

2.4.1. THE APPLICATION OF THE COMPARATIVE METHOD TO PAPUAN LANGUAGES: GENERAL AND HIGHLANDS

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2.4.1.1. INTRODUCTORY REMARKS

Early impressions given by the Papuan languages of the New Guinea area had been that they were exceedingly numerous, extremely complex, and mostly quite different from, and seemingly unrelated to, each other, with no connections existing between them and any outside languages. Only a few small groups of quite evidently closely interrelated languages had been recognized.

Only during the fifties, some order began to be established in the vast conglomerate of the Papuan languages, and the existence of a few quite large groups of obviously interrelated Papuan languages recognized in several parts of the New Guinea mainland (Wurm 1960). Until that time, the term "Papuan" had been applied to languages of the New Guinea area which were not Austronesian solely as a negative classificatory term labelling such languages as non-Austronesian.

These first steps were, during the late fifties and the sixties, followed by the establishment, in part in preliminary forms, of a quickly increasing number of separate, mostly quite large, groups of interrelated Papuan languages (Wurm 1971), largely by linguists connected with the Australian National University. This preliminary work was, for the greater part, carried out on the basis of lexicostatistical comparisons and detailed comparisons of language structure, with the extensive materials needed for this work in hundreds of separate languages generally obtained during extended fieldwork periods by the individual research workers themselves.

These methods were found to be generally adequate for combining languages into families, and families into stocks. Also, connections between

members of different stocks allowing the inclusion of two or several stocks into one particular phylum were recognizable in quite a number of instances which resulted in the preliminary establishment of over a dozen distinct phyla before the end of the sixties. This number of distinct established phyla was swelled to beyond twenty by the additional establishment of a number of phylum-level families and stocks, i.e. language families and stocks which constituted distinct phyla by themselves.

2.4.1.2. EARLY ATTEMPTS AT PAPUAN COMPARATIVE LINGUISTICS

In the work mentioned so far, comparative linguistics methods aimed at providing definite proof for genetic interrelationships between languages had been resorted to only to a limited extent, and had in most cases played only a relatively subordinate role. Nevertheless, some of the results achieved through their application had special importance inasmuch as they foreshadowed the existence, between Papuan languages, of wider connections whose exact nature was to be recognized only at a later date. A short review of these earlier attempts at comparative linguistics may be given here:

Wurm (1951) undertook a comparative study of the languages of the Kiwaian Family in the Fly Delta area of southern New Guinea which was then thought to be an isolated family. On the basis of limited materials, he reconstructed one hundred and twenty Kiwaian Family proto-forms and demonstrated the sound changes apparent in the reflexes. At the same time, he noticed the existence of regular sound correspondences between some Kiwaian Family and Marind (south-eastern Irian Jaya, then Dutch New Guinea) words, and also mentioned correspondences between Kiwaian Family words, and words in Binanderean and Koiarian languages in the south-eastern tail section of New Guinea. While hypotheses could be put forward by him in an attempt to explain the obvious connections between Kiwaian and Marind languages, no explanation could at that time be given to account for a portion of those between Kiwaian Family words, and the corresponding words in Binanderean and Koiarian languages. Today it is known that all these languages are in fact interrelated, and that early study provided the first indication of this.

A short time after the publication of Wurm's 1951 study, small-scale comparative work was undertaken by Drabbe (1953) in languages of the southern part of what was then Dutch New Guinea, viz. in languages which are now known to be members of a single family, the Asmat-Sempan-Kamoro Family (McElhanon and Voorhoeve 1970, see also 2.6.2.2.6.1. in this volume). A few years later, Bromley (1961) applied comparative linguistics methods in his study of the phonology of languages belonging to the Greater Dani Family located in the highlands of what was then Netherlands

New Guinea. Rosemary Young (1962) introduced comparative linguistics considerations into her study of the phonemes of four languages of one of the families of the East New Guinea Highlands Stock, in the Papua New Guinea Highlands, and Laycock (1965) included some comparative notes in his study of the Ndu Family in northern Papua New Guinea. Wurm carried out some preliminary comparative studies (unpublished) in languages of the East New Guinea Highlands Stock set up by him in the late fifties (Wurm 1960), in order to establish the correctness of his assumption of the existence of a genetic relationship between these languages. Healey (1964b) undertook detailed comparative linguistic work in the Ok Family straddling the central border area of Irian Jaya and Papua New Guinea, proving the genetic interrelationship of its member languages through reconstructing 406 proto-Mountain Ok, 159 proto-Lowland Ok and 134 proto-Ok forms. Bee (1965 and 1973) carried out similar work on a smaller scale in the languages of the Eastern Family of the East New Guinea Highlands Stock, reconstructing sixty Eastern Family proto-forms.

Bee based her reconstruction work on one hundred and eighty cognate sets of forms in seven communalects of the Eastern Family which according to Wurm's latest classification (see 2.7.2.2.3.) represent five distinct languages. After establishing the regular sound correspondences in the sixty least complicated and most transparent sets of cognates, she proceeded to reconstructing Eastern Family proto-phonemes, and Eastern Family proto-forms. The following are a few examples, with reflexes (the present writer has replaced Bee's symbols by the corresponding symbols in his own notation - see below 2.4.1.5.3. - to enhance comparability):

ear: *əʔraM

Tairora ato, Binumarien aaʔo:, Gadsup a:kami, Auyana aaʔa, Awa əre

hand: *-yə-u

Tairora kauʔu, Binumarien asauku, Gadsup aya:mi, Usarufa ayaamma,
Awa ayən

louse: *nu-M

Tairora numə, Gadsup numi, Usarufa numma, Awa nu

fire: *ida-V

Binumarien iʔda, Agarabi ira, Usarufa irama, Awa ira

say: *TE-

Tairora tiro, Gadsup seʔu, Agarabi temi, Usarufa tiyo

On the basis of Bee's work, the present writer carried out comparative work in languages of the various families of the East New Guinea Highlands Stock, and reconstructed a number of East New Guinea Highlands proto-forms. On this wider basis, he suggested proto-forms for the Eastern Family which differed from those proposed by Bee, e.g.:

	Bee	Wurm
<i>ear</i>	*əʔraM	*akTaM ~ *kaTaM
<i>hand</i>	*-yə-u	*kaSa(u)k ^{MÜ}
<i>louse</i>	*nu-M	*nuMa
<i>fire</i>	*ida-V	*iḍa-
<i>say</i>	*TE-	*TET ^m 0

The East New Guinea Highlands Stock proto-forms reconstructed by Wurm do not differ very significantly from the Eastern Family proto-forms reconstructed by him, e.g.:

	*Eastern Family	*East New Guinea Highlands Stock
<i>ear</i>	*akTaM ~ *kaTaM	*(0)KATAM
<i>eye</i>	*avu-Ta-ma	*avu-Ta-g ^m A
<i>hand, arm</i>	*kaSa(u)k ^{MÜ}	*kÖ(Sau)K ^{MÜ}
<i>skin</i>	*aTima	*KaTiMaʔa
<i>louse</i>	*nuMa, ¹ *numan	*numan
<i>fire</i>	*iḍa-	*iḍa ^{-te} _{-Pe}
<i>eat</i>	*nA	*nA
<i>say, speak</i>	*TET ^m 0	*(Ä)ČET ^(M) 0
<i>sleep</i>	*PAČ(i) ^a	*PAČ(i)(g) ^a

Some examples of reflexes of East New Guinea Highlands Stock proto-forms in East New Guinea Highlands Stock languages may be given:

ear: *(0)KATAM

Enga kare, Kuman kuna- (*-TA- > Ø), Kamano əgesa, Tairora ato, Awa əre (the last two *K- > Ø), Gadsup a:kami (*-TA- > Ø), Gants kenge (*-TA- > Ø), Wiru kapidi (ʔ)

hand: *kÖ(Sau)K^{MÜ} (also *arm*)

Note: *-(Sau)- has reflexes in only a few East New Guinea Highlands languages. In other instances *-(Sau)- > Ø has to be postulated. It is however attested from other Trans-New Guinea Phylum languages in which there are reflexes of the corresponding proto-Trans-New Guinea Phylum *-s^(r)ĩ(u)- in the proto-form *KÖs^(r)ĩ(u)Č^{MÜ} (see below 2.4.1.5.5.2.). Enga kingi, Kuman ongu, Kamano əga (the last two: *k- > Ø), Tairora kauʔu, Binumarien asauku (*k- > Ø), Gadsup aya:mi, Agarabi aya:n, Awa ayən (the last three: *k- > Ø)

¹On the basis of Eastern Family data alone, *nuMa seems justified because in Agarabe nun < East New Guinea Highlands Stock *numan (*-ma < Ø), the final -n appears to be equivalent to -m found in other forms such as Gadsup numi which may suggest -n and -m in these forms to be reflexes of *-M. Wider comparison has demonstrated that this assumption is in error.

louse: *numan

Enga lema (*n- > l), Kuman numan, Kamano -nema, Tairora nume, Gadsup numi, Usarufa numma, Awa nu (*-man > Ø)

fire: *iḍa-

Enga ita(te), Kuman ende, Kamano teve, Agarabi ira, Usarufa irama, Awa ira, Wiru toe

say, speak; talk, speech: *(Ä)čET^(M)Ø

Enga re (*say*), Kuman di- (*speak*), Kamano ge (*speech*) (the last three: *-T^(M)Ø > Ø), Tairora giro (*speak*), Agarabi temi (*speak*), Auyana siyo (*speak*), Kalam angəp (*speak*)

With few exceptions, the comparative linguistics studies referred to so far shared the feature of being carried out in groups of languages whose interrelationship had been demonstrated by other methods, and was quite obvious - one of the exceptions being perhaps the languages of the East New Guinea Highlands Stock taken as a whole. The results of these particular comparative studies supplied proof of the genetic nature of the already known interrelationship between the languages concerned.

2.4.1.3. INITIAL ATTEMPTS AT ESTABLISHING WIDER RELATIONSHIPS BY COMPARATIVE LINGUISTICS METHODS

One of the special features of the comparative linguistics approach, i.e. its suitability for the detection and establishing of genetic relationship between languages which are not known or believed to be inter-related, or whose interrelationship appears to be only very tenuous and not demonstrable by other methods, had been taken advantage of only to a very limited, though important, extent in the years before 1968. One interesting exception, apart from the one concerning the relationship of the Kiwaian Family languages to other languages as mentioned above in 2.4.1.2., concerns the re-construction of proto-forms of certain function morphemes. Wurm (1965) drew attention to the great similarity of suffixed subject markers appearing with sentence-final verbs in the languages of the East-Central and Eastern Families of the East New Guinea Highlands Stock. Pawley (1966) took up this point and gave proto-forms for the forms listed in Wurm 1965, at the same time pointing out that the proto-Eastern-East Central suffixes exhibited detailed similarity to the major allomorphs of subject suffixes in member languages of the Kalam Family which Wurm (1965) had until then regarded as constituting a stock-level isolate within the East New Guinea Highlands Phylum which at that time was thought to comprise the East New Guinea Highlands Stock, the Kalam stock-level family and what was then assumed to constitute three stock-level isolates. This similarity between languages classified as belonging

to different stocks suggested a closer relationship, and it could in fact be established subsequently that the Kalam Family was a member family of the East New Guinea Highlands Stock (Wurm 1971, see also 2.7.2.2.3.). Wurm pursued the question of the subject suffixes further and found some regular correspondences between the proto-Eastern-East Central and Kalam forms, and forms in languages of the Ok Family established by Healey (1964a). For instance, the suffixes of the 2nd sg., 3rd sg. and 1st pl. were proto-Eastern-East Central *-an, *-i (more probably *-ai in Wurm's opinion), *-un. The Kalam forms were -an, -a, -un, and major allomorphs in most languages of the Ok Family were -ab, -a (masc.), -ub. It was also notable that the 1st sg. marker was, in Wurm's view, proto-Eastern-East Central *-u(n), whereas Kalam had -in, and several Ok Family languages -in ~ -iin. There was only a vague suspicion of a possible relationship of the Ok Family to the East New Guinea Highlands Phylum at that time (Wurm 1964), and this discovery served to strengthen this suspicion which later proved justified (Wurm 1971, 1978).

At the same time, Wurm (unpublished) paid attention to the related question of the prefixed 1st, 2nd and 3rd singular object markers in a number of Papuan languages then believed to belong to several unrelated phyla, and found that the proto-forms *na-, *ka-, *a- could be posited for a considerable number of languages of what was then regarded as the East New Guinea Highlands Stock, the Huon Peninsula Phylum, the Anga phylum-level Family, the Ok Family, and also for languages in the highlands areas of Irian Jaya which had by then been included in a West New Guinea Highlands Phylum. This again strengthened vague earlier assumptions of some distant interrelationship between all these languages.

By 1968, enough evidence of a general nature had been accumulated to permit the tentative inclusion of seven or eight of the phyla and other phylum-level groups mentioned above in one large supergroup named the Central New Guinea Macro-Phylum (a term first suggested for such a group in Voegelins 1965) which occupied close to three-quarters of the New Guinea mainland and comprised hundreds of languages (Wurm 1971) (see also 1.3.3. in this volume). However, apart from a few indications such as those reviewed above, comparative linguistics evidence for a genetic interrelationship between these separate phyla was still lacking.

2.4.1.4. THE DISCOVERY OF THE TRANS-NEW GUINEA PHYLUM

The first major step in a new direction was taken by K. Franklin (personal communication, later published in Franklin and Voorhoeve 1973) who demonstrated the existence of regular sound correspondences between over sixty words in one member language of the East New Guinea Highlands

Phylum, and one of the Central and South New Guinea Phylum established by Voorhoeve (1968) (see 1.3.3.). At the same time, it was found by Voorhoeve (unpublished, quoted in Wurm 1971; McElhanon and Voorhoeve 1970) that the Duna language which Wurm (1964, 1965, 1971) had classified as a family-level isolate within the East New Guinea Highlands Stock, could also be classified as one within the Central and South New Guinea Phylum (see 1.3.4.). This was suggestive of the possibility that the two phyla might be combined into one, and that their interrelationship was rather closer than tentatively assumed earlier. Such a belief was enhanced, and its validity geographically extended, by McElhanon (1967) noticing structural similarities between languages of the Ok Family and languages of the Huon Peninsula area which were separated from the Ok Family by the large East New Guinea Highlands Phylum. Also, Voorhoeve (1969), in considering the problem of the genetic interrelationship between the Asmat language of the Central and South New Guinea Phylum and the Sentani language in north-eastern Irian Jaya, produced evidence favouring the assumption of the possible location of their proto-language in a low-lying swampy area, and he suggested the Sepik or Ramu basins as possibilities, though in the light of the overall picture of possible past Papuan linguistic migrations, the Upper Fly and more westerly regions may perhaps seem more likely (see 3.4.1. in this volume). Voorhoeve also noticed striking similarities between lexical data on Madang District languages given by Z'graggen (1971) and corresponding data in Central and South New Guinea Phylum languages.

Encouraged by these various discoveries which took place in 1967-68 though some of their results were published only much later, McElhanon and Voorhoeve proposed the hypothesis that the member languages of at least a few of the distinct phyla included in the Central New Guinea Macro-Phylum could be shown to be in fact members of a single phylum and relatively closely interrelated. To substantiate this hypothesis, they concentrated on comparing lexical items of the Central and South New Guinea Phylum, and the Finisterre-Huon Phylum which had superseded the Huon Peninsula Phylum in McElhanon's classification, considering languages of other potential phyla only marginally, and purposefully leaving out the geographically interposed East New Guinea Highlands Phylum from their deliberations.

In carrying out their work, McElhanon and Voorhoeve compared 85 items throughout, and not less than 53 of these yielded interphylic series of cognates (McElhanon and Voorhoeve 1970). In the majority of these cases, the members of the series were phonetically so close, and the sound correspondences between them so obvious and regular that these results could be regarded as evidence for a relatively close genetic relationship

between the languages considered. The two authors reconstructed proto-forms and established the sound correspondences involved only in a few instances, because of the discontinuous nature of the basis chosen by them for their work. Nevertheless, the results seemed most impressive, and persuaded the authors to alter the concept of a Central New Guinea Macro-Phylum as consisting of a number of separate, distantly interrelated phyla, and to establish a single large phylum, named by them the Trans-New Guinea Phylum which embraced several of the former phyletic members of the Central New Guinea Macro-Phylum in the form of the stocks previously composing them.

A point of great interest emerging from this work was the discovery of a small number of Austronesian loan words in Papuan languages located far away from any present-day Austronesian influence areas (see 2.5.4.2.2.) which was of great value in determining directions of language spread in earlier days (see 3.4.1.).

2.4.1.5. RECONSTRUCTION OF TRANS-NEW GUINEA PHYLUM PROTO-FORMS

2.4.1.5.1. INTRODUCTORY REMARKS

At this juncture, it was obvious that the next step was to be the comparison of the member languages of the East New Guinea Highlands Phylum, or at least of the large East New Guinea Highlands Stock, with those languages of the newly postulated Trans-New Guinea Phylum which had been drawn upon by McElhanon and Voorhoeve in their comparisons. Also, it was desirable to attempt the reconstruction of proto-forms in this.

The traditionally correct way to proceed in this would have been to reconstruct proto-forms for the individual families, followed by those for the stocks and then to compare the various stock proto-forms with each other with a view to reconstructing Trans-New Guinea Phylum proto-forms. Such a procedure has in fact been attempted in part through drawing on the few already proposed family and stock proto-forms, but there are two major difficulties: a) the very large number of languages involved which would delay obtaining results of wider validity for a long time; b) the fact that entire families within individual stocks are often characterised by the loss of proto-consonants or whole syllables whose loss becomes immediately obvious upon comparing languages of such families with those of another family within the same stock, or across stock boundaries. Similar remarks could, to a lesser extent, be made about entire stocks.

In view of these factors, it was therefore decided to attempt a short-cut method in drawing upon only one, two, or three languages of individual families within various stocks for the purpose of comparison and the re-

construction of proto-forms, with the proto-forms arrived at regarded as quite preliminary and subject to revision in the light of more detailed later work.

As the first step, a comparison was made by the present writer between those fifty-three lexical items for which series of interphylic cognates had been established by McElhanon and Voorhoeve (1970) (see 2.4.1.4.), and their equivalents in languages of the various families of the East New Guinea Highlands Stock. The results were encouraging: in individual languages of the Eastern Family, only an average of 24% of the items compared could not be tied in with the series of inter-phylic cognates established by McElhanon and Voorhoeve (1970) predominantly for members of the former Central and South New Guinea, and Finisterre-Huon Phyla. For the East-Central Family languages, this figure was 22%, for those of the Central Family 29% and for those of the West-Central Family 24%. These figures reflect rather accurately previous findings concerning the greater or lesser aberrant status of languages of those four families within the East New Guinea Highlands Stock (Wurm 1964) and also the greater structural similarity of East-Central Family languages to those of the Huon Peninsula area and the Ok Family (Wurm 1964).

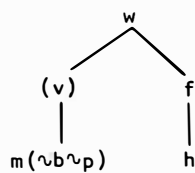
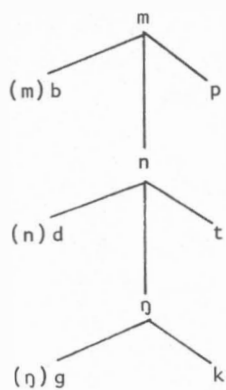
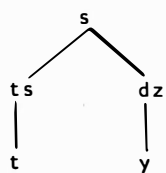
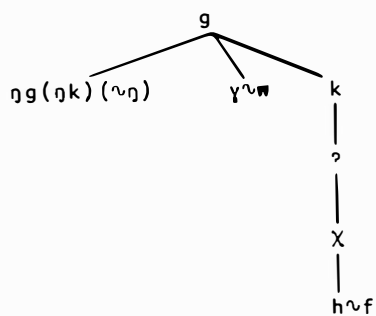
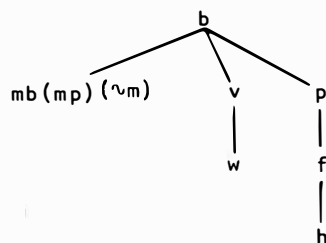
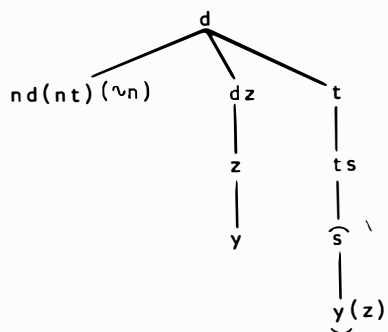
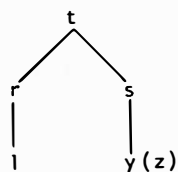
Similar procedures were applied by the present writer to languages belonging to the various stocks which are now regarded as members of the Trans-New Guinea Phylum, with encouraging results (see 1.3.4.) which ultimately led to the postulation of the Trans-New Guinea Phylum in its present form. Voorhoeve added further proof for language groups recently included in the phylum (see 2.6.2.3.).

2.4.1.5.2. CONSONANT AND VOWEL SETS

In the course of the work referred to above in 2.4.1.5.1., it was found that, in Trans-New Guinea Phylum languages, there were sets of consonants and vowels whose members appeared sometimes as allophones of one phoneme in individual languages, and frequently as corresponding consonant and vowel phonemes in closely related languages, or in different dialects of one language. Such sets were for instance:

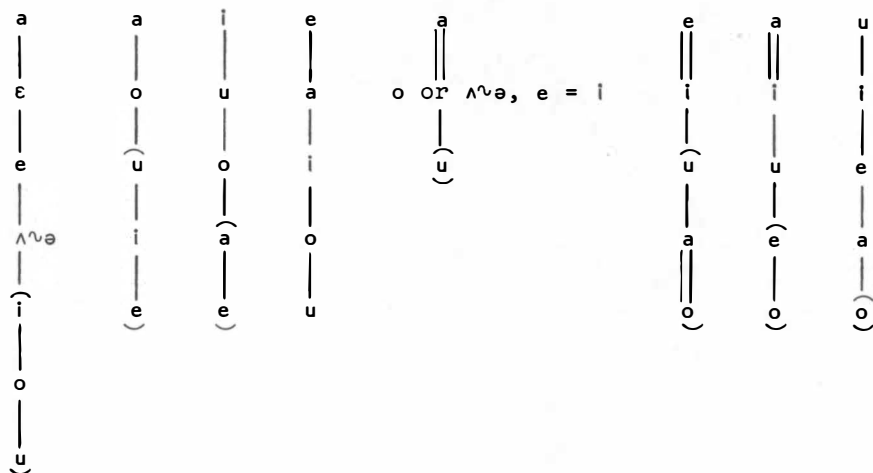
2.4.1.5.2.1. Consonants

Note: Consonants and consonant series in parentheses occur comparatively rarely. The frequency of the occurrence of consonants in individual columns decreases from top to bottom and from left to right.



2.4.1.5.2.2. Vowels

Note: The same statements apply as have been made above in 2.4.1.5.2.1. for consonants, except that the appearance of vowels and vowel series added in parentheses is comparatively rarer than is the case with consonants similarly marked. The symbol = denotes approximately even frequency of the vowels denoted by the vowel symbols linked by it.



2.4.1.5.3. PROTO-SOUNDS

The appearance of such sets as listed above suggests the possibility of positing proto-consonants and proto-vowels for tentative reconstruction work. The following may be mentioned, and their reflexes listed under them, with the principles of their arrangement being the same as those laid down above in 2.4.1.5.2.1. and 2.4.1.5.2.2.

2.4.1.5.3.1. *Consonants

*P	*T	*T ₁	*D
↓	↓	↓	↓
p	t	t	d~nd(nt)(~n)
b~mb(mp)(~m)	r	r	dz
v	l	l	z
w	s~y(z)		t
f~h	h		ts
			s~y

$*D$		
$*T$	+	$*D$
↓		↓
t		$d \sim nd(nt) (\sim n)$
r		dz
l		t
$s \sim y(z)$		ts
h		$s \sim y$

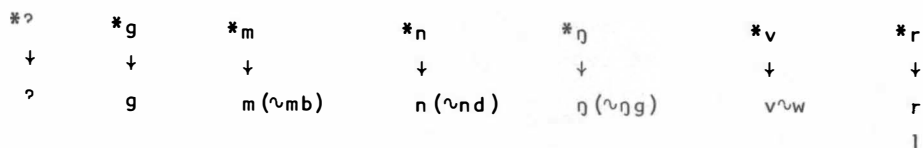
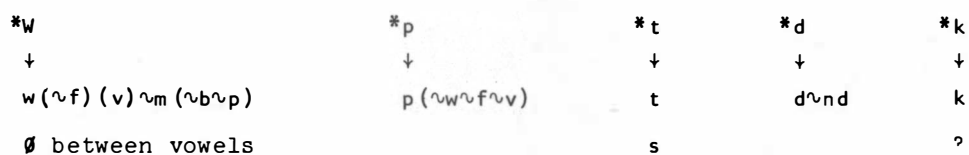
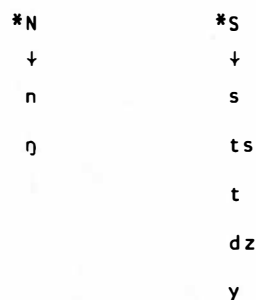
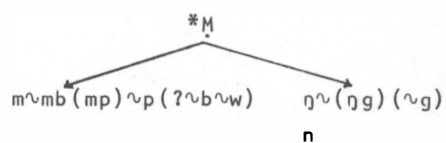
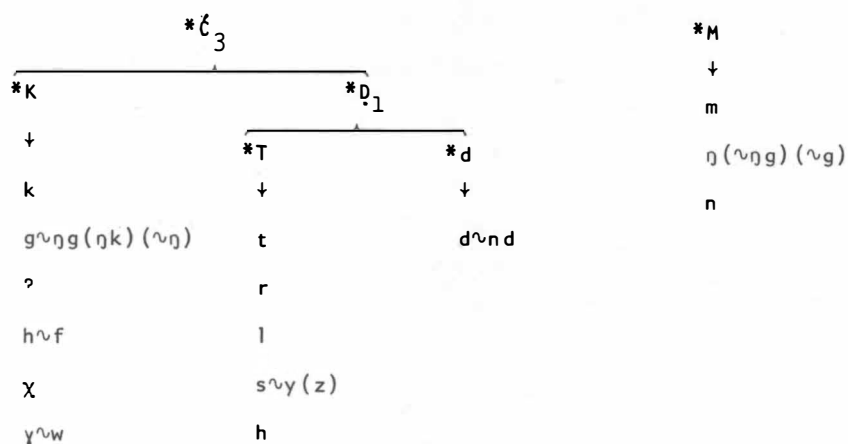
$*D_1$		
$*T$	+	$*d$
↓		↓
t		$d \sim nd$
r		
l		
$s \sim y(z)$		
h		

$*K$
↓
k
$g \sim ng(\eta k) (\sim \eta)$
?
$h \sim f$
χ
$\gamma \sim w$

$*C$		
$*K$	$*D$	
↓	$*T$	$*D$
k	↓	↓
$g \sim ng(\eta k) (\sim \eta)$	t	$d \sim nd(nt) (\sim n)$
?	r	dz
$h \sim f$	l	t
χ	$s \sim y(z)$	ts
$\gamma \sim w$	h	$s \sim y$

$*C_1$	
$*K$	$*T$
↓	↓
k	t
$g \sim ng(\eta k) (\sim \eta)$	r
?	l
$h \sim f$	$s \sim y(z)$
χ	h
$\gamma \sim w$	

$*C_2$	
$*K$	$*T_1$
↓	↓
k	t
$g \sim ng(\eta k) (\sim \eta)$	l
?	r
$h \sim f$	
χ	
$\gamma \sim w$	



2.4.1.5.3.2. *Vowels

*A	*Ä	*E	*I	*İ	*O	*Ö	*Ü
↓	↓	↓	↓	↓	↓	↓	↓
a	e	e i	i	a i	a	a o or ʌ~ə	u
ε	a	i	u	i	o	e i	i
e	i	(u a)	o	u	(u	e i	e
ʌ~ə	o	a	(a	(e	i	i	a
(i	u	o	e	o	e	(u	(o
o							
u							

*a	*e	*i	*u	*v
↓	↓	↓	↓	↓
predo- minantly a	predo- minantly e	predo- minantly i	predo- minantly u	any vowel

Note: With *Ö, the frequency of e=i in reflexes is approximately half of that of a=o.

2.4.1.5.4. RECONSTRUCTION PROCEDURES

Proto-forms containing posited proto-consonants and vowels based on sets of consonants and vowels such as those listed in 2.4.1.5.2.1. and 2.4.1.5.2.2. were tentatively reconstructed, with attention paid to the question of regularities in the appearance of member consonants and vowels of given sets in this reconstruction work. In those few instances in which proto-forms had been reconstructed before by a step-by-step comparison method proceeding from local proto-forms to forms of wider applicability, it was found that the differences between the tentative proto-forms arrived at on the basis of these consonant and vowel sets, and the already available reconstructions were not greatly significant. In view of this, proto-forms arrived at on the basis of these consonant and vowel sets are believed to have at least some validity in a preliminary way, and proto-Trans-New Guinea Phylum forms have therefore been suggested along these lines.

2.4.1.5.5. ILLUSTRATIVE EXAMPLES

2.4.1.5.5.1. Introductory Remarks

The symbols representing posited proto-sounds have been listed in 2.4.1.5.3. The following explanations may be added:

‡ = metathesis.

The addition of a raised consonant symbol after another consonant symbol (e.g. *T^M, *K^M) serves to indicate that in a few languages in a set of languages compared, reflexes of the proto-consonants denoted by the raised symbol are met with in the place of the reflexes of the proto-consonants referred to by the first, non-raised, member of such a pair of symbols which are more commonly encountered in the given set of languages.

Symbols - including raised ones - and syllables of proto-forms appearing in parentheses indicate proto-consonants, vowels and syllables whose reflexes appear in only a very limited number of instances in present-day member languages of the Trans-New Guinea Phylum.

2.4.1.5.5.2. Family, Stock and Phylum Proto-Forms

To illustrate the nature of Trans-New Guinea Phylum proto-forms, the list given in 2.4.1.2. of some proto-forms suggested by Wurm for the Eastern Family of the East New Guinea Highlands Stock, and for that stock itself, has been repeated below, with the Trans-New Guinea Phylum proto-forms added to them.

	*Eastern Family	*East New Guinea Highlands Stock	*Trans-New Guinea Phylum
<i>ear</i>	*akTaM ~ *kaTaM	*(O)KATAM	*(O)KAḐAM(a) ~ (*(O)ĈAḐAM(a))
<i>eye</i>	*avu-Ta-ma	*avu-Ta-g ^M A	*(avu-)DaḑK ^M A(-Pur ⁽ⁿ⁾)
<i>hand, arm</i>	*kaSa(u)k ^M ü	*kō(Sau)K ^M ü	*Kös ^(r) ï(u)Ĉ ^M ü
<i>skin</i>	*aTima	*KaTiMa [?] a	*KOḐOP ^M Ika
<i>louse</i>	*nuMa, *numan	*numan	*T ⁿ ImÄ { ⁿ ₀
<i>fire</i>	*iḐa-	*iḐA { ^{-te} _{-Pe}	*(ï)ḐÄ { ^{-Ḑe} _{-kaP^(M)Ä}
<i>eat</i>	*nA	*nA	*(ï) _n ^(d) A(i) ~ (*(ï) _N ^(d) A(i))
<i>say, speak</i>	*TET ^m O	*(Ä)ĈET ^(M) O	*(Ä)ĈÖ { ^{Tⁿm} _(w) O
<i>sleep</i>	*PAC(i) ^a	*PÄĈ(i)(g) ^a	*PÄĈÄ(g)O

2.4.1.5.5.3. Some Trans-New Guinea Phylum Proto-forms with Reflexes

The reflexes listed below with each of the proto-forms constitute only a selection from those attestable in the over four hundred and ninety Trans-New Guinea Phylum languages. The reflexes are listed under stock (or sub-phylum) names in the same order in which the individual Trans-New Guinea Phylum stocks are listed in 2.5.3.3.2.

a) *ear*:

Trans-New Guinea Phylum: $*(0)KA\dot{D}AM(a) \sim *(0)\acute{C}A\dot{D}AM(a)$

Note: The reflexes requiring the postulation of $*(0)\acute{C}A\dot{D}AM(a)$ are few in number.

Finisterre Stock: Sakam $\dot{s}d\dot{o}m$ ($*K- > \emptyset$), Mamaa du ($*KA- > \emptyset$)

Huon Stock: Nomu kedzap, Komba kesap, Timbe $\dot{o}nd\dot{o}p$ ($*K- > \emptyset$), Mape (Western dialect) kadze?, Kâte (Wamorâ dialect) hadza? (the last two $*M > ?$)

East New Guinea Highlands Stock: Enga kare, Kuman kuna- ($*-Da- > \emptyset$), Kamano $\dot{a}gesa$, Tairora ato, Awa $\dot{a}re$ (the last two $*K- > \emptyset$), ?Kalam tumənt ($*\acute{C} + \dot{\tau}$, or tum-ənt $*KA- > \emptyset?$), Gants kenge ($*-DA- > \emptyset$), Wiru kapidi ($\dot{\tau}$)

Kutubuan Stock: Foe yo- $\dot{k}hiya$

Central and South New Guinea Stock: Sylagha toro, Pisa suru (the last two $*\acute{C}$), Southern Kati kende, Northern Kati kene-, Bimin kaluun

Angan stock-level Family: Kamasa kata $\dot{a}$

Marind Stock: Boazi gia ($*\dot{D} > \emptyset$)

Sentani Stock: Sentani $\dot{a}nkei$ ($*-DAM > \emptyset$)

Dani Stock: Western Dani -tuk ($\dot{\tau}$)

Dem stock-level Isolate: Dem $\dot{y}o\dot{n}elo$

Wissel Lakes-Kemandoga Stock: Ekagi (Kapauku) gapa ($*-DA- > \emptyset$), Uhunduni $\dot{n}elo$

Mairasi-Tanah Merah Stock: Semimi -fira

West Bomberai Stock: Baham $\dot{k}warp-ak$

Binandere Stock: Yega kari, Binandere gari = *hear*

Gailalan stock-level Family: ?Fuyuge gadorō ($\sim < *-M?$)

Koiarian stock-level Family: Koita korema, Mountain Koiari gorema

Kwalean stock-level Family: Kwale akuru

Dagan stock-level Family: Onjob ikarana

Rai Coast Stock: Kwato a-gi $\dot{f}aw$, Jilim kasab (the last two forms would require the postulation of $*M \rightarrow m\dot{u}mb(mp)\dot{u}p(\dot{u}b\dot{u}w)$... which is very rare (see 2.4.1.5.3.1.)

Pihom Stock: Pila $\dot{n}duat$ ($*\acute{C}$)

Josephstaal Stock: ?Katiati $\dot{k}ansi-gi$

Wanang Stock: Emerum $\dot{g}i\dot{n}tsi$

Brahman Stock: Isabi gari, Biyom kwali (*-ḍA- > Ø)
 Teberan stock-level Family: Daribi oro (*K- > Ø)
 Turama-Kikorian Sub-Phylum: Kairi ko: (*-ḍAM > V:)
 Eleman Sub-Phylum: Toaripi kiro-ri, Purari keporo (ʔ)
 Trans-Fly Stock: Southern Kiwai gare, Gidra -krom, Tirio toro? (*Ĉ),
 Waia garo, Tonda ndzaŋo (*Ĉ)
 Bulaka River (Yelmek-Maklew) stock-level Family: Maklew op-klo, Yelmek
 oida (*K- > Ø)
 Senagi sub-phylum-level Family: Dəra -gere (may mean *opening*)
 Border Stock: Awyi keato, Amanab angut
 Tor-Lake Plain Stock: Mander kere, Uria i-ŋara, ?Aikwakai a-wita
 Nimboran sub-phylum-level Family: Nimboran keni (*-ḍA > Ø)
 Kaure Sub-Phylum: ?Kaure goklu (*-ḍ- > kl?)
 South Bird's Head Sub-Phylum: Arandai a-kare

b) *bone*:

Trans-New Guinea Phylum: $*KO(K^{N(M)}\ddot{I})T^{(n)}AT_1 \sim (*\dot{C}O(K^{N(M)}\ddot{I})T^{(n)}AT_1)$

Note: The reflexes requiring the postulation of $*\dot{C}O(K^{N(M)}\ddot{I})T^{(n)}AT_1$ are few in number.

Finisterre Stock: Komutu kudat, Yau karat, Kewieng katar, Irumu konzar,

Nakama kwada

Huon Stock: Nabak kaset, Nomu siwit, Burum siyit (the last two *Ĉ-),
 Selepet hayit

East New Guinea Highlands Stock: Enga kuri, Huli kuni, Kuman yambiro,
 Kamano yəferi- (the last two *Ĉ- and (*M)), Tairora vu-haari, Awa
 nya-husa, Kalam tənī (*Ĉ-), Gants taŋəle (*Ĉ-), Wiru tono (*Ĉ-)

Kutubuan Stock: Fasu kiki, Foe kigi (the last two *-T⁽ⁿ⁾AT₁ > Ø)

Central and South New Guinea Stock: Southern Kati kondo, Telefol kun,
 Awin kro, Duna kuni

Angan stock-level Family: Baruya ya-ginya

Gogodala-Suki Stock: Gogodala gosa

Marind Stock: Marind (Ŋgawir dialect) hiau

Sentani Stock: Tanah Merah oro, Demta ari (the last two *K- > Ø)

Dani Stock: Western Dani -kano, Kwerba kaka (*-T⁽ⁿ⁾AT₁ > Ø)

Mairasi-Tanah Merah Stock: Mairasi -tura (*Ĉ-), Tanah Merah -so (*Ĉ-),
 *-T⁽ⁿ⁾AT₁ > Ø)

Binandere Stock: Binandere undoru (*K- > Ø)

Mailuan stock-level Family: Mailu kisa

Rai Coast Stock: Bom tanu (*Ĉ-)

Pihom Stock: Parawen kwata

Teberan stock-level Family: Daribi diri (*Ĉ-)

Pawaian stock-level Family: yemi (*Ĉ- and (*M), *-T⁽ⁿ⁾AT₁ > Ø)

Inland Gulf Sub-Phylum: Ipiko hoŋo

Eleman Sub-Phylum: Toaripi uti (*K- > Ø)

Trans-Fly Stock: Southern Kiwai soro (*Ĉ-), Bine kake, Agöb kut, Waia oro (*K- > Ø), Dorro goat, Yeŋ gor

Oksapmin sub-phylum-level Isolate: Oksapmin tamo: (*Ĉ- and (*M̥), *-T⁽ⁿ⁾AT₁ > Ø)

Senagi sub-phylum-level Family: Senagi hamenda (*M̥)

Pauwasi Sub-Phylum: Dubu gwaro

Border Stock: Manem kar, Waris kəl, Amanab kil

Tor-Lake Plain Stock: Mander kera-ne

Usku phylum-level Isolate: Usku kla

South Bird's Head Sub-Phylum: Kampong Baru utu (*K- > Ø)

Kolopom (or Frederik Hendrik Island) sub-phylum-level Family: Kimaghama duro (*Ĉ-)

c) fire:

Trans-New Guinea Phylum: *(Ī)q̃ä^{-De}_{-kaP}(M̥)ä

Note: The reflex r(l) < *-q̃- is, with the exception of one Marind Stock language, restricted to those instances in which reflexes of *Ī- are present or ʔ has occurred. The vowel preceding the reflex of *-q̃- may have been a conditioning factor in the manifestation of this reflex as r(l). In view of this, it might be possible to postulate *-D- instead of *-q̃- in the Trans-New Guinea Phylum proto-form.

Finisterre Stock: Kewieng dere, Neko tite

Huon Stock: Momolili tedzi, Momare dza? (*-De > ??)

East New Guinea Highlands Stock: Enga ita(te), Kuman ende, Kamano teve (*-ka- > Ø), Agarabi and Awa ira, Usarufa irama (*-ka- > Ø), Wiru toe

Kutubuan Stock: Fasu ira, Foe ira

Central and South New Guinea Stock: Bedamini daru, Awin de, Kamoro uta, Asienara usara

Angan stock-level Family: Baruya dika

Gogodala-Suki Stock: Gogodala ila, Suki araka

Marind Stock: Marind (Ŋgawir dialect) tekav, Yaqay de, reka

Kayagar stock-level Family: Kaygir aru

Sentani Stock: ?Sentani i

Dani Stock: Western Dani idu, North Ngalik iduk, Kwerba ser

Wissel Lakes-Kemandoga Stock: Ekagi (Kapauku) dagu = numerical coefficient for fire, bo-diya = fire, Moni usa

Mor stock-level Isolate: Mor taha

Binandere Stock: Binandere izi, Aeka zi

Goilalan stock-level Family: Kunimaipa iti

Kwalean stock-level Family: Kwale ire

- Manubaran stock-level Family: Maria ita-isa
 Mailuan stock-level Family: ?Mailu eu
 Dagan stock-level Family: Jimajima ira-rema
 Rai Coast Stock: Erima eya
 Mabusu Stock: Kare ɔnda, Murupi arɔ, Mosimo are, Sihan day
 Isumrud Stock: Malas andup (*-ka- > Ø)
 Wanang Stock: Paynamar tate
 Brahman Stock: ?Tauya o'o (*-p- > ?? *ʈ?)
 Pawaian stock-level Family: Pawaia sia
 Teberan stock-level Family: Polopa si, Daribi sia
 Inland Gulf Sub-Phylum: Ipiko tai, Tao Suamato ta¹li
 Trans-Fly Stock: Southern Kiwai era, Wabuda kera (ʈ), Bine utio, Tirio
 su:r
 Bulaka River (Yelmek-Maklew) stock-level Family: Yelmek ete, Maklew doyo
 Senagi sub-phylum-level Family: Senagi hay
 Pauwasi Sub-Phylum: Yafi dau
 Border Stock: Awyi tao, Mananab suw (*-ka- > Ø), Kilmeri su
 Tor-Lake Plain Stock: Berik tokwa, Bonerif ti, ?Uria syawk (ʈ), Taworta
 do
 Molof sub-phylum-level Isolate: Molof tombe (*-ka- > Ø)
 Usku sub-phylum-level Isolate: Usku yo
 Nimboran stock-level Family: ?Nimboran kip (*(i)ḍÄ- > Ø?)
 Kaure Sub-Phylum: Kaure sare, Narau sare
 Kolopom (or Frederik Hendrik Island) sub-phylum-level Family: Kimaghama
 do, Riantana ⁿdör
 Timor-Alor-Pantar Sub-Phylum: Makasai ata
- d) eat:
- Trans-New Guinea Phylum: *(i)n^(d)A(i)- ~ (*(i)N^(d)A(i)-
- Note: A very few possible reflexes in sub-phylic groups such as the Mabusu Stock and Trans-Fly Stock would require the postulation of *(i)N^(T)A(i).
- Finisterre Stock: Degenan na, Morafa nei, Ngaing ne, Komutu na, Awara na
 Huon Stock: Sialum ne, Kâte (Wemo) no
 East New Guinea Highlands Stock: Enga ne, Kuman ne-, Kamano na, Agarabi
 na:, Tairora ne, Kalam nʔə-ŋ-, Wiru na-
 Kutubuan Stock: Fasu na-, Foe ne-
 Central and South New Guinea Stock: Asmat na, Kaeti andi, Telefol una,
 Southern Kati ane, Pare da, Kubo na, Duna nai-, Asienara na-
 Angan stock-level Family: Baruya nɪ-
 Gogodala-Suki Stock: Gogodala na
 Sentani Stock: Sentani anə, Tanah Merah ani

Dani stock-level Family: Grand Valley Dani na-n, Kwerba na-wo
 Dem stock-level Isolate: Dem na-m, ne-nawe
 Wissel Lakes-Kemandoga Stock: Ekagi (Kapauku) nal-, Uhunduni no-win
 Mairasi-Tanah Merah Stock: Mairasi ne-
 West Bomberai Stock: Iha na-
 Binandere Stock: Zia na, Binandere inda
 Gollalan stock-level Family: Fuyuge ge (n-class verb)
 Kwalean stock-level Family: Kwale a-ne-
 Dagan stock-level Family: Daga na-
 Rai Coast Stock: Urigina na, Sumau ne
 Mabusu Stock: Murupi da, ?Kare za, ?Garuh la, ?Gumalu re, ?Amele ye
 (the last four would require the postulation of $*(\ddot{I})N^{(T)}A(i)$)
 Pihom Stock: Yaben nu
 Isumrud Stock: Dimir na
 Mugil stock-level Isolate: Mugil ne
 Josephstaal Stock: Ikundun na, Osum ni
 Wanang Stock: Angaua na
 Brahman Stock: Isabi ne, Biyom n(a), Tauya ni
 Teberan stock-level Family: Daribi na, Polopa nal
 Turama-Kikorian Sub-Phylum: Kairi no
 Inland Gulf Sub-Phylum: Minanibai idie
 Eleman Sub-Phylum: Purari u-navai
 Trans-Fly Stock: ?Southern Kiwai oru-so (would require the postulation
 of $*(\ddot{I})N^{(T)}A(i)$)
 Bulaka River (Yelmek Maklew) stock-level Family: Yelmek na, Maklew na
 (*-N-)
 Oksapmin sub-phylum-level Isolate: Oksapmin da- (requires $*(\ddot{I})N^{(T)}A(i)$)
 Senagi sub-phylum-level Family: ?Dera re, ?Senagi lala (both would
 require the postulation of $*(\ddot{I})N^{(T)}A(i)$)
 Pauwasi Sub-Phylum: Dubu ne, Wolof ne
 Border Stock: Awi na, Manem na, Kilmeri ne, Ningera de
 Tor-Lake Plain Stock: Mawes na-, Taworta di-
 Molof sub-phylum-level Isolate: Molof ne
 Nimboran sub-phylum-level Family: Nimboran na-m
 Kaure Sub-Phylum: Kaure -ne
 South Bird's Head Sub-Phylum: Puragi ni-, Yahadian no
 Timor-Alor-Pantar Sub-Phylum: Makasai nawa

e) say, speak, tell; talk, speech (myth, song):

Trans-New Guinea Phylum: $*(\ddot{A})\ddot{O}\left\{\begin{matrix} T^{n\eta_0} \\ (W)0 \end{matrix}\right.$

Note: a) Of the reflexes of $*-n^{\sim}\eta-$, $-n-$ is largely restricted to languages whose phoneme inventories do not contain η .

b) There appears to be a tendency, on the semantic level, for reflexes of a possible shorter Trans-New Guinea Phylum proto-form $*(\ddot{A})\check{\text{ö}}-$ to mean *say, speak*, and of the full form $*(\ddot{A})\check{\text{ö}}\left\{\begin{smallmatrix} T^{n^{\sim}\eta} \\ (w) \end{smallmatrix} \right\}_0$ to mean *speech, myth, song*, though there are quite a few exceptions to this (e.g. Central and South New Guinea Stock: Pare sa = *speech*, Gogodala-Suki Stock: Suki gie = *speak*, Finisterre Stock: Degenan diy = *speak*). In languages in which short reflexes mean *speak* and long ones *speech*, the traditions governing the reflexes of $*(\ddot{A})\check{\text{ö}}-$ are sometimes different (see the Huon Stock: Ono (Amugen dialect), Sialum, Selepet and Momare examples given below), sometimes identical (see the Huon Stock: Nabak examples below).

Finisterre Stock: Degenan diy (*speak*), Asat giy (*speak*), Morafa yey (*speak*), Gira dɔr (*speak*), Nahu ye (*speak*), Som ya (*speak*)

Huon Stock: Ono (Amugen dialect) re (*speak*), don (*speech*); Sialum ra (*speak*), dan (*speech*); Nabak dze (*speak*), den (*speech*); Selepet so, yo (*speak*), den (*speech*); Kâte (Wamorâ dialect) dɔŋ (*speech*), Momare don (*speak*), yofa (*speech*); Migibac yowa (*speech*)

East New Guinea Highlands Stock: Enga re (*say*), Kuman di- (*speak*), kayo- (*speech, language*); Kamano ge (*speech, language*), Tairora giro (*speak*), Agarabi temi (*speak*), Auyana siyo (*speak*), Usarufa tiyo (*speak*), Kalam angəp (*speak*)

Kutubuan Stock: Fasu ra- (*speak*), Foe ta- (*speak*)

Central and South New Guinea Stock: Kamoro tao (*song*), Pisa ro (*speak*), Telefol saŋ (*myth*), Awin soa (*speech*), Pare sa (*speech*), Agala to- (*speak*), Beami sia (*speak*), Kaluli to (*speech*)

Angan stock-level Family: Baruya di- (*speak*)

Gogodala-Suki Stock: Gogodala la (*speak*), gi (*speech, word*); Suki gie (*speak*)

Marind Stock: Yaqay tumi (*speech*)

Kayagar stock-level Family: Kaugat kep (*say*)

Sentani Stock: Tanah Merah erime (*speak*), ?Demta anaya-ndo-tan (*speak*)

Dani Stock: Western Dani kone (*speech*), Ngalik kele (*speech*)

Dem stock-level Isolate: Dem gaba (*speak*)

Wissel Lakes-Kemandoga Stock: Ekagi (Kapauku) tuupe (*song*), Moni ngudi (*speak*)

Binandere Stock: Binandere ge (*speak*)

Golilalan stock-level Family: Kunimaipa nga (*tell*), da- (*song*); Fuyuge ge- (t-class verb)(*say*)

Kwalean stock-level Family: Kwale yoe-re (*speak*)

Yareban stock-level Family: Yareba yau-ra (*speak*)

- Mailuan stock-level Family: Mailu riba (*speak*)
- Rai Coast Stock: Urigina kando (*talk*), Duduela le- (*speak*)
- Mabuso Stock: Amele ye- (*talk*), Isebe ze (*talk*), Bemal ze- (*talk*)
- Pihom Stock: Tani tan- (*speak*)
- Isumrud Stock: ?Bunabun tanΛ-ř (*speak*)
- Josephstaal Stock: Pondoma gia (*talk*),
- Wanang Stock: Emerum tsiaŋ (*speak*)
- Pawaian stock-level Family: Pawaia hũε- (*speak*)
- Inland Gulf Sub-Phylum: Minanibai te-ki (*speak*)
- Eleman Sub-Phylum: Purari u-kuruai (*speak*)
- Turama-Kikorian Sub-Phylum: Kairi ga- (*speak*)
- Trans-Fly Stock: Tonda dɔðΛ (*speak*), Gidra yet (*speak*), Gizra (bö:)-ta (*speak*), Waia gaiya (*speak*), ?Southern Kiwai aro-go (*speak*)
- Oksapmin sub-phylum-level Isolate: Oksapmin -ari (*say*)
- South Bird's Head Sub-Phylum: Konda su-suane (*speak*)
- Kolopom (or Frederik Hendrik Island) sub-phylum-level Family: Kimaghama jaoa-dru (*speak*), Riantana eta, tröa- (*speak, talk*)
- Timor-Alor-Pantar Sub-Phylum: Buna? dale (*speak*)

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