NOTES ON THE HISTORY OF
TIGAK PHONEMES

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1.0 INTRODUCTION

Tigak[1] is an Austronesian language spoken by just over 4000 people who live in the northern part of New Ireland in Papua New Guinea. It has been classified as a member of the Northern New Ireland subgroup of languages (Beaumont 1972: 15) which also includes Lavongai, Kara, Tiang, Nalik, Notsi and possibly Tabar. This subgrouping is in turn part of a wider New Ireland - Tolai grouping[2] which includes most of the twenty languages of New Ireland and the Duke of York and Tolai languages of New Britain. In Grace's classification (Pawley 1972: 5; Grace 1955, 1968) the New Ireland - Tolai grouping is one of 19 co-ordinate branches of Oceanic (earlier called Eastern Malayo-Polynesian).

It is possible to study the history of the sounds of present-day Tigak in relation to reconstructions for two proto-languages - Proto-Austronesian and Proto-Oceanic.[3] All the Tigak phonemes[4] except /b/ may be accounted for from these two related sources. In the process of doing this, the membership of Tigak within the Oceanic group of Austronesian is clearly confirmed.

In his brief study of the phonological history of some of the Austronesian languages of West Irian (1971: 12-14) Grace states his reasons for using Proto-Oceanic as a starting point rather than the more remote Proto-Austronesian. In the present study I have followed the same practice but I have also used Proto-Austronesian as a subsidiary reference. This makes the link between Proto-Oceanic (PO) and Proto-Austronesian (PAN) more explicit. A further advantage is that the reconstruction of PO is not yet as well developed as the reconstruction of PAN and dual reference provides a firmer basis.

As this study depends on these proto-languages they are discussed briefly first in 2.1 to 2.3. Reflexes in Tigak for each Proto-Oceanic sound are presented in section 3. In giving examples, PAN reconstructions are cited as well, where the PO reconstructions appear to derive from them. A summary of the origin of the Tigak phonemes is given in 4.0.

2.0 PROTO-AUSTRONESIAN

Proto-Austronesian is the source of about 500 present-day languages which spread over a vast area, from Madagascar in the west to Easter Island in the east, and from New Zealand in the south to Taiwan and Hawaii in the north. The major work in the reconstruction of Proto-Austronesian remains that of Dempwolff (VLAW[5] 1934-38). His work has been criticized but not supplanted.

The reconstructions of PAN words used in section 3 are based on those made by Dempwolff. The orthography changes advocated by Dyen (1971: 23) for use "without phonetic prejudice" are made. In addition Dyen's restatements concerning the laryngeals (1953, 1971: 36-40) are followed and also his change of *-aj to *-ey (1949: 421fn., 1971: 27). The changes made are:
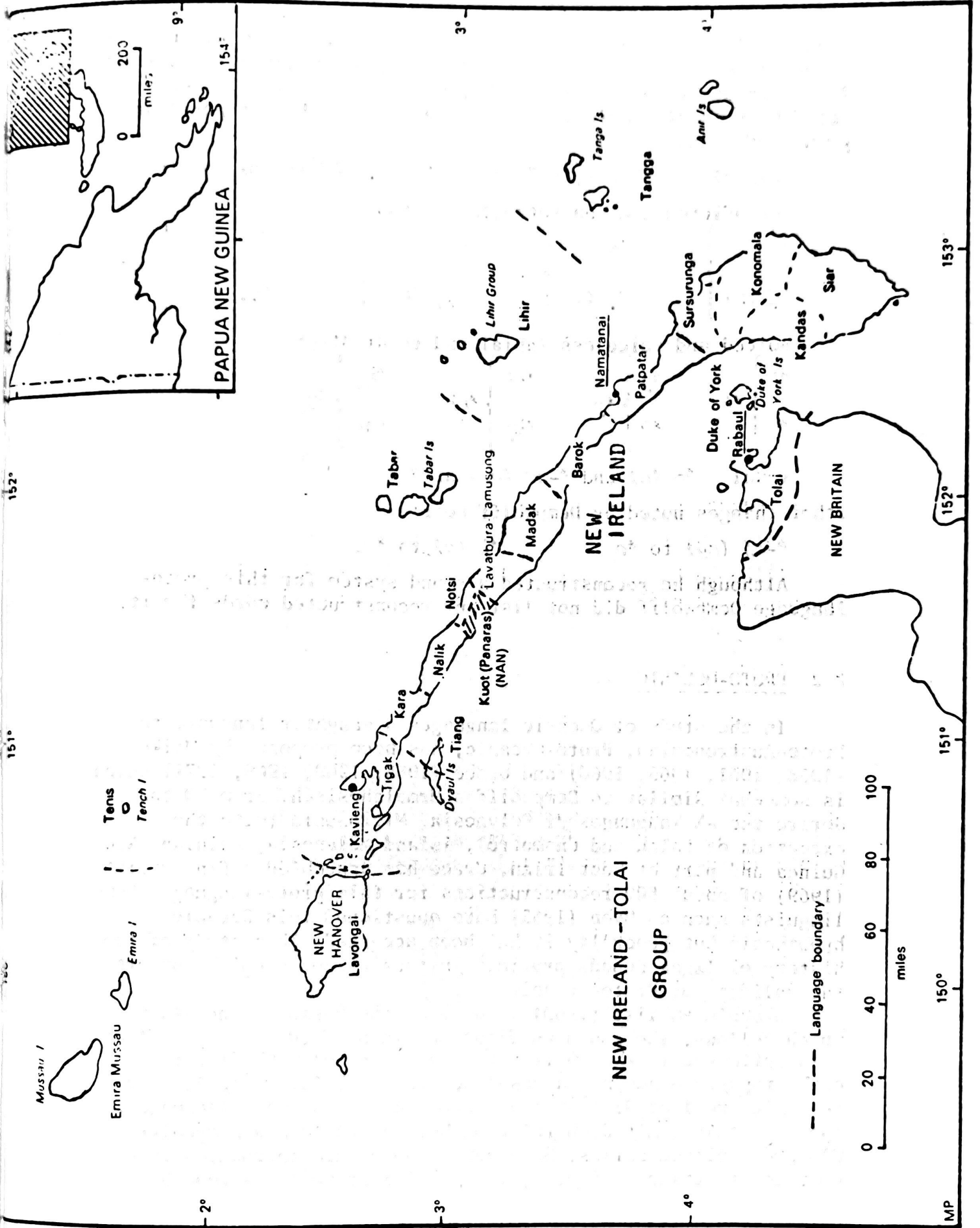
Dempwolff	Dyen		Dempwolff	Dyen
ə	e		k^-	c
v	w		g^-	j
ṭ	T		γ	R
ḍ	D		h	q
ḷ	r		<	ø, h
t^-	s		aj	ey
d^-	z			
n^-	ñ			
j	y			

These changes make the PAN reconstructions easier to compare with those for PO. Other changes suggested by Dyen (1971) are not followed as they introduce further complications which are not relevant to this study. Five reconstructions which are not in the VLAW are quoted from Capell (1943 and 1971) and Blust (1970) and are clearly identified on the first occasion they occur.

2.1 DEMPWOLFF'S URMELANESISCH

In the second volume of the VLAW Dempwolff considered some major groupings of AN languages, based mainly on sound changes. His three groups are Indonesian, Melanesian and Polynesian. Dempwolff takes the Indonesian group as the main grouping and concludes finally (1937: 194) that his Urindonesisch can be called Uraustronesisch. He also identifies (p.192-3) the similarities between the Melanesian and Polynesian sound systems and also some further unification of sounds in Polynesian.

Dempwolff (1937: 166) summarized a number of sound changes between his Urindonesisch (=PAN) and Urmelanesisch. Although these changes were illustrated only in relation to Fijian and Sa'a (Solomon Islands) (p.125-64), ten other Melanesian languages were also examined (p.164-5) including two, Pala (=Patpatar) and
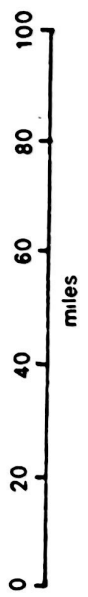
PAPUA NEW GUINEA

NEW IRELAND – TOLAI
GROUP

- - - Language boundary

Tuna (=Tolai), which are in the same New Ireland - Tolai group as Tigak. As well as languages in Melanesia, Dempwolff also included languages of Micronesia in his Melanesian group. The changes noted by Dempwolff were the coalescing of a number of pairs or groups of sounds:

palatals *d̂ (z), *t̂ (s), *ĝ (j), *k̂ (c) as *d̂ (z)

retroflexed and non-retroflexed stops

$$
\left.\begin{array}{l} *d \\ *ḍ \ (D) \end{array}\right\} *d \qquad
\left.\begin{array}{l} *t \\ *ṭ \ (T) \end{array}\right\} *t \qquad
\left.\begin{array}{l} *nd \\ *nḍ \ (nD) \end{array}\right\} *nd \qquad
\left.\begin{array}{l} *nt \\ *nṭ \ (nT) \end{array}\right\} *nt
$$

voiced and voiceless labial and velar stops

$$
\left.\begin{array}{l} *b \\ *p \end{array}\right\} *b \qquad
\left.\begin{array}{l} *g \\ *k \end{array}\right\} *g \qquad
\left.\begin{array}{l} *mb \\ *mp \end{array}\right\} *mb \qquad
\left.\begin{array}{l} *ŋg \\ *ŋk \end{array}\right\} *ŋg
$$

vowel *ə (e) and *-av (aw) as *o.

Other changes noted by Dempwolff were:

*-aj (ey) to *e   *h (q) to *k.

Although he reconstructed a sound system for this proto-language Dempwolff did not list any reconstructed words for it.

2.2 PROTO-OCEANIC

In the study of Oceanic languages a daughter language to Proto-Austronesian, Proto-Oceanic, has been proposed by Milke (1958, 1961, 1965, 1968) and Grace (1955, 1968, 1969, 1971) which is somewhat similar to Dempwolff's Urmelanesisch. From PO they derive the AN languages of Polynesia, Micronesia (with the exception of Palau and Chamorro), island Melanesia, mainland New Guinea and part of West Irian. Grace has assembled a finder list (1969) of about 800 reconstructions for this proto-language. Some linguists such as Dyen (1965) have questioned this Oceanic hypothesis but generally it has been accepted. This study of the history of Tigak sounds provides further evidence which supports the validity of Proto-Oceanic.

Grace's PO list (1969) is used as the basis in the study which follows. The sound unifications identified by Dempwolff are also reflected in the PO list though sometimes with different orthography.[6] Grace has a nasal series, *mp, *nd, *nt, *ŋk and *ns which reflect distinctions found in many Oceanic languages. There is only limited correlation between these and Dempwolff's PAN prenasalized series. Some new phonemes are introduced in the PO reconstructions - *ŋp, *ŋm, *nj (similar to *s) - though Grace

(1969: 42-44) gives these (and *r) only qualified endorsement. Correspondences between PO and PAN and Tigak are summarized below in Table 1.

In using the PO reconstructions I have followed Grace's orthography except for some modification of the use of bracketing, discussed below. All are from Grace (1969) except that for three examples (5, 7 and 83) the form is from Grace's more recent article (1971). Grace's list is compiled from several sources (Biggs 1965, Capell 1943, Goodenough 1961, Grace 1961, Milke 1958, 1961, 1965, 1968). As some reconstructions were made for Eastern Oceanic, which is to be considered one of .the branches of Oceanic coordinate with New Ireland - Tolai (Pawley 1972: 5), these are marked as PEO, though some at least probably go back to PO.

Grace (1969) brackets the final consonant in a number of reconstructions and in 1971 he brackets all of them with the statement that "these final consonants are generally based on PAN evidence, and do not necessarily indicate that the consonant has been observed in Oceanic languages". Most of these PAN final consonants are retained in Tigak and, where this is the case, the brackets are removed. These examples are: 1 *punu(q), 4 *pula(n), 19 *laŋi(t), 24 *ndanu(m), 27 *kuli(t), 35 *mimi(R), 40 *ika(n), 47 *qunsa(n), 61 *sala(n), 63 *ansa(n), 83 *mapana(s). Capell (1971: 300-3) gives other evidence of some of these final consonants occurring in Oceanic languages.

Brackets are also removed from 5 *pu(n)ti. 11 *mpe(e)mpe(e) is written as *mpempe and 62 *k(au)nsupe is written as *kunsupe. Otherwise brackets are retained. If two or three sounds are bracketed it means that it is uncertain which sound occurred. If one sound is bracketed this means that the sound may possibly have been part of the form.

Table 1 which follows indicates the main correspondences between PAN and PO and also summarizes the Tigak reflexes which are discussed individually in the sections which follow. PO is used as the central point of reference and where evidence of correspondence in PAN or Tigak is inadequate, phonemes in these lists are bracketed. The symbol Ø means a zero reflex, while - means that no equivalents to the reconstructions containing the particular phoneme have so far been found. The table does not include all the sounds reconstructed for PAN but only those that appear to be reflected in PO reconstructions.

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TABLE 1

Correspondences between PAN, PO and Tigak

PAN	PO	TIGAK
b, p	p	p, ∅
(b, mp)	mp	ß, p
(b)	ᵐp	(ß, p)
ω	ω	(β)
t	t	t
(t, nt)	nt	r
d, D	d	l
(d)	nd	r
r	r	-
l	l	l
R	R	-:-, -k, (l-)
k	k	k, ∅
(k)	ŋk	(k)
q	q	k, ∅, (i-)
m	m	m
(m)	ŋm	(m)
n	n	n
ŋ	ŋ	ŋ
s, z, j, c	s	s, (t, r, l-)
s, z, j	ns	s
-	nj	-
y	j	i
a	a	a, (ω)
-ey	e	e, -∅
i	i	i, -∅
e, aw	o	o, u, -∅
u	u	u, -∅

3.0 REFLEXES OF PROTO-OCEANIC SOUNDS IN TIGAK

The major features revealed in a diachronic study of Tigak phonology are the retention of final consonants which are lost in most Oceanic languages and the loss of most final vowels other

than *a. As no reflexes have yet been positively identified for
*nj or *r these are omitted from consideration. Evidence for some
of the other phonemes is inadequate but it is included.

Reference to the forms of reconstructions used has already
been made in 2.3 and 2.1. Where Grace has given more than one
possible meaning for a reconstruction, only those most relevant
have been included. Meanings of Tigak and PAN forms are given
only if they differ from that given for the PO form. A third
person object suffix -i is attached to Tigak transitive verbs.
Examples are numbered consecutively for cross referencing. The
number is bracketed when the example is first quoted in full.
When it is necessary to quote an example again the same number is
used. As additional evidence, only the number and the Tigak reflex
are given.

3.1   BILABIALS

The two main bilabials in the PO list, *p and *mp, generally
show different reflexes though two examples (11 and 12) show some
overlapping. *ŋp and *w are not common in the PO list and the
small amount of evidence indicates similarity with *mp.

3.1.1   PO *p (PAN *b, *p)

PO *p in initial position is reflected in Tigak as p or else
lost. In medial position *p is lost. *p is only reconstructed in
final position in a few words and no reflexes of these have so
far been found.

Reflexes as p are:

(1)   PO *punuq   'strike, kill' (PAN *bunuq)
      TK punuk-i   'kill'

(2)   PO *poli   'buy, sell' (PAN *beli)
      TK pul-i

(3)   PEO *puki   'return'
      TK ulpuk-i   'change', tapuok   'return'

Other examples are 34 pakpakal and 83 pinpin.

Loss of p is equally frequent:

(4)   PO *pulan   'moon' (PAN *bulan)
      TK ulan

(5)   PO *punti   'banana' (PAN *punti)
      TK ur

(6)   PO *topu   'sugar cane' (PAN *tebu)
      TK tu

(7) PO *saŋapulu 'ten' (PAN *puluq)
    TK sa'ŋauluŋ

Other examples of loss of *p* are 65 *uaia* and 71 *un*. The syllable containing *p* is lost in 62 *kusia* and 64 *so*.

3.1.2 PO *mp

This is reflected as β or *p*. Only five examples have been found.

Reflexes as β are:

(8) PO *mpoRo 'pig' (PAN *beRek - Blust 1970)
    TK βogo

(9) PO *mpua 'areca (betel) nut' (PAN *buaq 'fruit')
    TK βuai

(10) PO *tumpu 'grandparent, grandchild' (PAN *tumpu 'ancestor')
    TK tiβu-

Reflexes as *p* are:

(11) PO *mpempe 'butterfly' (PAN *mbembe - Capell 1971: 258)
    TK pepe

(12) PO *tampu 'ritual restriction protected by supernatural sanction' (PAN *tambu - Capell 1943)
    TK tap

3.1.3 PO *ŋp

Reflexes of *ŋp appear similar to *mp but only two examples are found, one of β and one of *p*. For the example of *p* the reconstruction was made for Eastern Oceanic.

(13) PO *ŋpoŋi 'night' (PAN *beŋi)
    TK βuŋ

(14) PEO *ŋpatu 'head' (PAN *baTuk)
    TK patu

3.1.4 PO *w

PO *w is reflected as β in the only example found:

(15) PO *qalawa 'mother's brother'
    TK laβa

3.2 ALVEOLARS

Although evidence is inadequate it appears that the PO
reconstructions reduce to three in Tigak - *t remains t; *nd and
*nt become r; *l and *d become l.

3.2.1 PO *t (PAN *t)

This is reflected as t in all positions:

(16) PO *taliŋa 'ear' (PAN *taliŋa)
     TK talaŋa

(17) PO *tama 'father' (PAN *ama)
     TK tama-

(18) PO *mata 'eye' (PAN *mata)
     TK mata

(19) PO *laŋit 'sky' (PAN *laŋit)
     TK laŋit 'rain'

Other examples include 6 tu, 10 tiβu, 27 kulit, 45 tuk, 54 natu,
67 mat.

3.2.2 PO *nt

*nt is not common in the PO list and only two reflexes have
been found, both showing r:

(20) PO *-nta 'our (inc)' (PAN *kita 'we')
     TK -ra

5   PO *punti⁷ 'banana' (PAN *punti)
     TK ur

3.2.3 PO *d (PAN *d, *D) and PO *r (PAN *r)

There is some doubt whether *d and *r should be distinct in
Proto-Oceanic. In the PO list they are sometimes bracketed as
alternatives. For the reconstructions containing *r no definite
reflexes have so far been found in Tigak. Evidence for *d is also
inadequate but it suggests that *d like *l is reflected as l.

(21) PO *doŋo 'hear' (PAN *deŋeR)
     TK pa'loŋ-an-i 'hear', loŋok 'listen'

(22) PO *(dl)iki 'small' (PAN *Dikiq)
     TK lakliak

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In one example *d is lost:

(23) PO *dua 'two' (PAN *Duwa)
    TK pauak

This example can be considered a probable reflex of the PO *dua as the prefix pa- or po- precedes several numerals in Tigak (Beaumont 1974: 155 and cf. 29 po-'tul). The addition of a final consonant in Tigak is not unusual (see 3.9). The PO *dua is clearly reflected in the other New Ireland languages (Lithgow and Claassen 1968: Chart III; Capell 1971: 256).

3.2.4 PO *nd

Only two examples are found with a reflex of *nd and in both cases this is r.

(24) PO *ndanum 'water' (PAN *danum)
    TK ru'rum (syllable reduction and reduplication)

(25) PO *ndaula 'frigate bird' (possibly PAN *dara 'pigeon')
    TK raula

3.2.5 PO *l (PAN *l)

PO *l is consistently reflected as l.

(26) PO *laŋo 'a fly' (PAN *laŋaw)
    TK laŋ

(27) PO *kulit 'skin' (PAN *kulit)
    TK kulit 'body'

(28) PO *lo 'in'
    TK lo

Other examples include 2 pul-i, 7 sa'ŋauluŋ, 16 talaŋa, 19 laŋit and 61 salan.

*l is not reconstructed in final position but l does occur finally in Tigak, because of the loss of some final vowels:

(29) PEO *tolu 'three' (PAN *telu)
    TK po-'tul

3.3 VELARS

Three of the reconstructed sounds, *q, *k and *ŋk, appear to merge in Tigak as k, although there are a number of instances of ∅. This merger applies to the whole New Ireland - Tolai group (Beaumont forthcoming). Reflexes of *R vary according to position.

3.3.1 PO *R (PAN *R)

PO *R is reflected as g in medial position, k in final position and possibly as l in initial position.
Examples showing reflex as g are:

(30) PO *kaRati 'bite' (PAN *kaRat)
    TK kagat-i

8   PO *mpoRo 'pig' (PAN *beRek)
    TK βogo

(31) PO *noRa 'yesterday'
    TK nenogo

(32) PO *tuRaŋ 'friend, kinsman'
    TK tiga- 'brother'[8]

Examples showing k are:

(33) PO *qatoluR 'egg' (PAN *teluR)
    TK katiluk

(34) PO *paRa 'shoulder' (PAN *baRa)
    TK pakpakal

(35) PO *mimiR 'urinate' (PAN *miRmiR)
    TK mimik

(36) PO *saliR 'flow' (PAN *aliR)
    TK salik

Evidence for l initially is inadequate. The only example could be explained as a borrowing from another New Ireland language or merely coincidence:

(37) PO *Ruŋma 'house' (PAN *Rumaq)
    TK lui (cf. Duke of York, Kandas ruma. Siar rumai, Sursurunga rum, Lavongai lui, Tiang lu, Lihir liom, all in or adjacent to New Ireland).[9]

Reflection of PO *R as l or r is seen in several New Ireland languages, as can be seen from the data for 'pig' PO *mpoRo listed by Capell (1971: 257-8) as well as from the data given for the example above.

3.3.2 PO *k (PAN *k)

PO *k is generally reflected in Tigak as k:

(38) PO *-kai 'one'
    TK saʰkai

27 PO *kulit 'skin' (PAN *kulit)
    TK kulit

30   PO *kaRati 'bite' (PAN *kaRat)
      TK kagat-i

(39) PO *lako 'go, walk' (PAN *laku)
      TK lak 'go up, enter'

      Also 3 ulpuk-i, 22 lakliak, 62 kusia.
      Loss of *k in Tigak occurs in some words. All of these are examples where the other New Ireland languages also show loss of *k. There are some apparently irregular reflexes in Tigak and some of the other languages, but these are best explained as showing loss of *k with later additions.
      Examples of loss of *k are:

(40) PO *ikan 'fish' (PAN *ikan)
      TK ien

(41) PO *manu(k) 'bird' (PAN *manuk)
      TK manui[10]

(42) PO *kutu 'louse' (PAN *kutu)
      TK ŋut (cf. Lavongai, Kara ŋut, Tolai, Patpatar, Notsi ut, Siar fut)

(43) PO *kai 'tree' (PAN *kayu or *kaqiw)
      TK iai (cf. Lavongai iai, Kara wai, Tabar ei, Tolai davai, Duke of York diwai, Kandas rakai).

      Data for the other New Ireland languages for 'fish' and 'bird' has been published by Capell (1971: 257-8) and for 'louse' and 'bird' by Lithgow and Claassen (1968: Chart III). From this data it is clear that *k in *ikan and *manuk is lost in all New Ireland languages. *k of *kutu is lost in languages of the southern half of New Ireland, while in the northern half ŋ is found in four languages (Tigak, Lavongai, Kara and Tiang). Kandas is the only language that shows a regular reflex of *k for *kai. A more regular set of reflexes for *k in New Ireland languages may be seen in the list for 'leg' (PAN *kaki 'foot', Tigak kak) given by Lithgow and Claassen (loc. cit.).

3.3.3 PO *ŋk

      This is reflected as k:

(44) PO *-ŋku 'my' (PAN *-ŋku)
      TK -k

3.3.4 PO *q (PAN *q)

      PO *q is reflected as k or non-syllabic i, or lost. The two

examples of *i* (both initial) may represent loss of **q* with later addition of *i*.

The reflex *k* is seen in the following:

(45) PO **tuqu(d)* 'stand' (PAN **tuquD*)
TK *tuk*

(46) PO **qone* 'sand'
TK *kono*

32 PO **qatoluR* 'egg' (PAN **teluR*)
TK *katiluk*

1 PO **punuq* 'strike, kill' (PAN **bunuq*)
TK *punuk-i*

Loss of **q* is seen in:

(47) PO **qunsan* 'rain' (PAN **quzan*)
TK *usan* 'rain heavily'

(48) PO **quma* 'garden' (PAN **quma* 'orchard')
TK *uma*

(49) PO **tuqa* 'old, older sibling of same sex' (PAN **tuqa* 'old')
TK *tuan* 'eldest sibling'

Examples which now have non-syllabic *i*[11] are:

(50) PO **qate* 'liver' (PAN **qatey*)
TK *iat*

(51) PO **qanso* 'sun' (PAN **qanjaw*)
TK *ias*

3.4 NASALS

Nasals are very consistent.

3.4.1 PO **m* (PAN **m*)

This is reflected as *m* in all positions:

18 PO **mata* 'eye' (PAN **mata*)
TK *mata*

17 PO **tama* 'father' (PAN **ama*)
TK *tama-*

(52) PO **inum* 'drink' (PAN **inum*)
TK *i'num*

Other examples include 24 *ru'rum*, 35 *mimik*, 41 *manui*, 48 *uma*, 67 *mat* and 73 *-m*.

3.4.2 PO *ŋm

This is reflected in only one example. The reflex is *m* though this could be interpreted as *mʷ*.

(53) PO *ŋmata* 'snake'
TK *muata* (*mauta* in Western dialect)

3.4.3 PO *n (PAN *n)

PO *n is reflected as *n*.

(54) PO *natu* 'child, offspring'
TK *natu*

41 PO *manu(k)* 'bird' (PAN *manuk*)
TK *manui*

(55) PO *laman* 'sea'
TK *la'man*

Other examples include 1 *punuk-i*, 4 *ulan*, 61 *salan*, 40 *ien*, 31 *nenogo*, 52 *i'num*.
Loss of *n has only been found in one example:

24 PO *ndanum* 'water' (PAN *danum*)
TK *ru'rum* (*rum* with later reduplication)

3.4.4 PO *ŋ (PAN *ŋ)

PO *ŋ is reflected as ŋ but is lost from the final position of PO reconstructions, though loss of many final vowels leaves ŋ at the end of some present Tigak words.
Reflex as ŋ is seen in the following:

(56) PO *ŋusu* 'lips, mouth' (PAN *ŋusu*)
TK *ŋur* 'mouth'

(57) PAN *paŋan* 'eat' (cf. PO *kani* and PEO *paŋa*)
TK *ŋan* (cf. Kara *ŋan*, Lavongai, Siar *aŋan*)

(58) PO *noŋi* 'beg, ask for'
TK *nuŋ-i*

Other examples are 19 *laŋit*, 26 *laŋ*, 13 *ßuŋ*, 16 *talaŋa*, 21 *pa'loŋ-an-i*.
Loss of final ŋ is seen in:

(59) PO *isu(ŋ)* 'nose' (PAN *ijuŋ*)
TK *isu-*

Another example is 32 *tiŋa-*.

3.5 SIBILANTS

3.5.1 PO *s (PAN *s, *z, *j, *c)

PO *s is reflected as s initially or medially, provided that this does not become word final due to loss of final vowel. In final position in the Tigak word, limited evidence suggests that *s is reflected as t or r. There are few examples of *s in final position in a PO reconstruction, and no definite reflexes of these have been found for Tigak.

Reflex as s is seen in:

(60) PO *susu 'breast' (PAN *susu)
     TK sut

(61) PO *salan 'road, path' (PAN *zalan)
     TK salan

59 PO *isu(ŋ) 'nose' (PAN *ijuŋ)
    TK isu-

Reflex as t is seen in 60 sut above, and r is seen in:

56 PO *ŋusu 'lips, mouth' (PAN *ŋusu)
    TK ŋur 'mouth'

3.5.2 PO *ns

This is reflected as s:

(62) PO *kunsupe 'rat' (possibly PAN *tikus)
     TK kusia

(63) PO *ansan 'name' (PAN *ajan)
     TK asan

(64) PO *nsapa 'what' (PAN *apa)
     TK so

51 PO *qanso 'sun' (PAN *qanjaw)
    TK ias

Other examples are 70 poisan, 68 panasai.
*ns is not reconstructed in final position for PO.

3.6 SEMI-VOWEL

3.6.1 PO *y (PAN *y)

*y is not common in the PO list. Only one cognate has been

found in Tigak and the reflex for *y in it is a non-syllabic *i*:

(65) PO *puqaya* 'crocodile' (PAN *buqaya*)
    TK *uaia*

3.7 VOWELS

A five vowel system is used for PO and also in my analysis of Tigak. Dempwolff reconstructed a four vowel system for PAN. Reflexes in Tigak vary from PO in a few instances but they are generally similar. Final *o*, *u*, *e*, and *i* are usually lost.[12]

3.7.1 PO *a* (PAN *a*)

PO *a* is generally reflected as *a*:

55 PO *laman* 'sea'
    TK *la'man*

(66) PO *-na* 'his' (PAN *-ña* - Capell 1943)
    TK *-na*

18 PO *mata* 'eye' (PAN *mata*)
    TK *mata*

Other examples with consistent reflexes include 4 *ulan*, 17 *tama*, 19 *laŋit*, 30 *kagat-i*, 33 *katiluk*, 50 *iat*, 54 *natu*, 15 *laβa*, 61 *salan*.

There are a few examples which show variations:

30 PO *noRa* 'yesterday'
    TK *nenogo*

64 PO *nsapa* 'what' (PAN *apa*)
    TK *so*

39 PO *ikan* 'fish' (PAN *ikan*)
    TK *ien*

Loss of *a* appears to be confined to instances such as 64 above where the number of syllables is reduced. Other examples of this are listed in 3.9.

3.7.2 PO *e* (PAN *-ey*)

PO *e* is reflected as *e* in medial position but it is not common. In final position *e* is usually lost. Only one PO reconstruction begins with *e* and this has no reflex in Tigak.

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Reflex as *e* is illustrated by:

11 PO *mpempe* 'butterfly' (PAN *mbembe*)
   TK *pepe*

Loss of final *e* is shown in:

(67) PO *mate* 'die' (PAN *matey*)
     TK *mat*

50 PO *qate* 'liver' (PAN *qatey*)
   TK *iat*

Variations from this are found in two examples:

46 PO *qone* 'sand'
   TK *kono*

(68) PO *anse* 'chin' (PAN *azey*)
     TK *panasai* (Lavongai *asai*)

3.7.3 PO *i* (PAN *i*)

PO *i* is generally reflected as *i* in initial and medial position and lost in final position. This loss is less obvious in relation to transitive verbs which generally have the 3rd sg. object suffix *-i*.

Reflexes as *i* include:

35 PO *mimiR* 'urinate' (PAN *miRmiR*)
   TK *mimik*

59 PO *isu(ŋ)* 'nose' (PAN *ijuŋ*)
   TK *isu*

and also 27 *kulit*, 40 *ien*, 19 *laŋit*, 52 *i'num*.
   Loss of final *i* is seen in:

13 PO *ŋpoŋi* 'night' (PAN *beŋi*)
   TK *βuŋ*

(69) PO *maqati* 'reef'
     TK *mat*

Other examples are 5 *ur*, 22 *lakliak* and the verbs 3 *ulpuk-i*, 2 *pul-i* and 30 *kagat-i*.
   Variations include the following:

22 PO *(dl)iki* 'small' (PAN *Dikiq*)
   TK *lakliak*

16 PO *taliŋa* 'ear' (PAN *taliŋa*)
   TK *talaŋa*

Another example appears at first to show a variation:

(70) PO *pinsa* 'how many' (PAN *pija*)
TK *poisan*

However a likely explanation is that this is a regular reflex with the numerical prefix *po-* (cf. 23 and 29). The *p* of *pinsa* would have become medial and been lost following the usual rule for *p* in this position (3.1.1).

3.7.4 PO *o (PAN *e, *-aw)

This is generally reflected as *o* but it is sometimes lost in final position. *-oCu* and *-oCi* are reflected as -uC.[13]
Reflexes as *o* include:

8   PO *mpoRo* 'pig' (PAN *beRek*)
     TK βogo

21   PO *doŋo* 'hear' (PAN *deŋeR*)
     TK *paloŋ-an-i* 'hear', *loŋok* 'listen'

28   PO *lo* 'in'
     TK *lo*

Other examples are 31 *nenogo*, 46 *kono*. In these two instances *-oCa* and *-oCi* become *-oCo*.
Loss of final *o* is restricted to examples where the vowel of the preceding syllable is not *o:[14]

26   PO *laŋo* 'a fly' (PAN *laŋaw*)
     TK *laŋ*

39   PO *lako* 'go, walk' (PAN *laku*)
     TK *lak* 'go up, enter'

51   PO *qanso* 'sun' (PAN *qanjaw*)
     TK *ias*

Reflexes as *u* are found when *o* is followed by a consonant and final *i* or *u*. The final vowel is then lost:

2   PO *poli* 'buy' (PAN *beli*)
     TK *pul-i*

29   PEO *tolu* 'three' (PAN *telu*)
     TK *po-tul*

58   PO *noŋi* 'ask for'
     TK *nuŋ-i*

(71) PO *ponu* 'turtle' (PAN *peñu*)
     TK *un*

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Other examples are 13 βuŋ, and 6 *tu*.
   One variation of the general pattern is:

33   PO *qatoluR* 'egg' (PAN *teluR*)
     TK *katiluk*

3.7.5   PO *u* (PAN *u*)

   The main reflex of PO *u* is *u*. *u* is lost finally except
that it remains in some kinship and body part words which are
usually suffixed to indicate possession.
   Examples showing reflex as *u* include:

1   PO *punuq* 'strike, kill' (PAN *bunuq*)
     TK *punuk-i*

4   PO *pulan* 'moon' (PAN *bulan*)
     TK *ulan*

54   PO *natu* 'child, offspring'
     TK *natu*

(72) PO *uti(n)* 'penis' (PAN *uti*)
     TK *uti-*

Other examples are 5 *ur*, 27 *kulit*, 52 *i'num*, 14 *patu*, 10 *tiβu-*,
59 *isu*.
   Examples of loss of final *u* are:

(73) PO *-mu* 'your (sg)' (PAN *-mu* - Capell 1943)
     TK *-m*

(74) PO *tunu* 'to cook' (PAN *tunu* 'roast')
     TK *tun*

Other examples are 42 ŋut, 56 ŋur, 44 *-k*, 29 *po-tul*.
   Loss of non-final *u* is seen only in:

(75) PO *niu(R)* 'coconut' (PAN *niyuR*)
     TK *nik*

     PO *u* is modified to *i* in:

32   PO *tuRaŋ* 'companion, friend'
     TK *tiga-* 'brother' (cf. Lavongai *tuŋa*)

10   PO *tumpu* 'grandparent, grandchild' (PAN *tumpu*)
     TK *tiβu-*

3.8   VOWEL SEQUENCES

   Some VV sequences occur in the PO reconstructions though

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Dempwolff did not allow for any in PAN. Each vowel is treated as a separate phoneme.

Some of these sequences have identical reflexes in Tigak:

(76) PO *au 'I' (PAN *aku)
     TK -au 'me' (object suffix)

(77) PO *tau 'man' (PAN *tawu)
     TK tauan 'men'

43   PO *kai 'tree' (PAN *kayu)
     TK iai

Other examples are 23 pauak, 25 raula, 38 sakai.

Only one vowel is retained in two examples:

(78) PO *nsai 'who' (PAN *sayi)
     TK na-si

(na- is an article - Beaumont 1974: 69, paragraph 4.2.2.)

75   PO *niu(R) 'coconut' (PAN *niyuR)
     TK nik

A further vowel is added in:

9   PO *mpua 'areca (betel) nut' (PAN *buaq[15] 'fruit')
     TK βuai

In one example there may be reduction to one vowel or metathesis:[16]

(79) PO *mai 'come' (PAN *maRi 'hither')
     TK ima (Southern dialect ma)

3.9 REDUCTION AND ACCRETION

In some reflexes syllable reduction other than the loss of single phonemes has taken place. Accretion, usually in the form of reduplication, sometimes takes place in the same word:

24   PO *ndanum 'water' (PAN *danum)
     TK ru'rum (*ndanum > *ndum > *rum > rurum)

Other examples of syllable loss are:

(80) PO *matudu(R) 'sleep' (PAN *tuDuR)
     TK ma'tuk 'lie down'

(81) PO *tina 'mother' (PAN *ina)
     TK (ri) na-

In this example ri is an article (Beaumont 1974: 90, paragraph 5.1.2.).

Whether there is actual syllable loss or accretion depends on the reconstructed form being correct and on it being assigned

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to the correct proto-language. In the following PO reconstructions the underlined syllables are not found in Tigak, but there is no corroborating evidence from PAN of their early existence: 15 *qalawa, 62 *kunsupe, 69 *maqati. Two examples not already quoted are:

(82) PO *pinsiko 'flesh'
TK pinpin 'skin'

(83) PO *mapanas 'hot' (PAN *panas)
TK manas

Loss of medial *p and *q (3.1.1 and 3.3.4) would account for the main change in examples 62, 69 and 83.

Two other examples of reduction are 57 ŋan (from PAN *paŋan) and 37 lui.

Accretion occurs in the form of prefixes which are no longer productive (21 pa'loŋ-an-i, 3 tapuok), reduplication (31 nenogo, 22 lakliak), addition of extra vowels (22 lakliak, 41 manui) and addition of final consonants (7 sa'ŋauluŋ, 70 poisan, 21 loŋok[17]).

4.0 PROTO-OCEANIC ORIGINS OF TIGAK PHONEMES

Words easily traceable to Proto-Oceanic and Proto-Austronesian form only a small part of the Tigak vocabulary, but only one of the present phonemes - b - is not found in any reflex from Proto-Oceanic.[18] A few distribution occurrences (e.g. initial g, final u) are not accounted for in terms of PO reflexes alone. Table 2 summarizes, with references, the origin of Tigak phonemes in relation to PO. Bracketing is used where evidence is slight.

TABLE 2

TIGAK	PROTO-OCEANIC			
β	*mp - 3.1.2.,	(*ŋp) - 3.1.3.,	(*w) - 3.1.4.	
p	*p - 3.1.1.,	*mp - 3.1.2.,	(*ŋp) - 3.1.3.	
b	none			
t	*t - 3.2.1.,	(*-s-) - 3.5.1.		
r	*nt - 3.2.2.,	*nd - 3.2.4.,	(*-s-) - 3.5.1.	
l	*l - 3.2.5.,	*d - 3.2.3.,	(*R-) - 3.3.1.	
y medial	*-R- - 3.3.1.			
k	*k - 3.3.2.,	*q - 3.3.4.,	*-R - 3.3.1.,	(*ŋk) - 3.3.3.

m	*m* - 3.4.1.,	(*ŋm*) - 3.4.2.		
n	*n* - 3.4.3.			
ŋ	*ŋ* - 3.4.4.			
s	*s* - 3.5.1.,	*ns* - 3.5.2.		
i syllabic	*i* - 3.7.3.,	(*u*) - 3.7.5.		
non-syllabic	*i* - 3.7.3.,	(*y*) - 3.6.1.,	(*q-*) - 3.3.4.	
e	*e* - 3.7.2.			
a	*a* - 3.7.1.			
o	*o* - 3.7.4.			
u	*u* - 3.7.5.,	*o* before consonant and final *u* or *i* - 3.7.4.		

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NOTES

[1] This paper is a revision of Appendix 2 of my thesis (1974) on the Tigak language. The remainder of the thesis is to be published by Pacific Linguistics. I am indebted to the following who have made

helpful comments on versions of this paper: Drs T.E. Dutton, D.T. Tryon, D.J. Prentice, Mr T.B. Wilson (all of the Australian National University), Dr A. Capell (Sydney) and Dr R. Clark (University of Auckland).

2   This was suggested by Grace (1955) and is discussed more fully by Capell (1971: 245, 254-65) and Beaumont (1972: 7-19). The name is from Pawley 1972 where Grace's classifications are summarized.

3   A brief study of the sound changes to all the New Ireland Austronesian languages is being published (Beaumont, forthcoming). As data is limited, I have not yet put forward reconstructions for any proto-languages for the New Ireland area. The phonemic analysis of Tigak on which this paper is based is that of my thesis (1974: 21-34). This varies from my earlier analysis (1969) in that the phonetic glide segments are now each interpreted as two separate phonemes. When stress does not fall on the first syllable this is indicated by a stroke ($'$) preceding the stressed syllable.

4   Phonemes occurring only in words borrowed from English or Pidgin (e.g. d, w, h, y, j - Beaumont 1974: 32-33) are excluded from consideration.

5   *Vergleichende Lautlehre des Austronesischen Wortschatzes.*

6   In PO *s is used for *dˀ (z) and *p and *k for *b and *g.

7   This is listed as *pu(n)ti by Grace (1971: 37). All prenasalization is bracketed in that article. In Grace (1969) it is listed as *puti. It is reconstructed as *punti for PEO (Biggs 1965: 397, Cashmore 1969: 17).

8   It is more satisfactory to derive *tiga-* from *tuRaŋ than from *tuqa 'old, older brother' (49). The reconstruction *tuRaŋ and supporting data are in Milke (1968: 167).

9   Capell (1971: 318-20) gives a wider listing of reflexes of *Ruŋᵐa in New Guinea AN languages.

10   There is also in Tigak a doublet *manmanuk* 'animal' which does show *k* retained.

11   These may be compared to 43 *iai*.

12   Single syllable words are to be excepted from this statement and similar ones in the sections which follow.

13   The symbol *C* represents any consonant.

14   On the data found so far, it would be possible to say that final *o is lost if the vowel of the preceding syllable is *a.

15   In Dempwolff's orthography this is *bu<ah.

16   Metathesis has not been found in any of the other Tigak reflexes from PO and this process is therefore considered doubtful here.

17   This final *k* may be a regular reflex from the PAN *R.

18   The phoneme *b* is rare and may be considered as a later development of minor significance. In the other dialects of Tigak *b* is not phonemically distinct from β.