settled a very high proportion of the uninhabited islands. All the evidence, archaeological and linguistic, suggests that the majority of islands within East Polynesia — an enormous area covering most of the Polynesian Triangle — were settled within an extraordinarily short period of time, i.e. the interval between approximately 0 A.D. and 1,000 A.D. In his *Ancient Voyagers in Polynesia,* Andrew Sharp notes the very high frequency of long voyages of accidental discovery which occurred in the early post-contact era in Polynesia, and which indicate how most of Polynesia was originally settled. The majority of such recorded voyages began when canoes proceeding on short inter-island trips were blown off course. Most of them resulted in a landfall well to the west of the starting point. This is in accordance with the east-west set of the prevailing winds and currents throughout Polynesia. A smaller proportion of voyages were on a predominantly north-south axis; a still smaller proportion were west to east voyages. It is clear, then, that early Polynesians were quick to colonize any uninhabited land lying to the west of their island homes.

The question arises why the Pre-PN linguistic community was able to remain unified for as long as it did, until its dissolution finally occurred with the breakup of the stage which we call PPN. Why, in the course of something like 1,000 years, were no linguistic colonies established by speakers of Pre-PN, at least no surviving colonies? Such a long period of unified evolution is unique among the proto-languages of Oceania. No other subgroup is marked off so clearly by so many common innovations as the PN languages.

Since we know that PPN and its earlier stages were spoken by people who possessed many words for seafaring, it can scarcely be argued that they were not a seafaring people. The explanation must be that no uninhabited land lay nearby, particularly to the west of the homeland, where the winds were most likely to carry them.

At the time of the breakup of PPN, it is certain that all the major island groups of Melanesia were settled and, with the probable exception of Fiji, were already linguistically quite diverse. Even Fiji, the eastern outpost of geographic Melanesia, is known to have been widely settled by around 1,000 B.C. (Radiocarbon dates of this order have been obtained from habitations in several parts of Viti Levu and offshore islands.) Most small isolated high islands in Melanesia and Micronesia were also occupied well before the breakup of PPN, if available radio-carbon dates and the present linguistic diversity and affiliations of these regions are any indication. There are, in fact, very few such isolated islands in Melanesia. Rotuma is perhaps the most remote but has apparently been settled for a very long time – the Rotuman language is very divergent from all other Oceanic languages, and according to glottochronological evidence has been separated from them for upwards of 3,000 years. It is noteworthy, however, that Rotuma has often been reached by Polynesian voyagers in relatively recent times, and that the language shows clear signs of heavy borrowing from PN sources at two distinct periods in its history (Biggs 1965).

It has already been pointed out that the PN Outliers do not represent the kind of colonies we are looking for. Rather than being offshoots of Pre-PN, all the Outliers are closely related to the Samoic group of languages spoken in West Polynesia. Evidence presented in Bayard (1966), Pawley (1967) and Elbert (1967) indicates that Ellice and Futuna are the ultimate sources of the settlement of Outlier Polynesia, although many Outliers were clearly colonised from other nearby Outliers. Evidently, once populations were established on the islands in the northwest of West Polynesia, settlement of uninhabited islands to the west followed quickly. Island groups which were already inhabited, such as the New Hebrides, New Caledonia, the Gilberts and the Carolines, were frequently contacted by accidental voyagers, but PN languages as a rule did not become established in such places. However, linguistic colonies were established in some already populated island groups, such as the Loyalty Islands, Santa Cruz and the New Hebrides.

All this makes the absence of linguistic colonies surviving from the Pre-PN era still more puzzling. It is difficult to find any island which would have been hemmed in by already well populated lands to the West, but at the same time sufficiently isolated from them and from other uninhabited islands to prevent occasional successful colonization over a period of 1,000 years. The island group which best meets the requirements is perhaps Tonga.

The Tongan chain lies approximately 200 miles to the east and southeast of the Lau islands, and about 360 miles southeast of the main islands of the Fijian group. These two groups of islands form a very effective double barrier, likely to catch any canoes sailing or blown away to the west of Tonga. All the other islands of Triangle Polynesia (other than the distant Kermadecs and New Zealand) lie to the east and north of Tonga. The next best situated island for our purposes is probably Niue, which is Tonga's nearest neighbour to the east, about 280 miles distant.

Restricted Distribution of Tongic Languages

The geographic position of the two members of Tongic probably explains one remarkable linguistic fact. Whereas the Nuclear PN subgroup, since it separated from Tongic, has diversified into some 25 distinct languages, in the same period (probably more than 2,000 years) Tongic has split into just two languages, Tongan and Niuean.

We are probably fairly safe in assuming that Niuean separated from Tongan somewhere

around 1,500 years ago (a glottochronological dating consistent with their degree of grammatical differentiation). Since their separation, Niue has established not a single surviving linguistic colony and Tonga has established just one (Niuatoputapu, 180 miles north of Vava'u in the Tongan group, where Tongan has replaced a Samoic-type language sometime since the 17th century, when the first records of Niuatoputapu speech were obtained). Tongan influence is apparent in certain other languages, such as East Uvean and Niuafo'ouan, but it is clear that these languages are basically Nuclear PN.

Neither Tonga nor Niue, then, has been a prolific source of surviving linguistic colonies. This fact has sometimes been overlooked in discussions of Polynesian movements, which have paid undue attention to the spectacular record of the Tongans as long-distance voyagers in the immediate pre-contact and early post-contact period.

Distribution of Nuclear PN Languages

The other principal island groups in the West Polynesian region are Samoa, Futuna, Uvea, the Tokelaus and the Ellice Islands. We may call this northern region of West Polynesian the "Samoic" region. Uvea and Futuna are favourably sited for settlement from Samoa. Uvea lies about 180 miles west of Samoa. Futuna is 112 miles southwest of Uvea. All lie to the northeast of Fiji and are well placed to be the sources of Outlier colonies. As noted earlier, all the Outlier languages belong to the Samoic subgroup within Nuclear PN.

On the other hand, no West Polynesian island group has been a prolific source of colonies in East Polynesia, to judge by the linguistic evidence. This of course is consistent with the fact that the prevailing winds and currents come from the east, and that westerlies blow much more capriciously. Tonga and Niue have established no surviving linguistic offshoots at all in East Polynesia. The other West Polynesian islands, between them, appear to have managed just two. One is Pukapuka, an island in the Northern Cooks, some 250 miles north east of Samoa and about the same distance southeast of the Tokelaus. The other was the ancestral Eastern PN language, whose location is unknown but was presumably somewhere in East Polynesia. It is not known what islands provided the linguistic ancestors of Pukapukan and Proto-Eastern PN but it is highly probable that they were in the Samoic region. Pukapukan falls into the Samoic subgroup of Nuclear PN. Both the archaeological and linguistic materials incidate that East Polynesia was settled later than the Samoic region. Once populations were established in East Polynesia the indications are that all the main island groups in that region were rapidly colonised. No East Polynesian community, however, has established surviving linguistic colonies in West Polynesia, although accidental voyages to this region were very common. Apparently the West Polynesian islands were already too well populated to be much affected by small groups of East Polynesian migrants.

Archaeological Evidence

Tonga has the earliest dates for human occupation of any region in Polynesia. A constant sequence of radio-carbon dates from Tongatapu go back to 1,140 B.C. (Groube 1971). The earliest reliable dates so far obtained from Samoa are much later : 1st century A.D., although somewhat earlier dates are anticipated. Both in Tonga and Samoa there is evidence of cultural continuity from earliest settlements through to recent times (Poulsen 1968; Groube 1971; Golson in press; Green 1966, 1968, in press; Green and Davidson 1969).

These facts are consistent with the hypothesis of a Tongan homeland for Pre-PN. It is of

course not intended to assert that the earliest settlers of Tonga indicated by archaeological excavations were *necessarily* speakers of the language ancestral to PPN, or that PPN was necessarily spoken at the same place as Pre-PN. We merely point out that while on grounds of linguistic diversity, and Pre-PN/PPN terms for natural objects, there is little to choose between any of the main high island groups of West Polynesia as locations for the development of Pre-PN, the theory of a Tongan homeland shows fewer inconsistencies with the total body of evidence – including that of physical geography and archaeology – than any other.

Dialect Diversity in Proto-Polynesian

Another question of which the lexical reconstructions may inform is that of dialect diversity in PPN. Most contemporary PN languages show relatively little regional dialect variation (although honorific and colloquial stylistic variants within the same regional dialect are sharply distinguished in some communities.) Such homogeneity is less common in Melanesia, where extensive and complex dialect chains occur on most of the large and many of the small islands. This diversity seems to be a function both of long settlement and of regular contacts between neighbouring communities speaking different languages. In the latter instance, it is related to the matter of borrowing considered earlier.

One sort of evidence for dialect diversity in a proto-language consists in the necessity of reconstructing more than one form of a word for a given meaning, in an unusually large number of cases where no daughter language has more than a single form. That is, where many alternative cognate forms (doublets, triplets, etc.) have to be reconstructed, such as */iha* and */isa,* both reconstructed for 'nit, egg of louse' in the list of PPN terms cited above. Of course any dialect will have some words which its speakers pronounce in a variety of ways. Many variants will occur in the speech of the same individual (e.g. English *going to/gonna, have not/haven't, bicycle/bike, aunt/aunty, CONtroversy/conTROVersy*). But when the proto-language contains a much higher proportion of such alternants than any single present-day dialect, we are entitled to assume either that the reconstructions are imprecise or that we are dealing with a proto-language which had several dialects. Proto-Germanic, for example, evidently consisted of a chain of dialects, just as its modern descendants in Scandinavia, Holland and Germany, and Britain do.

Walsh and Biggs attribute to PPN a few alternant forms, but the proportion does not appear to exceed that of any contemporary PN language without significant dialect variation. Of the 400 or so words cited here, only one reconstructed item shows alternation of consonants (*/iha, /isa*). A number show alternative vowel shapes, but most of these cases appear to consist of an uncertainty as to the vowel length of the word arising from inadequate marking of vowel length in dictionaries or other shortcomings in the data, rather than from a conviction than the proto-language possessed both alternants.

A second mark of dialect variation in the parent tongue consists of overlapping distributions in the innovations exhibited by the daughter languages. In discussing a well-known example, Bloomfield (1933, p.316) notes that Germanic and Balto-Slavic share the development of case endings with *m* replacing Proto-Indo-European *bh.* On the other hand, Balto-Slavic shares with Indo-Iranian, Armenian and Albanian (exclusively of Germanic and the rest of Indo-European) *s* and *š* type consonants reflecting parental velar stops in certain forms. He gives further cases where a wider subgrouping in Indo-European sub-families suggested by one set of shared innovations is contradicted by the distribution of other sets of

innovations. Independent development and borrowing can be ruled out in most cases and the conclusion can be drawn that we are dealing with a proto-language which had differentiated into a number of dialects. Innovations of one Indo-European dialect region sometimes spread to other dialects, but the direction and extent of the spread was variable. Hence the inconsistent distribution of innovations in contemporary subgroups. In the present example, the dialect ancestral to Balto-Slavic apparently shared a common boundary with the dialect ancestral to Germanic, on the one hand, and with that ancestral to Indo-Iranian, etc., on the other.

There are relatively few cases of overlapping distributions among the innovations characterizing groups of PN languages. Some instances of such overlapping are obviously the result of borrowing or convergent development. One case which is less easily explained concerns the word for 'what ?'. External witnesses (e.g. Fijian *cava*) lead us to expect PPN **hafa,* becoming **afa* in Nuclear PN and **hafa* in Tongic. The Samoic-Outlier members of Nuclear PN should retain **afa* as *afa* or *aha;* the Proto-Eastern PN form should be **aha.* In fact we find that Eastern PN languages do reflect PPN **hafa* regularly. So do a few Outliers (Kapingamarangi, Nukuoro, West Futuna, Mele-Fila *aha*). The rest of PN reflects PPN **haa,* showing absence of medial *–f–* (Tongan, Niuean *haa;* Samoan, Ellice, Futunan, Mae, Pileni, Rennell, Sikaiana, Luangiua, West Uvean *aa,* Tikopian *a*). No single PN language appears to possess reflexes of both **hafa* and **haa.* Convergent development (loss of **f* in the context *a–a*) in both Tongic and in one branch of Samoic-Outlier languages is possible, but this would be an unusual change. Borrowing is unlikely : if Tongic languages borrowed Samoic-Outlier *aa,* why does the Tongic form **haa* show regular retention of PPN **h,* which occurs only in Tongic ? If Samoic-Outlier languages borrowed Tongic *haa*, why does the Samoic-Outlier form *aa* show the regular loss of PPN **h* in this word ?

It seems that both **hafa* and **haa* must be attributed to PPN. Whether or not both forms occurred in a single dialect, or in different dialects of PPN, is less certain. The fact that no single present-day PN language retains both forms is perhaps an indication that they were unlikely to have co-existed in a single dialect of PPN. However, a solitary case is not convincing evidence for dialect diversity in the parent language.

Indications that PPN was free of any marked dialect variation are consistent with the hypothesis stated earlier that Pre-PN was not in close contact with any other languages during most of the period of its evolution. Borrowings from alien languages are one of the main sources of differences among the dialects of a widely dispersed language.

Absence of dialect diversity is also consistent with the theory that PPN was confined to a single island group. A more widely dispersed language, spoken over two archipelagoes, would be almost certain to develop distinct dialects within a few centuries. (Notice that we refer here strictly to PPN. The possibility has already been mentioned that Pre-PN was at some stage spoken in more than one archipelago, and that it survived only in one place (where it developed into PPN). This possibility logically does not exist for PPN, which by definition was just that language which split into two *surviving* divisions : Tongic and Nuclear PN.)

On the other hand, it is entirely possible that the speakers of Tongic and Nuclear PN remained in contact after the decisive split. If the separation involved a movement from one West Polynesian island to another, say from Tonga to Samoa, it would be surprising if such contact did not occur. Borrowings dating from this early period, between Pre-Tongic and Pre-Nuclear PN, are hard to detect, for the words concerned have been transmitted to all the

descendants of these two languages. Nevertheless, there is a small group of words which look like early loans. Most appear to be forms donated by Tongic to Nuclear PN, before the dissolution of Proto-Nuclear PN into its Eastern PN and Samoic-Outlier divisions. A larger number of loans can be dated to a later period, following the breakup of Nuclear PN but before most of the Samoic-Outlier languages had separated from one another. Still later borrowings, occurring after the present-day languages had become distinguished from each other, are numerous among the languages of West Polynesia. The earlier borrowings deserve some attention because of their relevance to the problem of locating the languages concerned.

The following table shows the regular correspondence between certain consonants which are involved in the diagnosis of borrowings.

TABLE I : Regular correspondences indicating direct inheritance

PPN	*l	*r	*h	*s
PNP	*l	*l	*ø	*s
PEP	*l	*l	*ø	*h
PSO	*l	*l	*ø	*s
PTO	*l	*ø	*h	*h
FIJ	l	r	c	s

Note : PNP, PEP, PSO, PTO and FIJ stand for Proto-Nuclear PN, Proto-Eastern PN, Proto-Samoic-Outlier, Proto-Tongic and Bauan Fijian, respectively.

It can be seen that Proto-Nuclear PN (and its descendants) merged **l* and **r* into a single sound, and lost **h*. Proto-Tongic (and its descendants) lost **r* and merged **h* and **s*. Where contemporary Nuclear PN languages show a loss of **r* instead of the expected reflex, or where they fail to show loss of **h*, we conclude there has been borrowing from Tongic. There are often several clues as to the period in which a borrowing was made. An important indication is the number and distribution of the languages which show the irregular sound correspondence. If the irregular correspondence is found in *all* of the widely distributed Nuclear PN languages it is inferred that the borrowing occurred before the members of that subgroup had diverged.

Words which fall into this category include several words which show loss of **r*, such as the Proto-Nuclear PN pronouns : **maaua* '1st person, exclusive, dual' **taaua* '1st person inclusive, dual', **laaua* '3rd person dual' and possibly **efu* 'dust', instead of expected **malua, *talua, *lalua,* and **lefu*.

Another set of loans are confined to non-Eastern PN members of Nuclear PN. The Eastern PN languages exhibit the normal reflexes in these cases, while some Samoic-Outlier languages show irregularities indicative of borrowing from Tongic. The inference here is that these borrowings are later, having been made after the ancestral Eastern PN language had separated from the rest of Nuclear PN and had moved out of the Samoic region. Examples include : PPN **kehe* 'different' (PEP **kee*, Samoan *ʔese* Futunan, West Uvea, Rennellese *kese,* Uvea, Nanumea, Tokelau *kehe,* West Futuna, Sikaiana, Nukuoro *kee*); PPN **ʔaho* 'day'

PEP **(?)ao* Samoan, Futunan *aso*, Nanumea, Tokelau, Luangiua, Sikaiana *aho*); PPN **toho* 'pull, drag' (PEP **too*, Samoan, Futunan *toso*, Nanumea, Uvea *toho*); PPN **hiwa* 'nine' (Nukuoro, Tikopia *siva*, Sikaiana *sivo*, PEP **iwa*, Futunan, Samoan, Tokelau *iva*).

It is interesting that in some cases (such as PPN **kehe*) some of the Outliers exhibit the regular reflex, suggesting that they too had become separate before these particular borrowings occurred.

The latest borrowings are confined to one or two languages. For example, PPN **huhu* 'breast' is generally reflected by *uu* in Nuclear PN, but Samoan and Uvean show irregular *susu* and *huhu*, respectively; for PPN **murimuri* 'follow, come after' Samoan has both regular *mulimuli* and irregular *muimui* 'criticize someone behind his back' which probably derives from Tongan *muimui* 'follow' or *muimui'i* 'follow s.o. secretly'; Samoan *saka* 'to boil' (instead of expected *sa'a*) is probably from Tongan *haka* or Fijian *saqa*. East Uvean is the language which has the heaviest layer of borrowings from Tongan.

Tongan and Niuean show loans from Nuclear PN languages whose source and period of transfer can sometimes be determined by similar methods. The total distribution of borrowings can be explained by positing an initial linguistic split within West Polynesia, followed by a period of contact between the diverging daughter communities, and a series of later splits in which some Nuclear PN languages moved out of West Polynesia, while others remained there and continued to be in intermittent contact with each other, and with Tongan and Niuean.

Cultural Terms

The list of reconstructions for cultural objects is probably far from complete. A good deal of the kinship terminology, for instance, would appear to have so far escaped retireval. Names for descent groups and other social aggregates are fewer than one would expect from a knowledge of contemporary Polynesian societies. Although words for a variety of ornaments appear in the list, terms for strictly utilitarian artefacts are surprisingly scarce.

On the other hand, the terminologies for gardening and fishing have already been recovered in sufficient detail to indicate an economy of the same general type as those recorded by European observers on high islands in tropical Polynesia during the immediate post-contact period. With the possible exception of the sweet potato, all the main cultivated food plants are there : taro, yam, banana, breadfruit, sugar cane, arrowroot, fruit pandanus and coconut. Biggs (in press) discusses linguistic discrepancies which suggest that *kuumala* and other PN terms for sweet potato are not of PPN origin, a conclusion in line with the botanists' opinion that the plant was introduced into Polynesia in relatively recent (though pre-European) times.

The domesticated animals comprised the pig, dog and fowl.

Terms for marine life and fishing gear and activities indicate a variety of methods for taking food from the sea – nets, lines, fishtraps, hands (but so far, not harpoons or poisoning) – and exploitation of offshore as well as inshore and reef resources.

Hunting vocabulary is slight. Two words for snaring exhaust the present list (apart from general terms like *fana* 'to shoot', of uncertain application to hunting).

It remains to be seen whether the terminologies for social and political organization will ever be reconstructed completely enough to provide checks on theories of social change which

have been proposed by some writers on Polynesia. Such problems as whether the extensive honorific vocabularies characteristic of Tonga, Samoa and Uvea were present in ancestral PN society, cannot be resolved from the present reconstructions. The fact that other highly stratified societies speaking distantly related languages also make rather similar sorts of distinctions (see Milner 1961) is not in itself a strong argument for the antiquity of the honorific/familiar distinction in PN languages; recent independent development in West Polynesia is also quite likely. Crucial evidence would be the discovery of cognates of the West Polynesian forms in Outlier and Eastern PN languages and in closely related non-PN languages. So far the number of cognates noted is small.

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