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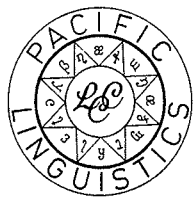

Department of Linguistics
Research School of Pacific and Asian Studies
THE AUSTRALIAN NATIONAL UNIVERSITY

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PACIFIC LINGUISTICS
Department of Linguistics
Research School of Pacific and Asian Studies
The Australian National University
Canberra ACT 0200
Australia

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TOWARDS A RECONSTRUCTION AND RECLASSIFICATION OF THE LAKES PLAIN LANGUAGES OF IRIAN JAYA

DUANE A. CLOUSE

1. INTRODUCTION

Until recently, little has been known about the languages in the western Lakes Plain region of Irian Jaya, Indonesia. This large region of mostly sago swamp remains isolated from the rest of the province, as access into the area is by foot or by single engine aircraft only. Some areas around the headwaters of and to the south of the Wapoga river have not yet had any contact with the outside world.

In 1991 the *Irian Bulletin* published the second edition of the *Index of Irian Jaya languages* (Silzer and Clouse 1991[1]). In that edition, several languages in the western Lakes

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1 The languages discussed in this paper were classified in the *Index* as follows. The number following the language is the approximate population:

Trans New Guinea Phylum	
Dani-Kwerba Stock	
Dani Sub-Family	
Western Dani	129,000
Northern Sub-Phylum-Level Superstock	
Tor-Lakes Plain Stock	
Tor Family	
Berik	1,000
Orya Family Isolate	
Orya	1,600
Central Lakes Plain Family	
Doutai	335
Eritai	425
Obokuitai	150
Sikaritai	800
Biritai	250
Kai	250
Waritai	?
Duvle	200
Kwerisa	56
Papasena	400
East Lakes Plain Family	
Taworta	?
Dabra	100
Foau	230
Turu Family Isolate	
Edopi	750
Iau	500

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Pacific Linguistics, A-85, 1996.

Plain region remained unclassified, several others were little more than rumoured. Some languages were grouped together with the Geelvink Bay Phylum and others with the Trans New Guinea Phylum.

My wife and I began linguistic research in the Kirikiri language of the Lakes Plain area in 1989. After discovering several unusual phonological features (for non-Austronesian languages) in Kirikiri (Clouse and Clouse 1993) and other Lakes Plain languages, we became aware of the need for a wider, more comprehensive investigation. This research was followed in 1992 by a linguistic survey of the Wapoga River area.

My original, limited goal was to be able to more accurately classify the Kirikiri language and to understand how it genetically fits into the wider linguistic environment. This goal ultimately led to a comparative study of almost all of the western Lakes Plain languages and an attempt at a historical reconstruction of Proto Lakes Plain. In this paper I will attempt, through a historical reconstruction, to demonstrate that all of the Lakes Plain languages are related to each other and that there is ample phonological and lexicostatistical evidence to reclassify them under a superstock, belonging to the Geelvink Bay Phylum rather than under Tor Stock, Trans New Guinea Phylum. All the reconstructions proposed in this paper are original. Since many different theoretical approaches were used by the authors of the various phonologies of the Lakes Plain languages, I reanalysed many of the published and unpublished phonologies in order to make the comparation easier. A 'realist' as opposed to a 'formalist' approach was used in reconstructing the protolanguages. This means "reconstructed protolanguages are viewed not as formal devices but as real entities, as real as the languages around us" and therefore "there is great concern with positing typologically plausible systems" (Lichtenberk 1994:1). The languages in the Lakes Plain not included in the study were Kwerisa and Papasena in the Central Lakes Plain Family and Taworta, Dabra and Foau in the East Lakes Plain Family, as classified by Voorhoeve 1975 and Silzer and Clouse 1991. The data available for these languages was considered insufficient for drawing any conclusions, although they are included in the final reclassification offered at the end of this paper. This paper constitutes the results of my findings to date. All of my conclusions must be taken as tentative as much of my data consists of 267-item word lists (some taken monolingually by non-linguists). Since little grammatical information was available, no attempt was made at a comprehensive comparison of the grammatical features of these

Kaure Sub-Phylum-Level Stock	
Kaure Family	
Kaure	400
Geelvink Bay Phylum	
East Geelvink Bay Stock-Level Family	
Bauzi	1,500
Demisa	500
Awera Group	
Awera	100
Saponi	10
Rasawa	200
Unclassified	
Kirikiri	250
Fayu	400
Tause	350
Rumoured (no data)	
Sehudate	75
Faia	100
Weirate	75
Deirate	75

languages. Despite the inherent inaccuracies that are bound to occur in these circumstances, I hope that this initial attempt at reconstructing and reclassifying the Lakes Plain languages will be of some use to those interested in non-Austronesian languages and phonological universals and will prompt further linguistic study of this lesser known area of the island.

1.1 NAMES

When the term western Lakes Plain is used in this paper, it refers roughly to the area from the juncture of the Tariku (Rouffaer) and Mamberamo Rivers westward to Cenderawasih (Geelvink) Bay. Many geographical names were changed when Irian Jaya became a province of Indonesia. The older names have been retained when they coincide with recognised linguistic classifications (e.g. Geelvink Bay with Geelvink Bay Phylum) or have been used extensively in other linguistic literature. Otherwise, the more recent Indonesian name has been used. The language names used are those found in the second edition of the *Index of Irian Jaya languages* (Silzer and Clouse 1991).

1.2 LOCATIONS

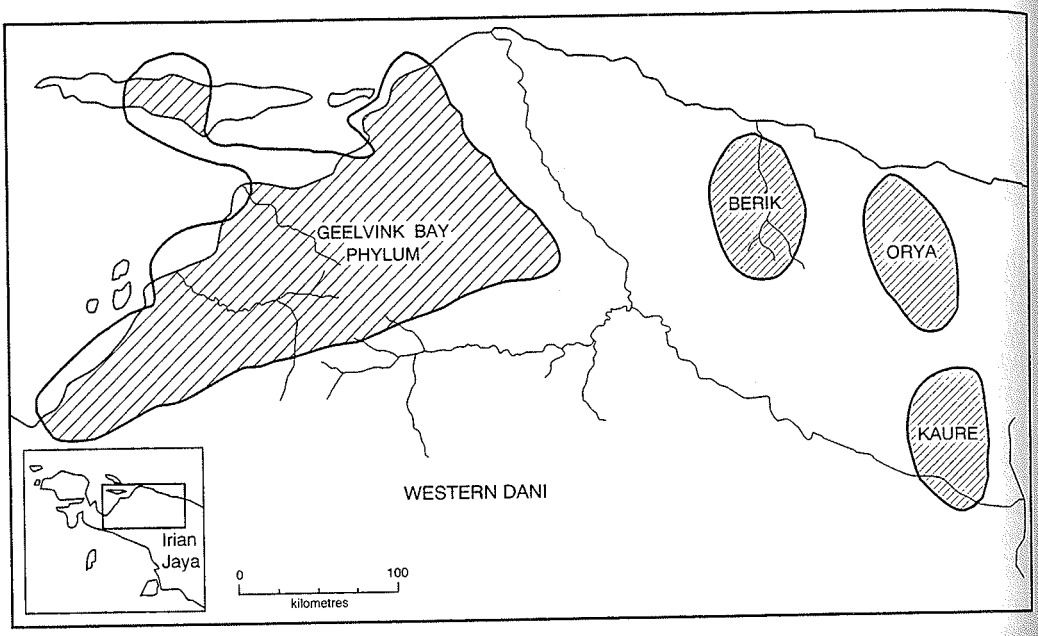
No attempt was made at placing villages on the maps. Most of these groups are semi-nomadic and village locations are constantly moving. Only the villages in which the word lists were taken are listed in Appendix 3. These villages are plotted with a small dot (•) on Map 2 in order to give the reader a sense of possible second language influence. Dialect boundaries are marked on Map 2 by a dotted line.

1.3 ABBREVIATIONS

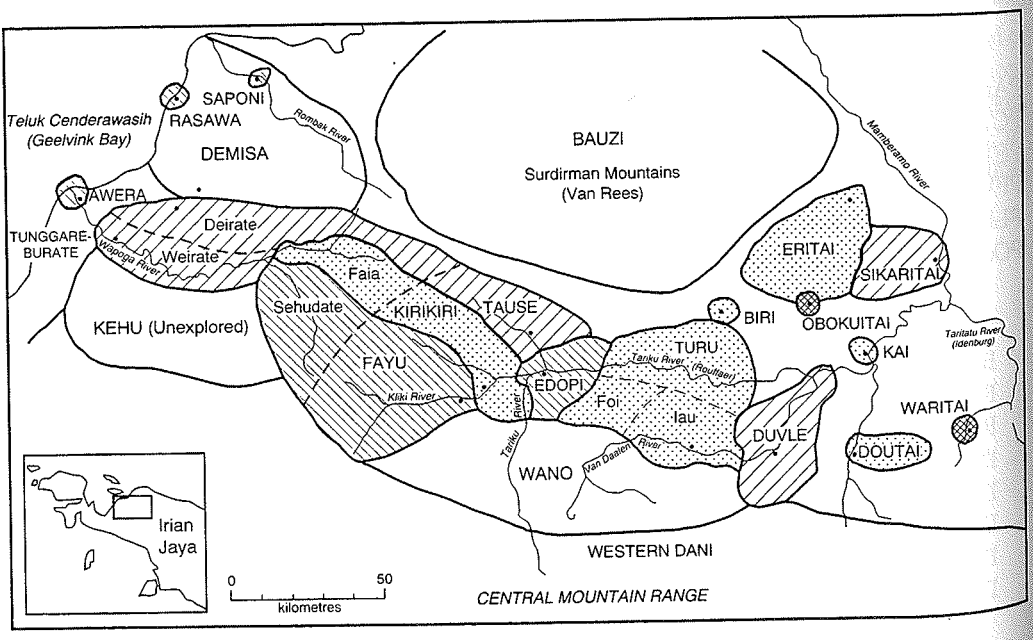
Abbreviations used in this paper are:

PAn-D	Proto Austronesian – Dempwolf	POc-Gr	Proto Oceanic – Grace
PCT	Proto Central Tariku	PT	Proto Tariku
PET	Proto East Tariku	PWT	Proto West Tariku
PFW	Proto Far West	V^	extra high vowel
PLP	Proto Lakes Plain	C˺	unreleased consonant
POc-BLAA	Proto Oceanic – Blust		

Aw	Awera	Ed	Edopi	Or	Orya
Bi	Biritai	Er	Eritai	Ra	Rasawa
Bk	Berik	Fa	Faia	Sa	Saponi
Bz	Bauzi	Fy	Fayu	Se	Sehudate
De	Deirate	Ia	Iau	Si	Sikaritai
Dn	Dani	Ka	Kai	Ta	Tause
Do	Doutai	Ki	Kirikiri	Wa	Waritai
Ds	Demisa	Kr	Kaure	We	Weirate
Du	Duvle	Ob	Obokuitai		

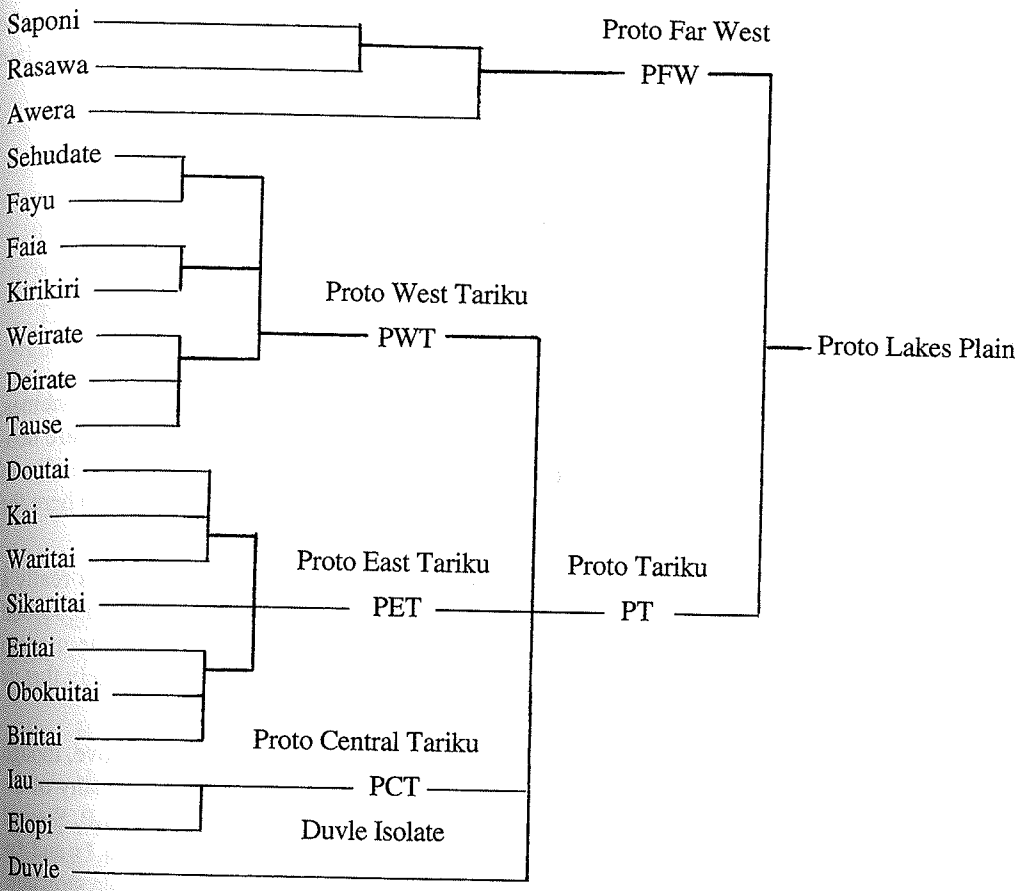


MAP 1: NORTH IRIAN JAYA
(according to Voorhoeve 1975)



MAP 2: THE WESTERN LAKES PLAIN
(Modified from Silzer and Clouse 1991)

The discussion in this paper will be based on the following tree diagram, which represents the order of historical divergence. Moving right to left, therefore, Proto Lakes Plain diverged into Proto Far West and Proto Tariku and Proto Tariku into Proto West Tariku and so on.



2. BORROWED VERSUS COGNATE

Foley (1986) has stated in his book *The Papuan languages of New Guinea* that we face a "daunting assignment" as we try to reconstruct Papuan languages. With no written documents before the twentieth century and, more significantly, because the languages are small, contiguous and "normally exhibit a pattern of enormous cross-influence in all areas" (1986:209), I have found with this study that sorting cognates from borrowings is at best a "tricky undertaking". Therefore, in formulating a reconstruction of Lakes Plain languages, core vocabulary (pronouns, nouns referring to body parts, simple kin relations, natural phenomena and basic verb roots) was used in order to lessen the chance of borrowing.

3. PROTO LAKES PLAIN

Proto Lakes Plain was a non-Austronesian language spoken perhaps a millennium or more ago in the southern Van Rees mountains east of Cenderawasih Bay in what is now the

province of Irian Jaya, Indonesia. If their current physiology is any indication, these ancient people were typical of Melanesians found along the north side of the island of New Guinea, relatively tall and slender rather than short and stocky like highland people. Little else can be presumed about them. Although we know nothing of the area from which they may have migrated, on the basis of the findings of this study (though not the purpose of this paper) one could make some educated guesses as to their movement since the time Proto Lakes Plain (PLP) was spoken (see Clouse 1993).

3.1 CONSONANT SYSTEM

The Proto Lakes Plain consonants were:

**p*	**t*	**k*
**b*	**d*	
**(w)*	**(y)*	

The most notable feature of the PLP consonant system is the small number of phonemes, in particular the lack of nasals. In all of the languages studied, nasals (if existing) were non-contrastive with their corresponding voiced stop. This feature of PLP remains in the eastern Tariku languages, where there is a lack of even a phonetic nasal, and in Rasawa, where the nasals are very rare phonetically.

Because of limited data, it is inconclusive at this point, whether a flap **ɾ* was really a separate phoneme from **d*. The flap seems to have occurred exclusively as the second member of a consonant cluster or intervocalically but never word-initially. In the modern languages, the flap is not contrastive with *d*. If it was a separate phoneme, it is likely that its phonemic status weakened as the syllable structure simplified.

The semivowels **w* and **y* were included in the PLP consonant inventory above, though parenthetically, to reflect the word list transcriptions in Appendix 3, to which many of the references in this paper apply, and to raise the possibility that they existed in PLP. Several phonologies have been done in Lakes Plain languages and in none of them have **y* and **w* been posited as phonemes nor have they had a bearing on determining the syllable structure. Therefore, in the reflex charts, where the word lists used *y* and *w*, **i* and **u* were reconstructed.

3.2 VOWEL SYSTEM

It was impossible to reconstruct the PLP vowel system by using all of the word lists. Vowels are perhaps the most difficult of sounds to transcribe accurately. The word lists available were transcribed by several different people and since it is more likely that each ear will hear vowels slightly differently, only those lists where a reliable phonological analysis had been done in the language were used. Fortunately, a phonological analysis of some kind has been done in at least one of all the major language groupings (with the exception of the Proto Far West group): PWT, PCT, Duvle and PET (Bateman 1990b, Jenison and Jenison 1991a, Kim and Kim 1995, Kügler 1990, Kügler and Kügler 1990, Martin 1986, McAllister and McAllister 1991, Murdoch n.d.[1], and Munnings 1991a). It was from these phonologies and dictionaries (more expanded than what is seen in Appendix 3) that the reconstruction for PLP and PT vowels was made.

PLP had a five vowel system:

*i *u

*e *o

*a

In most of the present-day languages the quality of *e and *o are realised as [ɛ] and [ɔ].

3.3 SYLLABLE STRUCTURE AND PHONOTACTICS

The syllable structure of PLP was at least V, CV, and CCV. However, there are closed syllables (or evidence for an underlying closed syllable) in the current languages. Two hypotheses are possible for the existence of closed syllables in the present languages.

The first hypothesis assumes that there were no closed syllables in PLP. Several factors argue for this interpretation:

(1) Only voiced obstruents close the syllable in the modern languages where there are closed syllables.

(2) In other contexts, voiced obstruents occur only intervocalically.

(3) It is a universal tendency that if voiced obstruents close a syllable, voiceless ones will too. (This would suggest that a vowel existed after the last voiced obstruent. By the time PT was spoken, this vowel deleted and the obstruent became unreleased.)

A second hypothesis assumes that closed syllables existed in PLP and that the syllable-final consonant was a voiceless obstruent, but in word-final position it became unreleased and voiced by the time PT was spoken. To summarise:

Hypothesis 1: PLP *tikV > *tigV > PT *tig˺

Hypothesis 2: PLP *tik > *tik˺ > PT *tig˺

All we can be certain of is that by the time PT was spoken, a word-final voiced and unreleased obstruent existed, producing the syllable types *CVC and *CCVC.

The only other phonotactic constraint in PLP was that the second member of a consonant cluster could only be a flap. It was also likely that the *k became labialised when followed by *u and another vowel; *kuV>*k^{w}V.

3.4 PHONOLOGICAL CHANGES FROM PROTO LAKES PLAIN TO PROTO FAR WEST AND PROTO TARIKU

The most notable changes occurred in Proto Far West. PFW simplified the PLP words in a number of ways. One noticeable change was the deletion of most instances of the word-initial *ku sequence (unless it was the only syllable in the word); PLP *kubadi > PFW *poidi 'a fly', PLP *kupade > PFW *pare 'stone' among others. It can be seen that some changes happened before others. One of the first changes to occur was to delete a flap *ɾ between vowels: PLP *kuɾire > PFW *kuie 'rain'. After this change, the *ku was deleted and then the intervocalic *d became a new flap *ɾ: PLP *kudaide > PFW *taio 'fire' and PLP *dia-dau > PFW *ta-ɾau 'to stand'. The syllable structure was simplified in two ways: by inserting an echo vowel between the consonant cluster; PLP *pɾi > PFW *piɾi 'louse'

and PLP **bɾi* > PFW **biɾi* 'tooth'; and, perhaps earlier than the **ku* deletion, by deleting the final syllable; PLP **kɾi*CV > PFW **kiɾi* 'banana' and PLP **ku*CV > PFW **ku* 'tree'. Although the breaking of the consonant cluster was complete in Saponi, there are still consonant clusters in Awera and Rasawa. Compare the word 'one' in Ra *kɾiβi*, Aw *pɾiya*, and Sa *kiɾipɛje*. The phone [s] can be found in the modern Far West languages, though it is the least common phone. Its occurrence today could be a result of borrowing or later sound changes that cannot be confirmed with the data available.

The sound changes in PT were less pronounced but more confusing than those in PFW. Perhaps this is because there are few intermediate protoforms possible to reconstruct between PLP and the modern Far West languages and so the changes seem more dramatic. Similar to the change from PLP to PFW was the weakening of intervocalic **d* to become a flap **ɾ* in PT. However, this happened only within a morpheme in PT. PLP **dia-dau* > *PT *dia-de* 'to stand' but PLP **diadi* > PT **diaɾi* 'cassowary'. The intervocalic flap **ɾ* remained unchanged at this point, PLP **kuɾia* > PT **kuɾia* 'stomach', but will be seen to drop in later reflexes. These phenomena are a common trend and do not seem to apply at all times. Regrettably, the data is insufficient to determine what specific rules applied in each instance.

The most puzzling change that occurred was the emergence of **s* in PFW and PT. Although the phone [s] occurs in all of the languages, in no instance are there cognates where the reflex **s* is chosen for all of the languages; **t* is always chosen as the reflex in one or more of the languages, but not consistently in the same languages. In the modern Lakes Plain languages [s] can occur with any vowel, but the Lakes Plain languages in the Wapoga headwaters area (Deirate, Weirate, Faia, Sehudate), the sequence [si] does not occur. In addition, with the exception of one word, the sequence [tiV] does not exist in the Far West or central and western Tariku languages and in the eastern Tariku languages it is exceedingly rare. This evidence prevents the positing of **s* in PFW and PT, although it is evident that its status as a full phoneme is becoming more certain.

CHART 1: PFW AND PT REFLEXES

PLP	PFW	PT
**p*	**p*	**p*
V**p*V	**p*	**ɸ*
**k*	**k*	**k*
**b*	**b*	**b*
**t*	**t*	**t*
**d*	**d*	**d*
V**d*V	**ɾ*	**ɾ*
V**ɾ*V	**Ø*	**ɾ*
**a*	**a*	**a*
**e*	**e*	**e*
**i*	**i*	**i*
**o*	**o*	**o*
**u*	**u*	**u*

4. PROTO FAR WEST

Proto Far West has been reconstructed from only three languages which together do not share a large number of cognates, though there are other language groups in the area that have not been contacted or documented which may be related. Because there are so few languages from which to draw data (and the only data that do exist are word lists) it is difficult to tell when PFW was spoken. If the rate of language deterioration was the same for all of these languages, then it would have been spoken about the same time as PWT, PCT and PET. The only things readily apparent are that the divergence of PFW from PLP was at an earlier stage than when PT diverged into PWT, PCT, Duvle and PET, and that, based on lexicostatistics, and to a lesser degree on sound changes, PFW is clearly distinct from PT.

4.1 CONSONANT SYSTEM

The PFW consonant system was:

**p*	**t*	**k*
**b*	**d*	

This system is similar to PLP except that the **d* has become a flap **ɾ* intervocalically in nearly all cases. Nasals continue to be missing. In Rasawa they are found almost exclusively in the adjectival suffix *-nu/no*. Since this suffix in most of the other Lakes Plain languages is *-e*, *-we*, and *-be/bi*, it is possible that the *-nu/no* suffix was borrowed in Rasawa. What is more, in Awera and Saponi, though the nasals are frequent, there is no contrast between the nasals and their corresponding voiced stops.

4.2 VOWEL SYSTEM

Until more reliable data is available, as discussed in §3.2, reconstructing the PFW vowel system is nearly impossible.

4.3 SYLLABLE STRUCTURE AND PHONOTACTICS

The syllable structure of PLP began to simplify in the PFW languages. In Saponi the change is complete and now only the syllables V and CV exist; with an echo vowel inserted between the previous CC. This change appears to still be in process in Rasawa and Awera: Sa *kiɾipeje*, Ra *kɾiβi*, Aw *priya* 'one'; Sa *niɾiwa*, Ra *dɾiβo* 'three'; Sa *taɾau*, Aw *tɾaβi* 'to stand'. In those languages where the initial consonant cluster occurs, the second member of the cluster is always a flap **ɾ*.

4.4 PHONOLOGICAL CHANGES FROM PFW TO AWERA, SAPONI AND RASAWA

Although the lexicostatistical cognates percentage is lowest between Saponi and Awera (29 per cent) these show the greatest similarity in sound changes from PFW.

The numbers given after the reflexes refer to the numbered words in the word lists in Appendix 3. It is from these words that my conclusions were drawn.

CHART 2: PFW-TO-LANGUAGES REFLEXES

PW	Sa	Ra	Aw	Ref.
**#p*	*#p~f*	*#p*	*#p*	106, 188, 84, 88
**#p*	*#Ø*			138, 164
V**pV*	*p~f*	*ɸ*	*p*	56
**#k*	*k*	*k*	*k*	108, 118
V**kV*	*g~ɣ*	*x~k*	*ɣ*	164, 168, 171, 177
**#bV*	*#ß~mV* [+lo]	*#b~mV* [+lo]	*#ß~mV* [-hi]	161, 162, 16, 58
**VbV*	*w*	*ß*	*ß~w*	168, 178, 21
**#t*	*#t*	*#t*	*#t~ɾ~n*	20, 37
**tiV*	*sV*	*sV*	*sV*	186, 199
**#d*	*#n*	*#d*	*#n*	46, 29, 140, 151
**V*dV*	*ɾ*	*ɾ*	*ɾ~Ø*	187, 188
**iiɛ/*Vdiɛ*	*jɛ/ɾɛ*	*iyɛ/ßie*	*iyɛ/ße*	30, 13, 35, 43

As stated earlier, the exact nature of the emergence of [s] in the Far West languages remains a mystery. Its occurrence is rare in all the languages and its distribution is limited. Although there exist examples of tV$_1$... and sV$_1$... in all the languages, there are no contrasts between tiV$_1$ and sV$_1$.

Another innovation is the appearance of the affricate *j* in Saponi. This occurs only in a final suffix. Considering the absence of **ti*V in PFW and its resulting form, the absence of the sequence **V*diV from Saponi also is not surprising. Since these sequences result in [s] and [j] in other Lakes Plain languages, it could have happened in Saponi. However, because the sequence V*ɾi*V exists in Saponi, the palatalisation of **d* would have to have occurred before the flapping of intervocalic **d*. Another possible source is the sequence *iy*V:

Saponi	Rasawa	
nɛ-iɛ	*de-ye*	water (Ref. 29)
Ø-ɛɾɛ-jɛ	*de-keɾi-ye*	lake (Ref. 30)

A final possibility is that Saponi [j] was formed from more than one source.

5. PROTO TARIKU

PT was more conservative phonologically than PFW. The phonemic inventory and the syllable structure and phonotactics were nearly identical to PLP. This suggests that when the PFW group and PT group diverged, the PT people remained linguistically homogeneous and conservative for a few centuries.

The only possible change in the syllable structure is the introduction of closed syllables via the deletion of a final vowel (quality unknown) producing a word-final unreleased voiced obstruent and the additional syllable patterns *CVC and *CCVC. Irrefutable evidence for this vowel is hard to reconstruct from the present-day languages. The possibility was discussed in §4.3 that closed syllables could have been present in PLP, in which case there would be no difference between PLP and PT.

5.1 PHONOLOGICAL CHANGES FROM PT TO PWT, PCT AND PET

In the consonant system, the most pronounced change came in PCT, perhaps because this group diverged from PWT and PET earlier than these did from each other. PT **ku* became **b* in PCT; PT **kuɾe* > PCT **be* 'fire'; PT **kuaɾi* > PCT **ba* 'mouth'; PT **kuɾi* > PCT **bi* 'rain'; PT **kuaukaɾi* > PCT **baukai* 'chin'. In these examples, there is also an intervocalic flap **ɾ* deletion reflex in PCT, which precedes the **ku* > **b* reflex. This sound change is nearly complete in PCT. In the other PT languages there is evidence for the intervocalic flap **ɾ* deletion, but also for its creation. When an epenthetic or echo vowel is inserted between *Cɾ* sequences, the result is an intervocalic flap **r*: CV*ɾ*V. It is likely that, in time, this flap will delete as it has in PC: PT **tɾe* > PWT **tre*, PET **tɾe*, PCT **tere* > **tee* > Ia *te* 'mosquito'.

In the vowel system, two extra high vowels were created in PWT and PCT when the final consonant in closed syllables merged with the preceding vowel. This process in Kirikiri and other Lakes Plain languages is discussed in fuller detail in Clouse and Clouse (1993).

CHART 3: PROTO TARIKU REFLEXES

PT	PWT	PCT	PET	Ref.
**p*	**ɸ*	**ɸ*	**p*	15, 52
**t*	**t*	**t*	**t*	20, 17
**ti*V	**ti*V	**s*V~**ti*V	**s*V~**ti*V	73, 215, 216
**b*	**b*	**b*	**b*	213, 6
**d*	**d*	**d*	**d*	151, 179, 101
V**d*V	**d*	**ɾ~*d*	**d*	159, 171, 177
V**ɾ*V	**ɾ~Ø*	**Ø~ɾ*	**ɾ~Ø*	37, 213, 214, 223
**ku*	**ku*	**b*	**ku*	5, 37, 88, 54, 95
**k*	**k~Ø*	*Ø~*k*	**k*	190, 162, 233, 83
**i*C	**i^*	**i^*	**i*C	217, 78, 215
**u*C	**u^*	**u^*	**u*C	216, 20
**a*	**a*	**a*	**a*	214, 52
**e*	**e*	**e*	**e*	107, 88
**i*	**i*	**i*	**i*	59, 118, 215
**o*	**o*	**o*	**o*	73, 213
**u*	**u*	**u*	**u*	101, 83

6. THE DUVLE ISOLATE

There is very limited data on the phonology of Duvle. What is available is in the form of a summary, which does not include examples. There are several features in the limited data, though, that make it an obvious Lakes Plain language. However, there are other features which are very uncharacteristic of Lakes Plain languages. In view of additional lexicostatistical and grammatical evidence (Murdoch n.d.[2]), it seems apparent that Duvle is more distantly related to the other Lakes Plain languages than any of those languages are to one another. It is possible that the Duvle language was the first to diverge from PT, or even predated PT.

Duvle is identical to PLP in regard to syllable patterns with V, CV and CCV. Additionally, the vowel in each of these patterns can have an offglide. Phonotactically, Duvle is much more complicated than PLP. The second member of a consonant cluster can be a retroflexed flap following /p/, /k/, /b/, /f/, and /v/ or can be a /ɣ/ following all non-back consonants. Consonant clusters with /ɣ/ can also be found in some East Tariku languages, as will be demonstrated later. Whereas this cluster (Cɣ) is limited to co-occur with the phonemes /s/, /p/ and /k/ in Sikaritai and /s/ and /p/ in Waritai, it has a greater distribution than the retroflexed flap in this position in Duvle.

6.1 CONSONANT SYSTEM

Unique to Duvle is a relatively large number of consonant phonemes. Besides the five found in PLP are the additions of /ɣ/, /f/, /s/, /v/, and /z/. It is most interesting that all of these additions are fricatives (although /ɣ/ fluctuates with /g/ word-initially) and that there are no nasals. Murdoch (n.d.[1]) states that there is a lack of nasals in any environment. This lack of even phonetic nasals can be seen in some East Tariku languages as well.

A question arises how these extra consonants came to be, if in fact Duvle descended genetically from a five-consonant PLP. It was seen in the Far West languages, and will be seen in the other languages below, that some consonant innovations stem from the merging of a consonant, usually an alveolar, with a high front vowel to produce an affricate. That this consonant/high vowel coalescence is a possibility for the extra Duvle consonants is more convincing when we see that Duvle has two high front vowels, /i/ and /ɪ/, but the /ɪ/ "has a far greater occurrence than the /i/" (Murdoch n.d.[1]). It could be that many of the /i/s are underlying (historically) in the fricative consonants. Further evidence is that there are no examples of the sequence obstruent C/i/V in the Duvle data. The combinations *bɪa*, *pɪa*, and *dɪa* do exist, however. This could be evidence that {*v, f, z, ɣ*} +V is underlyingly *{*b, p, d, k*} +**i*+*V. In searching the word lists, coming up with clear cognates is difficult. In fact, the situation becomes more confusing as the fricatives could be coming from a variety of sources. It will be clearly demonstrated that PT **kwɾ* and **kw* become **wɾ* and **w* in PCT (with **w* further reducing to *b* in the modern languages) and **kɾ* and **kw* in PWT. In Duvle this seems to have become *fɾ* and *f* respectively: Du *fɾæ*, Wa *kwɾɛ*, Ia *bɛ*, Do *kɛi^* 'thorn' and Du *fæɾi*, Ki *kwa*, Ed *bai*, Ia *ba* 'come'. Duvle *v* may have come from a similar source: Du *ævisa*, Do *ɛbisa* 'egg'; Du *ovɛi*, Do *wɛi* 'ear'; Du *væiɾɛ*, Ia *bai^* 'sun'; and Du *vada*, Ia *ba* 'shoot'. However, with a flap it seems to have been derived from PT **p*: Du *vɾæ*, and Do *pɾi* and Wa *ɸɾi* 'spit'. The Duvle fricative *z* is even more mysterious. Both PT **t* and **d* are good candidates for its source: Du *zæɾi*, Do *dɛɾi* 'tongue', Du *zo*, Do *do* 'sand', and Du *ziɾi*, Ka *tɛhɛi* Er *tei* 'child'. There were not enough cognates with Duvle *ɣ* to show any possible source.

6.2 VOWEL SYSTEM

Whereas Duvle resembles the East Tariku languages in its consonants and consonant cluster, it resembles the central and western Tariku languages in its vowels. In addition to the five PLP vowels, there are two more high vowels, one front and unrounded and one back and rounded ("slightly fronted and lower than /u/" according to Murdoch n.d.[1]).

The Duvle vowel system is:

i			*u*
ɪ		*ʉ*	
	e		*o*
		a	

The innovation of the two extra vowels found in central and western Tariku languages stems from a coalescence of a high vowel with a consonant which closes a syllable (see below). As we have seen, this same kind of process may have produced extra fricative consonants in Duvle. One answer to the dilemma of the extra vowels and consonants in Duvle is that the processes seen in Duvle consonants and central/western Tariku vowels may both be at work, with one process feeding the other.

We will see that in Elopi the emergence of /j/ is a result of the extra high /i^/. For this process to occur the /i^/ had to occur first from the coalescence /i/ and a syllable-closing consonant. I propose that perhaps the process emerging in Elopi is merely further along in Duvle than in any of the other Tariku languages. The process just described could be represented in the following way: **i*C > **i*^ > (C)**i*^V> /extra fricative C/. In other words, the /i/ in a closed syllable coalesces with the following consonant producing an extra high /i^/. Later the /i^/, if followed by a vowel, coalesces further with the preceding consonant, producing a fricative consonant. This process might also explain why /i/ (/i^/?) is so uncommon in Duvle.

To be sure, more data is needed from Duvle so that more cognates can be found, perhaps proving or disproving the hypotheses suggested above. This data would take us a long way to understanding how Duvle became so different from its sister languages. At this point it is sufficient to say that Duvle is genetically related to the Lakes Plain languages, but its exact relationship is still undetermined. Lexicostatistically it seems more related to the East Tariku languages, but the extent to which it has progressed (or digressed) from PT is similar to the Central Tariku languages. For example, whereas the Duvle phonology innovated four extra fricative consonants, Iau innovated four extra tone contrasts. It is for all of these reasons I have suggested that Duvle be considered a family-level isolate.

7. PROTO EAST TARIKU

Although PET was not the most conservative of the PT languages in word innovations, it was the most conservative in phonological innovations: the phonemic inventory and the syllable structure and phonotactics. One minor difference is that PT **ti*V is retained in a very few instances in east Tariku languages (on numbers), except in Sikaritai where it has been completely replaced by *s*V.

The two languages furthest to the east (Sikaritai and Waritai) also show some unusual initial consonant clusters. Besides the cluster C*r*, there are:

Sikaritai	Waritai	Ref. no.
sg	*sg*	34, 87, 129
kg		43, 44
pg	*pg*	19, 142
ts		143

Martin (1991) claims that in Sikaritai the *g* in each of these cases is phonetically *γ* and is underlying **ik*, (though he does not state why he chose the vowel *i*), thereby maintaining that only flap [ɾ] can be the second member of a consonant cluster. There is some evidence that a vowel did precede the **k*: Si *kˀγigˀ*, Ob *kɛkaigˀ*, Do and Wa *kɛiki* 'one'. The one occurrence of *tš* is cognate with the Obokuitai and Eritai sequences *tis*.

A change that does not seem to be taking place in east Tariku languages is the deletion of intervocalic flap [ɾ]. Although there are a few instances of it in Doutai and Waritai, this deletion is far less common than in either West Tariku or Central Tariku languages.

The question arises, did PET diverge from PT later than PWT because it was phonologically more conservative or did PWT diverge later, because there are, lexicostatistically, more word cognates with PT? More research into grammatical typology may shed some light on the subject.

7.1 PHONOLOGICAL CHANGES FROM PET TO INDIVIDUAL LANGUAGES

As stated earlier, the PET languages are most like PT in terms of phonology. The merging of the syllable-final consonant with the preceding vowel is evident in all the languages producing fricated vowels. However, Obokuitai and Sikaritai have retained the syllable-final consonants but as voiced and unreleased. In addition, the fricative [s], most likely derived from an earlier **ti*, has received full phonemic status. There is some evidence as well that this is continuing to change toward [h]. The affricate [j] is coming into prominence from the sequence *d + i* and/or from the following sequence: fricated vowel (created at the loss of syllable closure) or high vowel in a closed syllable, this followed by a non-extra-high vowel. This conclusion is drawn from the absence of **di*V and **ti*V in these languages and cognates like the following.

Sikaritai	Obokuitai	Kai	Biri	
igˀju-a	*igˀjɛ-kwa*	*i^ja-wa*	*i^a-ka*	tie
bɛju-a	*badubˀ-kwa*	*baru-wa*	*badi*	see

Sikaritai	Obokuitai	Kai	Doutai	
kugˀje-wa	*sudo-kwa*	*ku^ju-wa*	*sudu-wa*	thunder
igˀjɛkigˀ	*sukwigˀ*	*i^jɛki^jɛ-wa*	*su^jaki^*	night
a-ϕed	*a-sai*	*a-hai*	*a-sudo*	skin
asito	*ahigɛigˀ*	*atahai*	*aiahi*	near

Like all Lakes Plain languages, the eastern Tariku languages lack phonemic nasals. In all of the other languages, the phonetic nasals that do exist do not contrast with their voiced-stop counterpart. A phenomenon is found in these eastern languages, as well as in Duvle, which is most unusual: the lack of even phonetic nasals. A more detailed discussion of this phenomenon is given in Clouse and Clouse (1993). A final point of interest is that where in the West and Central Tariku languages the nasal *m* and *n* are only morpheme initial and fluctuate with *b* and *d* (usually before low vowels), in the East Tariku language of Doutai, *b* and *d* word-initially are, according to McAllister (1991), implosive.

CHART 4: PROTO EAST TARIKU REFLEXES

PET	Do	Wa	Ka	Bi	Ob	Er	Si	Ref.
*p	p~ɸ	p~ɸ	ɸ	h~ɸ	ɸ~h	p~h	p~h	52, 71
*t	t	t	t	t	t	t	t	20, 117, 140
*s	s	s	s	s	s	s	s	73, 76
*b	b	b	b	b	b	b	b	16, 115
*b#	Ø#	Ø#	Ø#	Ø#	b¬#	Ø#	b~Ø#	13, 20
*d	d	d~t	d	d	d	d	d	125, 151
*diV	jV[22]	di	di	di	di	j	j	127, 163
*i^V	i^j	i^jV	i^jV	i^jV	i^jV	i^jV	i^jV	95, 75, 62
*ɾ	Ø	Ø	ɾ	ɾ	ɾ	ɾ	ɾ	37, 88
*Cɾ	Cɾ	Cɾ	Cɾ	C	Cɾ	Cɾ	Cɾ	12, 42, 52, 119
*ku	ku	ku	ku	b	ku	ku	ku	41
*kV^	kV^	kV^	kV^	V^	kV^	kV^	kV^	40, 83, 97
*C#	Ø#	Ø#	Ø#	Ø#	g¬#	d#	d/g#	23
*iC	i^	i^	i^	i^	iC	iC~i	iC	23, 41, 97
*uC	u^	u^	u^	u^	uC	uC	uC	125
*a	a	a	a	a	a	a	a	52
*e	ɛ	ɛ	ɛ	ɛ	ɛ	ɛ	ɛ	88
*i	i	i	i	i	i	i	i	41, 45, 119
*o	o	o	o	o	o	o	o	76
*u	u	u	u	u	u	u	u	83, 101

8. PROTO WEST TARIKU

With regard to the PT daughter protolanguages, PWT was the least innovative lexicostatistically. The PWT consonant system was identical to PT, except that the voiceless bilabial consonant underwent lenition in all positions and two extra vowels were created as a result of a syllable-closing consonant merging with the preceding vowel:

	*t	*k	*i^	*^u	
*b	*d		*i		*u
*ɸ				*ɛ	*ɔ
				*a	

In addition, PWT *tiV became [sV] and intervocalic flap *ɾ (that is, intervocalic /*d/ within a morpheme) began to delete. A major change that did occur in PWT was in the syllable structure and vowel system.

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2 McAllister (1991) claims *i*V exists in Doutai although no example is seen in the word lists in Appendix 3.

8.1 SYLLABLE STRUCTURE AND VOWEL SYSTEM

When PWT diverged from PT the syllable structure simplified, resulting in only V, CV and CCV. The final consonant in syllables that became closed, as a result of a final vowel deleting, merged with the preceding vowel. This affected only the preceding high vowels. These high vowels, **i* and **u*, became higher, fronted, and constricted or fricated and two extra contrasting vowels were created. However, the resulting seven-vowel contrast applies, in Kirikiri at least, mostly to single vowels. The seven vowels contrast in some VV sequences but not all (Clouse and Clouse 1993).

Kaye (1989:56-57) states in effect that it is so far unattested for a language without closed syllables to have consonant clusters (he calls this a "001" or "011" language). However, we can see from some Lakes Plain data that such languages do exist. It should be noted, though, that Kaye's statement seems to be coming true for West Tariku (and other Lakes Plain) languages, for the CCV syllable type is in the process of simplifying further by inserting an epenthetic or echo vowel unconditionally between the consonant cluster, leaving us with "000" or "010" languages. (However, Kaye also states that "010" languages are unattested.) If this process continues as it has in Central Tariku languages, the resulting intervocalic flap **ɾ* will eventually delete and the resulting VV sequence will assimilate. This process may be the cause of Iau's (a Central Tariku language) reported eight tonal contrasts where most of the other Tariku languages have only four contrasts.

8.2 PHONOLOGICAL CHANGES FROM PWT TO KIRIKIRI, FAYU AND TAUSE

Proto West Tariku produced three daughter languages, each with two or three dialects. I will call these three languages Kirikiri (with Faia dialect 89% cognate), Fayu (with Sehudate dialect 81% cognate) and Tause (with Weirate dialect 78% cognate and Deirate dialect 77% cognate). It is worth mentioning that the three languages mentioned have, until four years ago, had very little if any contact with their related dialects. In 1990, for instance, the Kirikiri did not know the Faia existed. This was undoubtedly due to the mountain range and no-man's-land that separated those living in the west Tariku River watershed from those in the Wapoga River watershed. It is not surprising then that we find reflexes shared by the dialects in the Wapoga watershed that are not shared by their corresponding sister dialects in the Tariku watershed.

The most notable features of these three languages are (1) the emergence of nasals word- or morpheme-initial, (2) the creation of [s] from **ti*, (3) the creation of [j] from **di*, and (4) the further simplification of syllable structure to V and CV only (though the processes in (3) and (4) are not complete).

I will refrain from listing the vowel reflexes. Having worked extensively on the Kirikiri vowel system, it seems clear to me that the reliability of the Fayu and Tause word lists in Appendix 3, which were taken before a complete phonological analysis was done, is questionable. Personal investigation of Fayu reveals a vowel system similar to Kirikiri, which is the same as the PWT vowel system.

CHART 5: WEST TARIKU REFLEXES

PWT	Ki	Fa	Fy	Se	Ta	We	De	Ref.
**p*	*ɸ~h*	*ɸ~h*	*ɸ~h*	*ɸ~h*	*ɸ*	*ɸ~h*	*ɸ~h*	117, 119
**t*	*t*	*t*	*t*	*t*	*t*	*t*	*t*	20, 140
**k*	*k*	*k*	*k~g*	*k*	*k*	*k*	*k*	78, 88
Intervocalic **k* became *k~x~g~ɣ* in all languages								10, 80
**#b*	*b~^{m}b*	*b*	*b~^{m}b*	*b~^{m}b*	*b~^{m}b*	*b*	*b~^{m}b*	78, 162
**ba*	*#ma*	*#ma*	*#ma*	*#ma*	*#ma*	*#ma*	*#ma*	43
Intervocalic **b* became *b~β* in all languages								62, 108, 116
**d*	*d~^{n}d*	*d*	*d~^{n}d*	*d*	*d~^{n}d*	*d*	*d*	29, 151
**#da*	*#na*	*#na*	*#na*	*#na*	*#da*	*#da*	*#da*	108, 47, 48
V**dV*	*r~l~Ø*	*r~Ø*	*r~Ø*	*r~Ø*	*r~Ø*	*r~l~Ø*	*r~l~Ø*	105, 2, 77
**diV*	*diV*	*diV*	*jV*	*jV*	*yV*	*jV*	*jV*	9, 105
**tiV*	*sV*	*sV*	*sV*	*sV*	*sV*	*sV*	*sV*	215, 73

As stated earlier, how the [s] emerged in these languages is uncertain. The only thing clear is that in most of the languages the sequence *ti*V does not exist but in the Wapoga watershed dialects the sequence *si* does not exist either. Other possible changes are a consonant (flap **ɾ* or **k* or both) deleting intervocalically in the sequence **ti*CV (there is plenty of evidence of this happening in other contexts), and the resulting *tiV becoming *s*V. Although, in other instances it looks as though the *CV or **i*C in the **ti*CV sequences were deleted. Perhaps all of these processes happened to some degree or another at different times, feeding or bleeding the change conditions. Other than that, with the data available, it appears that the [s] in the west Tariku languages emerged randomly. This is doubtful, but more accurate data will be needed to find the answer.

9. PROTO CENTRAL TARIKU

PCT shows a greater number of sound changes from PT than either PET or PWT. This argues for an earlier divergence from PT than PET and PWT. Most of the sound changes that can be seen taking place in PET and PWT seem to have carried through to the greatest extent in the PCT languages. This is especially true for dropping consonants and syllables. This has produced in the modern languages an overwhelming percentage of monosyllabic words and many more contrastive tone patterns compared to modern east and west Tariku languages.

9.1 CENTRAL TARIKU PHONOLOGY

The PCT consonant and vowel systems are similar to those found in PET and PWT, including the two extra high vowels from the merging of a high vowel and a syllable-final consonant and the emergence of **s* from the PT sequence **ti*.

	**t*	**k*	**i^*	**^u*	
**b*	**d*		**i*		**u*
**ɸ/h*	**s*			**ɛ*	**ɔ*
				**a*	

However, lexicostatistically, the Central Tariku languages share fewer cognates with East and West Tariku than East and West Tariku do with each other, also suggesting an earlier divergence.

Phonetic nasals have come into use in the modern Central Tariku languages. The nasal *m* is present morpheme-initially as a variant of *b* in both languages studied. The nasal *n*, is present in Edopi as a morpheme-initial variant of *d*, and in Iau as a variant of *l* in this position. Edopi is also developing the affricate *j* from the sequence *di* and/or from the extra high vowel *i^* (giving credence to the idea that the vowel is a result of the merging of a final consonant in a closed syllable with the preceding vowel).

PCT has simplified the syllable structure of PT to V, CV and CVC (very rare). An echo vowel was inserted between the PT *C sequence: PT **kɾi* > PCT **kiɾi* > Ed *kiɾi* 'banana'. In modern Iau a further simplification occurred where the resulting intervocalic **ɾ* was deleted and the identical vowels assimilated: PCT **biɾi* > **bii* > Ia *bi* 'teeth'; PCT **ɸɛɾɛ* > **ɸɛɛ* > Ia *ɸæ* 'eye'.

9.2 PHONOLOGICAL CHANGES FROM PCT TO EDOPI AND IAU

Edopi was phonologically more conservative than Iau in regard to sound changes. Edopi further simplified the syllable structure by deleting the syllable-final consonant (in Iau it is very rare), whereas Iau deleted all occurrences of flap **ɾ*. Iau also deleted word-initial **k* and many final syllables on words. The result was a language of mostly monosyllabic words with combined tone patterns.

CHART 6: CENTRAL TARIKU REFLEXES

PCT	Ed	Ia	Ref.
*C#	*Ø#*	C# (rare)	217, 245
*CV#	CV#	*Ø*	57, 108, 156
**ɸ*	*h*	*ɸ~h*	4, 214, 244
**b*	*b*	*b*	213
**#b*	*#m~b*	*#m~b*	69, 72, 99, 111, 158
**d*	*d*	*d*	151, 57
**#da*	*#da~na~la*	*#da~la~na*	108, 236, 60, 65, 66
**di*	*j*	*di*	172
V**ɾV	*ɾ*	*Ø*	8, 9, 16, 18, 29
**t*	*t*	*t*	20, 217
**s*	*s~t*	*s*	149, 216, 228
**k*	*k*	*k*	95
**#k*	*#Ø*	*#Ø*	10, 19, 52, 180
**au*	*au*	*ɔ*	62, 149
**i^*	*ji^*	*i^*	148, 159
**u^*	*u^*[3]	*u^*	

3 Although there are no phonemes marked *u^* in the word lists in Appendix 3, both Kim and Kim (1991) and Bateman (1990b) make a three-way phonemic distinction in the back rounded vowels.

PCT	Ed	Ia	Ref.
*i	i	i	151
*u	u	u	83
*e	e	ɛ	3, 152
*o	o	o	33
*a	a	a	17, 150

10. GRAMMATICAL TYPOLOGY

Although the grammatical data is growing, it is not sufficient to propose genetic relationships. Because this paper mainly concerns reclassifying these languages and since there are good reasons to do so on lexicostatistical and phonological grounds alone, a complete picture of the grammatical typology of the Lakes Plain languages will wait for a later date. What is immediately obvious is that all Lakes Plain languages are verb-final non-Austronesian languages. Also, a typological feature of all Lakes Plain languages is a relatively small amount of verbal affixation (isolating). This is in contrast to what is typical of agglutinative languages of the Trans New Guinea Phylum.

It is also possible that a fair amount of borrowing of pronouns occurred among the languages in the Geelvink Bay Phylum. The blanks in the chart below are a result of lack of data, not necessarily indicating that the particular pronoun does not exist. Three dashes indicate that the pronoun does not in fact exist, but is made by using the vernacular word for 'people'.

CHART 7: LAKES PLAIN PRONOUNS

	1SG	2SG	3SG	1PL	2PL	3PL
Sa	*mamire*	*ba*	*ki*	*mamire*		*niaware*
Ra	*ebe*	*debe*	*kibie*	*duobi*		*kioio*
Aw	*yai*	*nai*	*ku*	*e*		*koro*
We	*di*	*ba*	*we*	*ai*		---
Ta	*di*	*ba*	*te*			---
Fy	*a*	*de*		*e/i*		---
Fa	*ɛ*	*di*				---
Ki	*a*	*de*	*o*	*ɛ*	*da*	---
Ed	*a*	*di*	*o*	*e*		---
Ia	*a*	*di*	*au*	*e*	*da*	---
Du	*ɛ*	*do*	*o*	*a*	*da*	---
Do	*i*			*a*		---
Bi	*e*	*de*	*de*	*ai*		---
Ob	*i*	*di*	*oi*	*ai*	*dai*	---
Si		*di*	*ba*			---
Bz	*e*	*o*	*a*	*i*	*u*	---

11. TONE TYPOLOGY

Tone is a prominent feature of all Lakes Plain languages and therefore was most likely a feature of some of the protolanguages as well. This fact further distances Lakes Plain languages from the Trans New Guinea Phylum. All the modern languages have at least high and low tone. Duvle and Sikaritai have only these tones with Martin (1991) analysing the Sikaritai system as pitch-accent. The remainder of the languages also have combinations of high and low (or contours); Obokuitai has a fall (Jenison 1991), Doutai (McAllister 1991), Edopi (Kim 1995) and all the western Tariku languages have a fall and a rise (Clouse n.d.[1]). Iau (Bateman 1990b, Edmonson et al. 1992) claims eight contrastive tones including several rises and falls. Having compared Iau words with cognates in other related languages, it was suggested earlier that many of the complex tone patterns occur because Iau has, historically, deleted consonant and vowel segments of a syllable in the protolanguage but not the tone segments, therefore producing more than one tone pattern on a syllable. It is significant to note that of the eight tones in Iau, four are short and correspond to the four tones found in the other Lakes Plain languages, and the other four are nearly twice as long and occur on long (perhaps geminate?) vowels. They often correspond to cognate two-syllable words in other Lakes Plain languages.

12. PROTO AUSTRONESIAN INFLUENCE

There are several PLP words and many more words in these languages that have striking similarities to Proto Austronesian and Proto Oceanic. Although only a few forms are listed below, someone with more expertise in the field of Austronesian reconstruction could undoubtedly find more. Most of the similarities listed are monosyllabic words (in PLP). Since the Lakes Plain languages have a high percentage of one- and two-syllable words and a very low number of phonemes, the chance for coincidental similarity is high. If these words are in fact borrowings, the question arises why such seemingly core vocabulary would be borrowed.

The following POc-Gr and PAn-D reconstructions were taken from the Wurm and Wilson (1975) *English finderlist of reconstructions in Austronesian languages.*

CHART 8: POSSIBLE AUSTRONESIAN INFLUENCE

PLP	POc-Gr	PAn-D	
**du*	**manu*	**manuk*	bird
**tou*	**t'ut'u*	**tutu*	breast
**dati*	**mata*	**mata*	eye
**pada*	**panua*	**panu[v]a'*	earth
**tuC*	**uti(n)*	**bu(t)uh*	penis
**tau*	**tau*	**[t]avu[']	person
**ku*	**kau*	**kaju'*	tree
**ti*	**tiRi*$_{o}$	**i'ë[h]*	urine
PET	POc-GR	PAn-D	
**wari*	**wai(R)*	*[dd]anum*	water
	POc-BLAA		
**bo*	**mpo mpo*	-----	firewood bundle

13. TOWARD A CLASSIFICATION OF THE LAKES PLAIN LANGUAGES

It is clear from the data presented so far, by means of historical reconstruction, that the languages discussed are related to each other, both in terms of phonology and lexicostastically. How these languages are genetically related to each other has also been shown. Now I attempt to place these languages genetically in the context of a Phylum, that is, to non-Lakes Plain languages. The introduction stated that most of the Lakes Plain languages were classified in Voorhoeve (1975) and Silzer and Clouse (1991) as belonging to the Trans New Guinea Phylum, Tor–Lakes Plain Stock. Therefore, a comparison was made of the major languages bordering the Lakes Plain (Geelvink Bay Phylum languages Bauzi and Demisa to the north and the Trans New Guinea Phylum language Dani to the south), languages in the Tor–Lakes Plain Stock (Berik and Orya) and a language in the far eastern part of the Lakes Plain (Kaure). The percentage matrix and tree diagrams below are based on lexicostatistic similarity (obtained by the computer program LEXISTAT version 2.1 by Thilo C. Schadeberg) with a margin of error of five per cent. The lexicostatistical similarity generated by LEXISTAT is derived from my own decisions listed in Appendix 4.

LEXICOSTATISTIC PERCENTAGE MATRIX

	Sa	Ra	Aw	We	De	Ta	Se	Fy	Fa	Ki	Ed	Ia	Du	Do	Wa	Ka	Bi	Ob	Er	Si	Bz	Ds	Kr	Bk	Or	Dn
Sa	--																									
Ra	47	--																								
Aw	29	34	--																							
We	18	19	14	--																						
De	16	18	14	78	--																					
Ta	16	18	13	78	7	--																				
Se	16	15	15	39	39	45	--																			
Fy	18	17	17	33	34	39	81	--																		
Fa	15	19	17	37	36	41	44	48	--																	
Ki	13	13	15	39	33	33	42	46	89	--																
Ed	10	9	8	34	29	32	35	37	45	43	--															
Ia	11	10	9	34	9	30	35	39	39	42	71	--														
Du	9	9	10	25	20	22	23	26	29	28	28	28	--													
Do	11	11	10	32	27	26	33	34	37	30	27	26	45	--												
Wa	12	13	10	33	28	28	31	33	37	30	30	25	38	73	--											
Ka	12	11	8	30	27	25	32	31	38	29	27	25	31	63	63	--										
Bi	13	12	10	33	29	26	37	35	43	35	29	26	28	44	48	49	--									
Ob	10	10	8	31	27	25	35	33	43	32	30	26	29	51	54	59	60	--								
Er	12	12	10	29	26	24	34	35	37	30	28	25	29	48	52	60	52	75	--							
Si	11	14	12	29	25	24	31	35	33	28	25	22	27	48	51	55	43	49	55	--						
Bz	5	4	5	10	8	10	12	15	10	11	11	12	7	10	8	11	13	12	10	13	--					
Ds	8	5	2	9	7	8	11	9	8	8	9	9	6	11	10	10	13	11	10	11	42	--				
Kr	3	2	2	7	7	7	9	9	11	7	6	6	5	8	7	10	9	8	6	7	2	4	--			
Bk	1	1	0	3	2	2	4	3	4	2	3	2	1	2	2	2	2	2	2	2	2	3	4	--		
Or	1	0	1	1	2	1	3	1	2	1	1	1	1	1	1	2	1	2	2	1	2	6	3	26	--	
Dn	0	1	0	2	1	1	1	2	3	2	2	1	1	1	1	1	2	2	1	2	1	0	1	1	1	--

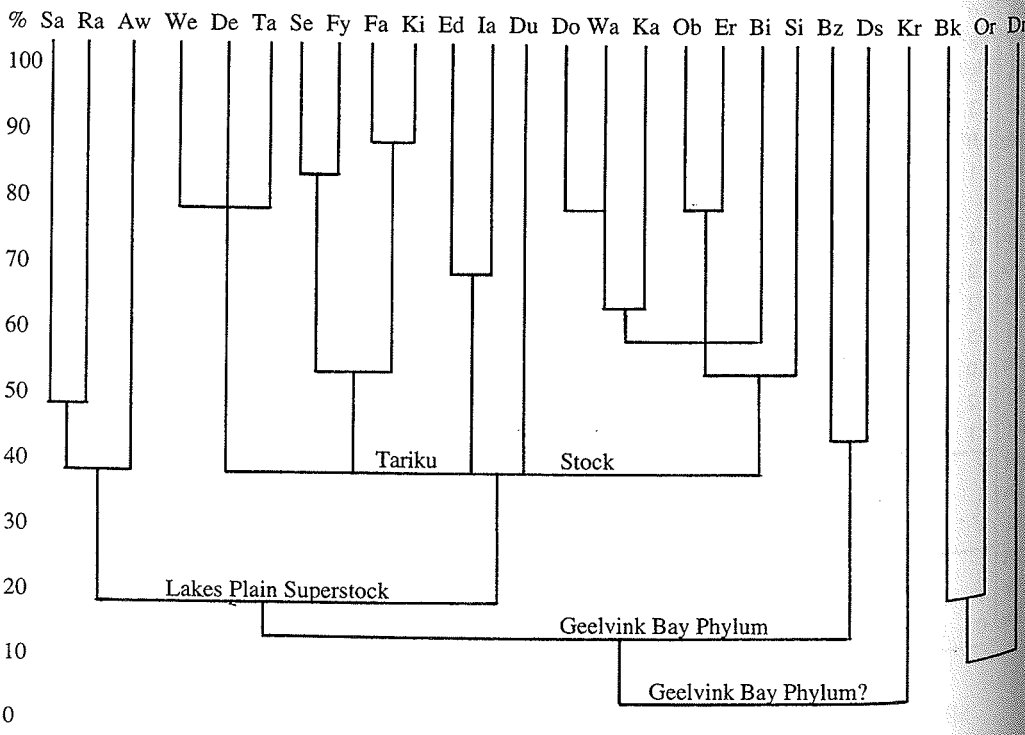
The criteria used in the classification given in the chart above are based mostly on those used for subgroupings in Voorhoeve (1975:16) with some modifications.

100% – 76% of shared cognates: dialects of one language
75% – 40% of shared cognates: languages of the same family
39% – 20% of shared cognates: languages of the same stock
19% – 11% of shared cognates: languages of same superstock
10% – 5% of shared cognates: languages of the same phylum

The matrix is read by following horizontally, left to right, a line of numbers until it intersects with a vertical line of numbers, read top to bottom. So, following Si (Sikaritai) to the right until it intersects with Er (Eritai), read down, gives 55%.

Several observations can be made from the evidence given that would lead to a reclassification of some of these languages. First, the Lakes Plain languages are not in the same stock as the Tor languages. In fact, they do not seem to be in the same phylum. Second, the Lakes Plain languages clearly belong to the Geelvink Bay Phylum, but they are a different stock from East Geelvink Bay. Finally, the Lakes Plain languages divide into two distinct stocks with five families within the Tariku Stock. It is quite logical that the languages previously classified as East Lakes Plain Family (Foau, Dabra and Taworta) would constitute a sixth family. I have made that assumption in the reclassification that follows. No attempt was made to reclassify the languages outside of the Lakes Plain Superstock (i.e. Kaure), though it should be noted that recent comparisons between Kaure and Lakes Plain grammars give some support to placing Kaure in the Geelvink Bay Phylum.

Based on this information, the following tree diagram was made (generated by the computer program LEXISTAT):



Therefore, I would like to suggest the following reclassification of the Lakes Plain languages.

GEELVINK BAY PHYLUM
- Lakes Plain Superstock
  - Rasawa Stock
    - Rasawa – Saponi Family
      - Rasawa
      - Saponi
    - Awera Family-Level Isolate
      - Awera
  - Tariku Stock
    - Tause Family-Level Isolate
      - Tause
        - (a) Tause
        - (b) Weirate
        - (c) Deirate
    - West Tariku Family
      - Fayu
        - (a) Fayu
        - (b) Sehudate
      - Kirikiri
        - (a) Kirikiri
        - (b) Faia
    - Central Tariku Family
      - Edopi
      - Turu
        - (a) Iau
        - (b) Foi
        - (c) Turu
    - Duvle Family-Level Isolate
      - Duvle
    - East Tariku Family
      - Doutai
      - Waritai
      - Kai
      - Biritai
      - Obokuitai
      - Eritai
      - Sikaritai
      - Kwerisa
      - Papasena
    - East Lakes Plain Family
      - Foau
      - Taworta
      - Dabra
  - East Geelvink Bay Stock
    - Bauzi Family
      - Bauzi
      - Demisa
      - etc. as per Silzer and Clouse (1991)