

THE RELATIONSHIPS OF THE AUSTRONESIAN LANGUAGES OF CENTRAL PAPUA: A PRELIMINARY STUDY

ANDREW PAWLEY

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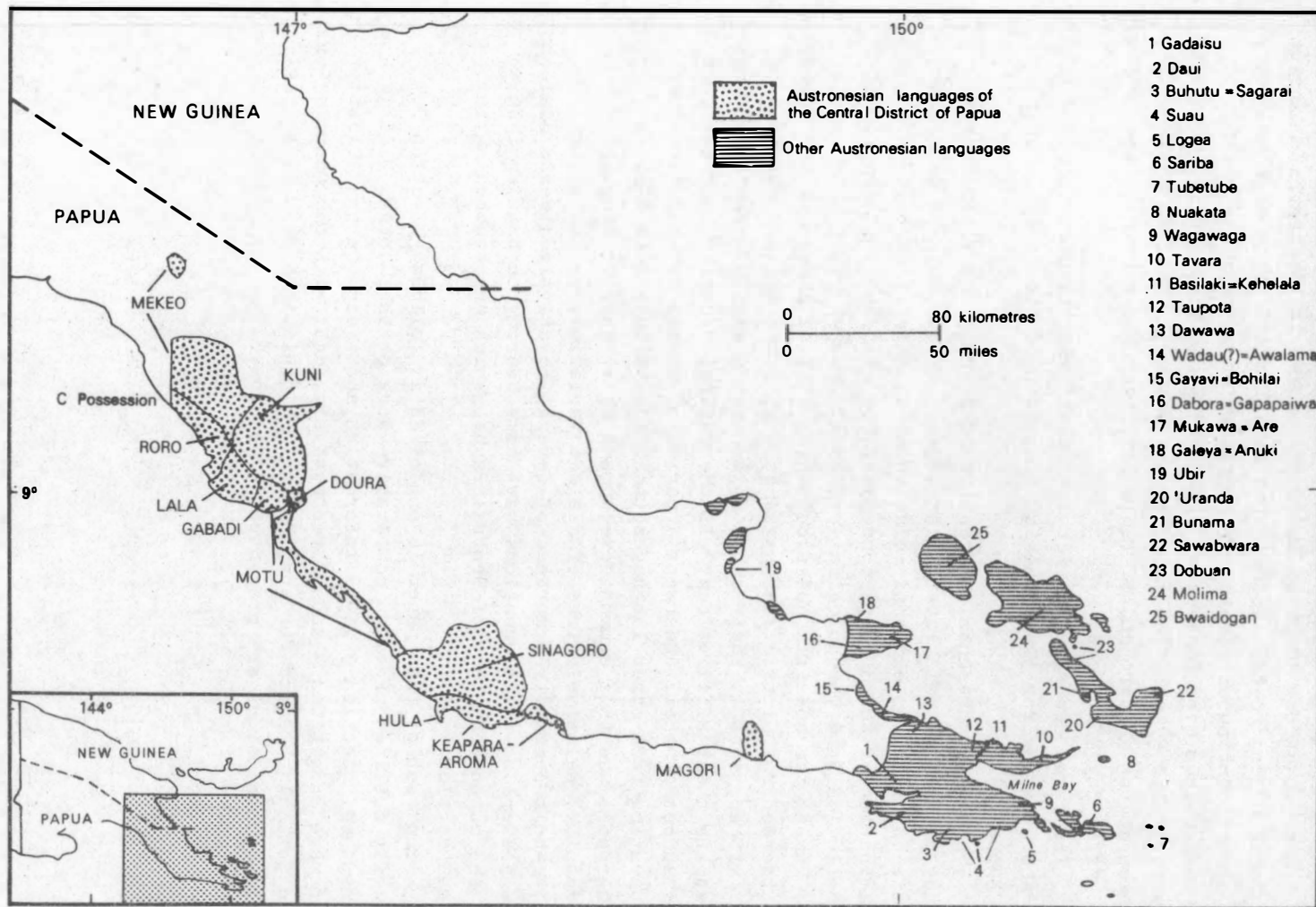
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MAINLAND CENTRAL AND SOUTHEAST PAPUA AND D'ENTRECASTEAUX ISLANDS, SHOWING LOCATIONS OF PRINCIPAL AUSTRONESIAN LANGUAGES AND DIALECTS MENTIONED IN THE TEXT (AFTER DUTTON, 1973)

1.0 INTRODUCTION¹

Some 10 of the 30 or so languages spoken in the Central District of Papua belong to the Austronesian (AN) family. Nine of them occupy an almost continuous stretch of territory on or near the coast, extending from Cape Possession (146° 24' E) in the west, to Cheshunt Bay (148° 17' E) some 150 miles to the east. A small AN isolate is spoken at the eastern end of Table Bay, near the border of the Central and Milne Bay Districts.

The term 'Central District languages' will be used from now on as an abbreviation for 'Austronesian languages of the Central District of Papua'.

This paper presents the results of a preliminary comparative study of the Central District languages. It attempts to determine their internal and external relationships, chiefly through an examination of sound correspondences, but also by consideration of some lexical and morphological evidence.

Among the specific questions which will be asked are the following. Do the Central District languages belong to the Oceanic subgroup of AN? If so, what is their subgrouping status within Oceanic? If not, what are their affiliations? If the Central District languages, or any subset of them, underwent a period of common development after separating from other languages (that is, if they form a closed subgroup), was this common development as a cohesive language community, relatively free of dialect variation, or was it as a loose-knit community comprised of several relatively diverse dialects? The answers to these questions have some bearing on broader issues in the culture history of Central Papua, which are touched on in the final section.

The rest of this paper is organized as follows. Section 2 briefly outlines previous comparative work on the Central District languages. Section 3 gives information about each Central District language. Sections 4 and 5, respectively, deal with the phonological and lexical evidence for subgrouping. Linguistic and culture historical conclusions are presented in Section 6.

2.0 PREVIOUS STUDIES

At present there is no general agreement as to the answers to the above questions, with the partial exception of the first. This is not due entirely to neglect of the Central District languages by comparativists. Indeed, these languages have received more attention than any other comparable geographic group in the New Guinea region. Comparative study began with missionary scholars, such as W.G. Lawes, in the 1880's, was carried on by S.H. Ray (1895, 1907, 1929) and others, and reached a high-point with the appearance in 1943 of A. Capell's monograph The Linguistic Position of South-Eastern Papua. Since then further papers have given comparative treatment to at least one or two of the Central District languages, usually in wider comparative studies, e.g. Grace (1955), Chrétien (1956), Milke (1958, 1965), Dyen (1965), Dutton (1970, 1971b), Kess (1969), Capell (1969, 1971) and Pawley (in press).

Few of these studies, however, apply the classical comparative method to subgrouping questions. Those that do either do so only for a very restricted number of languages or for a very restricted range of evidence. The large scale study by Capell (1943) is a partial exception, in that it deals with a considerable body of evidence in investigating the origins of the AN languages of Southeastern Papua, including all those of the Milne Bay, Northern and Central Districts for which he had data. However, Capell's book is not strictly a subgrouping study in the classical tradition. He treats a very large number of languages, and while he examines their reflexes of Proto-Austronesian phonemes he is forced to do so in a relatively sketchy and incomplete way by the scope of his project and, in the case of some languages, by the restricted number of cognates available for comparison. Further, he does not systematically explore the consequences of the sound correspondences for subgrouping; perhaps this follows from his apparent rejection of the family tree (genetic) model as a means for determining the history of the Southeast Papuan languages.

Dempwolff's (1934-8) proposal, based on comparative phonological evidence, that most of the AN languages of Oceania belong to a single subgroup (now known as Oceanic) was rejected by Capell. He felt that Dempwolff had accounted only for the systematic similarities in a

small body of common vocabulary shared by the languages of Melanesia with those of Indonesia and had failed to account for great lexical and grammatical diversity of the Melanesian languages. This diversity he saw as the result of several movements of populations out of the Indonesia-Philippines area into various parts of Melanesia, where the migrants' AN languages were strongly influenced by unrelated Papuan languages (see Section 6 for a more detailed discussion of this hypothesis).

It is doubtful that Capell was justified in rejecting Dempwolff's theory of an Oceanic subgroup. Dempwolff was concerned to account for the systematic similarities exhibited by the Oceanic languages with each other and with other AN languages. The genetic model, which allows these to be explained as resulting from an earlier period of linguistic unity, seems to be the best, and possibly the only way we have of accounting for such phenomena (see Section 6.0). Capell on the other hand was concerned to account for the unsystematic differences exhibited by the Southeast Papuan (and other 'Melanesian') languages - the vocabulary that was not derivable from Dempwolff's Proto-Austronesian, and with differences in phonology and grammar distinguishing the Melanesian languages from each other and from other AN languages.

The comparative method has no tools for dealing with the history of non-cognate vocabulary, and it is traditional in comparative work to regard the questions of its origins as being of small importance as against tracing the history of the cognate forms. No doubt Capell was right in objecting to neglect of the large body of material which was not traceable to Dempwolff's Proto-Austronesian word stock. But his 1943 study does not provide a satisfactory alternative to the family tree model in its account of the origins of the cognate material shared by the Oceanic languages. Specifically, his account does not deal with the question of why the Oceanic languages exhibit a large number of common phonological innovations, this being Dempwolff's evidence for a period of common development apart from other AN languages (see Section 4.0 for discussion of this evidence).

While Capell's study has been of enormous value in subsequent research on Oceanic historical linguistics and influential in recent attempts to reconstruct the culture history of Southeast Papua, his

main conclusions are no longer accepted by most linguistics working in the Oceanic field. Unfortunately, no other scholar has provided a reanalysis of the Southeast Papuan data, at least not of the scope of Capell's 1943 study. The present paper is by way of being a preliminary reanalysis of a part of the data, within the framework of the family tree model.

There have been several more recent studies touching on the Central District languages. Following a survey of more than 300 languages and dialects which he assigned to the Oceanic subgroup, Grace (1955) tentatively classified them into 19 major subgroups. The Central District languages for which he had data constituted one of these groups, and the Milne Bay languages another. No evidence, however, was offered in support of the classification.

Milke (1958) proposed a classification of Oceanic languages based on their treatment of three Proto-Oceanic consonants, *l, *d and *R. He recognised a large subgroup (called C), distinguished by its unification of *d and *R as against *l. This group included all the AN languages of New Guinea east of the Bird's Head, together with those of New Ireland and much of the Western Solomons, Tuna of New Britain and the languages of the Banks and Torres Islands. For reasons unspecified he assigned the Central District languages to a subgroup C.1(b) together with most other New Guinea mainland languages. In 1965 Milke clarified this point by noting a number of lexical isoglosses (in addition to the merger of *d and *R) which he believed to mark off a New Guinea subgroup of Oceanic. Besides the mainland languages east of Humboldt Bay, he included certain languages of West New Britain and nearby small islands in the group.

Dyen's (1965) lexicostatistical classification of more than 200 AN languages treated only Motu from among the Central District languages. Dyen placed Motu in the Heonesian Linkage, a linkage being a grouping made partly on geographic grounds and partly on weak lexicostatistical grounds. The other members of Heonesian were the languages of Fiji, Polynesia and Rotuma, and certain languages of the Southeast Solomons and New Hebrides-Banks Islands. Several other languages from the Southeast Papuan region were included in the classification, but all were excluded from Heonesian. The Heonesian Linkage in turn is a subgroup of the Malayopolynesian Linkage which is one of 40 first-order subgroups of the Austronesian Linkage. A striking feature of the lexicostatistical classification is that while nearly all the languages of Indonesia, Malaysia and the Philippines are included in the Malayopolynesian Linkage, most of the

languages of Melanesia are excluded. Of the 40 first-order subgroups recognized by Dyen, more than 30 are located in Melanesia! He thus found no lexicostatistical support for an Oceanic subgroup, but considerable support for the hypothesis that Proto-Austronesian was spoken in Melanesia, and that the spread of Austronesian languages was from Melanesia to Indonesia and not vice versa. These conclusions have not been widely accepted, however.

Kess (1969) deals with the Motu reflexes of Proto-Austronesian. He shows that Motu has undergone all the phonological innovations which Dempwolff regarded as characterising the Oceanic subgroup.

In two recent works, Capell (1969, 1971) argues for the existence of a subgroup, or typological group of AN, corresponding roughly to Milke's New Guinea Oceanic group. However, Capell excludes certain of the languages which Milke assigned to his group, including these of West New Britain. Capell's main reasons for positing a large subgroup comprising many of the New Guinea mainland languages were that these languages contrast with other AN languages of Oceania in exhibiting an SOV order of constituents, along with postpositional locative markers and a syntax generally closer to that typical of Papuan languages.

Dutton (1971b) has recently demonstrated that Magori, a language spoken by fewer than 200 people in two Table Bay villages, is not Papuan as previously believed, but Austronesian. He suggests that Magori may have its closest relationships with the Sinagoro dialects, one of the main group of Central District languages which lie further west.

3.0 THE CENTRAL DISTRICT LANGUAGES

Because of dialect chaining in certain regions, it is hard to agree on the exact number of AN languages in the Central District. By almost any criterion, however, there are at least 10. The boundaries between these 10 languages are quite clear, insofar as they have been mapped. Proceeding very approximately from west to east the languages are: Roro (Maiva), Mekeo, Kuni, Lala (Nara, Pokau), Gabadi (Kabadi), Doura, Motu, Sinagoro (Sinaugolo), Hula-Aroma and Magori. The approximate location of each language is shown on the accompanying map.

These languages show a degree of lexicostatistical diversity which is considerable greater than that of such groups as Polynesian or Germanic. Some pairs of languages share as little as 21 percent

cognates (200 word list) and indeed certain Central District languages show percentages with non-Central District languages that are slightly higher than some intra-Central District percentages. Thus, it is not obvious from inspection of the lexicostatistical data that the Central District languages form a subgroup. Section 5 contains more detailed discussion of lexicostatistical comparisons.

The following paragraphs provide information about the individual languages to be compared.

3.1 Mekeo

There appear to be at least three distinct dialects or dialect groups assignable to the language known as Mekeo. The largest population of Mekeo speakers lives around the middle Angabunga (St. Joseph) River. The dialect of this area, spoken by some 5,000 people, is known simply as 'Mekeo'. For convenience we will label it here as 'East Mekeo'.

East Mekeo shares around 77-79 percent of basic vocabulary with West Mekeo (also known as Bush Mekeo), a dialect spoken by about 1,600 people living in villages further west. It shares around 65-71 percent with a dialect spoken in two villages (Urulao and Okovae) well to the north, on the slopes of Mt. Yule. This dialect is sometimes called Kovio, after the name for Mt. Yule. West Mekeo and Kovio show around 69-75 percent cognation. These figures and some of the data cited in this study are from Taylor (n.d.) Other data were supplied by students at the University of Papua New Guinea.

There are certain phonological differences between the three main dialects and probably among their respective communalects, which are very poorly understood at present. The materials used in this study are East Mekeo, but they show a considerable number of irregularities which indicate inter-dialect borrowing. West Mekeo forms often show *k* corresponding to East Mekeo glottal stop (from POC **t*), *p* for East Mekeo, *f* (POC **mp*), and *g* for East Mekeo *k* (POC **s*, **ns*).

The Mekeo live inland, being separated from the sea by the Roro who occupy the coastal strip to the south and immediate west. To the east and southeast, the Mekeo are bounded by the Kuni and Lala, respectively, while their northern neighbours are Papuan languages of the Goilalan group.

3.2 Roro

Roro is the westernmost coastal AN language in Papua. It extends from Cape Possession in the west along the coast to Hall Sound and the lower Angabunga River. Yule Island is Roro-speaking while a single Roro village, Hisiu, lies further east sandwiched between Lala and Gabadi. The total number of Roro speakers is about 7,000.

The dialect geography of the Roro region is described in an unpublished paper by M. Davis (Davis n.d.). He finds that basic vocabulary differences between Roro communalects are restricted to half a dozen items, but that phonological correspondences present a more complex picture. Differences exist in the treatment of two Proto-Oceanic phonemes or sets of phonemes: *s and *ns, on the one hand, and *t, on the other. On the basis of reflexes of *t, a two-way division can be drawn (and is drawn by the Roro themselves) between the 'Waima' dialect and the 'Roro' dialect. Proto-Oceanic *t yields Waima h [h] in all positions, and Roro [ts] or [s] before i or u, [t] elsewhere. Proto-Oceanic *s and *ns merge in both dialects, yielding t before non-high vowels in all dialects. Before i and u, the reflex is [s] in Tsiria and Delena, but [ts] or [č] in other villages in Davis' survey. The distribution of reflexes of *s and *ns thus cuts across the main Waima-Roro division.

The Roro villages form a geographically central group which includes Tsiria (Yule Island), Babiko, Mou, Rapa, Biotou and Delena. The Waima villages occupy the peripheries, chiefly in the west (Kivori, Waima, Bereina) but also in the east (Nabuapaka and Hisiu). Data cited in this study are primarily from word lists of Waima and Bereina communalects compiled by students at the University of Papua New Guinea.

The western neighbours of the Roro language community are the Elema (Kerema), speaking a Papuan language of the Toariplan group. The Mekeo and Kuni occupy the northern and northeastern flanks, while to the east are the Lala, Gabadi and Doura.

3.3 Kuni

Like the Mekeo, the Kuni live entirely inland. They occupy the upper Angabunga (St Joseph) and Aroa (Dilafa) Rivers. They are bounded on the west by the Mekeo, on the south by the Roro, Lala, Gabadi and Doura, and on the north and east by Papuan languages of the Gailalan and Koiarian groups.

Although van Rijswick (1967) speaks of six dialect regions and of mixed Kuni-Papuan languages, the small amount of data we have on four communalects shows relatively little variation. The Lapeka dialect shows *n* for Proto-Oceanic **d*, **R*, and **nd* where Bakoiudu shows *l*. The data used in the present study are from Bakoiudu, a village of 1,200 people which has become the center of Kuni life in recent years as a result of the Government's resettlement policy. The data were collected by W. Tomasetti and myself at Bakoiudu in 1969.

3.4 Lala

Lala (called Nara by the Motu and Pokau by the Roro) is spoken by some six to nine villages between Hall Sound and Galley Reach. Roro, Kuni and Gabadi are the neighbouring languages. Our lexical data are from a Vanuamai informant, grammatical data are from Lanyon-Orgill's (1941) sketch.

3.5 Gabadi

Gabadi (Kabadi) is spoken between Galley Reach and the Aroa River a few miles to the west. The Gabadi number only about 1,400, occupying about five villages (Keveona, Kopuana, Magabaira, Pinu and Ukaukana). Our data are from a Pinu informant.

The Gabadi have as their western neighbours the Lala and Roro, and as their eastern the Motu and Doura. Inland, they are bounded by Papuan languages: Fuyuge and Mountain Koiari.

3.6 Doura

The Doura language community is a small one, with different sources estimating the number of villages as low as three and as high as six. These are located on the eastern side of Galley Reach, and are flanked by Gabadi, Motu, Mountain Koiari and Koita languages.

Our data are from Mr. Kere Moi, a student at the University of Papua New Guinea in 1969, whose home village we failed to record.

3.7 Motu

Much the best known language of Papua, Motu is spoken by more than 14,000 people occupying some 70 miles of coastline

between Manumanu, at the mouth of Galley Reach, and Kapakapa, about 40 miles east of Port Moresby. The neighbouring languages are Sinagoro and Hula-Aroma to the east, and Doura, Gabadi and Lala to the west, while speakers of Koita (Koitapu), a Papuan language, occupy the same stretch of territory as the Motu and, in some places, the same villages. Kolarian languages occupy the hinterland.

Although the Motu regard themselves as falling into two main divisions, which Groves et al. (1957) call the Western and Eastern Motu, there appear to be no sharp dialect boundaries and relatively little divergence between Motu communalects. Basic vocabulary lists for most of the villages were collected from Motu students attending the University of Papua New Guinea. Principal references for Motu, however, are Lister-Turner and Clark's (n.d.) grammar and dictionary, as revised by Chatterton and Taylor's syntax (1970).

3.8 The Sinagoro Chain

A large and diverse dialect chain extends some distance inland to the east of the coastal strip between Kapakapa (Motu-speaking) and Hood Bay (Hula-sepaking). The term Sinagoro (Sinaugoro, Sinaugolo) is often used for this group of dialects, which in all are spoken by upwards of 12,000 people. Dutton (1968) has recorded vocabulary lists for many Sinagoro villages, which confirm the existence of a chain of intergrading communalects, with villages at the extremes probably sharing around 70 percent or less cognation on the 200 word list. The region is phonologically quite diverse in ways that are not well understood - for example, there is some evidence that certain phonological changes, such as accretion of [ŋ] initially and between vowels, have spread village by village and word by word across parts of the region, thus greatly complicating the pattern of sound correspondences.

The Saroa communalect was the initial primary source for the present study. Since the appearance of Koloa and Collier's (1972) grammar and vocabulary of Balawaia, however, this last has become the best-documented communalect, and data from Balawaia are also

cited here.

3.9 The Hula-Aroma Chain

A string of intergrading dialects stretches along the coast and for short distances inland, between Hood Bay and Cheshunt Bay. Extremes of the chain exhibit less than 70 percent cognation in basic vocabulary.

There is no conventional name for this chain, for which Dutton has recently (1970) suggested the term 'Keapara', after one of its three best known dialects. The other two are Hula and Aroma. Each of these dialects consists of several very similar, though not entirely homogeneous, communalects. Hula was described in some detail by L. Short in her Master's thesis (Short 1939), and Aroma is presently being studied by Dr. John Lynch of the University of Papua New Guinea. Since these two dialects represent the geographic extremes of the chain, we will adopt the label 'Hula-Aroma' for the whole chain.

More than 16,000 people speak communalects belonging to the Hula-Aroma chain, which is bounded on the north and northwest by Sinagoro and on the east by Papuan languages of the Mailuan family which extend eastwards along the coast and hinterland for close to 100 miles before the next AN language is encountered. Hula data cited here are from a Babaka (Babaga) word list, supplemented by material from Short's thesis (communalect unspecified). Aroma data are primarily from a Lalaura word list, with additions and corrections by Dr. Lynch. Keapara data are from a Keapara village word list.

3.10 Magori

A small AN enclave language, hemmed in by Papuan languages, is spoken by perhaps 160 people in two villages near the lower reaches of the Bailebo-Tavenai River at the eastern end of Table Bay. This language, Magori, was assigned by earlier observers to the Mailuan group, but T.E. Dutton's recent work (Dutton 1971b) has shown that it is Austronesian. Magori has however borrowed a great deal of vocabulary, including much basic vocabulary, from

its Papuan neighbours.

Our data are from Dutton's short grammatical sketch and comparative vocabulary.

4.0 PHONOLOGICAL EVIDENCE FOR SUBGROUPING

The strongest evidence presently available for classifying the Central District languages is phonological. This section, which examines the correspondences of Proto-Oceanic consonants and vowels in each Central District language, and explores their implications for subgrouping, is thus the central one in the present study.

4.1 The Oceanic Hypothesis

Dempwolff (1934-38) reconstructed a sound system for Proto-Austronesian (PAN) which, with some changes, is still generally accepted. He also posited the existence of a large subgroup, containing most of the AN languages of Melanesia, Micronesia and Polynesia, on the grounds that the members of this grouping show a large number of common simplifications to the PAN sound system which he reconstructed, these developments not being found in any non-members. He assumed that these shared sound changes had already taken place in the common ancestor of the subgroup before the daughter languages diverged from one another. This large subgroup is now generally known as Oceanic, and its boundaries have been defined more exactly as a result of the studies of Milke (1958, 1961, 1965) and Grace (1955, 1972); they have shown that the western boundary of Oceanic in the New Guinea area lies between Biak Island in Geelvink Bay (Biak is non-Oceanic) and the Sarmi coast languages (which are Oceanic) west of Hollandia Bay, i.e. in the region of 135-138° East.

Dempwolff reconstructed a Proto-Oceanic sound system which has been slightly expanded by later researchers. With two exceptions, the phonological simplifications which he regarded as characterizing the Oceanic group have stood the test of time. Tables 1 and 2 set

out the sound correspondences between PAN and Proto-Oceanic (POC) which are now generally accepted.

PAN	p b	mp mb	CtT	nt	d 0 r	nd nD	l	s, z, c, j, Z
POC	p	mp	t	nt	d ¹	nd	l	(n)s
PAN	ns, nz, ñc, ñj, nZ	k g	ŋk ŋg	m n	ñ ŋ	w q	R S	y
POC	(n)s	k	ŋk	m n	ñ ŋ	w q	R	∅ ² y

TABLE 1: CONSONANT CORRESPONDENCES BETWEEN PAN AND POC

Notes: 1. Biggs (1965) suggested that Rotuman distinguishes PAN *r from PAN *d and *0 in a few words. However, no other Oceanic language is known to preserve the distinction and Wolff (in press) has shown that the Rotuman evidence can be otherwise explained.

2. ∅ represents a zero reflex, i.e. loss of a phoneme.

PAN	a	e, aw	i, uy	ay, ey	u	iw
POC	a	o	i	e	u	?

TABLE 2: VOWEL CORRESPONDENCES BETWEEN PAN AND POC

It can be seen that POC merges several sets of PAN consonants: *b and *p; *mp and *mb; *nd and *nD; all the palatals; *k and *g; *ŋk and *ŋg, and loses *S. It also merges the vowels *e and *aw (which appear as POC *o), and merges *i and *uy (as *i) and *ay and *ey (as *e). In addition, PAN nasal clusters are reflected in Oceanic languages by unit phonemes, rather than as sequences of a nasal phoneme plus an obstruent phoneme. This development is associated with the loss of nasal accretion as a productive morphophonemic process. Oceanic languages show a further common development in exhibiting prenasalised obstruents (*mp, *nt, *nd, *ns, *ŋk) in initial as well as medial position in the word.

Dempwolff regarded the body of sound changes common to the Oceanic languages in his sample as sufficient, even without examination of the grammatical evidence, to assign them to a subgroup. While not all later writers accept the sufficiency of this evidence, it

is generally acknowledged that Dempwolff's phonological arguments for Oceanic are very cogent. Further study has revealed two further phonemes which must be attributed to POC, and which may result from splitting of two PAN phonemes. POC evidently had two labiovelar consonants, *ɲm (sometimes written *mw) and *ɲp (sometimes written *pw), which were in contrast with plain *m and *p. The origins of the labiovelars are not altogether clear, but it has been noted that they occur most often adjacent to a rounded vowel. However, on present evidence PAN *m corresponds to both *m and *ɲm in POC, and PAN *b and *p both correspond to POC *p and *ɲp, and if phonemic splitting occurred in POC, the conditions have yet to be defined.

The Oceanic grouping does not rest on phonological evidence alone. There is an increasing body of grammatical and lexical evidence, touched on in Section 5.0.

4.2 The Central District Languages and Oceanic

That one Central District language, Motu, exhibits all the phonological developments characteristic of the Oceanic subgroup was demonstrated by Kess (1969). The present study shows this to be true of all the Central District languages (with the qualification that for a few languages, particularly Magori, the evidence is insufficient to conclusively establish the outcome of certain PAN phonemes). Such a result comes as no surprise. It agrees with the conclusions of Dempwolff (1937), Milke (1958, 1961, 1965) and Grace (1955) each of whom assigned the Central District languages (other than Magori, then unrecorded) to Oceanic. As far as I am aware, however, evidence for this conclusion has been given in detail only for Motu.

Table 3 gives the reflexes of POC phonemes in the 10 languages/dialects treated in this study. Some exceptions to the regular correspondences exist, most of these being explainable as resulting from borrowing between languages or dialects, or from other secondary developments. A key to abbreviations of language names and examples attesting each set of correspondences follow.

POC ¹	*p	*mp	*t	*nt	*k	*ŋk ²	*q	
PCD	*p	*b	*t	*d ²	*∅	*g ²	*∅	
MEK	p	f	ʔ, ∅	ʔ ²	∅	∅ ²	∅	
ROR	b	p	n	k ²	∅	∅ ²	∅	
DOU	h	b	k, s	t ²	∅	∅ ²	∅	
GAB	v, ∅	b	k, s		∅	∅ ²	∅	
KUN	b	f	k, s		∅	∅ ²	∅	
LAL	v	b	k, s	t ²	∅	ʔ ²	∅	
MTU	h	b	t, s	d ²	∅	g, k ²	∅	
SIN	v, ∅	b	t, s	r ²	∅	g, k ²	∅	
HUL	v, ∅	p	t, ∅	r ²	∅	g, k ²	∅	
KEA	v, ∅	p	∅, ʔ		∅	k, ʔ ²	∅	
ARM	v, ∅	p	∅, ʔ		∅	g, k ²	∅	
MAG	v, ∅	b	t	d ²	∅	g ²	∅	
POC	*s	*ns	*d	*nd	*R	*l	/_{∅}	*l/_{∅}
PCD	*D		*r	*r	*r	*l	∅	
MEK	k		g	g ²	g	l	∅	
ROR	t, ts		r	r ²	r	∅	∅	
DOU	t		r	r ²	r	∅, i	∅	
GAB	d, g		r		r	∅	∅	
KUN	d		l	l ²	l	l, j	∅	
LAL	d		l		l	l	∅	
MTU	d		r	r ²	r	l	∅	
SIN	r		l	l ²	l	∅	∅	
HUL	r		l	l ²	l	∅	∅	
KEA	r		l	l ²	l	∅	∅	
ARM	r		l	l ²	l	∅	∅	
MAG	k				l	∅ ²	∅ ²	
POC	*m	*n	*ñ	*n	*w	*y ³	*ŋm	
PCD	*m		*n	*ŋ	*w	*y	*m	
MEK	m		ng	ng, n	v	l		
ROR	m		n	∅	b, w	e		
DOU	m		n	∅	v	r		
GAB	m		n	∅	v	r		
KUN	m		n	∅	v	j		
LAL	m		n	n	v	l		
MTU	m		n	∅	v	l	m	
SIN	m		n	∅	w	∅	m ²	
HUL	m		n	∅	w	∅	m ²	
KEA	m		n	∅	w	∅		
ARM	m		n	∅	w	∅	m ²	
MAG								

TABLE 3: MAIN REFLEXES OF POC CONSONANTS IN CENTRAL DISTRICT LANGUAGES

Notes: 1. All of these correspondences refer only to word-initial

and -medial position. Word-final consonants are lost in all Central District languages.

2. This reflex is tentative, resting on a very small number of attestations.

3. Except in the context *a_u, which is attested only in the reflexes of POC *kayu 'tree', where all Central District witnesses have a zero reflex.

4.21 Reflexes of Proto-Oceanic Vowels

The POC vowels *a, *e, *i, and *o are regularly reflected as a, e, i and o, respectively, in each Central District language. POC *u is reflected in each language as i in the context * {^o}_# , and as u elsewhere.

4.22 Reflexes of Proto-Oceanic Initial and Medial Consonants

This section treats the POC phonemes one by one, listing cognate sets which illustrate the outcome of each POC sound in the Central District languages as far as has been determined.

The following abbreviations are used for language names.

ARM	Aroma
DOU	Doura
GAB	Gabadi (Kabadi)
HUL	Hula
KEA	Keapara
KUN	Kuni
LAL	Lala (Nara, Pokau)
MAG	Magori
MEK	Mekeo
MTU	Motu
ROR	Roro
SIN	Sinagoro
PAN	Proto-Austronesian
PCD	Proto-Central District
POC	Proto-Oceanic

In citing cognate sets languages are listed, not in alphabetical order, but very roughly in geographic order, proceeding from west to east. POC forms head the list, followed by PCD reconstructions. The living languages are listed in the order Mekeo, Roro, Doura, Gabadi, Kuni, Lala, Motu, Sinagoro, Hula, Keapara, Aroma and Magori.

Almost all the POC reconstructions are taken from Grace's

1969 Proto-Oceanic Finder List. In a few cases I have modified the shape of reconstructions according to evidence which has appeared since 1969. For example, Grace used parentheses around final consonants in certain forms to indicate uncertainty as to whether the PAN final has been retained in that form. Capell (1971), Blust (1972a and b), Haudricourt (1971) and Lynch (n.d.) have shown that the PAN final is retained in a large number of forms in certain Oceanic languages, and must therefore be attributed to POC. Wolff (in press) has shown that there is no longer good reason to believe that PAN *r is kept apart from the reflex of PAN *d and *D in Rotuman, and therefore in POC; accordingly, I write *d for both the *d and *r of Grace's orthography.

POC sounds are treated in the following order: stops and obstruents *p, *mp, *t, *nt, *k, *ŋk, *q, *s and *ns; resonants *d, *nd, *R, *l, *m, *n, *ñ, *ŋ, *w, *y; labiovelars *ŋm and *ŋp; vowels.

Because evidence is much fuller for these, the word-initial and -medial reflexes of POC consonants are treated first; reflexes of POC final consonants are illustrated in a later subsection.

POC *p

POC *p-	*pani	*pati	*pinsiko	*pulu	*pani	*puqaya
	'wing'	'four'	'flesh'	'hair'	'give'	'crocodile'
PCD *p-	*pani	*pati ¹	*pidio	*pui	*peni	*puaya
MEK p-	pani	pani		pui	peni	uala
ROR b-	bani	bani	bitio	bui	ben-a	buaea
DOU h-	hani	hani	hetio	hui	heni	
GAB v-	vani	vani				uaa
KUN b-	bani	bani		bui	beni	
LAL v-	vani	vani		vui		vuala
MTU h-	hani	hani	hisio	hui	heni	uala
SIN v- ²	vane	vasi	virig/o	gui	vini	g/ua
HUL v- ²	vane	vaivai	virig/o	gui	vein-a	
KEA v-	vane	vaivai	viroo	viu	veni	
ARM v-	vane	vaivai	virig/o	vui	veni	vuala
MAG v-	vane	vati				

POC	*-p-	*Ropo	*Rapi (Rapi)	*nsapa	*nsipo	*nipi
		'to fly'	'evening'	'what?'	'downwards'	'dream'
PCD	*-p-	*ropo	*rapi	*dapa	*dipo	*nipi
MEK	-p-	ngopo	ngapi ³	kapa	kipo	ngipi
ROR	-b-	robo	rabi ³	taba	tsi	nibi
DOU	-h- ⁴	roho		taha	tio	
GAB	-v- ⁴		raviravi		dio	i-nivi
KUN	-b-		labi	daba	dlbo	nibi
LAL	-v-		lavilavi	dava	divo	nivi
MTU	-h-	roho	ado-rahi		divo	nihi
SIN	-v- ⁴	lo/g/o	lailai		ri/g/o	nivi
HUL	-v- ⁴	lovo	lavilavi		ri/g/o	nivi
KEA	-v-					
ARM	-v-	lovo	lavilavi			nivi
MAG	-v-		raravi			nivi

Notes: 1. MEK, ROR, DOU, GAB, KUN, LAL and MTU n for *t is irregular.

2. SIN, HUL reflect *-p- as zero before u in most, possibly all forms,

3. Meaning 'night'.

4. *-p- sporadically lost intervocalically, especially before rounded vowels.

POC	*mp					
POC	*mp-	*mpempe	*mpimpi (R)	*mpoRok	*mpoŋi	*(m)palapa -
		'butterfly'	'lip'	'pig'	'night'	'wide'
PCD	*b-	*bebe/ro	*bibi/a	*boro	*boŋi	*balapa *badina
						'because'
MEK	f-	fefe	fipi			falapa
ROR	p-	pepero		ai/poro		panaba pokina
DOU	b-		bibi/a			patina
GAB	b-		bibi	boro/ma		panava
KUN	f-	o/fefo		folo/ma		fasina
LAL	b-	e/bebelo	bibi/a	bolo/ma	boni	palapa badina
MTU	b-	kau/bebe	bibi	boro/ma	hanua-boi	labaha badina
SIN	b-	kau/bebe	bibi/g/a		bo/g/i	
HUL	p-	pepe	pipi/g/a		po/g/i	
KEA	p-, b-	bebe	bibi		po/g/i	
ARM	p-	pepe	pipi/ga		po/g/i	rava (?)
MAG	b-	bebe				

POC	*mp					
POC	*-mp-	*kampit	*d[a,u]mpia	*kampu		see also *mpempe, *mpimpi under POC *mp-
		'take, hold, carry'	'sago'	'burn'		
PCD	-b-	*abi		*gabu	*guba	'sky'
MEK	-f-, -p-	api			ufa	
ROR	-p-				kupa	
DOU						
GAB	-p-		rapia			
KUN	-f-	afi-a			ufa	
LAL	-b-					
MTU	-b-	abi-a	rabia	gab-u-a	guba	
SIN	-b-	g/abi	labia	gab-u-a	guba	
HUL	-p-	api	lapia		kupa	
KEA	-b-	abi-a	lapia			
ARM	-p-	g/abi-a	rapia	kapu-a		
MAG	-b-			gab-u		

POC	*t				
POC	*t-	*tama	*tina	*tanis	*tuRi(a)
		'father'	'mother'	'weep'	'to thread, sew'
PCD	*t-	*tama	*tina	*tani	*turia
MEK	∅ ⁻¹	ama	ina		
ROR	h-	hama	hina	hai	
DOU	k ⁻²	kama	sina	kani	kuri
GAB	k ⁻²				kuri
KUN	k ⁻²	kama	sina	kani	kuli
LAL	k ⁻²	kama	sina	kani	kuli
MTU	t ⁻³	tama	sina	tai	turi
SIN	t ⁻³	tama	sina	ta/g/i	turituri
HUL	t-	tama	tina	ta/g/i	tuila
KEA	∅ ⁻¹	ama	ina	a/g/i	uli
ARM	∅ ⁻¹	ama	ina		uli
MAG	t-		tina		turi

POC	*t					
POC	*-t-	*qate 'liver'	*kita 'see'	*natu 'child'	*kutu 'louse'	*mate 'die'
PCD	*-t-	*ate	*ita	*natu	*utu	*mate
MEK	- ' -	a'e	isa ⁴		u'u	ma'e
ROR	-h-		iha	nahu	uhu	--
DOU	-k-		ika		uku	make
GAB	-k- ²		isa ⁴	naku		
KUN	-k- ²	ake	ika	naku	uku	
LAL	-k- ²	ake	ika		uku	
MTU	-t- ³	ase	ita	natu	utu	mase
SIN	-t- ³	g/ase	g/ita		gutu	mase
HUL	-t-	g/ate	g/ita			
KEA	-∅- ¹ , '1	ae	g/ia			
ARM	-∅- ¹ , '1	g/ae	ia		u'u	mae
MAG	-t-					

POC	*pati 'four'	*petuqu 'star'	*pitu 'seven'	*topu 'sugar-cane'
PCD	*pati	*pitiu	*pitu	
MEK	pani ⁵			
ROR	bani ⁵	bihiu		
DOU	hani ⁵			
GAB	vani ⁵	visiu	isu ⁴	
KUN	bani ⁵			
LAL	vani ⁵	visiu		
MTU	hani ⁵	hisiu	hitu	tohu
SIN	vasivasi	visi/g/u		
HUL	vaivai ⁶	vitiu		
KEA	vaivai	g/ivu		
ARM	vaivai	viu		ovu
MAG	vati	vitiriu		

Notes: 1. Orthography suspect; true reflex of *t may be glottal stop.

2. *t > s before i.

3. *t > s before e or i.

4. s for *t unexpected.

5. n for *t unexpected.

6. Dialect borrowing. At least one Hula-speaking village usually shows orthographic zero for *t. See Short 1939.

POC	*nt			
POC	*nt	*-nta	*untolu	*(n)to(η)ko
		'1st person pl. poss.'	'1,000, large number'	'stay, continue'
PCD	*d	*-da	*idoi	*do (?)
			'whole, all'	
MEK	'	- 'a	i'oi ¹	
ROR	k	-ka	ikoi ¹	
DOU	t	-ta		
GAB				
KUN				
LAL		-ta		
MTU	d	-da	idoi	do ²
SIN	r	-ra		
HUL	r	-ra		
KEA				
ARM				
MAG	d		mama/idoi	

Notes: 1. 'Other, another, different'

2. Possibly a contraction of dohore, particle of continuance, this being the function of do.

POC	*k					
POC	*k-	*kani	*kayu	kita	*ko[e.i]	*kutu
		'eat'	'tree'	'1st inc.pl.'	'2nd sg.'	'louse'
PCD	*∅-	ani	*au	*au	*oi	*utu
MEK	∅-	aniani	au	i'a	oi	u'u
ROR	∅-	aniani		a/ika	oi	uhu
DOU	∅-	aniani	au	ita	oi	uku
GAB	∅-			isa	o/n/i	
KUN	∅-	ani	au	ika	oi	uku
LAL	∅-	ani	au	a/ita	o/n/i	uku
MTU	∅-	aniani	au	ita	oi	utu
SIN	∅-	g/ani-	g/au	g/ita	g/oi	g/utu
		/g/ani				
HUL	∅-	g/ani-	g/autupu	ia	g/oi	
		/g/ani				
KEA	∅-	aniani	au/upu	ia	oi	
ARM	∅-	g/ani-a	g/au/upu	ia	g/oi	u'u
MAG	∅-	ani		ita	o/n/i	

POC	*k			
POC	*-k-	*iku	*pinsiko	*lako
		'tail'	'flesh'	'go'
PCD	*-Ø-	*iu	*pidio	*lao
MEK	-Ø-	iu		lao
ROR	-Ø-		bitio	ao
DOU	-Ø-	iu	hetio	
GAB	-Ø-	iu		
KUN	-Ø-	iu		
LAL	-Ø-	iu		
MTU	-Ø-	iu	hisio	lao
SIN	-Ø-	g/i/g/u	viri/g/o	a/g/o
HUL	-Ø-	g/iu	viri/g/o	ao
KEA	-Ø-	i/g/u	viroo	
ARM	-Ø-	g/iu	viro/g/o	th/ao
MAG				

POC *ŋk-. Only one cognate set reflecting a POC form with initial *ŋk- has been found, but a number of forms reconstructible for PCD show the same correspondences as for POC *ŋk.

POC *ŋk- *(ŋ)kensu
'back of
head'

PCD	*g-	*gedu	*gado	*geda	*gopu	*guba	*guna-na
			'neck, throat, voice, speech'	'mat'	'lake, pond'	'sky, rain'	'old'
MEK	Ø-				ofu/ga	ufa	
ROR	k-, Ø-	eku	ako				
DOU	Ø-		ato/bu		ohu		unana
GAB	Ø-		ago	ega/na	ou		
KUN	Ø-					ufa	
LAL	Ø-		ato	eta	ovu		gunana
MTU	g-	gedu	gado	geda	gohu	guba	guine
SIN	g-, k-		garo		kou	guba	kunena
HUL	k-		garo			kupa	kenena
ARM	g-, k-		garo		ou		kuinena
MAG							

POC	*ŋk					
POC	*-ŋk-	*-ŋku	*nsiŋkap	*lanka	*wanka(l)	
		'1st pers. sing. poss.'	'bad'	'step, stride, go'	'boat'	
PCD	*-g-	*-gu	*diga	*laga	*y/aga-	*boga 'belly'
MEK	-∅-	-u				
ROR	-'-, -∅-	-'u	kia ²			
DOU	-∅-	-u	tia-na			boa
GAB	-∅-	-u				
KUN	-∅-	-u				foa
LAL	-'-	-'u	tsia/va (?)			bo'a
MTU	-g-, -k-	-gu	dika	raka	l/aka-toi	boga ¹
SIN	-g-, -k-	-gu	raka/va (?)	laka	y/aka-toi	boga ¹
HUL	-g-, -k-	-gu	raka/va (?)	laka		poka ¹
KEA	-g-, -'-	-gu	raa/va (?)	la'a		
ARM	-k-	-ku	ra/va (?)		r/aka-toi	
MAG	-g-	-gu				

Notes: 1. 'mouth', 'aperture' (possibly not cognate).

2. k for *t unexpected; possibly borrowed from Mekeo.

POC	*q			
POC	*q-	*qate	*qansan	*qunsan
		'liver'	'name'	'rain'
PCD	*∅-	*ate	*ada	
MEK	∅-	a'e	aka	
ROR	∅-	ahe	ata	
DOU	∅-			
GAB	∅-		aka	
KUN	∅-	ake	ada	
LAL	∅-	ake		
MTU	∅-	ase	lada	
SIN	∅-	g/ase	ara	g/ura
HUL	∅-	g/ate	ara	g/ura
KEA	∅-	ae	ara	
ARM	∅-	g/ae	th/ara	
MAG	∅-		aka	

POC	*q			
POC	*-q-	*maqudip	*taqe	*puqaya
		'be alive'	'faeces'	'crocodile'
PCP	*-ø-	*mauri	*tae	*puaya
MEK	-ø-	mauni		uala
ROR	-ø-	mauri	hae	buaea
DOU	-ø-	mauri		
GAB	-ø-	mauri	kae	uaa
KUN	-ø-	mauli		
LAL	-ø-	mauli		vuala
MTU	-ø-	mauri	ta/g/e	uala
SIN	-ø-	ma/g/uli		g/ua
HUL	-ø-	ma/g/uli		
KEA	-ø-	ma/g/uli	a/g/e	
ARM	-ø-	mauli	a/g/e	vuala
MAG				

POC	*s,*ns			
POC	*s-	*salan	*nsipo	*(n)su(n)su
	*ns-	'path'	'down'	'breast,suck'
PCP	*d-	*dala	*dipo	*dudu
				*diba
				'correct'
MEK	k-	keaga	kipo	u'u, kuku
ROR	t-	tala/ra	tsi	tsutsu
DOU	t-		tio	i/tiba
GAB	d-		dio	i/diba
KUN	d-	daja	dibo	i/difa
LAL	d-	dala	divo	i/diba
MTU	d-	dala	diho	i/diba
SIN	r-		rig/o	ruru
HUL	r-		ri/g/o	ripa
KEA	r-			ripa
ARM	r-	thara ¹		ripa
MAG	k-			

POC *s,*ns				
POC *-s-	*isu	*ta(n)se	*qa(n)sa(n)	*pinsa
	'nose'	'sibling same sex, younger'	'name'	'how many?'
POC *-ns-				
PCP *-d-				
MEK -k-	ku/'a	aki	aka	pika
ROR -t-	itsu	hatsi	ata	bita
DOU -t-		kati	ata	
GAB -d-		kadi	aga	vida
KUN -d-		kadi	ada	bida
LAL -d-	idu	kadi		vida
MTU -d-	udu/baubau	tadi	l/ada	hida
SIN -r-	iru	tari	ara	vira
HUL -r-	lru		ara	vira
KEA -r-	iru		ara	vira
ARM -r-	iru	ari	th/ara	vira
MAG -k-			aka	vika

Note: 1. Metathesis: thara < yara < raya < rala < *nsalan

POC *d				
POC *-d-	*daRa	*dua	*d[a,u]mpia	*daqa(n)
	'blood'	'two'	'sago'	'branch'
PCP *-r-	*rara	*rua	*rabia	
MEK g-		gua		
ROR r-		rua		
DOU r-	rara	au/rua		
GAB r-	rara	rua	rapia	
KUN l-	lala	lua		
LAL l-	lala	lua		
MTU r-	rara	rua	rabia	ra-ga ¹
SIN l-	lala	rua	labia	
HUL l-	rala ²	roula	lapia	ra
KEA l-	rala ²	lualua	lapia	raa
ARM l-	lala	lualua	rapia	ra-ga
MAG				

POC *d				
POC *-d-	*maqudip	*kudon	*tudi ³	*udaŋ
	'alive'	'pot'	'bone'	'crayfish'
PCP *-r-	*mauri	*uro	*turia	*ura
MEK -g-, -n-	mauni, maungi		unia	
ROR -r-	mauri	uro		
DOU -r-	mauri		kuria	
GAB -r-	mauri	uro-na	kuria	
KUN -l-			ulia	
LAL -l-	mauli		kulia	
MTU -r-	mauri	uro	turia	ura
SIN -l-	ma/g/uli	g/ulo	tuli/g/a	
HUL -l-	ma/g/uli	g/ulo	tili/g/a	
KEA -l-	ma/g/uli	g/ulo	ili/g/a	ula
ARM -l-	mauli	ulo	ili/g/a	ula/lava
MAG				

- Notes: 1. *'branch of a palm bearing the fruit'*.
 2. Dissimilation.
 3. Apparently not related to POC *suRi *'bone'*; see Grace (1969) who lists both forms.

POC *nd			
POC *nd-	*ndaun	*ndanu(m)	*ndapu
	'leaf'	'fresh water'	'ashes'
PCD *r-	*rau	*ranu	*rapu
MEK g-	gau		
ROR r-	rau		
DOU r-	rau		koko/rahu
GAB			
KUN l-			labu
LAL			
MTU r-	au-rau	ranu	rahurahu
SIN l-	gou-lau	nanu	
HUL l-	gau-lau	nanu	
KEA l-	au-upu-lau	nanu	
ARM l-	g/au-upu-lau	nalu	
MAG			

POC	*R				
POC	*R-	*Ropo	*Ruma	*RapiRapi	*Rata(s)
		'to fly'	'house'	'evening'	'milk'
PCP	*r-	*ropo	*ruma	*rapirapi	*rata
				1. evening	
				2. night	
MEK	g-	gopo		gapi ²	
ROR	r-	robo		rabi ²	
DOU	r-	roho	ruma		
GAB	r-	ro	ruma	raviravi ¹	raka
KUN	l-		luma	labilabi ¹	
LAL	l-	lovo	luma	lavilavi ¹	
MTU	r-	roho	ruma	ado/rahi ¹	rata
SIN	r-	rovo	numa ³		lata
HUL	l-	lo/g/o	numa ³		la
KEA	l-		numa ³	lavilavi	
ARM	l-	lovo	numa ³	lavilavi	
MAG					
POC	*-R-	*-uRi	*ruRi(a)	*waRos	see also *daRa
		'left hand'	'sew'	'rope, vine'	under *d
PCP	*-r-	*(kw)auri	*turi-a	*waro	
MEK		awani ⁴			
ROR	-r-	awari			
DOU	-r-	rauri	kuri		
GAB	-r-	eari	kuri		
KUN	-l-	ewali	kuli	walo	
LAL	-l-	lali	kuli	valo	
MTU	-r-	lauri	turi	varo	
SIN	-r-	kauri	turitururi		
HUL	-l-	auli	tuila	walo	
KEA	-l-	auli	uli		
ARM	-l-	auli	uli	walo	
MAG					

- Notes: 1. 'Evening'.
 2. 'night'.
 3. Assimilation.
 4. West Mekeo. East Mekeo has lafani'a.

POC	*ɿ					
POC	*ɿ	before	*i, *u			
POC	*ɿ	*lima	*poli	*qalipan	*tolu	*talingga
		'hand'	'barter'	'centipede'	'three'	'ear'
						'laugh, smile'
PCP	*∅	*ima	*poi	*aipa	*toi	*tainga
						*ma-mai
MEK	∅	ima			oi/do	aina
ROR	∅	ima				haia
DOU	∅	ima			au/kui	kaia
GAB	∅	ima			koi	kai
KUN	∅	ima			koi	kaia
LAL	∅	ima			koi	kaia
						mamai
MTU	∅	ima	hoi	aiha	toi	taia
SIN	∅	g/ima	voivoi		toi	se/g/a
						mamai
HUL	∅	g/ima	voi-a		toitoi	te/g/a
						mamai
KEA	∅	g/ima	voivoi	aiva	oioi	ea
						mamai
ARM	∅	ima	voivoi	gaiva	oioi	e/g/a
MAG		ima				

POC	*katoluR	*pulu	ŋa-pulu
	'egg'	'hair'	'unit of 10'
PCP	*atoi	*pui	*a-pui
MEK	a'oi'na	pui	
ROR	ahoi	bui	
DOU	akui	hui	
GAB			a-hui
KUN	awoi	bui	
LAL	akoi	viu	ŋa-vui
MTU	g/atoi	hui	a-hui
SIN	g/atoi	g/ui	
HUL	g/atoi	g/ui	
KEA	aoi	viu	
ARM	g/aoi	vui	
MAG			

POC	*l					
POC	*l before a and o					
POC	*l	*lanj	*lako	*lano	*pula	*alo
		'wind'	'go'	'fly'	'moon'	'paddle'
PCD	*l	*lanj	*lao	*lano	*pula	
MEK	l, Ø		lac, ao	ango/ma		
ROR	Ø		ao	ao/maha		
DOU	Ø ¹ , l, i			lao/kama	huia	ao-na
GAB	Ø	ai-na		ao/kama	ue	
KUN	Ø ¹				buja	
LAL	l ¹	lanj		lalo-maka	vuia	
MTU	l	lai	lao	lao	hua	k/alo
SIN	Ø	a/g/i	a/g/o		g/ue	
HUL	Ø	a/g/i	ao		vue	
KEA	Ø	a/g/i			vue	
ARM	Ø	th/a/g/i	th/ao		vue	
MAG						

POC	*(n)talo(s)	*pitolo	
	'taro'	'hungry'	
PCD	*talo	*pitolo	*lopia
			'chief'
MEK			lopia/unga
ROR			ovia
DOU			
GAB			ovia
KUN			
LAL			lovia
MTU	talo	hitolo	lobia
SIN			
HUL			
KEA			
ARM			
MAG			

Notes: 1. *l> [y] (DOU, LAL i, KUN j) in the context u_a.

POC	*m				
POC	*m-	*manuk	*maya	*mata	*mumuta
		'bird'	'tongue'	'eye'	'vomit'
PCP	m-	*manu	*maya	*mata	
MEK	m-		mala		
ROR	m-		maia	maha	
DOU	m-	manu	mara		
GAB	m-	manumanu	mara	maka	
KUN	m-		maja	maka	
LAL	m-	manumanu	mala	maka	
MTU	m-	manu	mala	mata	mumuta
SIN	m-	manu	mea	mata	mumuta
HUL	m-	manu	mae	ma	mumua
KEA	m-	manu	mara	ma'a	mumua
ARM	m-	manu		maa	mumua
MAG					
POC	*-m-	*Ramu	*lima	*tama	See also *Ruma
		'root'	'hand'	'father'	'house' (under *R)
					and *ñamuk
					'mosquito' (under *ñ).
PCP	*-m-	*ramu	*ima	*tama	
MEK	-m-	gagamu	ima	ama	
ROR	-m-	ramu	ima	hama	
DOU	-m-	ramu	ima	kama	
GAB	-m-	ramu	ima		
KUN	-m-	lumi	ima	kama	
LAL	-m-	lamulamu	ima	kama	
MTU	-m-	ramu	ima	tama	
SIN	-m-	ramu	g/ima	tama	
HUL	-m-	lamu	g/ima	tama	
KEA	-m-	lamu	g/ima	ama	
ARM	-m-	lamu	ima	ama	
MAG	-m-		ima		

POC	*n					
POC	*n-	*natu	*nipi	*nansu	*nua	
		'child'	'dream'	'cook'	'inside'	
PCP		*natu	*nipi	*nadu	*nua	
					'heart, seat of emotions'	
MEK	g-	gau	gipi	gakugaku	gua	
ROR	n-		nipi		nua	
DOU	n-			nanatu		
GAB	n-	naku	i-nivi		nuanua	
KUN	n-	naku	nibi	nadu		
LAL	n-	naku	nivi		nua	
MTU	n-	natu	nihi	nanadu	nua	
SIN	n-		nivi			
HUL	n-		nivi	nanu		
KEA	n-		nivi	nanu		
ARM	n-			naru-a	nuanua	
MAG	n-	natu				
POC	*-n-	*pani	*inum	*kani	*tina	See also *pani
		'give'	'drink'	'eat'	'mother'	'wing' (under *p),
PCP	*-n-	*peni	*inu	*ani (ani)	*tina	and *manuk 'bird'
						(under *m).
MEK	-n-	peni-a	inu	aniani	ina	
ROR	-n-	bena	inu	aniani	hina	
DOU	-n-	heni	inu	aniani	sina	
GAB	-n-					
KUN	-n-	beni	inu	ani	sina	
LAL	-n-	veni	inu	ani	sina	
MTU	-n-	heni	inu	aniani	sina	
SIN	-n-	vini	niu	g/ani/g/ani	sina	
HUL	-n-	veina	niu	g/ani/g/ani	tina	
KEA	-n-	veni	niu	aniani	ina	
ARM	-n-	veni	inu	g/ani-a	ina	
MAG	-n-		unu	ani	tina	

POC	*ñ				
POC	*ñ-	*ñamuk	*-ñ-	*-ña	*poñu
		'mosquito'		'3rd person	'turtle'
				sg.poss.'	
PCP	*n-	*nam[o,u]	*-n-	-na	
MEK			-ng-	-nga	
ROR			-n-	-na	vonu
DOU			-n-	-na	
GAB			-n-	-na	
KUN			-n-	-na	
LAL			-n-	-na	
MTU	n-	namo	-n-	-na	
SIN	n-	nemo	-n-	-na	
HUL	n-	nemo	-n-	-na	
KEA	n-	nemo	-n-	-na	
ARM	n-	nemo	-n-	-na	
MAG			-n-	-na	

POC	*ŋ				
POC	*ŋ-	*ŋ(a) insa	*ŋusu	*ŋa-pulu	
		'when?'	'mouth, beak'	'unit of ten'	
PCD	*ŋ-	*ŋaida	*ŋudu	*ŋa-pulu	*ŋite
					'tooth'
MEK	ng-, n-	ngaika			nie
ROR	∅-	aita			nibe ³
DOU	∅-		utu	a-hui	ike
GAB	∅-			a-hui	nise ³
KUN	∅-	aida/l			ike
LAL	n-	aida ⁴	nutu	na-hui	nike
MTU	∅-		udu	a-hui	ise
SIN			m/uru ¹		
HUL					
KEA					
ARM			m/uru ¹		
MAG					

POC	*ŋ					
POC	*-ŋ-	*talɪŋa	*mponi	*laŋi	*(y)ano-(y)ano	*doŋo
		'ear'	'night'	'wind'	'yellow'	'hear'
PCD	*-ŋ-	*taɪŋa	*boŋi	*laŋi	*yao-baŋa	*loŋo ¹
MEK	-ŋg-, -n-	aina			lao/fanga	longo
ROR	-∅-	haia				
DOU	-∅-	kaia			rao/a	
GAB	-∅-	kai		ai-na	ao-bauba	ono ³
KUN	-∅-	kaia			jao-fana	jo
LAL	-n- -∅-	kaia ⁴	boni	lani	lao/bana	
MTU	-∅=	taia	hanua-boi	lai	lao-bana	
SIN	-∅-	se/g/a	bo/g/i	a/g/i		
HUL	-∅-	te/g/a	po/g/i	a/g/i		
KEA	-∅-	ea	po/g/i	a/g/i		
ARM	-∅-	e/g/a	po/g/i	th/a/g/i		
MAG						

POC	*-ŋ-	laŋo		*taŋis
		'fly'		'weep'
PCP	*-ŋ-	*laŋo		*taŋi
MEK	-ŋg-, -n-	ango/ma, anouma		
ROR	-∅-	ao/maha		hai
DOU	-∅-	lao/kama		kani
GAB	-∅-	ao/kama		
KUN	-∅-	amoaka		kani
LAL	-n-, -∅-	lalo/maka		kani
MTU	-∅-	lao		tai
SIN	-∅-			ta/g/i
HUL	-∅-			a/g/i
KEA	-∅-			a/g/i
ARM	-∅-			a/g/ia/g/i
MAG				

- Notes: 1. Initial m- unexplained.
 2. *d > *l unexplained.
 3. n instead of zero for *ŋ irregular.
 4. ∅ instead of n for *ŋ irregular.

POC	*w					
POC	*w-	*waRos 'rope, vine, string'	*waIR 'water'		*wanse 'divide, distribute'	*waRi(n)sa. 'two days hence'
PCD	*w-	*waro	*wal	*weri 'to pull'	*waDe	*waRa/ani 'yesterday'
MEK	v-		vei			
ROR	w- ¹ , b- ² ,	waro	bei	beri	wate	warani ⁴
DOU	v-			veri		varaani ⁴
GAB						
KUN	w-	walo	vei	weli		
LAL	v-	valo	vel	veli		
MTU	v-	varo	sina-vai ³	veri		varani ⁴
SIN	w-	walo	wai ⁶			g/ola/g/ani ⁴
HUL						
KEA						vara/h/ani ⁴
ARM						vara/g/ani ⁴
MAG						
POC	*-w-	*ansawa 'spouse'	*-sawa 'sea'	*(m)pakiwak 'shark'	*galawa 'sister's child'	
PCD	*-w-	*adawa	*-dawa	*baewa	*rawa	*pewa
MEK	-v-	akava			ngava	'bow'
ROR	-w-	atawa				
DOU	-v-	atawa	tava/ra		rava ⁵	
GAB	-v-	agava			rava-na ⁵	
KUN	-v-	adava				i-feva
LAL		ada				peva
MTU	-v-	adava	dava/ra		rava	peva
SIN	-w-	g/arawa	rawa-bara	ba/g/ewa		
HUL	-w-	arawa	rawa-para	paewa		
KEA	-w-	arawa	rawa-para	paewa		
ARM	-w-	g/arawa	rawa-para	paowa		pewa
MAG	-w-	g/arawa				

- Notes: 1. w before a.
 2. b before e.
 3. 'river'.
 4. Data from Milke, 1968:168.
 5. 'child's spouse, spouse's parent'.
 6. 'tidal river, lagoon'.

POC *y

It is questionable whether *y was phonemic in word-initial position in POC. There is some evidence that a palatal onglide [y] occurred predictably before initial *a and that was reinterpreted as a consonantal segment in some Oceanic languages. Initial unstressed *i (nominative pronoun marker) may also have been realized as [y] word-initially before *a. PCD appears to have treated the POC onglide as a phoneme which we write *y. POC *y was evidently phonemic in intervocalic position in words, and was reflected as *y in PCD in the context *a__a, but lost in the context *a__u.

	POC *-y- before *a				POC *-y- before *u		
POC	*-y-	*maya	*laya(R)	*puqaya	*-y-	*kayu	duyu(ŋ)
		'tongue'	'sail'	'crocodile'		'tree'	'dugong'
PCD	*-y-	*maya	*laya	*puaya	*-∅-	*kau	
MEK	-l-	mala		uala	-∅-	au	
ROR	-e-	maea	raea	buaea			
DOU	-r-	mara					
GAB	-r-	mara		uaa ¹			
KUN	-j-	maja					
LAL	l-	mala		vuala	-∅-	au	
MTU	-l-	mala	lara ²	uala	-∅-	au	rui ⁴
SIN	-∅-	mea ³		g/ua	-∅-	g/au	
HUL	-∅-	mae ³	laa		-∅-	au	
KEA	-∅-	mae ³					
ARM	-r-, -l-	mara	lara	vuala	-∅-	g/au-upu	
MAG							

POC *y-. There are only two sets of forms probably reflecting a POC word usually reconstructed with initial *y-. POC *yaro 'pearlshell' gives KEA, ARM aro. POC *yanoyano 'yellow' is probably cognate with the first element in MEK lao/faga, GAB rao/a, KUN jao/fana, MTU, LAL lao/bana. See under POC *ŋ for further commentary.

- Notes: 1. Zero reflex unexpected.
 2. -r- unexpected; possibly dissimilation.
 3. *-ay- > -e-, with metath. in HUL, KEA.
 4. This sole example suggests that *u > i after *uy, as well as after *ul, *ol, in PCD. Cf. reflexes of POC *l.

POC *ɲm, *ɲp

Only a handful of etyma with the labiovelars *ɲm and *ɲp have been reconstructed for POC. None of the reconstructions with *ɲp have known reflexes in the Central District languages. A few Central District languages are known to reflect forms with *ɲm. The segment corresponding to *ɲm is m in the Central District languages, but in some cases there is a development o < *a in a subsequent segment as a trace of the labiovelar.

POC	* m-	*ɲmata	*ɲmao	*ɲmalo	*ɲmata	*ɲmeda
		'snake'	'molar tooth'	'reef, submerge'	'sharp'	'boy, child'
PCD	*m-	*mota				*mero
MEK						
ROR						
DOU						
GAB						
KUN						
LAL						mero
MTU	m-		mao ¹	malo-a ²	mata ³	mero
SIN	m-	mota				melo
HUL	m-					melo
KEA						
ARM	m-	mota			maama	melo-apuna
MAG						

The only forms reflecting intervocalic *ɲm so far noted are MTU rama 'the anterior fontanelle, side of head', HUL lama 'cut off the head', which may be assigned to POC *ndaɲma 'top part, forehead' reconstructed by Milke (1968:151).

- Notes: 1. 'gums'.
2. 'to drown'; a doubtful cognate.

4.23 Reflexes of Proto-Oceanic Final Consonants

Dempwolff concluded, on the basis of the evidence available to him, that PAN stem-final consonants were lost in absolute final position in the word in all members of the Oceanic group. Subsequent studies have proved that a considerable number of Oceanic languages retain PAN final consonants without supporting suffixes, and that POC must have retained PAN word-finals. We can attribute the same set of consonants to word-final position as to word-initial and -medial in POC, except that the prenasalised obstruents (*mp, *nt, *ŋk, *ns) and labiovelars (*ŋm, *ŋp) *nd and the glides *w, *y did not occur finally.

Although some Milne Bay District and many other New Guinea languages retain POC word-final consonants, the Central District languages have lost them. The Central District languages allow only open syllables, and regularly reduce POC stems of the shape (C)V(C)VC to (C)V(C)V.

There are one or two instances in which the Central District languages appear to show retention of final consonants (with the addition of a following vowel), if we accept the usual POC reconstruction. The most obvious case is POC *pat 'four', yielding HUL vaivai, Sinagoro vasi, Kalo (HUL dial.) vativati. It is clear from other Oceanic witnesses, however, that POC had the form *pati, this form actually being more widely attested than *pat in Oceanic. It is probable that some similar explanation will account for all such apparent exceptions.

The number of cognate sets attesting the treatment of POC finals in Central District languages is not large, but sufficient to show that loss has regularly occurred in all languages (except Magori, for which data are sparse) for all consonants except *l. No forms showing the outcome of final *l are known.

POC	*-p			
POC	*maqudip	*qutup	*qinep	*nsinqap
	'be alive'	'draw water'	'lie down'	'bad'
PCD	*mauri			
MEK	mauni			
ROR	mauri		eno	kia
DOU	mauri			tia-na
GAB	mauri		eno	
KUN	mauli		eko	
LAL	mauli		eno	tsia/va (?)
MTU	mauri	utu	eno/dere	dika
SIN	ma/g/uli		gena	raka/va (?)
HUL	ma/g/uli		geno	raka/va (?)
KEA	ma/g/uli			raa/va (?)
ARM	mauli			ra/va (?)
MAG				

POC	*-t			
POC	*matakut	*(a)paRat		*kampit
	'be afraid'	'N.W. Monsoon'		'take, carry'
PCP	*matau	*(y)apara		*abi
MEK				api-a
ROR				
DOU				abi/kai
GAB				
KUN	makau			afi-a
LAL	makau			
MTU	matau	rahara		abi-a
	'grave, sedate'			
SIN				g/abi/tari
HUL		avala		api, g/api
KEA				abi-a
ARM		yapala		g/abi-a
MAG				

POC	*-k				
POC	*manuk	*mpoRok	*ñamuk	*tansik	*mpakiwak
	'bird'	'pig'	'mosquito'		'shark'
PCP	*manu	*boro			
MEK					
ROR		ai/poro			
DOU	manu				
GAB	manumanu	boro/ma			
KUN					
LAL	manumanu	bolo/ma			
MTU	manu	boro/ma	namo		
SIN	manu		nemo		ba/g/eva
HUL	manu		nemo		paewa
KEA	manu		nemo		paewa
ARM	manu		nemo		paowa
MAG					

POC	*-q			
POC	*sau(q)	*muta(q)	*Ru(ŋ)ma(q)	
	'far'	'vomit'	'house'	
PCP	*dau	*mu-muta	*ruma	
MEK				
ROR	tau/ai			
DOU	tau/ana		ruma	
GAB			ruma	
KUN	dau/ai		luma	
LAL	dau/ai-dau/ai		luma	
MTU	daudau	mumuta	ruma	
SIN		mumuta	numa	
HUL	rau/vagi	mumua	numa	
KEA	rau/vagiai	mumua	numa	
ARM	ia/rau	mumua	numa	
MAG				

POC	*-s		
POC	*taŋis	*waRos	*Rata(s)
	'weep'	'rope, string'	'milk'
PCD	*taŋi	*waro	
MEK			
ROR	hai	waro	
DOU	kani		
GAB			raka
KUN	kani	walo	
LAL	kani	valo	
MTU	tai	varo	rata
SIN	ta/g/i	walo	
HUL	ta/g/i		
KEA	a/g/i		
ARM	a/g/ia/g/i		
MAG			

POC	*-d, *-R			
POC	*mansu(d,R)	*katoluR	*waiR	*laya(R)
	'food, plenty of food'	'egg'	'water'	'sail'
PCD		*atoi	*wai	*laya
MEK		a'oi'na	vei	
ROR		ahoi	bei	raea
DOU		akui	vei	
GAB			vei	
KUN		awoi	vei-na	
LAL		akoi	vei	
MTU	madi-namo	g/atoi	sina-vai ¹	lara
SIN		g/atoi	wai ²	
HUL		g/atoi		laa
KEA		aoi		la
ARM		g/aoi		lara
MAG				

- Notes: 1. 'river'.
2. 'tidal river, lagoon'.
-

POC *-m, *-n	POC *-n				
POC *inum 'to drink'	*ndanum 'fresh water'	*kiRam 'adze, axe'	*kudon 'pot'	*ndaun 'leaf'	
PCD *inu	*ranu	*ira	*uro	*rau	
MEK inu				ngau	
ROR inu				rau	
DOU			uro	rau	
GAB		ira	uro-na		
KUN inu					
LAL inu		ila			
MTU inu	ranu	ira	uro	au-rau	
SIN g/inu	nanu	g/ira/va			
HUL niu	nanu			gau-lau	
KEA niu	nanu		g/ulo	au-upulau	
ARM inu	nanu		ulo	g/au-upulau	
MAG					

POC *-n	*-ŋ			
POC *qansan 'to rain'	*qansan 'name'	*uda(ŋ) 'crayfish'	*waŋka(ŋ) 'boat'	*qasa(ŋ) 'gills'
PCP *uda	*ada			
MEK	aka			
ROR	ata			
DOU				
GAB	aga			
KUN	ada			
LAL				
MTU	lada	ura		l/ada
SIN g/ura	ara			
HUL g/ura	ara			
KEA g/ura	ara	ula		
ARM	th/ara	ula/lava		
MAG				

POC *a, *e, *i, *o, *u

The five POC vowels remain in contrast in all Central District languages. The only conditioned change common to these languages is the merger of POC *u with *i as i in the context $\{ \underset{u}{\overset{o}{_}} \}_1 _$. This is attested by the following cognate sets.

POC	*tolu	*katoluR	*pulu	*ŋa-pulu	*quluŋa
	'3'	'egg'	'hair'	'unit of 10'	'pillow'
PCD	*toi	*atoi	*pui	*napui	*uiŋa
MEK	oi-do	a'oi-na	pui		
ROR		ahoi	bui		
DOU	au-kui	akui	hui	ahui	
GAB	koi				i-uina-na
KUN	koi	awoi	bui		
LAL	koi	akoi	viu	navui	
MTU	toi	g/atoi	hui	ahui	i-/k/wi-na
SIN	toi	g/atoi	g/ui		
HUL	toitoi	g/atoi	g/ui		
KEA	oioi	aoi	viu		
ARM	oi	g/aoi			
MAG		ato'i			

See under POC *l for examples of *i yielding i in the context $\{ \underset{u}{\overset{o}{_}} \}_1 _$.

A few conditioned changes occur in individual languages. Doura shows the assimilation PCD *oi > ui, e.g. akui 'egg' < *atoi; au-kui '3' < *toi. This may be restricted to the context k_, because Doura shows hoi 'to buy' from PCD *poi.

Hula shows a more complex development, whereby the sequence VC $[\underset{u}{\overset{i}{_}}]a$ metathesizes to V $[\underset{u}{\overset{i}{_}}]Ca$, e.g. PCD *peni-a 'to give s.t.' becomes HUL veina, *Doli-a 'to push s.t.' > roila, *turia 'to sew' > tuila, *kwatu-a 'to tie s.t.' > kwauta, *kwaDi-a 'to hit s.t.' > kwaira, *kori-a 'to bite s.t.' > koila.

4.24 Residual Problems

The preceding subsection presents a preliminary analysis of the outcome of Proto-Oceanic consonants and vowels in the Central District languages. Many problems remain, however, in the historical phonology

of these languages. There are some unexplained irregularities in the treatment of certain POC etyma. And there is a large body of cognate sets which cannot (so far) be traced back to POC, but which are represented in most or all of the Central District languages, and in some cases, also in some other languages of the New Guinea region. A good number of items, for example, seem to be common to the Central District languages and some languages of the Milne Bay District, while not known elsewhere.

Some additional PCD consonant phonemes must be reconstructed on the basis of cognate sets not traceable to POC. It appears that, beside PCD *g, we must reconstruct two, and possibly more, velar obstruents.

The following material suggests that there was at least one labialized velar stop, which we write *kw.

PCD	*kw	*kwapi 'skin'	*kwatu 'to tie'	*kwaDi 'to hit'	*kwara 'head'	*kwauta '10'
MEK	∅					oua nga
ROR	ʼ, ∅				'ara	
DOU	∅				ara	ouka-ra
GAB	∅					ouka
KUN	∅				ola	
LAL	∅				ola	ouka
MTU	kw, k ²	kopi	kwatu	kwadi	kwara	gwauta
SIN	kw, k ²	kopi		kwari		
HUL	kw, k ²	kopi	kwauta	kwaira	kwala ¹	
KEA	w, ∅ ²	opi	wau			

PCD	*kw (continued)		
PCD	*kwanau	*kwama	*kwaku
	'rope'	'mucous'	'claw'
MEK			
ROR	anau/a		
DOU			
GAB			
KUN			
LAL			
MTU	kwanau	kwama ³	kwaku ⁴
SIN		kwamo	
HUL		kwamo ⁵	kwaku ⁶
KEA	wanau		
ARM			
MAG			

- Notes: 1. 'base, source'.
 2. MTU, SIN, HUL k, KEA Ø before *ap.
 3. 'phglem'.
 4. 'claw of crab'.
 5. 'cough'.
 6. 'heel'.

Data on simple velar stops are not very reliable - some of our word lists, for example, do not distinguish [ɣ] and [g] where these are in phonemic contrast, while there may also be some interchange between k and g. However, it is likely that PCD had at least two plain velar obstruents, possessing *k as well as *g. Some cognate sets attesting *k are:

PCD	*k				
PCD	*k-	*kuDupe ¹	*kalopa	*kurokuro	*koekoe
		'rat'	'fire'	'white'	'loins, hips'
MEK	Ø-				
ROR	Ø-		iruba ²		
DOU	Ø		aroha		
GAB	Ø				oeoe
KUN	Ø	idube	aloba		
LAL	Ø	uduve	alova		
MTU	k			kurokuro	koekoe
SIN	k	kureve		kulokulo	
HUL	k	kuruve	kalova	kulokulo	
KEA	'Ø ³	uruve	'alova	'ulo'ulo	
ARM	Ø	uruve	alova	uloulo	

PCD	*k						
PCD	*kuba ⁴	*kapi ⁵	*kutou	*kapu ⁶	*kauri ⁷	*kunu	
	'short'	'near'	'heart'	'dust'	'left hand'	'anus, buttocks'	
MEK				a'e-apu	awani	ungu	
ROR				apu-ro	awari		
DOU				kabu-ore	r/auri	unu	
GAB		aviavi					
KUN					ewali	unu	
LAL					eali		
MTU	kubakuba ⁸	kahi/ra	kudou	kahu	l/auri	kunu	
SIN	kubi	kavi/nagi	kutou	gagau	kauli		
HUL	kupa	ve-kavi	kutou	kakau	kauli		
KEA	upa	avi		kakavu	auli		
ARM				kakavu	auli		

- Notes: 1. Reflects POC *k[a,u]nsupe 'rat'.
 2. Doubtful cognate, as first two vowels are irregular.
 3. Orthographic zero may represent glottal stop.
 4. Molima, Galeya, Nade, Dobu, Keldoge kukupa, Tubetube kuba, Sariba kubwa.
 5. Gayavi gwabi/tai, Are gwabi/nai 'near (it)'.
 6. POC *ka(m)pu(t) 'dust, mist, fog'.
 7. Nada, Molima keli, Suau s/euli, POC *-uRi 'left hand'.
 8. 'short, of coconut palm'.

4.3 Phonological evidence for a Central District Subgroup

The Central District languages show a considerable body of common innovations in their treatment of POC phonemes. The best documented are as follows:

1. *k is lost.
2. *l is lost before i and u.
3. *u merges with *i as i after *ol or *ul.
4. *d, *nd and *R fall together.
5. *s and *ns fall together, (a) either as a flapped r or (b) as a stop d, t, k.
6. Word-final consonants are lost in absolute final position, i.e. when not followed by a suffix.

7. *y is lost in the context *a_u.
8. *ñ merges with *n.
9. *q is lost.

These developments can be established for all Central District languages with the partial exception of Magori. The evidence for Magori is not complete enough to show whether this language participates in all nine innovations, but is sufficient to demonstrate that it has undergone most of them, including the most important ones for subgrouping purposes. Magori exhibits (1) loss of *k, (2) loss of *l before i and u, (3) merger of *u with *i as i after *ol and *ul, (5) merger of *s and *ns as a stop, k, and loss of *q. It also appears to merge *d and *R as r, and shows loss of some word-final consonants without showing any retentions.

Although innovations 1-9 are not each of equal weight, together they provide strong evidence for treating the Central District languages as a subgroup of Oceanic. It is virtually inconceivable that 1-9 could all have developed independently in two or more sets of languages. It is therefore concluded that the Central District languages remained a unity for some time after the breakup of POC.

This is not to say, however, that the Central District languages form a closed subgroup. In order to show that they form a subgroup apart from all other Oceanic languages we need to show that no other language has undergone the same, or virtually the same, set of phonological changes.

Unfortunately, we do not know enough about the phonological histories of all 400 or so Oceanic languages to exclude completely the possibility that some non-Central District languages have undergone the innovations 1-9. However, we do know enough to indicate that (a) this is unlikely, and (b) if such languages exist, they will be found in the Southeast Papuan region.

A study of the history of POC *d, *l and *R in the Oceanic languages was made by Milke (1958). He concluded that *d and *R have coalesced in most of the New Guinea Oceanic languages, and in those of southwest New Britain, in some of the languages of the Western Solomons and New Ireland, and in the Banks Is. languages. The reflex of *l remains separate from that of *d and *R in these languages. The merger of *d, *nd and *R is thus not a strong argument, by itself,

for a closed Central District grouping. Either *d and *R have merged independently a number of times, or the merger took place once at a time when most of the New Guinea languages, and other languages which show the same coalescence, were still a single language. On independent grounds it is unlikely that the New Ireland, Western Solomons and Banks Is. languages fall into a subgroup with New Guinea Oceanic languages. There is however a certain amount of evidence for a New Guinea Oceanic subgroup (Milke 1965, Capell 1969), possibly including the languages of southwest New Britain from the Talasea Peninsula to Maleu, and the coalescence of *d and *R may have occurred in Proto-New Guinea Oceanic.

The merger of *nd with *d is a common sound change in Oceanic, and does not carry much weight as a subgrouping argument.

*s and *ns have fallen together (innovation 5a) in many Oceanic languages besides those of the Central District. In the New Guinea region, the Tumleo group of the Rai coast, the Yabem-Tami group of the Huon Gulf and many of the Milne Bay District languages show this merger, according to Milke (1965:342). However, merger of *s and *ns cannot be assigned to Proto-New Guinea Oceanic because some members of this putative group keep these sounds apart. The easternmost languages on the New Guinea mainland to keep them apart, according to Milke, are Ubir, Mukawa and Wedau and their immediate relatives; the distinction is also maintained in many of the islands in the Massim area, e.g. in Kiriwina, Murua, Nimoa, Panayati, Nada and Western Sud-Est (Milke 1965: 339-40). This suggests that *s and *ns fell together fairly late in the history of the Central District languages, though not necessarily after their separation from all other languages; in this connection it is noteworthy that Suau, Dobu and Molima merge *s and *ns (as s) as well as sharing other developments with the Central District languages.

Aside from the loss of contrast, however, it may be significant that the Central District languages have a flap or stop as the outcome of *s and *ns. It is highly probable that PCD *D < *s, *ns was phonetically either a voiced apical stop [d] or flap [ɾ] (see next subsection for some discussion). While the phonetic nature of POC *s and *ns is not certain, it is likely that *s, at least, was phonetically an apical or a palatal fricative [s] or [sʲ]. The most common reflexes of *s and *ns are s, h and zero; a few languages outside

the Central District have r or t, and fewer still [ð].

Merger of *n and *ñ (innovation 8) has almost no value for determining subrelationship. It has happened many times independently in the history of the AN languages. Among Oceanic languages, only Bugotu and certain neighbouring languages of Santa Isabel maintain the contrast.

Loss of *q (innovation 9) is fairly weak evidence, for similar reasons. However, it carries more weight than (8) because of evidence that some of the languages of the Milne Bay District, which on other grounds seem to subgroup with the Central District languages, reflect *q as [k] or [ʔ].

Loss of *y in the context a_u - with retention of *y in the context a_a - is also of limited diagnostic value in subgrouping. *y was an infrequently occurring phoneme in POC and data on its outcome in many Oceanic languages are very sketchy. A number of widely scattered languages, however, appear to show the same conditioned change exhibited by the Central District languages.

Innovations (1), (2), (3), (5) and (6) each carries some weight. While none of them is unique to the Central District, they appear to have occurred less often in the history of the AN languages than loss of *q, merger of *n and *ñ, and loss of *y between a and u and unlike the merger of *d and *R, and *s and *ns, relatively few other languages in the New Guinea area seem to have undergone any of them.

It is probable that the only languages which have fairly similar phonological histories to the Central District languages are to be found in the Milne Bay District of Papua. Our knowledge of the phonological developments in the languages of this area is mainly due to Capell (1943). Although incomplete and tentative because of the limited quantity and quality of the data, Capell's analysis of sound correspondences in the individual Milne Bay languages indicate that none have participated in all of the developments common to the Central District languages.

Of those languages which, on inspection of Capell's analysis, seemed most like the Central District languages in their phonological behaviour, three were re-examined more closely. These were Dobuan, of Dobu Is. between Fergusson and Goodenough Is., Molima of Fergusson Is., and Suau of Suau Is. and the adjacent mainland area near the southeastern tip of the New Guinea mainland.

These languages fall into two lexicostatistical subgroups. Molima and Dobuan are quite closely related, sharing 54.6 percent cognation on a 200 word list (percentages refer to definite cognates - see section 5 for discussion of methodology). Percentages with Suau are considerably lower: Suau-Molima 28 percent, Suau-Dobuan 30.6 percent. The three Milne Bay District languages are lexicostatistically somewhat closer to each other than to the Central District languages. The differences, however, are relatively small: Suau-Motu and Suau-Kuni both 20.2 percent, Suau-Gabadi 21.1 percent, Molima-Motu 16.1 percent. In view of the geographic proximity of the Milne Bay District languages, and evidence for diffusion in this region, it is not impossible that Suau split apart from the Dobuan-Molima group at about the same time it diverged from the Central District languages, but remained lexicostatistically closer to the former group because of interdialect and language borrowing.

If we examine the three Milne Bay District languages for innovations comparable to (1)-(9), we find the following similarities and differences. (References to consonantal sound changes are to non-final position in the word unless otherwise stated.)

MOLIMA

1. *k > ʔ, with some, apparently unconditioned, instances of loss, e.g. 'ai 'eat' < *kani, 'ita 'see' < *kita, vesio 'flesh' < *pinsiko, but iyana 'fish' < *ikan.
2. *l is sometimes lost before i and u, e.g. tena 'ear' < *taliŋa, toi 'three' < *tolu. It is sometimes retained as l, e.g. wuluwulu 'body hair' < pulupulu, sometimes as n, e.g. nima 'hand' < *lima. buli 'cat's eye' may be from *mpuli 'cowry, white shell'.
3. *u sometimes becomes i after *ol, *ul, but sometimes remains as u, e.g. wuluwulu 'body hair' < *pulupulu, possibly b/ulu-b/ulu 'head' < *qulu, 'head, hair', toi 'three' < *tolu, and possibly ya-udi 'many' from *untolu 'many, 1000' (cf. Motu idoi 'whole', Bugotu udolu 'whole', Fijian udolu '1000', Molima maiboa-di 'all', geya-udi 'few', ta-udi 'they').
4. *d and *R merge as l, e.g. lua 'two' < *dua, muli-a 'to follow' < *mudi, go'ila 'fresh water' < *waiR, laviavi 'evening' < rapiRapi, k-eli 'left hand' < *m-auRi (cf. PCD *kauri) etc.

5. *s and *ns fall together as s: vesi'o 'flesh' < *pinsiko 'usana 'rain' < *qunsan, e-visa 'how many?' < *pinsa, susu 'breast' < *susu, sine 'female, of pig or dog' < *sin[a,e].
6. Data on final consonants are restricted to a handful of forms, but these indicate that *n and *R are regularly retained from absolute final position (Molima adds a vowel), while *-m is retained at least in transitive verbs: iyana 'fish' < *ikan, samana 'outrigger' < *(n)saRaman, or *(n)saman, 'usana 'rain' < *qunsan, 'atune 'fish sp.' < *qatun 'bonito', numa 'drink' < *inum, matauta 'to fear' < *matakut, go'ila 'water' < *waiR. Data on final *k are ambiguous: manu 'bird' < *manuk and namo 'fly', namokili 'mosquito' < *ñamuk 'mosquito'.
7. The outcome of *y in the context a_u is unknown.
8. The only examples of *ñ reflexes are those given under 6, above, which indicate that *ñ and *n have merged.
9. *q is problematical. The outcome of medial *q is probably zero: ae 'leg' < *(w)aqe. Initial *q is sometimes replaced by glottal stop, e.g. 'usana 'rain' < *qunsan, 'atune 'fish sp.' < qatun 'bonito', but it is not impossible that Molima ' here is an accretion, since it sometimes appears where no *q- has been reconstructed.

DOBUAN

Dobuan resembles Molima closely in its treatment of POC phonemes. The following notes refer to the Edugaura dialect. This appears to differ from the Tewara and Sanaroa dialects in showing glottal stop in many words where the latter have k (cf. Capell 1943: 58).

1. *k in initial position is sometimes reflected as k, sometimes as glottal stop (orthographic ') and, rarely, as (orthographic zero), e.g. 'omi 'you (pl.)' < kamiu, 'ita 'see' < *kita, 'utu 'lice, flea' < *kutu, koita 'octopus' < *kuRita, ila 'stone axe' < *kiRam, kalimana and 'alimana 'crab sp.' < *kalimaŋa (cf. Arosi arimango 'large crab of mangrove swamps').

Medial *k is reflected as zero in the only examples noted: esiyo 'flesh' < *pinsiko, matauta 'afraid' < *matakut.

2. *l is sometimes lost before *i or *u, e.g. tena 'ear' < *taliŋa, tui 'deaf' < *tuli, ma-toi 'thrice' < *tolu '3', but is sometimes reflected as l, e.g. k/ulig-a 'steer' < quliŋ, and sometimes as n, e.g. unuunu 'body hair' < *pulupulu, nima 'hand' < *lima.

3. *u sometimes becomes i after *ol or *ul: ma-toi 'thrice' < *tolu '3' is the only clear example, but note 'uya'uya 'hair of head' < *qulu, where initial glottal may be an accretion (cf. 9 below) and -a a suffix (cf. Samoan fulufulu-a 'hairy'). Sometimes it remains as u, e.g. unuunu 'body hair' < *pulupulu; Capell also cites sa-na-u '10' < *sa-ŋa-pulu.
4. Most of the evidence indicates that *d and *R fall together as a phoneme which Grant 1953 writes usually as l, occasionally as r (see p. 105 for author's statement of confusion). Capell 1943 writes r in corresponding words, as did our Dobuan informants. *d is reflected as r, e.g. rua 'two' < *dua, muri 'follow' < *mudi, rara 'blood' < *daRa(q), and *R is usually reflected as r, e.g. rara 'blood' < *daRa(q), ramu 'root' < *Ramu(t) waro 'artery, tendon' < *waRos. However, it is sometimes lost, e.g. koita 'octopus' < *kuRita, auau-na 'new' < *paqoRu. Capell derives g/amana 'outrigger boom' from PAN *saRaman, but there is also evidence for reconstructing POC *(n)saman alongside *(n)saRaman (e.g. Nggela, Mota sama). Some cases of orthographic l for *R in Grant are probably assignable to the r reflex, e.g. ila 'stone axe' < *kiRam.
5. *s and *ns have merged as s, e.g. tasi 'sibling of same sex' < *tansi, 'usana 'rain' < *qunsan, 'e-isa 'how many?' < *pinsa, susu 'breast' < *susu, sagasage 'fork' < *saŋa, suli 'taro sucker' < *suli, sawa-eyai 'betroth' < *(a)nsawa 'marry, spouse'.
6. Some word-final consonants are retained, with a following vowel added, e.g. 'esana 'name' < *qansan, 'usana 'rain' < *qunsan, iyana 'fish' < *ikan, g/amana 'outrigger boom' < *(n)saman, all attest *-n. Final *k was evidently retained at an earlier stage, as was final *p, because vowels have been added in forms such as manua 'bird' < *manuk, nemwa 'mosquito' < *ñamuk, 'atoa 'thatch' < *atep (cf. Capell 1943: 63). Note also numa 'drink' < *inum, matauta 'fear' < *matakut, where a transitive suffix has supported the final consonant of the stem.
7. Dobuan kaiwe 'wood' < *kauy provides the only evidence as to the outcome of *y in the context *_a_u. If -we is a suffix then we may conclude that *-yu became i, but the information we have is not sufficient to establish this. In any event, it appears that Dobuan treats *y differently from the Central District languages in this word.

8. *ñ merges with *n in the available examples. nemwa 'mosquito' < *ñamuk, -na '3rd pers. sing. poss.' < *-ña, natu 'child' < *natu, sina 'mother' < *tina.

9. The treatment of *q is uncertain. While glottal stop occurs initially in many words where POC *q is reconstructed, it also occurs in some words where no *q is reconstructed before an initial vowel, suggesting that Dobuan ' may be an accretion: 'usana 'rain' < *qunsan, 'ate 'liver' < *qate, but 'awa 'mouth, passage' < *awa. Medial *q appears to be lost, e.g. tae 'excrement' < *taqe, uwaia 'crocodile' < *puqaya.

SUAU

1. *k is usually reflected as glottal stop, but is sometimes zero. 'ai'ai 'eat' < *kani, 'ita 'see' < *kita, si'u 'elbow' < siku, lao-ma 'come' < *lako mai, omi 'you (pl.)' < *kamiu. *k remains as k in some members of the Suau dialect chain, though not in the prestige dialect.

2. *l is usually retained before i or u, either as l or n e.g. ulu 'head' < *qulu, 'unuli 'breadfruit' < *kuluR, nima 'hand' < *lima, 'aliha 'centipede' < *qalipan.

3. *u usually remains as u after *ul. There is no evidence concerning the sequence *olu. Examples attesting u < *u after *ul appear under 2 above. One possible exception is known: wuia 'fur' may reflect *pulu(pulu) plus a suffix -a; cf. comments on Dobuan 'uya'uya in paragraph 3 under Dobuan.

4. *d and *R merge as l, e.g. labi 'evening' < *RapiRapi, seu-seuli 'left hand' < *-uRi, lo-i 'to fly' < Ropo (dial.loho), sala 'dig' < *sada, lua 'two' < *dua, lamulamu 'root' < *Ramu(t).

5. *s and *ns merge as s: isu 'nose' < *isu, sine 'woman' < *sin[a,e], saga 'dance' < *saŋka(q), saha 'what?' < *nsapa, hisa 'few' < *pinsa 'how many?', esa 'name' < *qansan, asu-bena 'day' < *qanso.

6. Final consonants appear to be retained in some forms: goila 'water' < *waiR (dial. waila), 'unuli 'breadfruit' < *kuluR, nom 'drink' < *inum, but are frequently lost, e.g. manu 'bird' < *manuk, esa 'name' < *qansan. mataus-i 'fear' shows retention of stem-final *t as s before the transitive suffix.

7. There are no data on *y between a and u.
8. *ñ falls together with *n, e.g. vonu 'turtle' < *poñu, -na '3rd pers. sing. possessor' < *-ña, niu 'coconut' < *niuR, mahana 'sun' < *ma-pana(s) 'hot', nom 'drink' < *inum.
9. *q is lost in all positions, e.g. sinae 'guts' < *tinaqe, ae 'leg' < *(w)aqe, ate 'liver' < *qate, ulu 'head' < *qulu, halihaliu 'new' < *paqoRu.

4.4 Summary

The three Milne Bay languages show a number of differences from the Central District group. None of them exhibit innovation (1): loss of *k. Although all three usually reflect *k as glottal stop and occasionally as zero (possibly zero regularly in intervocalic position in Dobuan), the change *k < ? is evidently fairly recent in each case. We know this because, in the case of Dobuan and Suau, some dialects preserve *k as k, while Molima is closely related to Dobuan and therefore must have preserved *k until it split from Dobuan.

All three languages fail to exhibit innovation (6), loss of all consonants in absolute final position. Evidence is clearest for Dobuan and Molima, which retain, or retained until recently, final *m, *n, *p, *k, *R and possibly *t. Data on most other final consonants are lacking, although isolated examples suggest that at least some consonants have been lost. Where a final consonant has been retained Dobuan and Molima have added a following vowel to preserve the open syllable structure. Capell (1971: 301) shows that a good number of Southeast Papuan languages keep at least some final consonants, in each case with addition of a supporting vowel. Suau appears to have lost most final consonants, although the evidence is too patchy for firm conclusions. It has however retained final *R as l (with added vowel), and preserves *-m and *-t at least in transitive verbs.

The evidence concerning *q is difficult to interpret. Dobuan and Molima often exhibit glottal stop where *q is reconstructed for POC in word-initial position. But medially the reflex seems to be zero, suggesting that the initial glottal stop may be an accretion. Some other Milne Bay languages exhibit k- in cognate words, but again accretion cannot be ruled out (cf. discussion of γ-accretion in some Central District languages, in 4.52).

Suau fails to exhibit innovations (2) and (3), while the evidence in Dobuan and Molima is conflicting. There are good reasons to believe that (3) preceded (2) in the history of the Central District languages, i.e. that *u became i after *ol and *ul, then *l was lost before *i. Alternative explanations run into several difficulties. In the first place, it is somewhat more natural, and more economical, to suppose that *l was lost only before the palatal vowel i, presumably by palatalization of *l, then outright loss, than to suppose that *l was also lost before the velar vowel u. Second, loss of *l before *u, when the preceding vowel was also u, would have resulted in long \bar{u} or geminate uu, a sequence which already existed in the language. It is difficult to explain how some uu sequences could have become ui while others remained uu, when no conditioning explanation is available.

Dobuan and Molima show i for *u in only one clear instance: D., M. toi '3'. M. ya-udi 'many' may be from *untolu, and Dobuan 'uya'uya 'hair of head' may be from *qulu (see discussion of reflexes above). The exceptions are about as numerous, i.e. one clear case and one possible case for each language.

The evidence concerning *l is also inconsistent. Molima shows two clear instances of *l lost before *i, and Dobuan three. Each language shows two exceptions, although in each case one of them involves the form nima 'hand' < *lima, indicating that *l may have become n by assimilation in this word at an early point in the history of these languages (Suau also shows nima), before the sound change *l > \emptyset before i. Molima and Dobuan each retain *l before *u in the reflex of *pulupulu 'body hair', and each language shows one case of loss, or possible loss before *u.

Several alternative explanations suggest themselves for the inconsistencies in the treatment of *u and *l. (1) Regular changes identical to those undergone by the Central District languages occurred in Dobuan and Molima, but inter-language borrowing has reintroduced forms which do not exhibit the expected sound changes. (2) Dobuan and Molima underwent sporadic changes, affecting *tolu '3', *talina 'ear' and perhaps a few other forms, but not all forms which would have changed if the developments were phonologically regular ones.

If explanation (1) is correct, the question arises whether the changes occurred independently of those undergone by the Central

District languages. The relative rarity of innovations (2) and (3) is perhaps enough to make independent development unlikely. If we conclude that innovations (2) and (3) occurred at a time when Molima, Dobuan and the Central District languages were still a unity, however, we must conclude that Suau was probably already separate, because Suau has not undergone these innovations. (Some evidence conflicting with this conclusion is presented in subsection 5.2.)

The fact that all of the languages under consideration here merge *d and *R, and *s and *ns, suggests that these simplifications occurred while they were still one language. As noted earlier, unification of *d and *R may have occurred at a Proto-New Guinea Oceanic stage, but merger of *s and *ns is more narrowly distributed. This, by itself, is not sufficient to support the subgrouping of the three Milne Bay languages with the Central District languages, but it is at least suggestive. Their treatment of *l and *u, as we have seen, also suggests that Molima and Dobuan fall into a subgroup with the Central District languages.

We have also seen, however, that there is clear evidence for a closed Central District grouping, in that innovations (1), (5b) and (6), and possibly (2), (3) and (9) are absent from the three Milne Bay languages examined.

4.5 Internal Relationships of the Central District Group

Each of the Central District languages shows certain sound changes over and above those which are common to the whole group. Whereas developments (1)-(9) treated in the last subsection are most satisfactorily interpreted as having taken place in the unified pre-Central District language, i.e. before the breakup of Proto-Central District (PCD), those developments which are confined to a subset of the Central District languages must be assumed to have occurred after this period of unity had ended.

On the evidence of sound changes alone, it is hard to make a really compelling case for discrete subgroups among the Central District languages, other than those which may be considered part of one dialect chain. However, fairly forceful arguments can be adduced for any early division into three partly discrete units. The eastern languages: Sinagoro, Hula, Keapara and Aroma, all exhibit very similar phonological histories. The same can be said of the western languages: Mekeo, Doura, Gabadi, Kuni and Lala, and, to a lesser extent, Roro. Motu seems to

have occupied an intermediate position between these two groups (as it still does), but to have been more closely linked with the western group. There is a small amount of evidence for regarding Magori as an early offshoot of the eastern division.

Some dialect diversity in the stage that can be called Proto-Central District is also indicated by the distribution of reflexes.

The following paragraphs will deal with those phonological developments of potential subgrouping value.

4.51 Evidence for a Western Subgroup

PCD *t was almost certainly a voiceless apical stop [t]. This is so because (1) POC *t evidently had this value, [t] being by far the commonest reflex in Oceanic languages, (2) *t is reflected as [t] in Magori, Hula, Motu and Sinagoro in some or all environments, while the Roro dialect of Roro also shows [t] for *t before non-high vowels.

It is thus a probable innovation common to Doura, Gabadi, Kuni and Lala that they each reflect *t as [k] before vowels other than i. East Mekeo ' (glottal stop) varying with zero for *t also derives from *t via an intermediate [k]. This is shown by the fact that West Mekeo and Kovio dialects show k for *t in a fairly high proportion of forms, e.g. W. MEK ake, E. MEK a'e 'liver' < POC *qate, W. MEK ika 'we incl.' < *kita, W. MEK aka, E. MEK a'a 'laugh' < *kata. The remote geographic position of West Mekeo and Kovio makes it unlikely that they have borrowed k in recent times. Rather, it is simplest to assume that all Mekeo dialects had [k] < *t at one stage, with [k] becoming [ʔ] in East Mekeo. Subsequent borrowing between dialects had led to numerous irregularities, so that East Mekeo occasionally exhibits k for expected glottal stop, while the other Mekeo dialects quite often show glottal stop or zero for expected k.

The sole western language which has not participated in this change is Roro. Waima Roro reflects *t as h in all positions. The Roro dialect reflects *t as [t] before non-high vowels, and as [ts] before high vowels i, u.

As the change of an apical to a dorsal stop is a fairly uncommon one, it provides evidence that all the western languages except Roro underwent a period of common development after their separation from the remaining Central District languages.

PCD *g was probably a velar stop. Since PCD evidently had [b] for POC *mp and [d] for *nt, contrasting with PCD *p and *t, which were probably voiceless, it is perhaps reasonable to assume that *g < POC ŋk was voiced. There is some evidence (see Residual Problems section, above) that PCD had filled in the gap left by loss of POC *k by developing a new *k, but this question needs further study.

*g appears to have been regularly lost in Mekeo, Doura, Gabadi and Kuni, and sometimes lost in Roro and Lala. Roro and Lala have glottal stop for *g intervocalically in some words. Outright loss of [g] or [k] would be unusual, and it is reasonable to conclude that Roro and Lala partly preserve an intermediate stage in which *g became [ʔ], before its eventual loss in most western languages.

PCD *D was probably a voiced apical stop [d] or flap [ɾ]. External and internal evidence slightly favours [ɾ]. The languages which are probably immediately related to the Central District group share with the latter the merger of POC *s and *ns, but typically have [s] as the outcome. The sequence s > z > ʃ is perhaps a more likely unconditioned change than s > z > d in open syllable languages. There is also evidence for a separate PCD *d [d] reflecting POC *nt: *d and *D fall together in most Central District languages but not in all.

All the western languages, together with Motu, exhibit a stop reflex of PCD *D, whereas the eastern languages (other than Magori) reflect *D as r. Magori has k. Specifically, the western reflexes are Gabadi, Kuni, Lala d, Doura, Roro t, Mekeo k. Motu has d, strongly suggesting [d] as the earlier form in the western proto-language or dialect area, with devoicing in Doura and Mekeo yielding t and devoicing and shift to velar articulation in Mekeo yielding k. Mekeo also shows the same shift in its treatment of PCD *t (see earlier discussion) and *n, *d, *nd and *R. Magori k has no such parallel shift within its system.

The western languages show a probable innovation in their treatment of PCD *k. We reconstructed *k on the basis of Motu, Sinagoro and Hula k corresponding to zero in all western languages in about 10 cognate sets. Two questions which cannot be answered at present are whether PCD *k was distinct from PCD *g, and whether orthographic zero represents glottal stop in some western languages.

PCD *kw was also reconstructed on the basis of Motu, Sinagoro and Hula kw corresponding to zero in all western languages except Roro (where the reflex is zero in one item, ' in one item). The case for a distinct phoneme *kw is strengthened by external cognates showing corresponding kw. What is not clear is whether *kw > ? > Ø in the western languages is an independent development from *g > ? > Ø and *k > Ø, or whether all three PCD velars merged as *k in the first place. In any event, the western languages consistently show zero, or in Roro and Gabadi, zero or glottal stop, as their reflex of *g, *k and *kw, whereas these are distinguished in Motu, Sinagoro and Hula. Magori appears to reflect *g as g but we have no data concerning *k and *kw. Data for Keapara and Aroma are in unreliable orthographies, but suggest that these dialects kept *g, *k and *kw apart until recently, and possibly still do. *g is sometimes reflected as k in both Keapara and Aroma, sometimes as glottal stop (Keapara) and g (Aroma). *kw is reflected as w in Keapara; Aroma data are lacking. *k is sometimes reflected as glottal stop in Keapara, otherwise as orthographic zero in both Keapara and Aroma.

To summarize the phonological evidence for a western subgroup, we have found that these languages show similarities in their treatment of PCD g, *k and *kw, and, with the exception of Roro, in their treatment of *t. They also share with Motu and Magori the reflection of *D by a stop.

4.52 Evidence for an Eastern Subgroup

Evidence for an eastern subgroup is about equal in quantity and quality with that supporting a western division, i.e. enough to be strongly suggestive but less than conclusive. The eastern languages show loss of *ŋ in all positions, and loss of *y in all positions. They appear to lose *l in all positions.

They also show frequent, but on present evidence, not predictable, accretion of a voiced velar fricative word-initially and intervocalically. The center of this development is probably in the Sinagoro region. Dutton's (n.d.¹) survey shows certain Sinagoro communalects as showing γ-accretion is a very high proportion of forms, while it is less frequent in other Sinagoro communalects, and probably less frequent still in Hula, Keapara and Aroma. γ-accretion may thus have begun as a regular development in one dialect, but in other eastern dialects

spread through only part of the lexicon.

This development has not spread beyond the eastern group, except for a very small number of Motu forms. In the eastern languages it is present in hundreds of lexical items; numerous examples can be found in the materials illustrating reflexes of POC consonants.

The eastern languages also agree in their treatment of PCD *g, *k and *kw, *ɖ (see above) and *p (reflected as v, probably a voiced labiodental fricative, in all four eastern witnesses). These agreements may be due to common retentions from PCD rather than to innovation, but are at least consistent with the hypothesis of an eastern subgroup.

Lower-level Groups

Certain evidence for lower-level groupings exist. In most cases, however, only a single common development is involved, and in some cases a different grouping. Motu and Doura both reflect PCD *p as [h]. While the exact phonetic value of *p is uncertain, it was almost certainly a labial obstruent and not [h]. However, to posit a Motu-Doura subgroup is to run counter to other evidence, outlined above, that Doura belongs to a western group which excludes Motu. Since Motu and Doura are geographically contiguous languages, and the Doura speech community is very small and bilingual in Motu, Doura [h] may be due to Motu influence.

As already noted, the failure of Roro to participate in the *t > k development constitutes evidence for excluding that language from a subgroup containing all other western languages.

Keapara and Aroma agree in reflecting PCD *t as zero or glottal stop. Sinagoro has s for *t before front vowels, t elsewhere. Hula has t varying unpredictably with zero, as a result of dialect borrowing.

Lala and Mekeo merge PCD *n and *ŋ. In Lala the reflex is consistently n. In Mekeo it is usually ng but sometimes ɲ (the variation has nothing to do with whether the proto-phoneme was *n or *ŋ).

The remaining Central District languages show unconditioned loss of *ŋ. This fact is one bit of evidence for dialect variation in PCD. Unconditioned loss of a nasal consonant is a fairly rare sound change, and it is likely that it occurred only once in the history of the Central District languages. It is unlikely, for instance, that *ŋ disappeared in Motu, in a Proto-Eastern Central District language, and in a Proto-Western Central District language, after these three had become discrete languages. On the other hand, it is also unlikely that those languages which show loss of *ŋ form a subgroup apart from those which do not. That is, it is unlikely that Motu, Sinagoro, the

Hula-Aroma dialects and Magori fall into a subgroup along with Roro, Gabadi and Kuni, exclusive of Mekeo and Lala. Such a subgrouping conflicts with a considerable body of evidence which indicates that Mekeo and Lala underwent a period of common development with the other western languages after their separation from the languages to the east.

It is simpler to suppose that * η was lost in a dialect of PCD, before the east-west division had crystallized. Loss of * η , on this reasoning, would have defined an incipient split in the proto-language, but later realignments produced different dialect groupings, leading eventually to a definitive split into a western language, and eastern language, and pre-Motu.

The coalescence of * n and * η in Mekeo and Lala indicates that these two languages were at one stage some kind of a unity. As there appears to be no other evidence for a Mekeo-Lala subgroup exclusive of all other western languages, it seems likely that the unity was as contiguous dialects in the Proto-Western stage, rather than as a clearly defined subgroup.

The position of Magori is not clear, from what is presently known of its historical phonology. It can certainly be excluded from the Western Central District grouping which we have tentatively posited. It is not clear that it can be excluded from the Eastern subgroup; on the other hand, the available phonological evidence does not enable us to assign it to the Eastern grouping.

5.0 LEXICAL EVIDENCE

This section will deal, very briefly, with some quantitative (lexicostatistical) and qualitative (uniquely shared elements) lexical evidence for subgrouping the Central District languages.

5.1 Some Lexicostatistical Evidence

A preliminary lexicostatistical comparison of nine Central District languages was carried out at the University of Papua New Guinea in 1969. With the exception of Lala and Magori, all the languages treated in the present study were compared.

As the comparisons were made at an early stage in the comparative study, it is likely that some errors were made. Shortage of time has, however, prevented a restudy, and the figures cited below are from the 1969 study. Three sets of computations were made, all based on a modified version of the Swadesh 215 meaning list. One computation counted

only comparisons that could be scored as definitely cognate or definitely non-cognate. Cognation was determined by our knowledge, then less complete than now, of the regular sound correspondences: two forms with similar meanings were scored as cognate if they exhibited regular sound correspondences or exhibited irregularities explainable as resulting from natural internal developments, e.g. assimilation, metathesis, analogy, etc. The elimination of doubtful cognates, and other factors, reduced the total number of valid comparisons to about 200, or slightly fewer, for each language pair. The results are shown in Table 4.

A second computation counted as cognate forms which showed one or two unexplained irregularities, i.e. it included possible as well as definite cognates. A third computation averaged the first two. As the second and third computations were based on relatively lax procedures for determining cognation the results are probably less reliable than those of the first and will not be cited here.

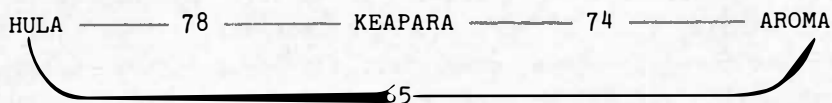
ARM									
KEA	74	KEA							
HUL	65	78	HUL						
SIN	-	49	50	SIN					
MTU	-	-	47	45	MTU				
DOU	-	-	33	32	52	DOU			
GAB	-	-	31	32	37	46	GAB		
ROR	-	-	25	23	39	34	36	ROR	
KUN	-	30	28	25	41	42	32	40	KUN
MEK	-	-	22	21	30	26	29	32	32

TABLE 4: DEFINITE COGNATE PERCENTAGES SHARED BY SOME PAIRS OF CENTRAL DISTRICT LANGUAGES

No one overall classification is strongly favoured by the data. Certain subgroupings among the languages are however rather clearly indicated.

Hula, Keapara and Aroma share upwards of 65 percent with each other, but no more than 50 percent with the next closest language.

The Hula-Keapara-Aroma figures show a chain-like relation which conforms to their geographic relations (see map). Keapara is the linking dialect:



Dutton's (n.d.) survey of Rigo Subdistrict communalects confirms that Hula and Aroma are the extremes of a dialect continuum. (His lexicostatistical figures, based on a word list of different size and composition from ours, are not directly comparable with those given here.)

Lexicostatistically the Hula-Aroma continuum is closest to Sinagoro (represented here by the Saroa dialect). The latter shares 50 percent with Hula and 49 percent with Keapara (no figure for Aroma). Thus we may speak of a lexicostatistically definable Eastern Central District subgroup.

Motu has some claims to membership in the Eastern group, as its percentages with Sinagoro (45) and Hula (47) are only a few percent below the Hula-Sinagoro figure. However, Motu shares similar percentages with many non-Eastern languages, while Sinagoro and Hula exhibit much lower percentages with all non-Eastern languages. It would appear that Motu's percentages with certain other languages are inflated; we return to this question below.

The figures for the languages west of Motu are difficult to interpret. Some idea of the contradictions present in the evidence can be seen if we try to assign either Motu or Doura to a position on a lexicostistical family tree. Motu shares its highest percentage with Doura (52). This is also Doura's highest percentage. In each case the next highest percentage is some 5 to 6 points lower, so that we must contemplate assigning Doura and Motu to a closed subgroup. Such a grouping, however, conflicts with many other facts. For example, Motu shares 47 percent with Hula, while the Doura-Hula agreement is only 33. On the other hand, Doura and Gabadi share 46 percent, while the Motu-Gabadi figure is only 33 percent.

A glance at the map will suggest an obvious explanation. Motu is geographically much closer to Hula than Doura is, while Doura and Gabadi are neighbours. Perhaps Motu scores high with its eastern neighbours because of borrowing, but scores low with all western

languages other than Doura, while Doura because of its geographic position scores high with its western neighbours? This turns out not to be the case, as Motu shares higher percentages than Doura with two western languages: Motu-Roro 39 against Doura-Roro 35, Motu-Mekeo 30 against Doura-Mekeo 26 (no figures were computed for Lala, while percentages with Kuni are about the same for both Motu and Doura).

No subgrouping of any two or more western languages can be made which excludes Motu, but Motu is also closer to the Eastern languages than it is to any western languages other than Doura! The problem remains.

There appears, at least on first inspection of the figures, to be a case for separating Mekeo from all other languages in the sample. Mekeo scores no higher than 32 percent with any other language. Even if it is assigned to a subgroup with other western languages, on the strength of its higher agreement with western than with eastern languages, it is consistently the low scorer in intra-western comparisons, suggesting that there is a core western group which excludes Mekeo. However there are no clearly defined groupings within this putative core western group, while the difficulty of positing such a group while excluding Motu have already been touched on.

In the absence of a strong lexicostatistical case for subgrouping any two or more of the non-Eastern languages, we must ask whether Proto-Central District could have shattered into some six coordinate divisions: Pre-Eastern, Pre-Motu, Pre-Doura, Pre-Gabadi, Pre-Kuni, Pre-Mekeo and Pre-Roro.

Such a hypothesis is no more satisfactory than any of the subgroupings among non-Eastern languages proposed earlier. Why does Mekeo consistently score lower than any other language? Why does Motu score consistently high? Why does Gabadi share a much higher percentage with Doura than with any other language? Why are Kuni's figures much higher with Doura, Motu and Roro than with the rest? And so on; there are many problems internal to the lexicostatistical classification, without even attempting to square this with classifications based on other criteria.

The contradictions make sense only if we assume that certain factors have caused unevenness in the rates of divergence. We have a certain amount of evidence indicating (a) that some languages have replaced their basic vocabulary at a faster rate than others, and (b) that undetected borrowing has inflated some percentages.

It is quite clear, for example, that Mekeo has a lower retention rate than Motu, Kuni and Gabadi (and probably all other Central District languages with the possible exception of Magori). This is shown by a comparison of percentages of cognates shared with non-Central District languages. Mekeo and Suau share 14 percent definite cognates on a 200 word list, compared with Motu-Suau 20, Kuni-Suau 20 and Gabadi-Suau 21 percent. Mekeo's percentage with Molima (another language with a low retention rate) is 12 against Motu-Molima 16.

If Mekeo's percentages with non-Central District languages are deflated by 4 to 6 percent, it is likely that its agreements with more closely related languages, i.e. with other members of the Central District group, are deflated by at least as much and probably by a larger percentage.

If we take non-lexicostatistical evidence for subgrouping into account, it is possible to estimate fairly exactly how much the deflation with other Central District languages is. According to phonological arguments, Mekeo belongs to a Western subgroup. The other Western languages share from 25 to 33 percent with Hula, and 23 to 32 percent with Sinagoro. Mekeo's figures of 22 percent with Hula and 21 percent with Sinagoro are about 7 percent below the average for the rest of the Western group. The Western languages, other than Mekeo and Doura (the latter being a special case for reasons discussed below), share from 37 to 41 percent with Motu. Mekeo-Motu 30 percent, falls 9 percent below the average. Thus it appears that Mekeo's percentages with other Central District languages are deflated by some 7 to 9 percent.

Now, whereas Mekeo's percentages are consistently on the low side, Motu's are consistently high. What explanation can be given for this? It seems that inflation of Motu's percentages is not attributable to a high retention rate in the basic vocabulary list. Comparisons with non-Central District languages show that Motu's retention rate is no higher than that of Kuni, Gabadi and Hula (except for Mekeo, external comparisons for other Central District languages were not made).

The answer must be that Motu's percentages are inflated as a result of undetected borrowing. That large scale borrowing should have taken place between Motu and other languages in the Central District region is not surprising. Not only does the large Motu-speaking community occupy middle ground between the eastern and western languages, but the Motu are renowned traders and sailors. There is some archaeological evidence that this has been their way of life for many

centuries. And there is linguistic evidence independent of lexicostatistical percentages that Motu has long occupied a geographically intermediate position between the eastern and western languages (see discussion of phonological features above, and of lexical innovations below).

It is possible to roughly estimate the degree of inflation in the comparisons involving Motu. We noted that on first inspection of the lexicostatistical evidence it was not possible to make a good case for assigning Motu to any subgroup; this was also the case with the phonological evidence, which defines Eastern and Western groups, with Motu standing apart from both.

The languages of the putative Western subgroup (other than Mekeo, whose percentages are considerably deflated) average 29.5 percent cognation with Hula, and 28.2 percent with Sinagoro. The ranges, given earlier, are fairly small. Motu shares 47 percent with Hula and 45 percent with Sinagoro, i.e. about 17 percent more than the average for the Western group.

With the Western languages (excluding Mekeo) Motu averages 42.2 percent (range 37 to 52) or 13-14 percent more than Sinagoro or Hula share with the same languages.

Thus it appears that Motu's percentages are generally inflated by about 13-17 percent. In a few cases the inflation may be lower (e.g. with Mekeo, where it is offset by Mekeo's low retention rate) or higher (e.g. with Doura, where the small Doura community has probably borrowed on a relatively large scale from the contiguous, and much larger Motu language community).

There are some indications that the interchange of basic vocabulary between Motu and its neighbours began soon after the original differentiation into subgroups of the proto-language, and that recent borrowing in the basic vocabulary has been slight (with the possible exception of borrowing by Doura). If large scale borrowing had occurred in recent times many of the loans would be transparent by virtue of showing irregular sound correspondences. For example, it is possible to show that Motu *tage* 'excrement' is a borrowing from an Eastern language because the directly inherited Motu form should be *tae*, γ -accretion is a feature of the Eastern languages but not of Motu or any Western language (except in isolated cases like *tage*). Although a few transparent loans probably escaped notice in the 1969 lexicostatistical study, the number could not have been too large because we

were then familiar with most of the regular sound shifts, and eliminated a number of comparisons which seemed to be borrowings. Some loans, of course, may remain undetected because no phonological irregularities are involved - the similarity in the sound systems of Central District languages is such that a good proportion of loans might fall into the undetectable category.

There is another explanation for the fact that the 13-17 percent inflation in Motu's percentages is not accountable for by transparent borrowings either by or from Motu. At an earlier stage in the history of the Central District languages the sound systems of these languages were even more similar than now. Because of this, borrowings which took place in this early period would have been largely undetectable.

If Pre-Motu occupied a geographic position intermediate between the Pre-Eastern and Pre-Western dialects, as seems likely on independent evidence, we can account for the inflation in Motu's percentages by the Wave Theory, i.e. by the standard principles of lexical diffusion along a dialect chain. It is well established that lexical diffusion in basic vocabulary occurs much more freely between dialects of one language, i.e. mutually intelligible speech traditions, than between discrete languages. It is also well established that the speech forms of central dialects in a chain of dialects spread outwards to the immediate neighbours, and, less often, to more distant dialects, while the central dialects by the same token receive speech forms from their immediate neighbours, and, less often, from more distant dialects.

The chain of intergrading communalects which is formed by this process of lexical diffusion is exemplified by the Hula-Aroma chain, and the Sinagoro chain, as they are now. Such a dialect chain may well have existed in the period before the Western dialects, Motu, and the Eastern dialects became sharply distinguished. Indeed, given the absence of natural geographic barriers in the coastal strip occupied by the main body of Central District languages, it would be surprising if some sort of dialect continuum had not developed. We do not know what caused the eventual breakup into discrete subgroups, and, later, into the various modern languages. Doubtless this had to do with population movements of both Austronesian-speaking and Papuan-speaking communities, including movements by the former up the major rivers where they would be in less frequent contact with coastal Central District communalects, and in more frequent contact with certain Papuan languages.

To sum up: (1) the lexicostatistical evidence defines only one clearcut subgroup - the Eastern group comprising Sinagoro and the Hula-Keapara-Aroma chain. The indications are that this group persisted as a unity for a considerable time after its differentiation from other Central District languages. (2) The lexicostatistical percentages are at least consistent with the hypothesis of an early Proto-Central District dialect chain with Pre-Motu occupying a middle position between Pre-Eastern and Pre-Western dialects; in fact this interpretation is possibly the only one that makes reasonable sense out of the matrix of percentages. (3) Unlike the Eastern group, however, the Western dialects did not remain a cohesive unit for very long after their separation from the languages to the east. There is clear evidence that Mekeo has changed its basic vocabulary at a relatively fast rate, but even if we discount Mekeo the remaining Western languages share only 32-46 percent of cognates as against 49 percent and above shared by the Eastern languages. The Eastern and Western groups converge at around 23-33 percent cognation.

Glottochronological Time Depths

If we take the Eastern-Western percentages as the most reliable ones for obtaining a glottochronological dating for the dissolution of the Central District group, we obtain a range of dates from 34 centuries before the present (23 percent cognation) to 25 centuries BP (33 percent), with the average Eastern-Western percentage (excluding Mekeo) yielding a time depth of around 29 centuries BP.

The differentiation of the Central District group from Suau is indicated to have occurred around 37 centuries ago (reckoned on 20 percent cognation, which approximates the figures for Motu-Suau, Kuni-Suau and Gabadi-Suau).

It should be mentioned that the reliability of glottochronological dating is not great, and that its performance at time depths greater than 2,000 years has not been well tested against historical evidence.

5.2 Qualitative Lexical and Morphological Evidence

5.21 *General*

Qualitative evidence for a subgrouping consists of features shared by members of the putative subgroup apart from non-members, which are possibly the result of innovations of the interstage immediately ancestral to the subgroup. Exclusively shared features which

are known to be retentions from some still earlier stage, ancestral to a larger group of languages, are usually discounted.

Lexical and morphological innovations may be of several kinds. A change may occur in the meaning of a lexical item, (using this term to include grammatical, i.e. morphological, markers), e.g. English deer from OE *deor* 'animal', English nice in its various senses replacing ME nice 'stupid, wanton'. A change may consist of the introduction of a new lexical item, formed e.g. by blending (*chortle, glimmer, fantabulous*), compounding (*home run, atomic bomb*) borrowing (*piano, mocassin*) and, very rarely, by creation of a completely new form. Finally, there is what is often called 'irregular' or 'idiosyncratic' change in the pronunciation of a lexical item; that is, a sound change which is sporadic, affecting the form of some but not all items belonging to a given phonological class. Examples are English bird and horse from OE *brid* and *hros* by metathesis, and a nickname from ME *an ekename*, by recutting.

It is the last of these types - irregular phonological change - which is generally the easiest to identify with certainty, and which consequently plays a critical role in subgrouping.

Nothing like an exhaustive search for lexical innovations has been made in the present study. The present quality of lexical coverage for the Austronesian languages is such that the returns for comparing entire lexicons would be small in comparison to the effort. However, a search confined to basic vocabulary items and morphemes with grammatical function - for which coverage is fairly good - has proved quite profitable.² While full treatment of this evidence would double the length of this paper, and will be given elsewhere, some results are summarized below, together with findings reported previously, by Capell (1943) and others.

5.22 Oceanic

Several lexical items attributed to Proto-Oceanic (POC) show irregular developments in comparison with the PAN etyma: POC **moli* 'citrus' shows metathesis in comparison with PAN **limaw* 'lemon'; POC **au* '1st person singular' shows unanticipated loss of **k* in comparison with PAN **aku*; POC **mai* 'come' shows irregular loss of **R* in comparison with PAN **maRi*; POC **suRi* 'bone' shows unexpected initial **s* in comparison with PAN *[*d, D*]*uRi* 'thorn'; POC **pati* 'four' shows unanticipated final **i* in comparison with PAN **e(m)pat* 'four'.

Central District languages lack known cognates of PAN *limaw. In each of the other cases, they reflect the irregular phonological change characteristic of Oceanic languages.

POC had at least a three-way distinction in possessive constructions, between what has been called zero-, na- and ka- marking, which was lacking in PAN.³ Whereas PAN uniformly suffixed the possessive pronoun to the head to indicate possessive relation, POC used such constructions only when the possessive relation was 'inalienable', i.e. where the head noun denoted a part of a whole or a kinsman. Alienable relation was marked by preposing the possessive pronoun, and prefixing to it a special possessive marker. When the possessor was in a relation of dominance to the referent of the head noun, e.g. if the latter represented disposable property or a deliberate act of the possessor, the marker was *na-. When the possessor was not dominant, e.g. if the head noun denoted an inherent bodily condition, or an action performed on, or directed at him, by someone else, the marker was *ka-. Thus, direct suffixation of pronoun ('zero-marking'), na-marking and ka-marking were associated, respectively, with inalienable, dominant and subordinate possessive relations. ka-marking also had the seemingly independent function of denoting edible relation, i.e. possession of things for eating, or from which food was obtained.

The Central District languages retain the three-way contrast between the marking of inalienable, dominant and edible possession, e.g. MTU ima-gu 'my hand', natu-dia 'their children', show suffixing of possessive pronoun, while e-gu boroma 'my pig' (as disposable property) and a-gu boroma 'my pig' (as food) show preposing with addition of possessive marker. One irregular formal development has occurred: POC *na-, dominant possession marker, has been replaced by e- in all Central District languages. A second change is that subordinate relation is now marked by suffixing the pronoun, rather than by expected a- (which would be the regular reflex of POC *ka-); i.e. this grammatical category has fallen together with inalienable relation, e.g. in Motu we find e-gu sivarai 'my story' (which I tell or make up) but sivarai-gu 'my story' (told about me) instead of *a-gu sivarai.

Suau and Dobuan agree with the Central District languages in exhibiting replacement of *na- by a new form, which is e- in Suau, 'i- in Dobuan. The Suau marker corresponds regularly with Central District e-. Suau also agrees in merging subordinate and inalienable relation,

using zero-marking for both, as e.g. (yau) e-gu gai 'my wound (inflicted on me)'. Dobuan, however, retains the widespread Oceanic use of ka-marking for subordinate possession, e.g. 'a-na barau 'his magic (of which he is the target or victim)', 'a-na bwebweso 'his death wound (inflicted on him)'. Thus, these developments provide an argument for assigning Suau to a subgroup with the Central District languages apart from Dobuan.

POC had two transitive suffixes to verbs: *-i, and *-aki ~ -akini. *-i usually marked a close relation between verb and its direct object, and *-aki a remote relation (instrument, cause, concomitant, etc.). While both suffixes have probable cognates outside of Oceanic, *-aki ~ -akini shows an irregular development in the second vowel in comparison with Javanese -aken ~ -ake ~ -ke, Toba Batak -hon ~ -kon, Wolio -aka, all of which can be assigned to an etymon *aken. The regular POC correspondence would be *-ako(n). The Central District languages show the characteristic Oceanic development, as MTU io magani na gwada-lai-a

spear wallaby I pierce-trans.-it

'I speared the wallaby/I pierced the wallaby with a spear'

This type of evidence thus strongly supports the inclusion of the Central District languages in Oceanic.

5.23 New Guinea Oceanic

The notion that most of the languages of mainland New Guinea east of Humboldt Bay belong to a subgroup of Oceanic has been developed most explicitly by Wilhem Milke (1958, 1965). Capell (1969, 1971) has also made a subgrouping proposal similar to, though not identical with that of Milke.

Milke (1965:343-6) pointed to some 20 lexical isoglosses which appear to link languages as far apart as Gedaged, in the Madang District, and the Central District languages, marking them off from the languages of Island Melanesia excepting Southwest New Britain. Milke also noted that members of his putative New Guinea grouping all appear to merge POC *d and *R, although he recognized that this merger is by no means confined to the putative subgroup.

He also mentioned two grammatical agreements as possibly characteristic of New Guinea Oceanic: (1) the 'realis-irrealis' opposition in verb inflection, (2) classificatory prefixes to verbs. The diagnostic value of these features is at present quite uncertain. But two features

which may well be significant have been noted by Capell (1969:23): (3) New Guinea Oceanic languages show a preferred SOV word order, while most Oceanic languages prefer SVO (and SVO but not SOV can be reconstructed for POC)⁴, (4) New Guinea Oceanic languages show postpositions marking case relationships which in other Oceanic languages are marked by prepositions. Specifically, place or positional relation was marked in POC by a preposition *(q)i (which is cognate with prepositions in external witnesses), but is marked in Central District and many other New Guinea languages by a postposition of the type MTU -ai, Suau yai, Kove yai, as MTU ruma lalo-n-ai 'under the house' ruma-n-ai 'at the house'.

Chowning (in press) has questioned Milke's (1965:332, 342) grounds for including the Kimbe group (Nakanai and others) of West New Britain in a subgroup with New Guinea mainland languages. She also expresses some scepticism about the unity of the mainland languages. Milke's New Guinea grouping is certainly not yet on a firm footing. Insofar as the evidence for it stands up, however, the Central District languages must be assigned to the group.

5.24 *Isoglosses Linking Central District and Milne Bay Languages*

Several lexical-grammatical isoglosses link the Central District languages with certain languages in the Milne Bay District. Two of these, connecting the Central District group with Suau, were mentioned in the discussion of possession-marking in 5.22. Others include:

(1) POC *kami '1st pers. excl., focal' and *-mami '1st pers. excl., possessive' are replaced by PCD *ai, and *-mai, respectively showing irregular loss of the medial *-m-. The same loss is seen in many Milne Bay speech traditions: *kami > Suau, Sagarai, Gau, Gadaisu, Bohutu 'ai, Sariba kai, and *-mami- > Suau, Tubetube, Nuakata, Bunama, Anuki -mai. Capell (1943: 206) notes that irregular loss of *-m- has occurred in a number of widely dispersed languages in Indonesia, and indeed it occurs in a few other far flung Oceanic languages. While a case can be made for reconstructing PAN, POC *kai and *-mai alongside the full forms, I prefer to regard loss of *m here as an innovation which has happened several times in the history of the Austronesian languages.⁵

(2) As the preverbal subject pronoun marking 1st person exclusive plural, the type Tubetube ka occurs very widely in the Milne Bay District (e.g. Dobu 'a, Wedau a, Anuki ka, Panayati ka).

Regularly corresponding forms are also found in MTU, KEA, MEK, LAL a, SIN g/a. While these forms are no doubt cognate with POC *kami, they show unexpected loss of the second syllable.

(3) POC *paqoRu 'new' is replaced by PCD *pariu > HUL valiu, SIN, KEA vali/g/u, ARM vali/v/u. If cognate, the Central District forms exhibit certain irregular developments: loss of *o, insertion of i before -u. The same irregularities appear in the Suau group: Gadaisu, Bohutu fali-faliu, Suau hali-haliu, although most Milne Bay languages show only the first: Molima vauvau, Dobuan hauhau, Panayati vavalu, Tubetube valuvalu 'new'.

(4) DOU, HUL, KEA, ARM nama, MTU, ROR namo, LAL namai, 'good' has cognates in Tubetube namwa, Logea, Sariba namwanamwa.

(5) MTU, SIN guba, KUN, MEK ufa, HUL, KEA, ROR kupa 'sky' corresponds to Are, Rabaraba guba.

(6) MTU boga, LAL bo'a, KUN foa, DOU boa has cognates in Suau, Dau, Sariba, Gadaisu, Wagawaga, Gauba boga.

(7) PCD *dubaduba 'black' (SIN dubaduba, HUL, KEA, ARM ruparupa, GAB gubaguba) corresponds to Suau, Sariba, Logea, Tubetube, Gadaisu, Oyaoya dubaduba, Wagawaga, Guhulu, Dau duba 'black'.

(8) PCD *kwapi 'skin' (MTU, SIN, HUL kopi, KEA opi) has apparent cognates in many Southeast Papuan languages, e.g. Suau 'opi, Wedau, Awana, Yaleba opi, Dawawa kopi, Tubetube kwapi, Dobra kwapi/ra.

(9) PCD *diba 'to know' (MTU diba, SIN riba, HUL, KEA, ARM ripa) has apparent cognates with identical meaning in several of the Suau group of dialects: Dau, Gadaisu, Buhutu siba 'to know'. Corresponding forms occur more widely in Southeast Papua in the meaning 'to say, speak, converse', e.g. Panayati livalivana 'converse', Wedau riwa 'to say, speak'.

(10) PCD *bada 'big' (MTU, DOU, bada, SIN bara) corresponds to forms widespread in the Massim: Dau, Gadaisu badabada 'big', Wedau bada 'big man', Sariba, Tubetube tau-bara 'chief' (cf. MTU tau-bada 'chief').

(11) PCD *deba 'head' (SIN deba, HUL, KEA, ARM repa) corresponds to Gululu, Keldoge, Dobuan 'head', Wedau deba, Kiriwina daba, Suau deba 'forehead'.

(12) PCP *kwara 'head' (MTU kwara, ROR, DOU ara, KUN, LAL ola) corresponds to Wedau kola and possibly Panayati koa (Capell 1943: 179 notes a possible connection with forms for 'mountain': Wedau ola, Kiriwina koya, Doba 'oya, etc.)

(13) A non-basic item which deserves mention is PCD *Darima 'outrigger' > MTU darima, KEA ralima. Capell (1943:25) assigns these forms to PAN *SaRaman 'outrigger', although the expected PCD reflex would be *Darama. The same idiosyncratic development in the second vowel is found in Suau salima, in the Normanby Island languages: Bunama, Sawabwara (salima) and 'Urada (halima), in Bohilai halima, Awalama and Taupota harima, but is lacking in Dobuan, Bwaidogan, Wedau, Gayavi, Mukawa and Ubir.

(14) See under (3) in next subsection.

5.25 *Isoglosses Marking off the Central District Group*

The Central District languages share a number of basic vocabulary items, or irregular developments in the same, exclusively of other languages for which we have data.

(1) PCD *tinapu '100' is reconstructed from DOU, MTU sinahu, KEA, ARM inavu-na, HUL tinau-na, ROR hinabu.

(2) PCD *ati(ki) 'not' is reconstructed from LAL asi'i, KUN asi, HUL, KEA aiki-na, MTU lasi, MEK la'i. While there is a possible connection with Proto-Eastern Oceanic *tika(i) 'no' (Pawley 1972:56), such a comparison shows several irregularities in the sound correspondences.

(3) PCD *metau 'heavy' (MEK me'au, MTU, HUL, KEA metau, LAL, KUN mekau, ARM meau) probably derives from POC *(m)pita 'heavy', although the expected form would be *bita or *pita. Regular reflexes of *(m)pita are widespread in Southeast Papua, but a few languages resemble PCD in exhibiting unexpected accretion of -u or -i, e.g. Yaleba witau, Awanai, Tavara, Yaneyane, Wedau vitai. (A Gadaisu list actually contains the form metau but error is suspected.) Replacement of the bilabial stop by a nasal, yielding PCD *metau, is a common sporadic sound change in Oceanic languages. i > e in unstressed syllables is also a fairly common sporadic change. If not cognate with *(m)pita, PCD *metau represents an exclusively shared lexical item.

(4)-(10) concern lexical items which appear to be uniquely shared by the Central District languages.

(4) PCD *tiapu 'hot' is reconstructed from DOU, MTU siahu, KUN, LAL siabu, HUL tiautiau, ARM iavuiavu, KEA iavu, GAB siau.

- (5) PCD *kalopa 'fire' is reconstructed from KUN aloba, KEA, LAL, ARM alova, HUL kaloa, DOU aroha, SIN karaba.
- (6) POC *ñamu 'mosquito' appears as PCD *namo (MTU namo, SIN, HUL, KEA, ARM nemo), with unexpected lowering of the final vowel.
- (7) PCD *[g,k]unana 'old' is reconstructed from MTU gunana, DOU unana, HUL kunena, ARM kuinena, SIN guine.
- (8) PCD *maDi 'to sing' is reconstructed from DOU mati, SIN, HUL, ARM mari, KEA marimari.
- (9) PCD *Dori 'to push' is reconstructed from MTU dori, DOU, ROR tori, KUN doli, KEA, ARM roli, HUL roila, MEK koni-na. Gululu soli 'to pull' and Fijian soli 'to give' may be cognate, although there is a meaning difference.
- (10) PCD *pilaula 'to work' is reconstructed from KUN bilaula, MEK pinauga, HUL, KEA ina/g/ulu, ARM ula/v/unu, DOU fa-ura.
- (11) PCD *pitiu 'star' is reconstructed from MTU hisiu, ROR bihiu, DOU bisiu, LAL, GAB visiu, SIN visi/g/u, HUL vitiu, ARM viu, KEA g/ivu. These forms undoubtedly derive from PAN *bituqen 'star'. No unambiguous reconstruction for POC has been made, but many Oceanic witnesses attest a form *pituqu(n), or *pituqi(n). However, the irregular development found in the PCD form (where *pitiu results either from *pituqi(n) by metathesis, or from *pituqu(n) by dissimilation) is not known to appear elsewhere.

5.26 *Isoglosses Defining an Eastern Central District Group*

The existence of an Eastern Central District group, already indicated by phonological and lexicostatistical evidence, is confirmed by the very large number of isoglosses marking off Sinagoro, Hula, Keapara and Aroma from other Central District languages (with the possible exception of Magori). Even the list from basic vocabulary alone is much too extensive to give here. Some examples of shared irregular phonological changes are: (1) PCD *taiŋa 'ear' becomes SIN se/g/a, KEA ea, HUL te/g/a, ARM e/g/a, with assimilatory change *ai > e following loss of *ŋ. (2) All Eastern witnesses reflect POC *ñamu 'mosquito' as nemo, compared with Motu namo. (3) POC *pani 'wings' is regularly reflected by Motu hani and by Western Central District languages, but becomes vane in all Eastern witnesses. (4) HUL, SIN rakava, KEA ra'ava, ARM rava 'bad' may be cognate with MTU

dika, ROR kia, DOU tia-na, which reflect POC *nsika 'bad', but if so, exhibit an unusual assimilation in the first vowel plus unexplained -va.

5.27 *Isoglosses Defining a Western Central District Group*

A fairly considerable number of isoglosses appear to link all the languages west of Motu, and so to support the phonological evidence for a Western Central District subgroup. Again, the list is too long for inclusion here. Some examples are: (1) KUN afadua, DOU abatoa, MEK avakua, West Mekeo apagua 'sibling of the opposite sex'. (2) DOU, LAL utu-a, KUN uku, GAB uku-na 'to cut with a knife'. (3) MEK aga, KUN ala, LAL alala, GAB ara-sa 'to bite'. (4) KUN ano-na, LAL ano, West Mekeo i-ago 'sharp'. (5) LAL dauai-dauai, KUN dauai, ROR tauai 'far'. dau-, tau- is no doubt cognate with MTU daudau, HUL rau-vagi, ARM ia-rau, KEA rau-vagiai, and ultimately from POC *nsau, PAN *zaSuq 'far', but these forms show unexplained final -ai (possibly from incorporation of the locative postposition -ai). (6) MEK ogogo, ROR ororo, KUN ololo, GAB ba/rō 'dry' may be cognate with MTU roro 'cracked, stretched', but no definite homosemantic cognates are known.

5.28 *Isoglosses Linking Motu with Western Languages*

Motu is linked to the Western subgroup by many isoglosses, e.g. (1) POC *pati, 'four' is regularly reflected in the Eastern languages and Magori, but reflexes in Motu and all Western languages show unexpected replacement of *-t- by -n-: MTU hani, LAL, GAB vani, MEK pani, ROR, West Mekeo bani, DOU au-hani. (2) PCD *Diba 'right hand' is replaced by MTU, GAB idiba, DOU itiba, ROR itsipa, KUN idifa, with addition of a prefix i-. This is probably the 'instrumental' prefix i- which in these and other Oceanic languages forms 'instrumental nouns' from verbs. The verb in this case is PCD *Diba 'to know', which is reflected as a verb by members of all three major subgroups. The Eastern languages, which use the same simple base form for 'right hand' as for 'know', follow a pattern that is widespread in Oceanic; the *i-diba formation found in Motu and the Western languages is, however, not known to occur elsewhere. (3) MTU ise, KUN ide, LAL nike, ROR nihe, MEK nia, GAB nise 'tooth'. (4) MTU matamata, ROR mahamaha, DOU, GAB, LAL makamaka 'new'. (5) DOU, MTU veri, ROR beri, KUN weli 'to push'. (6) MTU gwauta, DOU ouka-ra, MEK oua-nga, GAB, LAL ouka

'ten'. (7) MTU badina, KUN fasina, DOU batina, ROR pokina (ROR k for *t unexpected) 'because'. (8) MTU umui, KUN imui '2nd person plural'. These evidently derive from POC *kam(i)u (Pawley 1972:66), first by metathesis of the last two vowels, then by an assimilation which raised and backed the first vowel to u. Kuni imui shows a subsequent dissimilation from *umui. The Eastern languages reflect *omi, suggesting that the PCD form may have been *omiu. (Cf. Suau omi, Sariba, Logea, Panayati omiu.)

5.29 Isoglosses Linking Motu and Eastern Languages

A number of lexical isoglosses connect Motu and the Eastern Central District languages, including the following: (1) MTU gari, HUL kali, SIN gari-vini 'to fear'. (2) MTU ha-bona, SIN bonana, KEA ponana 'to smell (tr.)'. (3) MTU kamonal, KEA, ARM amona/g/i, HUL a/kamona/g/i 'to hear'. (4) HUL tau-limalima, MTU tau-nimanima, KEA, ARM au-ni-limalima 'person'. (5) HUL, KEA polapola, SIN borabora, MTU la-bora 'yellow'. (6) SIN, MTU bema 'if'.

6.0 CONCLUSION

It remains to summarize the linguistic findings of the study and to examine their culture historical implications.

6.1 Summary of Linguistic Findings

In section 4, it was observed that the Central District languages participate in all the regular sound changes diagnostic of the Oceanic subgroup of Austronesian. In section 5.22 it was found that they also share several lexical and grammatical innovations characteristic of the Oceanic group. There can be little doubt, therefore, that the Central District languages share a period of common development with other secure members of the Oceanic group, i.e. with the languages of Polynesia, Micronesia (excluding Palauan, Chamorro and possibly Yapese), and all the better known Austronesian languages of Melanesia.

On examining the stock of Proto-Oceanic morphemes which persist in present-day Central District languages, we found that nine regular sound changes are common to all the Central District speech traditions for which adequate data were available, and that the most important of these have also taken place in the remaining languages, Magori, which is not yet well documented. No external language is known to exhibit this particular combination of sound changes. The most economical

explanation for these facts is that the Central District languages form a closed subgroup of Oceanic. The qualitative lexical evidence was seen to support this conclusion: a number of apparent lexical innovations, common to all major branches of the Central District group, are not known to occur elsewhere. We did not carry out extensive lexicostatistical comparisons with outside languages; from the few comparisons made it is uncertain whether a Central District subgroup is lexicostatistically definable or not.

Part of the period of unified development undergone by the Central District languages after the breakup of Proto-Oceanic was probably shared with at least some of the Milne Bay District languages. All the better known languages of mainland New Guinea east of Wedau and its immediate relatives, share with the Central District languages the merger of POC *d and *R, and the merger of *s and *ns, as well as the less significant merger of *n and *ñ. In some words but not others, Dobuan and Molima also show two further developments in common with the Central District group: $i < *u$ after *o|, *u|, and loss of *l before *i, conditioned changes which occur regularly in PCD: Evidence was insufficient to establish whether these developments in Dobuan and Molima were regular, sporadic or due to borrowing. The fact that Suau lacks them perhaps argues against a historical connection between the Dobuan-Molima and the Central District developments, because other qualitative lexical evidence suggests that Suau is at least as closely related, and possibly closer than Dobuan and Molima, to the Central District group.

These three Milne Bay languages (and others) show at least two irregular phonological developments in grammatical morphemes which are also found in the Central District languages, and share with them several lexical items not known to occur outside of South-east Papua. Both the phonological and lexical evidence, then, provide some support for assigning the Central District languages to a subgroup with Suau, Dobuan and Molima, excluding all languages outside of South-east Papua. The name 'Milne Bay' will be used here for this putative group, without implying that all Milne Bay languages belong to it.

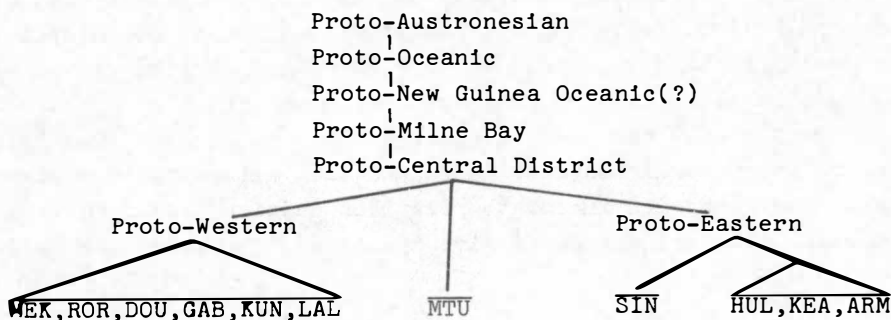
Certain qualitative evidence was found to suggest that Suau is closer to the Central District languages than either is to Molima or Dobuan. Suau (and its immediate relatives Gadaisu, Sagarai, Bohutu, etc.) share the dominant possessive marker e-, the type Hula *valiu* 'new'

(evidently from POC *paqoRu), the meaning 'to know' for the type HUL rīpa, and the type HUL rupa'rupa 'black', exclusively of Dobuan and Molima and other languages of the d'Entrecasteaux Islands and north coast of Papua. The amount of evidence is so far insufficient, however, to make a strong case for a Suau-Central District subgroup.

Milke's (1958, 1965) and Capell's (1969) arguments for a large subgroup of Oceanic comprising most of the Austronesian languages of New Guinea east of Humboldt Bay were noted. The Central District languages exhibit many of the features considered to be diagnostic of a New Guinea Oceanic subgroup; however, the present evidence for such a grouping is not nearly as persuasive as that supporting, say, the Oceanic grouping, or the Central District grouping.

The Central District subgroup, excluding Magori, appears to divide into three first-order subgroups. Phonological, lexicostatistical and qualitative lexical evidence strongly indicate an Eastern subgroup, comprising Sinagoro, Hula, Keapara and Aroma. The last three appear to form a dialect chain which is discrete from the Sinagoro dialect chain. Phonological and qualitative lexical evidence indicate (somewhat less strongly) a Western subgroup comprising Mekeo, Roro, Doura, Gabadi, Kuni and Lala. Motu forms a third branch by itself. However, all lines of evidence indicate that Motu has been geographically intermediate between the Eastern and Western groups since the dissolution of Proto-Central Papuan. It was concluded that the dissolution of Proto-Central Papuan was the result of gradual separation of dialects within a chain, rather than of the sudden dispersal of people speaking a homogeneous language. Extensive borrowing continued to take place between the subgroups after the decisive three-way split took place.

The principal subgrouping conclusions may be set out in skeletal form as follows:



6.2 Cultural Historical Implications

From the dry bones of linguistic facts we have reconstructed a linguistic genealogy for the Central District languages. The question arises: is such a skeleton of any use to the culture historian? Assuming the correctness of a given genetic classification of languages, are there any inferences about non-linguistic facts which may safely be drawn from it, e.g. inferences about the location and size of prehistoric speech communities, the nature and frequency of interaction between them, directions of population movement, etc.?

It is commonly assumed that linguistic classifications do provide evidence for inferences about non-linguistic events. Rarely, however, does one find explicit statement of the basis for such an assumption.⁶ I think it is still uncertain just what kinds of culture historical conclusions may be validly drawn from linguistic classifications, and that such classifications may prove to be of less use than is often supposed.⁷

Before returning the skeleton to the linguists' cupboard, however, the culture historian will at least want to examine it carefully for clues, and to distinguish between (a) inferences which are unjustified because the assumptions on which they are based are false, and (b) inferences which are unjustified only because the assumptions underlying them have not been made clear. The following is a brief discussion of some assumptions which underlie the inferences to be drawn here. These are set out as a framework of principles.

Principle 1. A language that is learnt as a native language by successive generations of speakers is said to have 'strong genetic continuity' or to be 'natively transmitted'.

Principle 2. For native transmission to be maintained over several generations or longer, a language must be spoken by a population which has other social cohesion besides possession by its members of a common mother tongue. It must consist of a community of native speakers who are numerous enough to replace themselves, feed themselves, defend themselves, maintain their separate linguistic identity in competition with other linguistic communities, and who use the language in a sufficient range of contexts for children raised in the community to acquire native-speaking competence.

In theory, a language could be transmitted natively by a community of four: a man and a woman rearing a boy and a girl in each generation. However, the existence of incest taboos, disease, warfare, and many other factors require a minimal community considerably larger than this. The desert island situation may permit a relatively smaller community

to persist for a short period than in normal situations where different language communities are in contact, but even here the number of native speakers presumably must include members of several different nuclear families.⁸

Principle 3. All languages constantly change.

Principle 4. In languages which are natively transmitted, change is gradual.⁹ It is gradual in this sense: a child reared in a given language community will understand without difficulty the speech of members of the community who are one generation older than himself, will have little if any difficulty in understanding the speech of the second ascending generation, and so on. No child, however, will learn a grammar or lexicon which is exactly like that of older speakers, or indeed exactly like that of any member of his peer group, but any peer group will agree in losing some features found in the language of older speakers, while adding others.

The cumulative effect on intelligibility of gradual change over a long period can, unfortunately, be tested only by appeal to written texts. Such a test is not completely satisfactory for measuring loss of intelligibility in spoken forms, for reasons that are well known. But it is surely significant that there are no well-known cases of written languages changing so fast that present day readers cannot understand fairly well texts on non-specialist subject matter written 200 or 250 years earlier. Typically there is some loss of intelligibility after a period of 250 years, or about 10 generations, considerable loss after 500 years, great loss after 1,000 years, and so on. (Cases where the writing system itself has changed, or where it is ideographic, are of course excluded.)

Principle 5. If two languages (a) show regular sound correspondences in a large body of semantically similar lexical items, including 'basic' or culture-free vocabulary and in grammatical elements, and (b) show relatively few exceptions to the rules for which a natural explanation is unavailable and if (c) the differences between the phonological and grammatical systems of the two languages can be largely accounted for in terms of gradual internal changes, these languages show strong genetic relationship. That is, they are genetic continuations, by native transmission, of an earlier single language.

Principle 6. For two mutually unintelligible languages to develop from one, while each maintains native transmission or strong genetic continuity,

there must be a split in the parent language community such that one part of the community ceases to be in regular contact with the other for a long period.¹⁰ Conversely, for a language to persist as a unity, no part of the speech community must be out of regular contact with the rest for a long period.

While no exact definition of 'long period' can be given, Principle 4 indicates that for severe loss of mutual intelligibility to occur, the period of isolation must be on the order of at least two or three centuries, and possibly longer. (Allowing that two contemporary speech traditions, once isolated, may in some cases diverge twice as much from each other in one century as either diverges from the common proto-language in the same period.)¹¹

The definition of 'regular contact' and 'isolation' also remains a problem. Undoubtedly, the nature and frequency of contact needed to maintain unity varies with such factors as size of language community, geographical spread of speakers, etc.

Principle 7. Under prehistoric conditions, a language community which undergoes a period of unified development is likely to do so while remaining in approximately the same place. That is, it is unlikely that a prehistoric language community will have evolved as a unity in one place for a certain length of time, then have moved to another distant place while still maintaining its unity. Rather, it is probable that such a move will involve only part of the community, and linguistic splitting will follow the move. Cf. Principle 9.

Principle 8. The likeliest location of a proto-language can be determined by the principle of fewest and shortest moves. This principle predicts that the breakup of a language will result from population movements to near locations rather than to distant ones, and will result from settlement of a small number of new locations rather than a large number.¹²

Thus, in determining the location of a proto-language from a given family tree, the hypothesis to be preferred is the one which requires fewer and shorter population movements to account for the distribution of the daughter languages.

8(1). It follows from Principle 8 that a proto-language is most likely to have been spoken in that area where its genetically most diverse descendants (measured in terms of first-order subgroups) are found.

8(2). It follows from principle 8 that if a proto-language A is itself an interstage (the ancestor of a subgroup) whose descendants occupy an area A, and if A is coordinate with another interstage B, whose descendants occupy an area B, A is more likely to have been spoken in a part of A which is close to B than in a part which is distant, and vice versa. Thus, if A is Proto-West Germanic, and B is Proto-North Germanic, A and B are more likely to have been spoken in adjacent areas of Northern Germany and Southern Scandinavia, respectively, than, say, Switzerland and Iceland.

Principle 9 (specific to New Guinea). No prehistoric Austronesian language community in the New Guinea area persisted as a unity while maintaining a geographic distribution larger than the largest Austronesian language community in this area at first European contact. Once the language community dispersed over a larger region, loss of cohesion, and linguistic divergence was inevitable.

The logic underlying Principle 9 is this. It is generally accepted that the New Guinea area was peopled by speakers of Papuan languages long before the spread of Austronesian began. Thus, it is unlikely that Austronesian communities colonizing New Guinea found any large unoccupied expanses of habitable territory. Once settlement was established, expansion was restricted by the presence of Papuan-speaking communities, as well as by other factors. In the few places where large continuous areas were settled by Austronesians, linguistic cohesion was difficult to maintain. This seems to be clearly borne out by the distribution and size of Austronesian language communities today.

The 200 or so Austronesian languages of the New Guinea mainland area are confined almost exclusively to the coastal strip (and small offshore islands). They occupy only a small proportion of the total coastline; in fact, no Austronesian languages are spoken on the entire stretch of south coast between Cape Possession, in the Central District, and the neck of the Bird's Head, in West Irian. The largest stretch of coastal territory occupied by any one language community is roughly 70 miles (by Motu). No coastal community extends more than 10 miles or so inland. Austronesian languages located entirely inland are very few, and generally quite small. There seems to be no reason to believe that in remote prehistoric times conditions were any more favourable to the existence of large cohesive language communities than in recent times.

Principles 1-8 deal with what we have called 'strong genetic relationship'. What, then, might 'weak genetic relationship' be?

Capell's (1943) analysis of the history of the Southeast Papuan languages appears to imply a contrast between two kinds, or at least, degrees of genetic relationship.

Like Ray (1926), Capell regarded the 'Melanesian' languages as being of mixed origins. He rejected Dempwolff's thesis (see section 2) that all the Austronesian languages of Melanesia have a single common origin, belonging to the branch of Austronesian now known as Oceanic. Instead, Capell proposed that several waves of Austronesian speakers, originating in different parts of Indonesia and the Philippines, moved into Melanesia at different times. There they encountered communities speaking Papuan languages, many of whom adopted the languages of the Austronesian intruders with a substrate residue. In some languages this residue is relatively small, but in many, including most of the Austronesian languages of the New Guinea area, it is large. All the 'Melanesian' languages, however, show some degree of influence from Papuan substrata, and differ from the languages of Indonesia and the Philippines in showing a much smaller 'Austronesian content'. The latter is defined in terms of the number of Proto-Austronesian (PAN) lexical items and grammatical elements retained. At least for the lexicon, Austronesian content is specifically equated with Dempwolff's (1938) PAN reconstructions which admit as PAN only forms with reflexes in Indonesian languages.

Before the arrival of Austronesian languages, Capell suggests, "three general types of language may be posited as existing" in Southeast Papua (Capell 1943:267). He calls these the North-East Coast, Southeastern, and Central Regional languages. These languages were largely replaced by Austronesian languages, but they deeply influenced these Austronesian languages in grammar and vocabulary. If I understand Capell correctly, the Mailuan (Magi) group of languages on the south coastal area of Papua are descended from one of the three Papuan Regional languages, possibly the Central language. So too, possibly is Yele (Yela) of Rossel Island.

Capell is not very explicit about the socio-linguistic processes involved in the replacement of Papuan languages by Austronesian languages. He suggests that Southeast Papua received as many as three or four infusions of Austronesian material, each associated with a different

Austronesian 'movement'. Evidently, as a result of each movement the originally Papuan languages were impregnated with more and more Austronesian content. Some languages received more infusions than others, e.g. Mailu shows relatively little Austronesian content and is still classified as Papuan. Others, like the precursor of Motu, were much more deeply affected, and were so essentially transformed that their descendants are now usually classified as Austronesian. However, they are not Austronesian in the same sense as Indonesian languages, apparently lacking 'strong genetic continuity' in the sense of Principles 1, 4 and 5. Rather, the Melanesian languages are mixed languages, which might be regarded either as Papuan languages transformed into Austronesian-like languages, or as Austronesian languages transformed into Papuan-like languages.

Whether the transformation was typically gradual, or whether it took place in one or more short periods of dramatic reorganization, following the arrival of a movement from Indonesia, is not altogether clear, but I make the latter interpretation.¹³

If this is actually what happened, or if languages do undergo periods of catastrophic change of approximately the sort posited by Capell, perhaps we can speak of 'weak genetic relationship', or degrees of genetic relationship. Capell does not use the term 'Pidgin' of the early stages of Melanesian languages (although Ray (1926) does), but what he is proposing sounds very much like pidginization. And there seems to be general agreement that, under certain socioeconomic conditions, a speech tradition can undergo extraordinarily rapid change, in the course of being learnt by non-native speakers. The clearest cases of pidgins violate several of our principles concerning 'strong genetic continuity', including Principle 1, requiring native transmission, Principle 4, requiring gradual change, and possibly Principle 5.

A crucial question, however, is whether there are any linguistic criteria which will tell us whether a given language shows weak genetic continuity, i.e. has undergone a period of rapid reorganization resulting from acquisition by a community of non-native speakers who eventually adopt it as their mother tongue.

It does not seem that the usual test of genetic relationship - the existence of regular sound correspondences in a core of basic vocabulary and grammatical items - will discriminate between strong and weak genetic continuity. For example, New Guinea Pidgin shows a large body of such items in which sound correspondences are regular.¹⁴

It must therefore be regarded as genetically related to 'ordinary' varieties of English, and to be a continuation of 19th century English.

But there are some linguistic clues that suggest to us that New Guinea Pidgin has undergone pidginization. Although it shares many innovations with English apart from other Germanic languages, which mark it as having diverged very recently from other varieties of English, it is also strikingly different from other varieties of English. The differences include many which are difficult to explain as natural internal reworkings, but which can easily be explained as resulting from influence by Austronesian languages. An obvious instance is the pronoun system. The morphemes are all English, but the system is otherwise identical to that found in many Oceanic languages, e.g. it exhibits the '1st person inclusive/exclusive' distinction, the dual vs. plural number distinction, and absence of gender contrast in 3rd person singular, all features which are not found in other Germanic languages. And beside the large core of regularly corresponding vocabulary, there is a body of irregular correspondences with English which is perhaps surprisingly large considering the recency of separation.

This suggests the following principle.

Principle 10. A language which is acquired and transmitted by a community of non-native speakers, shows 'weak genetic continuity' in a language A exists when that language (a) belongs to a subgroup with B, apart from C, (b) diverges more sharply from B in grammar and phonology than B does from C, in ways that are not explainable by gradual internal change, but are explainable by large-scale reworking of the grammatical and phonological systems under the influence of an unrelated language, (c) shows a larger number of irregular phonological developments than would be expected given the subgrouping relationships.

I do not have any great confidence in the adequacy of this principle. These kinds of evidence are probably not the only kinds, nor necessarily conclusive evidence, for weak genetic continuity. However, I think that an attempt to unravel the history of the Melanesian languages cannot ignore the problems pointed to by Capell or the explanations he has offered. Besides accounting for the similarities among the Austronesian languages we must also explain the differences. And it is undoubtedly true, as Capell and many others have insisted, that many

'Melanesian' languages show remarkably few cognates with other Austronesian languages.

Others have questioned the necessity of positing pidginization, or Papuan substrata, as the main explanation for Melanesian diversity.¹⁵ With regard to the Central District group, I doubt that it is necessary to assume loss of native transmission, or catastrophic change following acquisition by Papuan-speaking communities, at any point between Proto-Austronesian and the present. The possibility cannot be completely ruled out, but so far I find little in the phonology or grammar of Central District languages that could not be accounted for by assuming gradual change of natively transmitted Austronesian languages, spoken by communities who are surrounded by Papuan languages and borrow from them from time to time.

Assuming 'strong genetic continuity', then, what do Principles 1-9 tell us about the prehistory of the Central District language communities?

PROTO-OCEANIC

Some time after the breakup of PAN, a community speaking Pre-Oceanic existed as a unity for a period in the 'North New Guinea area' before dispersing. The dispersal of this community resulted in the breakup of the Oceanic parent language, i.e. Proto-Oceanic (POC). By 'North New Guinea area' I mean the north coast of New Guinea between the Sarmi coast and the Morobe District, and the Bismarck Archipelago. Previous writers (e.g. Grace 1961: 367; 1964: 37) have placed POC in approximately the same area. (It is of course implied that the community occupied some small part of this area, not the whole of it.)

Principle 8(1) locates POC in the general area of Melanesia because this is the area of greatest genetic diversity, but does not allow us to specify a particular subregion as the likeliest homeland. This is because the first-order subgroups of Oceanic area are not agreed on. We can, however, rule out Polynesia and Micronesia because each appears to contain only a single low-order subgroup of Oceanic. Within Melanesia two areas of diversity stand out. One, which we can call 'Southern Melanesia', comprises the New Hebrides, the Loyalties, New Caledonia and the Santa Cruz group. So far no one has suggested even weak grounds for assigning all the languages of Southern Melanesia to a single subgroup, or even for finding a single subgroup encompassing any two of the major island groups.

The other extremely diverse area is the 'North New Guinea area'. We have seen (section 5) that there are some grounds for recognizing a large New Guinea Oceanic group comprising most of the mainland languages of the eastern half of New Guinea, together with certain languages of Southwest New Britain - although scholars are by no means agreed that this is a valid subgroup. But no one has provided good cause for assigning the remaining languages of New Britain to this subgroup, or even to a single New Britain subgroup (see Chowning 1969). Similarly, the languages of New Ireland, the Admiralty Islands, and the Sarmi coast (Grace 1962) each forms a group or groups which has so far not been included in any larger subgroup (except that Kuanua of New Britain is regarded as a recent immigrant from New Ireland).

The principle of fewest and shortest moves, and specifically, Principle 8(2), allows us to choose the New Guinea region over Southern Melanesia as the likelier homeland: the former is that area of great diversity which is closest to the nearest external relatives of Oceanic.

There is increasing evidence (Blust n.d.) that the nearest relatives of Oceanic are to be found in eastern Indonesia and the western end of New Guinea itself. In any case, all the relatives of Oceanic lie to the west or north of New Guinea, and are remote from Southern Melanesia.

When did the POC community disintegrate? Our principles supply no dates, but on other grounds it seems unlikely that the community remained a unity after about 3,000 B.C. First, archaeological evidence indicates that material cultures which can be strongly associated with Oceanic languages were distributed from one end of Melanesia to the other, and were in West Polynesia, by 1,000 B.C.¹⁶ There is some evidence that Oceanic languages were spoken in New Caledonia as early as 3,000 B.C. Second, glottochronology indicates that the breakup of POC occurred not later than 5,000 years ago and possibly a good deal earlier. Indeed, it indicates that linguistic differentiation within half a dozen Oceanic-speaking regions - the New Guinea north coast, New Britain, the Western Solomons, the New Hebrides, the Loyalties, and New Caledonia - had probably begun by 3,000 B.C. While a large range of error must be allowed for glottochronological dates - especially at this order of time depth - these dates are not inconsistent with archaeological testimony, or with other indices of the degree of linguistic diversity.

PROTO-MILNE BAY

At least one community descended from POC moved down the northeast coast of New Guinea into Southeast Papua. Possibly this movement occurred after a period of unity with other 'New Guinea Oceanic' languages.

After developing for a time in isolation from languages to the west, this Southeast Papuan community shattered into communities speaking the languages ancestral to Dobuan and Molima, the Suau languages, and the Central District languages, respectively. The earlier, unified stage, which we have called Proto-Milne Bay, was probably ancestral to some other languages of Southeast Papua, including most of the mainland languages east of Wedau. However, I do not mean to imply that it was ancestral to all Oceanic languages of Southeast Papua.

Principle 8 places the Proto-Milne Bay community in the region of the d'Entrecasteaux Islands and/or the facing mainland coast, rather than on the south coast of Papua. In the first place, the immediate external relatives of the Milne Bay group (with the possible exception of some other languages of the north coast, such as Wedau and Mukawa, and some languages of the Louisiade group) lie further west on the north side of New Guinea. Second, there is some evidence (admittedly not conclusive) that the Suau and Central District languages differentiated after their separation from Dobuan and Molima. Such a subgrouping would increase the homogeneity of the south coast, and further reduce its claims to be the dispersal centre of the Milne Bay group.

Likeliest glottochronological dates for the dissolution of Proto-Milne Bay fall between 3,000 and 4,500 years ago. If we exclude comparisons of Suau with Dobu and Molima, which may yield percentages inflated by borrowing, the dates are in the 3,500-4,500 B.P. range.

PROTO-CENTRAL DISTRICT

If Suau and the Central District languages did remain a unity after diverging from Pre-Dobuan-Molima, it was not for long. According to glottochronology, Suau probably separated from Motu, Kuni and Gabadi around 3,700 years ago (see section 5.1); qualitatively, there is only a small amount of evidence for a Suau-Central District grouping exclusive of Dobuan and Molima (see 5.2).

The development of the Proto-Central District stage can be associated with a period of isolation following movement of speakers of a Milne Bay language into the Central District. The Central District

community remained a fairly close-knit unity for several centuries, before diverging into three dialect groups, ancestral to Motu, the Western languages, and the Eastern languages, respectively. The divergence of the Pre-Western and Pre-Eastern communities occurred between 2,500 and 3,400 years ago, according to glottochronology. Comparisons involving Motu yield shallower time depths. Glottochronology dates the divergence of Motu from its immediate neighbours at between 1,500 and 2,000 years ago. What this probably means is that while regional diversification began soon after the settlement of the Central District, a Proto-Central District dialect chain, with Pre-Motu in the centre, persisted for another 1,000 years or more. Mutual intelligibility between Motu and its immediate neighbours may have been maintained until at least A.D. 500, though the extremes of the dialect chain were probably quite divergent by this date.

This chronology is largely based on the glottochronological dates, and may be wrong. Again, however, archaeology provides at least some support. The early results of excavations in the Central District are discussed by Allen (1972), who concludes that a new population, with a mixed economy based on gardening and pig raising, and heavily supplemented by fishing and hunting, occupied the Central District coast and offshore islands some 2,000 years ago. These people made a fine-red slipped or burnished pottery with shell-stamped and incised motifs, and their pottery and other features of their cultural assemblages strongly indicate that they were Austronesian-speaking.¹⁶

The likeliest location of Proto-Central District, in the stage before advanced dialect diversification occurred, is indicated by Principle 8 to be in the coastal area and islands between Hall Sound and Hood Bay, an area which encompasses members of the three major subgroups. The position of Magori remains a problem, however. Discovery that Magori is an isolate coordinate with a group comprising all other Central District languages would affect inferences about the location of the proto-language. But on present evidence, it seems likely that Magori is an early offshoot of the Eastern subgroup (Dutton n.d.2), which established a beachhead among the Papuan-speaking peoples occupying the south coast from Cheshunt Bay almost to Mullins' Harbour. At the time of the first Austronesian movement into the Central District, Papuan languages were presumably spoken in this area; it was these which may have acted as a barrier preventing establishment of a dialect chain connecting the Pre-Suau speech communities (whose descendants extend to the western side of Mullins Harbour) and the Pre-Central District communities.

Two matters of culture historical interest which lie outside the scope of this paper are (a) reconstructions of vocabulary attesting the material culture and way of life of the Proto-Central District community and other proto-language communities, and (b) lexical diffusion in the Southeast Papuan region.¹⁷

NOTES

1. Many people have contributed to this work. Preliminary research was carried out at the University of Papua New Guinea in 1969, by myself and members of the Oceanic Culture History class: M. Buluna, A. Farapo, G. Gray, P. Leitao, N. Lutton, V. Maragao, P. Markis, S. Robertson and M. Saville. The University of Papua New Guinea provided a grant allowing Mr. W. Tomasetti and me to collect some 950 basic vocabulary lists from students at the University and at schools throughout Papua. Mr. Tomasetti acted as guide, interpreter, and research assistant during several short excursions to the field in Papua in 1969. Andrew Taylor and Tom Dutton each supplied word lists and other information on several languages of the Central District. Michael Davis provided information on Roro dialects, and Russell Cooper on the Suau dialect-chain.

Sections of a draft of this paper were read by Robert Blust, George Grace, Peter Lincoln, John Lynch and David Walsh, and Irwin Howard discussed with me problems in the treatment of sound change. Many improvements have been made as a result of their commentary. Errors which remain are of course my own.

2. 215 word basic vocabulary lists for virtually all Austronesian languages spoken in Papua (including those given in Pawley and Dutton (in press)) were compared, together with lists for more than 100 languages of other regions of New Guinea and Island Melanesia.

3. The Proto-Oceanic reconstructions are discussed in detail in Pawley (in press).

4. See Pawley, in press.

5. Omission of the second *m* from (underlying) forms of the shape $m_1 V m_2 V$ appears to be a fairly common (?dissimilatory) development in both adult and child speech. This, together with the sporadic distribution of the *m*-less pronouns within Austronesian makes it more reasonable to suppose that *-*m*- was lost several times independently than to suppose that the forms **kai* and **mai* co-existed as underlying forms in Proto-Austronesian, with **kami* and **mami*, only to be lost many times independently in daughter languages.

6. Dyen (1956) explores in detail principles for drawing inferences about prehistoric migrations from the geographical distribution of related languages (cf. fn. 12). See also Pawley and Green (in press) for some proposals concerning the relating of archaeological and linguistic facts.

7. Biggs (1972) examines critically the usefulness of linguistic subgrouping for culture historical reconstruction. At one point in his critique, he questions (pp. 147-9) the applicability of Dyen's (1956) migration theory to Polynesia, using as an illustration the difficulty of determining the Eastern Polynesian homeland. He observes that the Marquesas and the Society Islands, which have been regarded by culture historians as possible homelands, are unlikely candidates - they are too remote from Western Polynesia, which was presumably the location of the earlier, Proto-Nuclear Polynesian stage. Biggs suggests that it is more likely that Eastern Polynesian islands closer to Western Polynesia would be "settled first in the upwind struggle to the east", noting for example that "...It seems incredible that the Marquesas, separated by more than 2,000 miles and many intervening island chains from the Samoic and Tongic areas, would have been the area of Eastern Polynesia first settled." (pp. 147-8).

It is necessary, however, to distinguish between two uses of the term 'homeland'. Some culture historians have used it to mean the first area settled by speakers of a given linguistic tradition - in this case, the first part of Eastern Polynesia settled by Polynesian speakers. This use is distinct from that of Dyen. He uses 'homeland' to mean the location of a given proto-language (community) immediately before its breakup into surviving branches. Thus, to say that the Society Islands was not the first area of Eastern Polynesia to be settled, is not to deny that these islands could have been the location of the Proto-Eastern Polynesian community. It is quite possible that, say, the Northern Cooks was the first area settled, but that the language we know as Proto-Eastern Polynesian evolved in the Society Islands. This would be the case if (a) the Northern Cooks language derived from an earlier branching than Proto-Eastern Polynesian, with the Pre-Eastern Polynesian branch spoken in the Northern Cooks either becoming extinct, or surviving as a non-Eastern Polynesian enclave (Pukapukan being such an enclave), and if (b) the Pre-Eastern Polynesian branch that settled the Society Islands evolved into Proto-Eastern Polynesian,

whose descendants later dispersed over virtually the whole of Eastern Polynesia, sometimes replacing other languages. The principle of fewest moves (cf. fn. 12) does not by itself permit us to make inferences about the first settlement of Eastern Polynesia. It does permit us to make inferences about the location of Proto-Eastern Polynesian and certain subsequent movements of populations speaking Eastern Polynesian languages. Biggs' discussion shows, however, that distance as well as number of moves must be taken into account, in making inferences about homelands and population movements.

8. Pitcairn English is one potentially valuable source of information concerning linguistic change in an extremely small, isolated community: it is not clear from present evidence whether Pitcairn English can be considered a strong genetic continuation of 18th century English. But Pitcairnese is simply one of many such speech communities in the Pacific, which is one vast unexploited natural laboratory for the study of linguistic change under varying conditions.

9. I do not mean to imply that a language community consists of several discrete generations or age-groups, each with a language that is internally homogeneous but slightly different from that of other age-groups, or that a language is at any one time a uniform system which changes imperceptibly from year to year. As in the evolution of species, the seeds of linguistic change lie in the countless variations which exist in the population at any one time. In the case of language this includes not only variations between the speech of individuals, each of whom recreates the language in the act of learning it, but also more or less standardized variations, such as those which distinguish different styles or registers, regional and social dialects, etc. Cf. Kiparsky, 1968:175.

10. It has been suggested that linguistic splitting can occur even when regular contact is maintained, as in a socially stratified society where the speech forms of higher and lower strata diverge. While it is true that distinct dialects may develop under such conditions, I know of no cases where mutually unintelligible languages have developed within a single society. And the process of linguistic splitting is not completed until two distinct languages have developed.

11. This will, perhaps, rarely happen because of linguistic drift, i.e. the tendency of similar linguistic systems to change in similar ways.
12. See Dyen (1956) for discussion of what he calls the 'postulate of least [i.e. fewest] moves'. Essentially this is that "the probabilities of different reconstructed migrations are in inverse relation to the number of reconstructed language movements that each requires. In other words, if two reconstructed migrations differ in the number of necessary language movements, the one with the fewer movements has the greater probability." (Dyen 1956:613).
13. Ray (1926) is fairly explicit on this question. He says that the Indonesian (i.e. Austronesian) words in Melanesia "have the characteristics of a pidgin-tongue. They can no longer be referred, except in rare cases, to any one original [Indonesian] tongue, and are on a par with the modern pidgin of the Pacific where the so-called English has such words as 'savvy', 'pickaninny' and 'wewe'." (p. 597). To Ray, certain "characters of the vocabulary and grammar suggest that the [Indonesian] in [Melanesian] is a foreign element, introduced by colonists from the west. These settled on some of the smaller islands which became centres of trade and influence in the sea round about, the pidgin-[Indonesian] of the settlement eventually modifying and introducing a certain amount of likeness into the originally different [Papuan] dialects. This would persist, even after the disappearance of the settlers as a distinct community, and words would survive in much the same way as Celtic words survive in Saxon English or Italic French." (p.597). Cf. fn. 15.
14. Sound correspondences between New Guinea Pidgin (as represented by current standard orthography) and Australian English are discussed in an unpublished paper (Pawley n.d.), where a high degree of regularity in the correspondences is reported.
15. Objections to the 'mixed' or 'pidgin' theory of the origins of Melanesian languages have been raised by many scholars, including Grace (1965, 1968) and many of the commentators on Capell (1962). Dyen (1965) explains the lexical diversity of Melanesian languages as a function of great time depth, suggesting that Melanesia may have been the original dispersal centre of Austronesian. While few have agreed

with the latter suggestion, many would agree that Melanesia was an early dispersal center for Austronesian, and specifically, Oceanic languages.

16. The grounds for associating certain archaeological traditions with Austronesian languages are elaborated in Pawley and Green, in press.

17. This last is of course a principal subject of Capell's (1943) work. Dutton (1971b) has concerned himself with the problem of lexical diffusion in Southeast Papua, particularly with reference to the origins of Magori vocabulary.

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