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THE INTERNAL AND EXTERNAL RELATIONSHIPS OF THE TRUKIC LANGUAGES OF MICRONESIA

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THE INTERNAL AND EXTERNAL RELATIONSHIPS OF THE TRUKIC LANGUAGES OF MICRONESIA

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By

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We certify that we have read this dissertation and that in our opinion it is satisfactory in scope and quality as a dissertation for the degree of Doctor of Philosophv in Linguistics.

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ABSTRACT

This dissertation is a primarily comparative study of the Trukic languages of Micronesia. It has three interrelated aims: to establish the linguistic integrity of the Trukic subgroup of Oceanic; to form a principled hypothesis of subgrouping within the Trukic group; and to establish the identity of the languages and language groups that are most closely related to the Trukic group. Related to this last aim is the establishment of the integrity of the Micronesian group of languages, consisting of the Trukic languages, the Ponapeic languages, and the Marshallese, Kiribati (Gilbertese), and Kosraean (Kusaiean) languages, and the development of a principled subgrouping hypothesis for within Micronesian.

Chapter 1 provides an introduction to the work. In chapter 2, the major consonant correspondences between Proto-Oceanic and the Trukic languages are established, and a tentative phonemic system for Proto-Trukic (PTK) is reconstructed. Significant aspects of the PTK grammatical system are also reconstructed, and it is demonstrated that seven grammatical forms appear to be PTK innovations. Lexical evidence for the Trukic group is also presented.

In chapter 3, the sound systems of the modern Trukic languages are described, and the historical sound changes that have led to these systems are induced. Evidence is presented which appears to require the reconstruction of an additional PTK apical obstruent. Other

evidence is examined which suggests that rules affecting PTK *k and *t have been diffusing through the lexicons of Trukic languages at different rates in much the manner described in Wang (1979), and that the patterns of lexical diffusion constitute important evidence for subgrouping in Trukic. Grammatical and lexical evidence is also examined, and it is concluded that Ulithian was the first language to separate from the PTK community.

In chapter 4, phonological correspondences between Trukic and the other Micronesian languages are established, and qualitative evidence is presented for the integrity of the Micronesian group. Subgroupings within Micronesian are also proposed, and it is shown that the closest relative of Trukic is Ponapeic. In fact, evidence is examined which suggests that the Ponapeic languages may be members of the Trukic subgroup. The chapter concludes with speculation on population dispersal during the settlement of Micronesia.

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LIST OF ABBREVIATIONS

Languages and Proto-Languages:

CRL	Saipan Carolinian (southern dialect)
CRN	Saipan Carolinian (northern dialect)
HAW	Hawaiian
KIR	Kiribati (Gilbertese)
KSR	Kosraean (Kusaiean)
MAO	Maori
MAP	Mapian
MOK	Mokilese
MRS	Marshallese
MRT	Lower Mortlockese
NAU	Nauruan
NUK	Nukuoru
PAD	Proto-Admiralties
PAN	Proto-Austronesian
PCMC	Proto-Central Micronesian
PCO	Proto-Central Oceanic
PCP	Proto-Central Pacific
PCTK	Proto-Central Trukic
PEO	Proto-Eastern Oceanic
PETK	Proto-Eastern Trukic
PMC	Proto-Micronesian
PMP	Proto-Malayo-Polynesian
PMRT-TRK	Proto-Mortlock-Trukese
PNG	Pingelapese
PNP	Proto-Nuclear Polynesian
PNTK	Proto-Nuclear Trukic
POC	Proto-Oceanic
PON	Ponapean
PPN	Proto-Polynesian
PPP	Proto-Ponapeic
PSI	Proto-Siassi
PSTK	Proto-Sonsorol-Trukic
PSTW-CRL	Proto-Satawal-Carolinian
PTK	Proto-Trukic
PTK-PP	Proto-Trukic-Ponapeic
PUA	Pulo Anna
PUL	Puluwatese
PWMC	Proto-Western Micronesian
PWTK	Proto-Western Trukic
SAM	Samoan
SNS	Sonsorolese
STW	Satawalese
TBI	Tobi

TON	Tongan
TRK	Lagoon Trukese
ULI	Ulithian
WOL	Woleaian
YAP	Yapese

Language Groups:

AN	Austronesian
CMC	Central Micronesian
CTK	Central Trukic
EO	Eastern Oceanic
ETK	Eastern Trukic
MC	Micronesian
MRT-TRK	Mortlock-Trukese
NTK	Nuclear Trukic
OC	Oceanic
PN	Polynesian
PP	Ponapeic
STK	Sonsorol-Trukic
STW-CRL	Satawal-Carolinian
TK	Trukic
TK-PP	Trukic-Ponapeic
WMC	Western Micronesian
WTK	Western Trukic

Other Abbreviations:

1	first person
2	second person
3	third person
cls	classifier
cntg	counting
dem	demonstrative
esp.	especially
exc.	exclusive
f.	from
foc	focus
inc.	inclusive
k.	kind
num	number
obj.	object
p.c.	personal communication
pl	plural
poss	possessive
pref	prefix
pron	pronoun
sg	singular
s.o.	someone
sp.	species

s.t.	something
subj.	subject
suf	suffix
TA	tense-aspect
vb	verb
vi	intransitive verb
vt	transitive verb

I. INTRODUCTION

This work is a primarily comparative study of the Trukic languages of Micronesia. It has three interrelated aims: to establish the linguistic integrity of the subgroup of Oceanic which consists of these languages; to form a principled hypothesis of subgrouping within the Trukic group; and to establish the identity of the languages and language groups that are most closely related to the Trukic group. Related to this last aim is the establishment of the integrity of the Micronesian group of languages, consisting of the Trukic languages, the Ponapeic languages, and the Marshallese, Kiribati (Gilbertese), and Kosraean (Kusaiean) languages, and the formation of a principled subgrouping hypothesis within Micronesian.

1.1 Geographic and demographic background

The islands on which Trukic languages are indigenously spoken range from Tobi, at about 131 degrees east longitude, across approximately 1600 miles of the Pacific Ocean to Lukunor, at about 154 degrees east longitude. Most of these islands lie in a relatively narrow strip between about three and ten degrees north latitude, but there is evidence that a Trukic language was spoken until the end of the last century on the islands of Mapia, at about 134 degrees east longitude and one degree north latitude (see section 4.5), and Trukic speakers have within the last two hundred years migrated to the island of Saipan in the Northern Mariana Islands, which is slightly north of

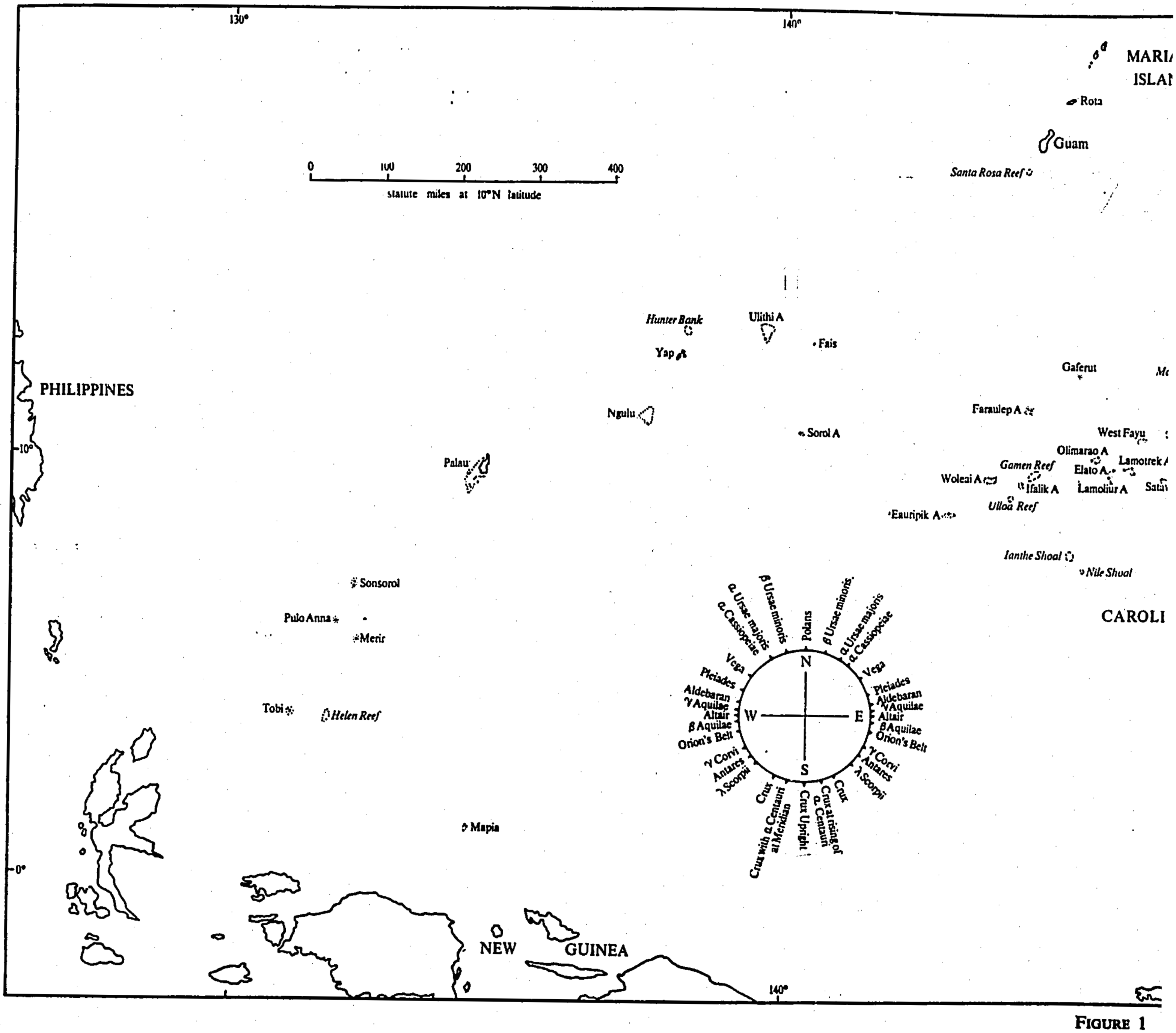


Figure 1. The Caroline Islands (Riesenberg 1976)

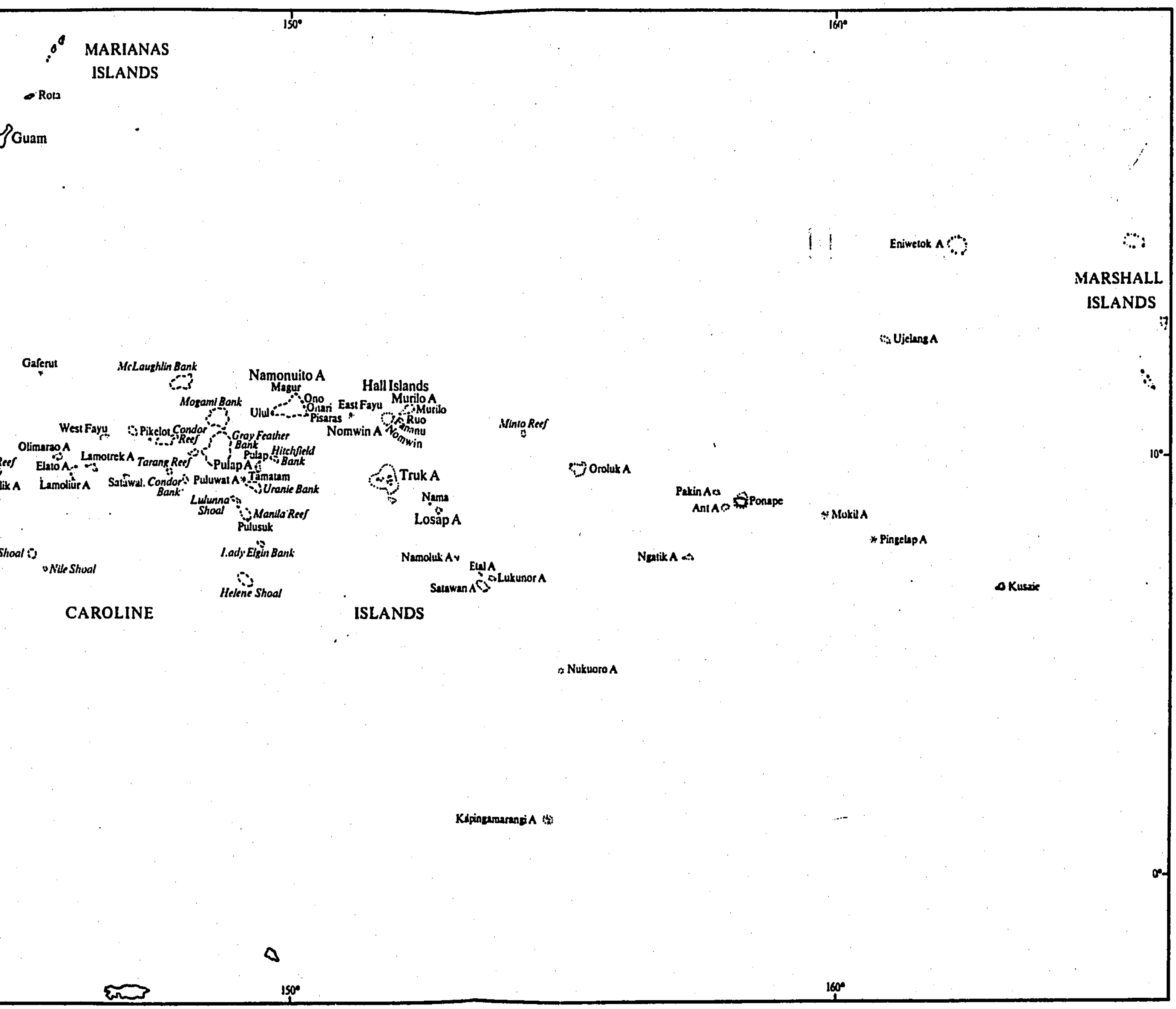

150°
160°
MARIANAS ISLANDS
Rota
Guam
Eniwetok A
MARSHALL ISLANDS
Ujelang A
Gaferut
McLaughlin Bank
Namonuito A
Magur
Hall Islands
Murilo A
Murilo
Ruo
Ono
Onari
Pisaras
Ulul
East Fayu
Nomwin A
Nomwin
Mogami Bank
Minto Reef
West Fayu
Pikelot
Condor Reef
Gray Feather Bank
Olimarao A
Lamotrek A
Elato A
Tarang Reef
Pulap A
Pulap
Hitchfield Bank
Tamatam
Truk A
Oroluk A
10°
Lamoliur A
Satawal
Condor Bank
Puluwat A
Uranie Bank
Nama
Pakin A
Ant A
Ponape
Mokil A
Lulunna Shoal
Manila Reef
Losap A
Pulusuk
Pingelap A
Lady Elgin Bank
Namoluk A
Ngatik A
Etal A
Lukunor A
Satawan A
Nile Shoal
Kusaie
Helene Shoal
CAROLINE
ISLANDS
Nukuoro A
Kapingamarangi A
0°
150°
160°

FIGURE 1

the fifteenth parallel. All of these islands except Saipan and Mapia are located within the Caroline Islands.

With the exception of Saipan and the islands of Truk Lagoon, all islands inhabited by Trukic speakers are coral islands, raised coral islands, or coral atolls, and have very little usable land.[1] Saipan and the islands of Truk Lagoon are volcanic islands, with considerably more area. These geographical facts have demographic consequences, as will be seen shortly.

The Trukic peoples have several non-Trukic neighbors. The Mariana Islands to the north and the Palau Islands to the west have been occupied for at least 4000 years (Craib 1983:922-923) by speakers of non-Oceanic Austronesian languages (Chamorro and Palauan, respectively). Both Palau and the Marianas are high islands. The high island of Yap is located almost among the Trukic islands, only a little over 100 miles west-southwest of Trukic-speaking Ulithi atoll. The linguistic origins of Yapese are not at all clear, but it is certain that it is Austronesian and probable that it is Oceanic (Bradshaw 1975 and p.c.). The Yapese appear to have been on Yap for at least 2400 years (Craib 1983:923).

About 150 miles southeast of Lukunor lies the Polynesian-speaking community of Nukuoru. About 450 miles to the east of Truk Lagoon lies the high island of Ponape, whose inhabitants speak a nuclear Micronesian language that is closely related to Trukic. Continuing to the east are the atolls of Mokil and Pingelap, whose inhabitants speak languages that are very closely related to Ponapean. Ponapean, Mokilese, Pingelapese, and the language of Ngatikese form a distinct subgroup within nuclear Micronesian (Rehg 1981:7-12). Farther to the east, at the extreme eastern extent of the Caroline Islands, lies the island of Kosrae (formerly Kusaie), where a distinct nuclear Micronesian language is spoken. To the northeast of Kosrae are the Marshall Islands, and to the southeast is the newly formed nation of Kiribati (formerly the Gilbert Islands). Both of these latter island groups consist entirely of atolls. Their inhabitants speak nuclear Micronesian languages that are distinct from Trukic, Ponapeic, and Kosraean, and also from each other. South-southeast of Kosrae, and below the Equator, lies the solitary island of Nauru. Native inhabitants of Nauru speak a language that may be closely related to nuclear Micronesian (Nathan 1973; also see chapter 4 below).

Due primarily to the small land area of most Trukic islands, the populations of those islands are quite small. Table 1 gives the preliminary population figures for Trukic islands of the 1980 Trust Territory Census, and also indicates whether the respective island is a high island (H) or low island (L). Not all of the populations indicated in the table consist entirely of Trukic-speaking people, as these figures give only the total populations of the islands. For islands which are administrative centers, such as Moen in Truk Lagoon and the island of Ulithi, the number of speakers of Trukic languages is thus somewhat smaller than is indicated here. For most, if not all other islands, however, these figures are reasonably accurate.

With other factors, the small populations and the limited natural resources of the low islands (and, more recently, artificial administrative boundaries that have been drawn between, for example,

Table 1

Populations of Islands with Trukic-Speaking Populations (Source: Preliminary figures, 1980 Trust Territory Census)

Island	Population
Dublon, Truk Lagoon (H)	3,233
Eauripik (L)	122
Elato (L)	51
Eot, Truk Lagoon (H)	189
Ettal, Mortlock Islands (L)	441
Fais (L)	210
Fala-Beguets, Truk Lagoon (H)	440
Fananu, Hall Islands (L)	238
Faraulep (L)	135
Fefan, Truk Lagoon (H)	3,096
Ifaluk (L)	391
Kutu, Mortlock Islands (L)	484
Lamotrek (L)	243
Losap, Mortlock Islands (L)	587
Lukunor, Mortlock Islands (L)	668
Magur, Namonuito (L)	97
Moch, Mortlock Islands (L)	622
Moen, Truk Lagoon (H)	10,373
Murilo, Hall Islands (L)	325
Nama, Mortlock Islands (L)	1,021
Namoluk, Mortlock Islands (L)	329
Nomwin, Hall Islands (L)	324
Onari, Namonuito (L)	79
Oneop, Mortlock Islands (L)	485
Ono, Namonuito (L)	59
Param, Truk Lagoon (H)	226
Pisaras, Namonuito (L)	118
Pis-Losap, Mortlock Islands (L)	240
Pulap (L)	432
Pulusuk (L)	214
Puluwat (L)	495
Romanum, Truk Lagoon (H)	457
Ruo, Hall Islands (L)	298
Satawal (L)	386
Satawan, Mortlock Islands (L)	766
Sonsorol (L)	79[a]
Sorol (L)	7

Table 1. (Continued) Populations of Islands with Trukic-Speaking Populations

Island	Population
Ta, Mortlock Islands (L)	294
Tamatam, Puluwat (L)	188
Tobi (L)	73
Tol, Truk Lagoon (H)	6,781
Tsis, Truk Lagoon (H)	324
Udot, Truk Lagoon (H)	1,083
Ulithi (L)	720
Ulul, Namonuito (L)	446
Uman, Truk Lagoon (H)	2,320
Woleai (L)	659
Saipan (H)	3,000[b]

[a]The figures for Sonsorol apparently also include those for the neighboring island of Pulo Anna.

[b]This figure is a very rough estimate that is based on information supplied by individual Saipan Carolinians. According to the preliminary figures of the 1980 Census of the Northern Mariana Islands, the total population of Saipan is 14,585, but this figure includes at least 10,000 Chamorros and a sizeable population of people from other areas, including the United States, Japan, the Philippines, Korea, and other places within Micronesia.

the neighboring islands of Satawal and Puluwat) have caused the Trukic islanders to maintain extremely sophisticated sailing and navigational capabilities. Many raw materials are not available on low islands. Strict incest restrictions often make it difficult or impossible for young people to find a suitable mate on their own island. Because of these and other factors, there is frequent commerce by means of single-hulled outrigger canoes between one Trukic community and another. As described by Gladwin (1974), McCoy (1976), and Riesenberg (1976), master navigators on Puluwat and Satawal in the Central Carolines think nothing of going on 100-mile voyages to neighboring islands and have the necessary knowledge within them to undertake much farther voyages. Indeed, Riesenberg (1976) has recorded information that indicates that Puluwat navigators have internalized specific instructions that would enable them to sail to Ponape, Kosrae, and atolls of the Marshalls and Kiribati in the east; to Guam, Saipan, and other islands of the Northern Marianas to the north;[2] to Yap, Palau, and the Philippines to the west; and to Sonsorol, Pulo Anna, Merir, Tobi, Mapia and beyond to the west and south. Although there is relatively little historical documentation of such extended voyages, Fr. Cantova (1722) tells of natives of Woleai informing him of voyages to the Philippines. In addition, Trukic loans in Nukuoru and Kapingamarangi, Ponapean, Mokilese, Kosraean and Marshallese give added testimony to the extent of travel of the Trukic islanders.[3]

This navigational capacity--and the contact among the Trukic communities that it has made possible--has had important effects on the languages of those communities.

1.2 Previous comparative and historical studies of the Trukic languages

Although the awareness of similarities among individual lexical items gave rise to speculations about the histories of the Trukic languages and peoples among the first Westerners to visit these islands (see, e.g., Cantova 1722, Kubary 1889, Fritz 1911, Krämer 1937), scientific comparative and historical study of these languages appears to have begun after the second World War.

Elbert (1947:5-9) includes in his Ulithi-English word-list a number of comparison sets for Ulithian, Lagoon Trukese, Marshallese, and Samoan, and establishes several consonant correspondences among those languages. Dyen (1949) establishes the apparent Lagoon Trukese reflexes of Proto-Austronesian, and demonstrates how the nine phonemic Trukese vowels must have developed from the vowels and diphthongs of that proto-language. Goodenough (1953) brings together from various early sources the names of important stars and constellations used in navigation and the names of the months of the traditional sidereal calendar among 24 Trukic languages, and demonstrates that they are strikingly similar from one end of the Trukic group to the other, and also quite different from the respective forms used in Polynesia. Goodenough also demonstrates the probability that the calendars used on Yap and Nukuoru are loans from Trukic.

Goodenough (1963) compares forms in Trukese with others in Kiribati to demonstrate the likelihood that previously problematic geminate consonants in Trukese (and in other Trukic languages) developed from the systematic loss of vowels in historically reduplicated forms. Dyen (1965:33-34), in his massive lexicostatistic study of more than 200 Austronesian languages, also included data from Trukic languages and computed that "Woleyan" (consisting of Woleaian, Satawalese, and Puluwatese) subgroups with Trukese as members of a Trukic subfamily. Dyen further proposes that Trukic, Ponapean, Marshallese, and Kosraean form the Carolinian Subfamily.

The most encompassing previous study of the Trukic languages is Edward Quackenbush's 1968 Ph.D. dissertation. Quackenbush elicited from persons who were members of 17 different Trukic communities a total of 585 lexical items and several short sentences, and used those data to establish consonant correspondences among the 17 languages represented and also to compute lexicostatistic percentages. Although Quackenbush does not refer to any data external to Trukic, he states that the shared cognate percentages among the languages in his study are indicative of a subgroup, and also points out that much of the grammatical structure of all Trukic languages is markedly similar.

On the basis of phonological isoglosses and shared lexical items, Quackenbush hypothesizes that the languages spoken in the 17 communities which he elicited data from can be meaningfully reduced to the following 13 distinct languages: Sonsorol, Tobi, Ulithi, Woleai, Satawal, Puluwat, Pullap, Namonuito, Murilo, Upper Mortlockese, Lower Mortlockese, Fanapanges (eastern Truk Lagoon), and Moen (western Truk Lagoon).[4] In another sense, however, Quackenbush shows that there are major theoretical problems in determining the number of languages within Trukic, due to the fact that each of the "languages" listed above share cognate percentages of greater than 80% with its immediately neighboring "languages." In fact, Quackenbush shows that the entire Trukic group, from Sonsorol in the west to the Mortlocks in the east, is chained together by interlocking links of cognate percentages greater than 80%, except for a single break between Tobi and Ulithi, which share only 78% of cognates.[5]

Since E. Quackenbush's (1968) study, there has been an increase in comparative and historical work done on these languages. Hiroko Quackenbush (1970) has carried out a comparative phonological study within the generative transformational framework of four Trukic languages. Bender (1971), in his review of the linguistic situation in Micronesia, proposes, following Matthews (1950), that the Trukic languages belong to a nuclear Micronesian subgroup of Austronesian that also consists of the Ponapeic languages, Marshallese, Kiribati, Kosraean, and, more questionably, Nauruan and Yapese. He states, however, that solid evidence to support the proposal had yet to be found. Bender also tentatively suggests that the Trukic group might, somewhat arbitrarily, be divided into three distinct languages: Ulithian (including Sonsorol, Ulithi, and Woleai), Carolinian (including Satawal, Puluwat, Pullap, Namonuito, and the Trukic dialects spoken on Saipan), and Trukese (including Truk Lagoon, the Mortlocks, and the languages of the Hall Islands north of Truk).

Marck (1975) suggests some quantitative and qualitative evidence for the integrity of the Trukic group in his historical study of the Micronesian languages. Sohn et al. (1977) assume the integrity of Trukic and reconstruct the consonant system of the parent language, which they term Proto-Ulithic. Their study includes data from Sonsorolese, Ulithian, Woleaian, and, to a lesser extent, Trukese. They conclude that there is phonological evidence to justify the theory that Ulithian was the first language to separate from Proto-Ulithic, and that Woleaian and Sonsorolese also subgroup apart from Trukese. So far as I am aware, this is the only prior study to state principled grounds for subgrouping within Trukic, although Goodenough and Sugita (1980) suggest without giving supporting evidence that the Trukic group consists of Eastern Trukic and Western Trukic subgroups. In Goodenough and Sugita's proposal, Eastern Trukic consists of the languages of Truk Lagoon, the Mortlock Islands, the Hall Islands, Namonuito, Puluwat, Pullap, and Old Mapian; Western Trukic consists of Sonsorolese, Ulithian, Woleaian, and Satawalese.

Goodenough and Sugita (1980) also suggest, but again without stated support, that the Trukic group is a coordinate member of a "Central Micronesic" group that also includes the Ponapeic languages. Central Micronesic, in turn, is a daughter of a "Micronesic" division of Oceanic. Also listed under Micronesic are Kosraean, Marshallese, Kiribati, and Nauruan.

Tawerilmang and Sohn (in press) provide a thorough study of the Woleaian reflexes of Proto-Oceanic, and the present author (in press a) attempts to establish the consonant system of the putative Proto-Trukic language and to show how Proto-Oceanic consonant phonemes were reflected in that language. Phonological innovations of the Proto-Trukic group are also proposed in that article (Jackson in press a), but those proposed innovations have since been discovered not to be sufficient for the establishment of the group (see chapters 2 and 4 below).

The works that have just been briefly surveyed have made important contributions to the understanding of the historical development of the Trukic languages, and most of them will be referred to again several times in the present work. Not one, however, has firmly established the integrity of the Trukic group or provided qualitative evidence for the grouping of Trukic within the putative Micronesian group. Moreover, although Sohn et al. (1977) do provide some qualitative phonological evidence for subgrouping within Trukic, they consider only three languages in detail.

To continue further in the historical and comparative study of the Trukic languages and their place within Micronesia and the broader scope of Oceanic, there is a need for a more encompassing study of the relationships among the languages, and for the establishment of firm subgrouping hypotheses. Moreover, as the following section demonstrates, there is now available for the first time sufficient data on a number of Trukic languages to permit this task to be undertaken.

1.3 Sources of data for the present work

The last ten years have seen a tremendous increase in the amount of basic documentation of the Trukic languages of Micronesia (and, indeed, of other languages in Micronesia, as well). Published during this period have been an extensive dictionary of Trukese (Goodenough and Sugita 1980), a grammar and dictionary of Woleaian (Sohn 1975; Sohn and Tawerilmang 1976), a grammar and dictionary of Puluwatese

(Elbert 1972, 1974), a grammar of Ulithian (Sohn and Bender 1973), and a syntactic study and lexicon of Pulo Anna (Oda 1977). Previously available were a word-list of Ulithian (Elbert 1947), a grammar of Trukese (Dyen 1965), and a grammar and word-list of Sonsorolese (Capell 1969), and soon to be published (and available to me in manuscript) are an English-Trukese finder-list (Goodenough and Sugita n.d.), a grammar of Trukese (Sugita n.d.), and a dictionary f Saipan Carolinian (Jackson and Marck forthcoming). These resources provide excellent sources of information on several Trukic languages.

While compiling the data that are reported in this dissertation, moreover, I have also had access to native speakers of the following Trukic languages: Lower Mortlockese, Trukese, Satawalese, Saipan Carolinian, and Woleaian. The speakers of these languages with whom I have worked have added significantly to the data which I have available and have corrected and expanded upon data obtained from published sources. They are the only sources of information that I have had on Mortlockese and Satawalese.

As a result, the Trukic data in this dissertation from Trukese, Woleaian, and Saipan Carolinian are perhaps the most complete, as they derive both from external sources and work with informants. Data on Puluwatese, Ulithian, Pulo Anna, and Sonsorolese come entirely from published sources, and data from Mortlockese and Satawalese derive entirely from elicitation sessions with native speakers.[6]

Data for non-Trukic languages that are reported in this work also come from published sources, with a few important exceptions to be discussed shortly. Sources for other nuclear Micronesian languages are as follows:

<u>Kiribati</u>:	Bingham (1908), Groves et al. (n.d.), Sabatier (1971)
<u>Kosraean</u>:	Lee (1975), Lee (1976)
<u>Marshallese</u>:	Abo et al. (1976), Bender (1969), Bender (n.d. a)
<u>Mokilese</u>:	Harrison (1976), Harrison (1977)
<u>Ponapean</u>:	Rehg (1981), Rehg and Sohl (1979)

Additional data on these Micronesian languages and on the Ponapeic languages of Pingelapese and Ngatikese have been obtained from Bender et al. (1983), which is a list of putative Proto-Micronesian reconstructions with supporting forms (see Bender and Wang 1983 for a summary of the work). Also, Ken Rehg, Judith Wang, Byron Bender, and Shelly Harrison have given me additional information on Ponapean, Kosraean, Marshallese, and Kiribati, respectively, and Shelly Harrison has also supplied more information about Mokilese.

Most of the information reported here on non-Micronesian languages is drawn from the standard sources given in the bibliography. Some, however, has been taken from Oceanic comparison sets in Grace et al. (1979). Some of the data from languages of the Admiralty Islands has been provided to me by Robert Blust (p.c.). In addition, Paul Geraghty has given me access to his extensive files on Fijian, which also include cognates that he has identified in other Oceanic languages. The assistance of both Blust and Geraghty has been extremely helpful.

Reconstructions for Proto-Austronesian, Proto-Malayo-Polynesian, Proto-Oceanic, Proto-Eastern Oceanic, Proto-Polynesian, and Proto-Micronesian are occasionally cited. Such reconstructions are from the following sources, unless otherwise noted:

Proto-Austronesian (PAN):	Dempwolff (1934-1938), Blust (1970), Blust (1972), Blust (1976), Blust (1978)
Proto-Malayo-Polynesian (PMP):	Blust (n.d.)
Proto-Oceanic (POC):	Grace (1969), Blust (1972), Blust (1978), Grace et al. (1979), Pawley (1973), Pawley (1979a), Pawley (n.d.)
Proto-Eastern Oceanic (PEO):	Pawley (1972), Geraghty (1979), Levy (n.d. a)[7]
Proto-Polynesian (PPN):	Biggs (1979)
Proto-Micronesian (PMC):	Bender et al. (1983)[8]

1.4 Orthography

In general, the orthography used in the original sources has been maintained in this work. Some minor alterations have been made in the orthographies of Trukic languages and some other Micronesian languages, however, for clarity of presentation. For the Trukic languages, these alterations consist primarily of regularizing the vowel symbols.

To assist the reader, the orthographic symbols used here for the citation of data from Trukic and other Micronesian languages are given below with their phonetic values:

1.4.1 Trukic languages

1.4.1.1 Lagoon Trukese (TRK) (Goodenough and Sugita 1980)

Symbol	f	s	k	m	mw	n	ng	p	pw	r	ch	t
I.P.A.	f	s	k	m	m^w	ɾ	ŋ	p	p^w	r	ƫˢ	t
Symbol	w	y	a	e	i	o	u	á	é	ó	ú	
I.P.A.	w	j	a	e	i	o	u	æ	ə	ɔ	ɨ	

Note: Geminate consonants and long vowels are written with doubled symbols.

1.4.1.2 Lower Mortlockese (MRT) (Goodenough and Sugita 1980)

Symbol	f	s	k	m	mw	n	ng	p	pw	r	l	sh	ch	t	
I.P.A.	f	s	k	m	m^w	n	ŋ	p	p^w	r	l	ʂ	ƫˢ	t	
Symbol	w	ẃ	y	a	e	i	o	u	á	é	ó	ú	ɉ	ɏ	ɏ́
I.P.A.	w	ɥ	j	a	ɛ	i	o	u	æ	ə	ɔ	ɨ	e	o˔	ə˔

Note: Geminate consonants and long vowels are written with doubled symbols.

1.4.1.3 Puluwatese (PUL) (Elbert 1974)

Symbol	p	pw	t	c	k	f	s	h	m	mw	n	ng	l	r	ŕ
I.P.A.	p	p^w	t	ƫˢ	k	f	s	h	m	m^w	n	ŋ	l	r	ɹ
Symbol	w	y	a	e	i	o	u	á	é	ó	ú				
I.P.A.	w	j	a	e	i	o	u	æ	ə	ɔ	ɨ				

Note: Geminate consonants and long vowels are written with doubled symbols. Elbert uses r̲ for the retroflex liquid and r̲ for the trill, but those symbols are reversed in this work to make comparison easier.

1.4.1.4 Pulo Anna (PUA) (Oda 1977)

Symbol	p	t	pw	d	s	k	m	mw	n	ng	l
I.P.A.	p	t	βʷ	θ	s	x	m	mʷ	ɳ	ŋ	l
Symbol	w	y	a	e	i	o	u	é	ú		
I.P.A.	w	j	a	e	i	o	u	ə	ɨ		

Note: Geminate consonants and long vowels are written with doubled symbols. The vowel symbols é and ú are substituted here for Oda's @ and +, respectively.

1.4.1.5 Saipan Carolinian (CRL) (Jackson and Marck forthcoming)

Symbol	p	t	tch	k	bw	f	s	sch	gh	m	mw	ng	l	r
I.P.A.	p	t	ʈᶳ	k	bʷ	f	s	ʂ	x	m	mʷ	ŋ	l	r
Symbol	w	y	a	e	i	o	u	á	é	ó	ú		
I.P.A.	w	j	a	e	i	o	u	æ	ə	ɔ	ɨ		

Note: Long vowels are written with doubled symbols; geminate consonants are written by doubling the symbol or, in the case of digraphs, doubling the first element in the symbol (e.g., mmw, nng).

1.4.1.6 Satawalese (STW)[9]

Symbol	p	pw	t	ch	k	f	s	m	mw	n	ng	l	r	rh
I.P.A.	p	pʷ̣	t	ʈᶳ	k	f	s	m	mʷ	n	ŋ	l	r	ɹ
Symbol	w	y	a	e	i	o	u	á	é	ó	ú			
I.P.A.	w	j	a	e	i	o	u	æ	ə	ɔ	ɨ			

Note: Long vowels are written with doubled symbols; geminate consonants are written as in CRL. The vowel symbols á, é, ó, and ú are used here to replace normal Satawalese ae, eo, oa, and <u>iu</u>, respectively. STW <u>l</u> and <u>n</u> appear to be in free variation.

1.4.1.7 Ulithian (ULI) (Sohn and Bender 1973)

Symbol	p	t	c	k	b	f	d	g	m	mw	ng	l	r
I.P.A.	p	t	t^s	k	β^w	f	θ	x	m	m^w	ŋ	l	r
Symbol	w	y	a	e	i	o	u	á	é	ó			
I.P.A.	w	j	a	e	i	o	u	æ	ə	ɔ			

Note: Geminate consonants and long vowels are written with doubled symbols. The consonant symbols <u>g</u> and <u>ng</u> here replace Sohn and Bender's <u>x</u> and <u>g</u>, respectively, to agree with other languages and with the recently standardized ULI orthography. The vowel symbols <u>é</u>, <u>ó</u>, and <u>á</u> also replace Sohn and Bender's <u>ė</u>, <u>ȯ</u>, and <u>ȧ</u>.

1.4.1.8 Woleaian (WOL) (Sohn 1975)

Symbol	p	t	ch	k	b	f	s	sh	g	m	mw	nn	ng	l	r
I.P.A.	p	t	$ʈ^ʂ$	k	ɸ	f	s	ʂ	x	m	m^w	nn	ŋ	ɽ	ʐ
Symbol	w	y	a	e	i	o	u	é	ó	ú					
I.P.A.	w	j	a	e	i	o	u	ø	ɔ	y					

Note: Geminate consonants are written as in CRL, but it should be noted that Sohn's <u>n</u> and <u>k</u> represent geminate consonants only. Here they are written as <u>nn</u> and <u>kk</u>. Sohn's orthography does not represent long vowels consistently, nor does it represent final voiceless vowels, although the latter are given in base forms in Sohn and Tawerilmang (1976). Both long vowels and final voiceless vowels are given in the present work, however. Voiceless vowels are written as capital letters, and long vowels by doubling the symbol. Also, the vowel letters e, o, and u are used here to replace eo, oa, and iu, respectively.

1.4.2 Other Micronesian languages

1.4.2.1 Kiribati (KIR) (Sabatier 1971)

Symbol	b	b'	t	k	m	m'	n	ng	r
I.P.A.	b	p^w	t	k	m	m^w	n	ŋ	r
Symbol	w	a	e	i	o	u			
I.P.A.	w	a	e	i	o	u			

Note: Both Sabatier and Bingham (1908) indicate long vowels by using a macron, but in this work the vowel symbol will be doubled. The two labiovelar consonants (m^w and p^w) are inconsistently written in Sabatier, with the symbols mw and bw used before front vowels and m' and b' used before a (when any indication is made at all). In this work they will be written consistently as m' or b'.[11]

1.4.2.2 Kosraean (KSR) (Lee 1975)

Symbol	p	pw	t	tw	to	k	kw	ko	f	fw	s	sw	so	sr	srw	sro
I.P.A.	p	$p^ɰ$	t	$t^ɰ$	t^w	k	$k^ɰ$	k^w	f	$f^ɰ$	s	$s^ɰ$	s^w	ʂ	$ʂ^ɰ$	$ʂ^w$
Symbol	m	mw	n	nw	no	ng	ngw	ngo	l	lw	lo	r	rw	ro		
I.P.A.	m	$m^ɰ$	n	$n^ɰ$	n^w	ŋ	$ŋ^ɰ$	$ŋ^w$	l	$l^ɰ$	l^w	ɹ	$ɹ^ɰ$	$ɹ^w$		
Symbol	w	y	a	e	i	o	u	ah	ac	ih	oh	oa	uh	uc		
I.P.A.	w	j	a	e	i	o	u	æ	ɛ	ɨ	ɔ	ɒa	ʌ	ə		

Note: The orthography used in the present work is exactly as in Lee (1975).

1.4.2.3 Marshallese (MRS) (Abo et al. 1976)

Symbol	p	b	j	t	k	q	m	m'	n	n'	n"
I.P.A.	p	$p^{ɯ}$	t^{y}	$t^{ɯ}$	k	k^{w}	m	$m^{ɯ}$	n	$n^{ɯ}$	n^{w}
Symbol	g	g"	l	l'	l"	d	r	r"			
I.P.A.	ŋ	$ŋ^{w}$	l	$l^{ɯ}$	l^{w}	ɽ	$ɽ^{ɯ}$	$ɽ^{w}$			
Symbol	w	y	h	a	e	é	i				
I.P.A.	w	j									

Note: The orthography used here has been designed by Bender for use in Micronesian comparative studies (see Bender et al. n.d.). It corresponds to the phonemic orthography given in Abo et al. (1976).

1.4.2.4 Mokilese (MOK) (Harrison 1976)

Symbol	p	pw	d	j	k	s	m	mw	n	ng	l	r
I.P.A.	p	p^{w}	t	c	k	s	m	m^{w}	n	ŋ	l	r
Symbol	w	a	e	i	o	oa	u					
I.P.A.	w	a	e,ɛ	i,j	o	ɔ	u,w					

Note: The orthography used here is the same as that used in Harrison (1976). A feature of that orthography is that long vowels are indicated by writing h after the vowel symbol. The symbol u represents the labiovelar glide following a vowel at the end of a syllable, and the symbol i may represent either the vowel or a palatal glide.

1.4.2.5 Ponapean (PON) (Rehg 1981)

Symbol	p	pw	d	k	t	s	m	mw	n	ng	l	r
I.P.A.	p	p^w	t	k	ʈ^s	s	m	m^w	n	ŋ	l	r
Symbol	w	a	e	i	o	oa	u					
I.P.A.	w	a	e,ɛ	i,j	o	ɔ	u,w					

Note: The orthography used here is the same as in Rehg (1981). As in Mokilese, the symbol h follows the vowel symbol to indicate length, and the symbols i and u are used to indicate semivowels as well as vowels.

1.5 Organization

The following chapter presents evidence in support of the hypothesis that the Trukic languages of Micronesia form a closed subgroup of Oceanic. Data to be considered in chapter 4, however, suggest the possibility that the Ponapeic languages are also members of that subgroup.

In chapter 3, the internal relationships of the Trukic languages are examined, and a subgrouping hypothesis is presented and supported. Chapter 4 demonstrates the integrity of the Micronesian group, and presents an hypothesis of how the Trukic languages fit within that group. Chapter 4 concludes with speculation regarding the population dispersal of the Micronesian peoples.

NOTES TO CHAPTER I

[1]There are small Trukic-speaking populations on Palau, Guam, Yap, and Ponape. These settlements are apparently quite recent, however.

[2]The route to Saipan has been tested recently by master navigators from both Puluwat and Satawal and has proved highly accurate. Strikingly, the last previous voyage of a canoe from the central Carolines to Saipan was in the first decade of this century, before any of the current master navigators had been born (McCoy 1976).

[3]One of the more interesting examples of these loans is the word for Truk Lagoon, which is riq in Marshallese and ruk in Kosraean, Ponapean, and Mokilese. The presence of the r in this form may suggest that it was borrowed from sailors from the islands west of Truk, where Proto-Trukic *c is reflected as a retroflex r (cf. PTK *cuku 'mountain, peak; Truk').

[4]It appears, in fact, that Quackenbush considers Upper and Lower Mortlockese and the two dialects spoken in Truk Lagoon to be only two distinct languages: Mortlockese and Trukese, respectively (Quackenbush 1968:94-108). If so, then he apparently believes that there are eleven Trukic "languages" (but see below).

[5]Cognate percentages were calculated by Quackenbush for a 175-word version of the Swadesh 200-word list.

[6]As a result, there are more gaps in my data for some languages than for others. This is especially true for Ulithian and Sonsorolese, for which there is no modern dictionary available, and for Mortlockese and Satawalese, the data for which I elicited myself.

Since informants were not always available when I was gathering data, I was unable to collect certain Satawalese and Mortlockese forms.

It should also be noted, however, that some forms were collected for these and other Trukic languages from earlier sources (e.g., Kubary 1889, Fritz 1911, Krämer 1937). These sources were especially helpful in the collection of terms associated with navigation and the Trukic counting system.

[7]Paul Geraghty has also provided me with some of his unpublished PEO reconstructions.

[8]On some occasions I have taken the liberty of altering some of the PMC reconstructions in Bender et al. (1983). I have also added several new PMC reconstructions.

[9]STW is written in an orthography based on that for Woleaian. Although the STW data which I report comes almost entirely from elicitations, I have still used a slightly modified version of that orthography. Reportedly, Hiroshi Sugita is now preparing a dictionary of Satawalese in which the same orthography is used.

[10]Shelly Harrison (p.c.) and Steve Trussel (p.c.) have pointed out several instances where neither Bingham (1908) nor Sabatier (1971) is accurate in recording vowel length or velarization on the labial consonants. Their corrections are incorporated in the present work. In addition, it should be noted that no Kiribati orthography distinguishes labiovelar from plain consonants before rounded vowels. They are apparently merged in that environment.

II. THE INTEGRITY OF THE TRUKIC GROUP

In this chapter, a case will be made for the proposition that those languages which are traditionally termed "Trukic" constitute a closed subgroup of Oceanic. As representative of the Trukic languages, data from the following languages will be examined: Lagoon Trukese (TRK), Lower Mortlockese (MRT), Puluwatese (PUL), Satawalese (STW) and the very closely related southern dialect of Saipan Carolinian (CRL), Woleaian (WOL), Pulo Anna (PUA), and Ulithian (ULI). Other data will also be referred to when relevant.

2.1 Review of the literature

The linguistic similarity of the Trukic languages has long been noted. Fr. Juan Cantova, who was later killed by natives of Ulithi, wrote in 1722 that "even though all these languages[1] differ among themselves, they seem to derive from a single original." In 1911, Georg Fritz, the German district administrator for Saipan, Yap, and Ponape, concluded (Fritz 1911:6) that the languages spoken in the Caroline Islands must be divided into the following six groups: Kosrae; Ponape, together with Pingelap, Mokil, and Ngatik; Nukuoru "mit 120 samoanischen Abkömmlingen"; Yap and Ngulu; Palau; and what Fritz calls the Central Caroline group, which he specifies as including:

> . . . die Truk-Inseln mit 14000 Einwohnern und sämtliche westlich von Ponape, östlich von Jap gelegenen Atolle mit Ausnahme von Ngatik und Nukuoru; als Hauptgruppen

> die Mortlock-, Hall-, Lamutrik-, Oleai- und Ululsi-Inseln. Zu den Zentralkarolinern gehören ferner die Bewohner von Sonsol, Ana, Merir (südlich von Palau) und die etwa 2000 Seelen starke karolinische Bevölkerung der Marianen. (Fritz 1911:6)

Krämer (1937:100) draws much the same conclusion in 1937, and also quotes Lütke as stating that between Lukunor and Ulithi "une même langue radicale" is spoken.

More recently, Dyen (1965a) has remarked on the great similarity between Lagoon Trukese and Ulithian. In 1968, Edward Quackenbush wrote a primarily lexical study of the Trukic languages in which he explicitly assumed the integrity of the group, and this same assumption has been continued by subsequent writers, including Hiroko Quackenbush (1970); Bender (1971); Marck (1975 and 1977); Sohn, et al. (1977), who present arguments for subgrouping within the group; and Goodenough and Sugita (1980).

Of these writers, however, only Edward Quackenbush and Marck (1975) present arguments for the integrity of the Trukic languages. Quackenbush (1968:29) refers broadly to the similarities that extend from one end of the chain to the other, and states, "The two most distantly-related languages [of the Trukic chain], Sonsorol . . . and Moen . . ., have a shared retention [sic] of 58%, sufficiently high to enable us properly to speak of the 'Trukic subgroup'." No mention is made of putative shared innovations to establish the group, and no comparisons are made with languages external to the group.

Marck (1975) also uses quantitative evidence to support the group's integrity. Using data from three Trukic languages, Lagoon Trukese, Woleaian, and Sonsorolese, Marck computed 100-word-list cognate percentages between each pair of those languages and also between each Trukic language and Ponapean, Kosraean, Marshallese, and Kiribati. His results show that the lowest cognate percentage between any two Trukic languages (Trukese-Woleaian 72%) is still significantly higher than between any Trukic language and any other Micronesian language, or even between any two other Micronesian languages. Marck concludes that "these scores give a general impression of internal coherency for Trukic versus other nuclear languages" (1975:22).

Additional evidence proposed by Marck in support of a Trukic subgroup include one putative phonological innovation, which Marck, however, recognizes as not applying to at least two Trukic languages, seven putative lexical innovations, and four putative grammatical innovations. Each of Marck's proposed innovations will next be examined.

Marck's single phonological innovation is the merger of earlier *n and *l, which he claims for Trukese, Woleaian, and Sonsorolese. Marck recognizes (1975:16) that these two sounds are not merged in, for example, Mortlockese and Puluwatese, but argues that "the presence of the merger everywhere but in the Mortlocks and Puluwat seems to favor a thesis of common genetic heritage, the Mortlock and Puluwat situations deriving from early splits from a proto community that gave rise to the rest of the group". Unfortunately, however, as chapter 3 below makes clear, there is no other evidence suggesting a Mortlockese-Puluwatese subgroup apart from all the rest of the Trukic languages. Moreover, as Marck should have recognized, it is methodologically improper to argue for a subgroup on the basis of an innovation that applies to only a few members of the purported group.

Marck's proposed lexical innovations present a considerably stronger case. Although four of the seven innovations that he proposes must now be rejected (one of them, represented by Trukese wyyn, Woleaian jyyl, Sonsorolese wyyrY 'to drink', is a reflex of PAN *inum, another reflects the type PEO *siini 'push, cram', which is attested in Fijian and Kiribati, and the other two are not given in the standard dictionaries for Trukese and Puluwatese, the two languages which Marck cites), the other three forms appear to be limited to Trukic, and at least two of them are clearly replacement innovations. These forms are:[2] (1) PTK *ka-m'acú 'hold, take, grasp', for which Marck cites Trukese amwochu, Puluwatese kȧmwar, and Sonsorolese famwasy; (2) PTK *cuku 'mountain', for which Marck cites Trukese cuuk-un, Puluwatese ruuk, and Sonsorolese thuugU-uri; and (3) PTK *úrae 'stick', for which he cites Trukese ira and Puluwatese ira.[3] Marck states (1975:19) that innovation (2) replaces a Proto-Micronesian *Solo 'mountain', and that innovation (3) is a replacement of PMC *kai 'stick'. Considerably more data are available to us now than were available to Marck, and it is clear that all of the forms except (1) are attested throughout Trukic, and all are apparently unattested elsewhere. The reconstructions and full supporting data are as follows:

PTK *ka-m'acú 'hold, grasp': MRT yamwashé, TRK émwéchú, PUL yamwaŕúy, CRL amwaschúw, WOL gemmwashúú, PUA kamwasú, SNS kamwasú (ULI géélú); PTK *cuku,a 'mountain, hill': MRT shuuk, TRK chúka-, PUL ŕuuk, STW rhuku-, CRL schuugh, WOL shuugU, ULI cugu-, PUA dúkÚ, where PUA d is unexpected. (It is possible that Fijian duke 'to protrude, stick out' is cognate, as may be Gilbertese riki 'origin, extraction, conception, stock, family'; however, even if cognate, neither of these forms would detract from the Trukic semantic innovation); PTK *úrae 'stick, branch, twig': MRT úrá, TRK irá, PUL yirá, CRL úrá, WOL iraa 'stick, log, pole', ULI ire, PUA ilaE, all of which apparently reflect a formal innovation from POC *raqa(n) 'stick'.

Of Marck's four proposed grammatical innovations, all of which are found in the personal pronoun sets, two, although striking, are attested widely elsewhere. The other two, however, are among the strongest pieces of evidence for a Trukic subgroup. The two externally attested forms are cognates of PTK *kaú,i[4] '1 pl exc subject pronoun', comparable forms of which are witnessed in Nggela, Motu, Kia, Blablanga, and throughout New Ireland, and PTK *kau '2 pl subject pronoun', cognates of which are found in Kapingamarangi, Rotuman, Mota, Sesake, Nggela, Kia, and also in New Ireland. These forms must presumably be reconstructed for Proto-Oceanic.

Marck observes correctly, however, that PTK *gagu '1 sg focus pronoun' and *ke(e)na '2 sg focus pronoun', both of which are reflected throughout Trukic,[5] do not appear to be attested outside Trukic. They are, thus, apparent cases of replacement innovations.

2.2 Stronger evidence for a Trukic group

Although promising, the evidence marshalled by Marck (1975) for a Trukic subgroup is not conclusive, as it might conceivably be refuted as data from other languages are recorded. In the remainder of this chapter, a stronger case will be presented for the integrity of the group, although it will be suggested in section 4.6 that the group may well not be a closed one. If this proves to be the case, a number of the innovations to be discussed below must have spread through the group as a result of the frequent and regular contact among speakers of the Trukic languages.

2.2.1 Phonological evidence for a Trukic group

Trukic reflexes of the reconstructed Proto-Oceanic sound system have been described by the present author (Jackson in press a), and these reflexes are summarized in Table 2 below. Subsequent investigation has shown that Proto-Micronesian must be posited as an intermediate stage, as long believed (see chapter 4).

Additional evidence has also been recognized which may suggest a second apical stop for Proto-Trukic, in addition to PTK *t. Data appearing to support this reconstruction will be presented and discussed in chapters 3 and 4. Jackson (in press a) also shows that there is some evidence in Trukic and, to a lesser extent, elsewhere in Micronesia for a separate reflex of what Ross (1977) has reconstructed as *nj for his Siassi subgroup of the New Guinea north coast. Of the forms that Ross reconstructs with this segment, Trukic languages reflect three, and in each case Trukic shows loss of *nj: PSI *njalan 'road, path' is reflected in PTK *ala; PSI *kianjo 'outrigger boom' is reflected in PTK *kiao; and PSI *tanjim 'sharpen' is reflected in PTK *taim-.[6] These forms may suggest yet another proto-segment for PTK (and PMC: see chapter 4).

Table 2

TK Consonant Correspondences

POC	*mp	*ŋp	*p		*t	*nt *nd	*s *ns *j	*k	*ŋk	*m	*ŋm	*n *ñ	*ŋ	*l	*R	*d	*w	*y	*q
PTK	*p	*p'[a]	∅[a]	*f	*t	*c	*d	*k	∅	*m	*m'[a]	*n	*g[b]	*l	∅[c]	*r[c]	*w	∅	∅
TRK	p	pw		f	∅,[d]s	ch[tʃ]	t	k,∅,[e]s[f]		m	mw	n	ng,n[g]	n		r	w		
ULI	p	b[βʷ]		f	s,[d]t	c[tʃ]	d[θ]	g[x][h]		m	mw	l	ng	l		r	w		
PUA	p	pw[βʷ][i]		f	d[θ],[d]t	s	t	k[x][h]		m	mw	n	ng	n		l	w		
MRT	p	pw		f	∅,[d]s	sh[ʃ][j]	t	k,∅[e]		m	mw	n	ng	l		r	w		
PUL	p	pw		f	∅,[d]h,ss[k]	r[ɹ][j]	t	k,∅[e]		m	mw	n	ng	l		r	w		
STW	p	pw		f	∅,[d]s	rh[ɹ][j]	t	k,∅[e]		m	mw	n,l[l]	ng	l,n[l]		r	w		
CRL	p	bw[i]		f	∅,[d]s	sch[ʃ][j]	t	gh[x],∅[e,h]		m	mw	l	ng	l		r	w		
WOL	p	b[βʷ][i]		f	∅,[m]s,[d]t[n]	sh[ʃ][j]	t	g[x],∅[o,h]		m	mw	l[p]	ng	l[p]		r	w		

[a]POC *mp > PTK *p', POC *m > PTK *m', and POC *p > PTK ∅, all before round vowels
[b]POC *n > PTK *g / a_i in some cases
[c]POC *R merges with *d in some forms and is lost elsewhere under conditions still to be determined
[d]before nonlow vowels
[e]*k > ∅ / usually before low vowels and sporadically before mid vowels
[f]*k > s / __i sporadically
[g]*ŋ > n / __i in most cases
[h]voiceless stop [kk] when geminate
[i]voiceless stop [pʷpʷ] when geminate
[j]voiceless stop [tʃtʃ] when geminate
[k]h --> s / when geminate
[l]the distinction between *l and *n is apparently collapsing in STW
[m]irregularly before nonlow vowels
[n]*t > s / before low vowels about 40% of time in WOL
[o]*k > ∅ sporadically before low vowels
[p]both *n and *l are [l] singly, [nn] when geminate in WOL

In the same article (Jackson in press a), I attempt to summarize phonological evidence for a Trukic subgroup by stating that to my knowledge, "there is no other language or language group [in Oceanic] that combines all of the following phonological innovations:

(1) Loss of POC *p before round vowels;

(2) Loss of POC *ŋk in all environments;

(3) Loss of POC *q in all environments;

(4) Merger of POC *n with *ŋ in the environment /a__i;

(5) Merger of POC *ñ with *n;

(6) Merger of POC *s, *ns, and *j;

(7) Separate reflex [loss] of [PSI] *nj;

(8) Merger of POC *nt and *nd [as a post-alveolar stop];

(9) [Irregular pattern of loss of POC *R, and of its merger with POC *d];

(10) Loss of POC *y."

Since the writing of that article, however, it has become clear that Ponapeic languages share with Trukic all of the proposed innovations except (2) and (5), Kosraean shares all but (2), (5), and (6), and Kiribati and Marshallese appear to attest all ten innovations. Thus, although innovations (1), (3), (4), (7), (8), (9), and (10) are useful in helping to establish a Micronesian subgroup, and innovation (6) helps to establish a Trukic-Ponapeic-Marshallese-Kiribati group within Micronesian (see chapter 4 for additional evidence for both groups), there are no phonological innovations that may reasonably be interpreted as uniquely shared by the putative Trukic group, and thus grounds for establishing that group.

The following sections will present a substantial body of grammatical, lexical, and lexicostatistical evidence for a Trukic group. The reader should keep in mind, however, that the latter two types of evidence may reflect convergence over a period of extended contact, rather than common origin, and that several cases of grammatical convergence have also been reported in the literature for other communities characterized by widespread bilingualism (Bynon 1977:239-244; Grace n.d.; Gumperz and Wilson 1971).

2.2.2 Grammatical evidence for a Trukic group

As noted by E. Quackenbush (1968), the grammatical forms and structures in all the Trukic languages are very similar. In this section, reconstructible grammatical forms will be listed, together with support for the reconstructions, and aspects of morpho-syntax reconstructible for Trukic will be discussed in relation to the forms. Many of the individual forms reflect morphemes of Proto-Eastern Oceanic or Proto-Oceanic antiquity, and most of the others are cognate with forms found outside of Micronesia or within Micronesia but outside of Trukic. The external data will be provided for such forms, which, although they clearly cannot constitute evidence for a Trukic group, nonetheless need to be listed to provide an understanding of the proto-system.

2.2.2.1 Personal pronouns

Like many Austronesian languages, Trukic languages have four distinct sets of personal pronouns: pre-verbal subject pronouns, post-verbal object pronoun suffixes, noun-suffixed possessive pronouns, and emphatic or focus pronouns. All pronouns are either singular or plural; there is no evidence of 'dual' or 'trial' morphemes as reconstructed by Pawley (1972) for PEO.[7] The four pronoun sets are shown in Table 3.

The only Trukic personal pronoun forms that to my knowledge are not attested outside of Trukic are the first and second singular focus pronouns, which were discussed earlier (and see note 5). Perhaps indicating shared formal innovations of widely attested etyma, however, are the Trukic first person plural exclusive and second person plural focus pronouns, where the long vowel in the first syllable cannot be accounted for by regular historical rules. Rehg (in press) presents a persuasive explanation of lengthened first syllable vowels in bisyllabic nouns (and other forms which may function as nouns, including focus pronouns) in Trukic and other Micronesian languages, but his explanation cannot account for the lengthened vowels in the trisyllabic PEO *kamami, POC *kamiu > PTK *kaamami and *kaamii. These long vowels may be a result of analogy with the other focus pronouns, all of which underwent regular lengthening because of their bisyllabic status, but the specific innovation, nonetheless, appears to be limited to Trukic.

A few of the other personal pronoun forms appear to be restricted to Micronesia (e.g., the first person plural inclusive and third

Table 3

Trukic Personal Pronouns

	PTK	TRK	MRT	PUL	STW	WOL	PUA	ULI	External Attestation	
SUBJECT PRONOUNS										
1 sg	*ú	wú	i	yiy/wú	i	i	i	yi	PEO	*(ŋ)ku
2 sg	*ko	ke	o	wo	o	go	ko	go	POC	*ko
3 sg	*e	e	e	ye	e	ye	e	ye	PEO	*e[8]
1 pl inc	*ti	si	si	hi	si	si	di	si	KIR	<u>ti</u>
1 pl exc	*kai,ú	áyi/éwú	áy	yáy	yáy/au	gaI	kaI	ga	POC	*kai[9]
2 pl	*kau	owu	awú	yaw	yów	gaI	kaÚ	ga	POC	*kau[9]
3 pl	*re	re	re	re	re	re	le	re	MRS,PON	<u>re</u>
OBJECT PRONOUNS										
1 sg	*-ai	-yey	-yáy	-ay/-ɔy	-yáy	-yaI	-eI	-yey	PEO	*au
2 sg	*-ko	-k	-k	-k	-k	-gO	-kO	-g	POC	*ko
3 sg	*-a	∅	∅	∅	∅	-A	-A	∅	POC	*a
1 pl inc	*-kica	-kich	-kɛsh	-kiř	-kirh	-gishA	-kisA	-gic	POC	*ki(n)ta
1 pl exc	*-kami/*kamami	-kem	-kámem	-kemem	-kemem	-gemamI	-kamamI	-gomam/-gam	POC	*kam(am)i
2 pl	*-kamii	-kemi	-kámi	-kámi	-kámi	-gamii	-kamii	-gomiy	POC	*kamiu
3 pl	*-ira	-Vr	-Vr	-Vr	-Vr	-VrA	-ilA	-Vr	KIR	<u>ia</u>

Table 3. (Continued) Trukic Personal Pronouns

	PTK	TRK	MRT	PUL	STW	WOL	PUA	ULI	External Attestation	
POSSESSIVE PRONOUNS										
1 sg	*-i	-y	-y	-y	-y	-yI	-I	-y	POC	*ŋku
2 sg	*-m'u	-mw	-mw	-mw	-mw	-mwU	-mwU	-mw	POC	*mu
3 sg	*-na	-n	-n	-n	-n	-lA	-nA	-l	POC	*ña
1 pl inc	*-ca	-ch	-sh	-ŕ	-rh	-shA	-sA	-c	POC	*(n)ta
1 pl exc	*-mi/*-mami	-m	-mem	-mam	-mem	-mamI	-mamI	-mam/-m	PEO	*mami[10]
2 pl	*-mii	-mi	-mi	-mi	-mi	-mii	-mii	-miy	PEO	*miu
3 pl	*-ira	-Vr	-Vr	-Vr	-Vr	-VrA	-ilA	-Vr	KIR	<u>ia</u>
FOCUS PRONOUNS										
1 sg	*gagú	ngaang	ngaang	ngaang	ngaang	gaangÚ	ngangÚ	ngaang	—[11]	
2 sg	*ke(e)na	een	een/keen	een	eel	geelA	kenA	geel	—	
3 sg	*ia	iiy	yiiy	yiiy	iiy	iiyA	iA	yiiy	POC	*ia
1 pl inc	*kica	kiich	kiish	kiiŕ	kiirh	giishA	kisA	giic	POC	*ki(n)ta
1 pl exc	*kamami/*kami	áám	yáámem	yáámem	yáámem	gaamamI	kamamI[12]	gaamem	PEO	*kam(am)i
2 pl	*kaamii	áámi	áámi	yáámi	áámi	gaamii	kaamii	gaamiy	POC	*kamiu
3 pl	*ira	iir	iir	yiir	iir	iirA	ilA	iir	POC	*ida

person plural subject pronouns and the third person plural object and possessive pronoun suffixes). These forms will be discussed in chapter 4. The doublets in the first person plural exclusive object, and focus pronouns may be of interest, but not for establishing Trukic (or Micronesian) as a group. The same doublets are attested in Marshallese and in Fijian (Geraghty, p.c.).

2.2.2.2 Inalienably possessed nouns and possessive classifiers

Like many if not most Oceanic languages, Trukic languages permit the possessive pronouns to be suffixed only to a restricted class of inalienably possessed nouns. This class includes terms for parts of the body, kinship terms, a very small number of personal possessions and apparel (including canoes, homes, sleeping mats, and garlands), and a restricted class of 'locational nouns', which include among them such meanings as 'inside', 'under', 'on', 'near', 'at', etc., and most of which are obligatorily possessed. Several locational nouns may be reconstructed for Trukic, and all but two of those may also be reconstructed for Proto-Micronesian or some other pre-Trukic stage. The two forms that cannot be reconstructed outside of Trukic are PTK *karapa- 'near, close', where other Micronesian languages reflect PMC *kara- (cognates of which are also reflected in the Southeast Solomons as a verb meaning 'near, almost'),[13] and PTK(?) *aro- 'around'. At first glance, Kosraean <u>yohroh</u> 'vicinity' appears to be cognate with the latter Trukic form, but it will be argued in chapter 4 that KSR <u>r</u> from *r is indicative of a loan, in this case probably from Trukic. PTK *ao 'on, above', almost certainly a reflex of POC *papo, is nonetheless unexpected in that POC *p, while lost before round vowels, is normally retained before *a. It is difficult to tell, however, whether this seeming innovation was restricted to Trukic, as all instances of POC *p are normally lost in Kosraean, Kiribati, and Marshallese. The Ponapeic languages, which do retain POC *p before nonround vowels, also retain it in this form.[14]

All of the Trukic locational nouns are given together with their reconstructions in Table 4.

Nouns in Trukic which cannot be inalienably possessed may nonetheless participate in possessive constructions. All Trukic languages include sets of possessive classifiers, several of which can be reconstructed, which indicate the relationship of the possessed noun to the possessor (e.g., general possession, offspring, vehicle, food, drink, or shelter). These classifiers take the possessive pronouns which may not be suffixed directly to alienable nouns. In Trukic, they always precede the noun. The reconstructible possessive classifiers are shown below:

	'general'	'off-spring,	'canoe, vehicle'	'food'	'drink'	'raw food'	'shelter'
PTK	*aa-	*na(t)u-[15]	*waa-	*kana-	*únuma-	*kocaa-	*im'a-
TRK	aa-	néwú-	waa-	ana-	wúnúma-	wochaa-	imwa-
MRT	aa-	naẃú-	waa-	ana-	únúma-	wushaa-	imwa-
PUL	yaa-	nawú-	waa-	yana-	wúnúma-	wora-	yimwa-
STW	aa-	nayú-	waa-	ana-	úlúma-	orha-	imwa-
WOL	yaa-	lai-	waa-	yala-	úlúma-	goshaa-	imwa-
PUA	aa-	naú-	waa-	ana-	--	kosa-	imwa-
ULI	yaa-	léé-	waa-	yala-	yuluma-[16]	gocaa-	imwa-

Table 4

Trukic Locational Nouns

Gloss	PTK	TRK	MRT	PUL	STW	WOL	PUA	ULI	External Attestation
'around'	*aro-[17]	--	--	yero-	yóro-	yaro-	--	--	cf. PPN *qaro 'front'
'at'	*ree-	ree-	ree-	ree-	ree-	ree-	yolo-	yi-ree-	PON reh-
'behind'	*m'uri-	mwiri-	mwuri-	mwiri-	mwuri-	mwiri-	mwili-	mwiri-	POC *mudi
'in'	*la(lo)-	nnó-	lló-	lló-	nnó-	lalo-	nano-	la-	POC *lalo
'in front'	*m'ua-	mwmwa-	mwmwa-	mwmwa-	mwmwa-	mwmwa-	mwua-	yi-moo-	POC *muqa
'center'	*luuka-	nuuka-	luuka-	luuka-	luuka-	luuga-	nuka-	--	POC *li,epuka[18]
'near'	*karapa-	arapa-	arapa-	yarapa-	arapa-	garepa-	kalepa-	garepa-	cf. PMC *kara
'on, above'	*ao-	wóó-	wóó-	wóó-	wóó-	wóó-	wo-	wu-woo-	cf. POC *papo
'outside'	*lúku-	núkú-	lúkú-	lúkú-	lúkú-	lúgú-	núkú-	lugu-	PAN *likud,z (Dahl 1976)
'under'	*faa-	faa-	faa-	faa-	faa-	faa-	daa-	yi-faa-	PMC *faa; ROT fani(?); cf. POC *papa

Of these forms, *na(t)u-, *waa-, and *ima'- are all of at least POC antiquity, although their use as classifiers is clearly more limited. The general classifier *aa-, which is attested in that form in Ponapean and Marshallese, and with a short vowel in Mokilese and Kiribati (and in Ponapean and Marshallese doublets), is possibly related to PPN *(q)a 'dominant possessive marker' (Harrison 1981). Other likely cognates include Oroha a-, which Ivens (1926-1928:596) says means 'belonging to, with, at', Marau Sound 'a- 'possessive' (Ivens 1929:352)--although Marau Sound glottal stop normally reflects earlier *k--and Kwaio a- 'possessive particle'. This latter form appears to have a very similar function to the forms in Trukic, Ponapeic, and Marshallese (Keesing 1975:xvi-xvii), suggesting the likelihood of a Proto-Micronesian *a-. If so, the long vowel in Trukic, Marshallese, and Ponapean may reflect an innovation.

PTK *kana- 'food classifier' is also reflected in Ponapeic languages and appears to represent a shared innovation linking Trukic with those languages (cf. POC *ka- 'edible classifier'). This form almost certainly derives from the transitive verb *kan- 'to eat', just as Trukic *únuma- 'drink classifier' is presumably related to POC *inum 'to drink'.[19]

The last classifier to be discussed is PTK *kocaa- 'raw food classifier', which must in some way reflect POC *qo(n)ta 'raw food'. (Ponapean woatoa- 'classifier for raw food', Kiribati ora 'eat raw (fish)', and Kosraean osrwac 'classifier for raw food' directly reflect the POC reconstruction; Marshallese wikewed 'raw' appears to agree with the Trukic forms in reflecting a *k, but is problematic in other respects.) Formally, the Trukic forms match more closely with Fijian koda 'eat raw food (vt)', or even Mota kokoda 'shellfish'. The probable cognacy of the Fijian form would seem to suggest a similar derivational process to those hypothesized for *kana- and *unuma-: the derivation of a possessive classifier from a transitive verb stem.

2.2.2.3 Demonstratives

Sachiko Oda-Tanaka (1978) describes important aspects of the demonstrative modifier systems for ten Micronesian languages, including five Trukic languages, and also makes an attempt at reconstructing a Proto-Micronesian system. She does not explicitly reconstruct a Proto-Trukic system, but her PMC forms are clearly heavily influenced by the Trukic data.

As Oda-Tanaka suggests, three basic demonstrative root morphemes can be reconstructed fairly easily for Trukic: *e(e) 'close to speaker', *na(a) 'close to hearer', and *we(e) 'away from both speaker and hearer'. (A fourth demonstrative root, the interrogative *faa 'which', will be discussed in the next section.) However, no Trukic language reflects this system exactly. Mortlockese, Puluwatese, Satawalese, Saipan Carolinian, Woleaian, and, as may be seen, in a few fossilized complex demonstratives, Trukese have all innovated a form *m'uu 'this, near hearer', presumably by analogy with the second person singular possessive pronoun PTK *-m'u. In the case of Puluwatese, Satawalese, and some dialects of Saipan Carolinian and Mortlockese, this has resulted in the form reconstructed as *na(a) changing its meaning so that it now means 'in sight, but away from both speaker and hearer', presumably by analogy with the form of the third person singular possessive pronoun PTK *-na. Reconstructed *we(e) is now reflected in all Trukic languages as we(e) 'definite, but out of sight of both speaker and hearer; past time'.

All Trukic languages except Ulithian permit a suffix on the demonstrative roots which may be reconstructed as *-na (Oda-Tanaka reconstructed *-ni on the basis of Pawley's (1972) PEO reconstruction *a,e,ini 'this, here', but both Woleaian and Pulo Anna agree in reflecting a final low vowel). The original meaning of this suffix is not easy to recover: when suffixed to *e(e) 'close to speaker' it has a generally emphatic meaning in all languages which reflect it, and it appears to have a similar function in those languages which have innovated *m'uu when suffixed to that form or to *na(a). In those languages which have not developed *m'uu, however, *na(a)-na has the meaning 'in sight, but away from speaker and hearer', while *na(a) retains its reconstructed 'close to hearer' meaning (cf. PEO *na 'away from speaker'). It appears that all Trukic languages have also developed another suffix *-i, which may be suffixed to the 'close to speaker' root and which also seems to provide an emphatic meaning. Ulithian, which it will be recalled has failed to develop the suffix *-na, permits *-i to be suffixed to *na(a) 'close to hearer', resulting in the form laay 'in sight, but away from speaker and hearer', which in turn corresponds to the other languages' *na(a) or *na(a)-na. Further discussion of these matters, however, can more appropriately be presented in chapter 3, which discusses internal developments within Trukic, and in chapter 4, which presents the case for a Micronesian subgroup and for further grouping within Micronesian.

In all languages except Trukese and Mortlockese, the demonstrative morphemes (together with a plural prefix, if necessary) invariably function as noun postclitics. In Trukese and Mortlockese they more often precede the modified noun, in which case they also require a prefix e-, which may be related to the Kiribati article te, suggesting together with some problematic Marshallese data (Bender 1981) the possibility of a *te article at some earlier stages in Micronesian (see chapter 4). Since both Trukese and Mortlockese also attest the postclitic use of the demonstratives in certain structures, and all other Micronesian languages appear to have postnominal demonstratives, it is almost certain that they must be reconstructed in that position.

Oda-Tanaka also reconstructs demonstrative pronoun sets which are formed by prefixing a nominalizing formative to the demonstrative roots (and their plural prefixes, where applicable). The most important of these formatives are *i-, which is prefixed to demonstratives in Trukic, Ponapeic, and Marshallese to derive such meanings as 'this one, that one', and the temporal/locative formative *ika-, attested in all Trukic languages and Kiribati, which derives such meanings as 'now, then, here, there'. A plural prefix to the demonstrative roots *(k)ka- can also be reconstructed for all Micronesian languages except Kosraean.

None of the forms discussed in this section is clearly a Trukic innovation except *m'uu, which is not attested in either Ulithian or

Pulo Anna, and perhaps the very problematic *-i suffix. Some of them, however, appear to reflect Micronesian innovations, and they will be discussed further in chapter 4.

2.2.2.4 Interrogatives

All Trukic interrogative morphemes are attested in at least one non-Trukic language. Most are reflected throughout Micronesia, and at least three are reflexes of well-known Oceanic etyma. The forms are given below:

Gloss	PTK	TRK	MRT	PUL	STW	WOL	PUA	ULI
'who?'	*i-tau	iyé	iyé	yiyɛ́	iiyo	iteǗ	itɛ́Ǘ	yiitey
'what?'	*mee-daa	meeta	meeta	meeta	meeta	mettaa	meta	meda
'when'	*i-gaeda	--	ingeet	yingeet	--	--	ingaetA	yingad
	*i-naeda	ineet	--	yineet	ileet	ileetA	--	--
'how much'	*fida-	fita-	fite-	fita-	fita-	fita-	dite-	feda-
'where?'	*(i)-iaa	iya	iiya	yiya	iya	iiyaa	iiyaa	yiiya
'which'	*-faa	-fa	-fa	-fa	-fa	-faa	-daa	-fa
'where, how, which place?'	*i-faa	*fa	--	yifa	ifa	ifaa	iedaa	ifa

Another PTK form may be reflected in Carolinian feita 'why, how?', Woleaian feitaa 'what happened, how?', Pulo Anna deitaa 'how is it, what happens?', which may be cognate with the Gilbertese verb aera 'to do what? how, why (did it happen)?'. If so, the reconstruction would be PTK *faidaa 'how? why? how did it happen?'.

The *t reflex in the form for 'who?', attested throughout Micronesia, is unexpected as a reflex of POC *(n)sai 'who?'. However, Gedaged it (itai in some patterns--see Dempwolff n.d.:30-31), and Nambel, Morouas ita (Tryon 1976) suggest that it may not be a Micronesian innovation. (Lawrence Reid (p.c.) suggests that Proto-Micronesian *tau 'who' might reflect POC *tau 'person, people', a possibility that needs to be explored further.) The *i- increment in *i-tau, perhaps related to the *i- formative discussed in the preceding section, is limited in Micronesia to only Trukic and Ponapeic languages, but the Gedaged and Espiritu Santo (Vanuatu) forms mentioned above suggest that it, too, may have wider distribution.

*Mee-daa 'what?', also attested in that form in Ngatikese and Kosraean (other Micronesian languages reflect only PMC *zaa), is almost certainly derived from earlier *meqa 'thing' (cf. PPN) and PEO *za(a) 'what?' (Geraghty 1979a). However, to my knowledge only Fijian reflects the compounded form, and Fijian meca apparently means only 'thing'. Thus, this form may, in fact, represent a Micronesian semantic innovation.

The forms for 'when?' are complex and interesting, but probably provide little support for any Micronesian or Trukic subgrouping hypotheses as both forms appear to be widely attested outside Micronesia, albeit not often with the *i- formative. Within Micronesia, all non-Trukic languages except Ponapean reflect the form with the velar nasal. Ponapean has iahd, and since Ponapean regularly loses the palatal nasal *ñ, this suggests that the correct pre-Trukic reconstruction is *i-ñaeza.[19]

PTK *fida- 'how much?' is clearly a reflex of POC *pija. In Trukic it functions as a number, and is always affixed to one of the counting classifiers which are discussed in the following section.

Micronesian forms for 'where' are quite complex, and the tendency to treat them as if they were not has led to some critical misanalyses. (Some of the difficulty has been the result of inaccurately recorded data, but not all of it.) For example, Pawley (1972:134) cites Kiribati ia 'where' as a likely reflex of Proto-North Hebridean-Central Pacific (PHCP) *pi,ea, and uses this to support a tentative hypothesis for including Micronesian within that subgroup. Marck (1977) reconstructs a PMC *ifa 'where' on the basis of Kiribati ia, Kosraean yac, Pingelapese ia, Ponapean ia, Trukese ifa, Puluwatese yifa, Woleaiean ifa, Pulo Anna iiya, and Marshallese yiyah, apparently ignoring the fact, which Marck himself observed, that Ponapeic languages regularly reflect PMC *f as p before *a, and that Pulo Anna reflects it as d. In fact, Marck was confusing two different etyma in Trukic, as the list of cognates above shows.

Trukic *-faa 'which?' functions as a demonstrative root. It may take the plural prefix *(k)ka-, as well as the pronoun formatives *ika- and *i-. Without those formatives it is a nominal enclitic. When it takes the formative *i-, it has the gloss 'which one? which place?' as in the Carolinian sentence Ifa nóónóómw? 'Which one is your mother? Where is your mother?' In some, if not all Trukic languages, *i-faa may also have the gloss 'how?', especially as an expression of surprise in response to an unexpected utterance. So far as I know, however, it can never have the meaning 'where' in a sentence like

'Where are you going?' or 'Where is he from?' That function is filled by *(i)-iaa. The type *i-faa, then, is a nominal, and can be preposed in a sentence or serve as the subject of a verbless sentence; *(i)-iaa, as an adverbial, can almost never be preposed and may never serve as subject. Thus, Marck's reconstruction for PMC is incorrect, and, on the face of things, PMC *(i)-iaa 'where' is a more correct reconstruction. Similarly, an examination of Micronesian data beyond Kiribati, determines that PHCP *pi,ea is probably not directly reflected by Kiribati ia.[21]

Trukic *-faa, however, could conceivably be cognate with PPN *fea,e 'where' (Biggs 1979), especially given such PN cognates as Niuean fee 'where, which, when', Rennelese hea 'which, what, where', and especially Tongan 'ifē 'which', fēfē 'in what way, of what sort, how' (Churchward 1959). But what about other Micronesian languages? Is there any evidence of Trukic *i-faa or *-faa there? Since Kiribati, Marshallese, and Kosraean regularly lose *f in all environments, and Marshallese and Kosraean fail to reflect many double vowels, we could expect little formal difference between reflexes of PMC *(i)-iaa and a hypothetical PMC *i-faa, so the distinction, where one exists, would have to be functional and/or semantic. A formal distinction would be expected, however, in Ponapeic languages.

The facts are, however, that neither Ponapean nor Mokilese appears to reflect PTK *-faa or *i-faa.[22] Ponapean ia 'where, which, what' apparently combines the functions of both Trukic forms (Rehg 1981:314-316), as can be seen from the following sentences:

(1) Ke pahn kohla ia? 'Where are you going?' (PTK *(i)-iaa)

(2) Ia ohpisen? 'Where is the office?' (PTK *i-faa)

(3) Ia edemw? 'What is your name?' (PTK *i-faa)

(4) Ke men kilang meh-n-ia kasdo?

'Which movie do you want to see?' (PTK *-faa)

Mokilese ia appears to function similarly. Thus, any Micronesian cognates of PTK *-faa to be found will be in Kiribati, Marshallese, or Kosraean.

There are three forms which are glossed 'where?' in Kosraean: piyac 'where (is or are)', and yac, oyac 'where'. Lee (1976) states that the latter two forms are "variants" of each other and provides an example of usage only for yac, which appears to correspond with PTK *(i)-iaa. Piyac apparently agrees partly in function with PTK *i-faa, but does not appear to be formally compatible. While the vowel sequence iyac might suggest that this form reflects Pawley's PHC *pe, ia 'where?', Kosraean p is a regular reflex only of nasal grade *mp, and not of *p, and Kosraean normally loses final vowels. No form is given by Lee for interrogative 'which?', and Kosraean 'how?' is fuhkah, which may reflect a borrowing of Trukic *faa prefixed to the Kosraean interrogative sentence marker kuh. Kosraean f is not a regular reflex of earlier *f (see chapter 4).

In Marshallese there are two forms for 'where?': yéwiy 'where, how much: demonstrative interrogative singular', and yiyah 'where, how'. In addition, there is a root yer- which appears to function similarly to yéwiy, but which is used only with plurals (Abo et al 1976; Bender 1969). The following sentences give examples of these uses:

(5) Kej yetal gan *yiyah*? 'Where are you going?' (PTK *(i)-iaa)

(6) Yepad *yiyah* pinjel yew ham'? 'Where is (stays) your pencil?'

(7) Kej yetal *yiyah* l'eq? 'How are you going?'

(8) *Yéwiy* m'eyew yim'em'? 'Where is your house?' (cf. PTK *i-faa)

(9) *Yéwiy* pinjel yew ham'? 'Where is your pencil?'

(10) *Yer*-kiy béq kew ham'? 'Where are your books?'

It is almost certain that *yiyah* is cognate with PTK *(i)-iaa and reflects PMC *(i)-iaa. While it seems fairly clear that *ye'wiy* fulfills the same basic function as PTK *i-faa, it is not at all clear that the forms are formally cognate. The search for a cognate for the Trukic form must depend on Kiribati.

The Kiribati form for 'which?' is -*raa*, a reflex of PEO *za(a) 'what?'. Sabatier (1971) gives *ia* 'where?' (Bingham 1908 shows *īa*), and example sentences that are provided appear to suggest that the functions of the Trukic forms are merged, as in Ponapeic:

(11) Ko nako ia? 'Where are you going?' (PMC *(i)-iaa)

(12) Ia abam? 'What is your nationality (your country)?' (cf. *i-faa)

Groves et al. (n.d.:107) give both *iia* and *iaa* 'where?', but then say nothing about any distinction between the two. The following sentences are given which suggest that the forms are free variants.

(13) Ti mena iia? 'Where are we?'

(14) E mena iaa? 'Where is it?'

However, Harrison has recently reported (p.c.) that in fact the two forms are not free variants, and that _iaa_ is found in sentences like (12) where one would expect Trukic *i-faa, while _iia_ is found in sentences like (11) and corresponds to PTK *(i)-iaa.

To summarize, all Micronesian languages reflect a Proto-Micronesian *(i-)iaa 'where?'. Trukic languages and, it now appears, Kiribati also reflect a type *i-faa 'where, which place, which one', which appears to have been lost or replaced in other Micronesian languages. Thus, both Trukic forms are reconstructible for an earlier stage in Micronesian. PMC *(i)-iaa may be an innovation, although Seimat _iia_ and Wuvulu _ia_ 'where?' are attested in the Admiralties (Smythe 1970; Blust p.c.), perhaps indicating a common retention.[23] PMC *i-faa can also now more reasonably be viewed as cognate with PPN *fea (PHCP *pi,ea), but with the initial *i- formative, also attested in Tongan, and innovative lowering of the first vowel, which is thus far attested only in Micronesia.

2.2.2.5 Numbers and counting classifiers

Harrison and Jackson (in press) have shown that all Micronesian languages except Marshallese reflect two different counting systems: a system for counting specific objects or quantities, in which a number root is prefixed to a counting classifier or "countable base," and a serial or abstract counting system, which is used when enumerating a series or when simply counting abstractly. The serial counting system, which runs from one to ten and is then repeated, reflects the unsuffixed number roots, without classifiers, with all languages except Kosraean also showing a prefixal increment on the form for 'one', and Ponapeic languages showing the same increment on all forms. Where the serial counting forms are disyllables, they reflect application of the lengthening rule mentioned in section 2.2.2.1 (see Rehg, in press a).

The number roots, reconstructed below, all reflect well-attested POC etyma except the form *faa- 'four' (cf. POC *pati), which, however, is also attested in Fijian and Polynesian languages and in Lakalai on the coast of New Britain (Chowning 1973).

Gloss	PTK	TRK	MRT	PUL	STW	WOL	PUA	ULI	POC
'one'	*-da	-t	-t	-t	-t	-tA	-tA	-d	*(n)sa
'two'	*rua	rúwa-	ruwa-	ruwa-	ruwa-	rúwa-	ruwa-	lie-	ruwa-
'three'	*telú	wúnú-	elú-	yélú-	yélú-	seli-	déni-	sulu-	*tolu
'four'	*faa-	fa(a)-	faa-	fa(a)-	faa-	faa-	daa-	faa-	--
'five'	*lima	nima-	lima-	lima-	lima-	lima-	nima-	lima-	*lima
'six'	*ono-	wono-	wono-	wono-	olo-	wolo-	ono-	wolo-	*ono
'seven'	*fitú-	fisu-	fúsú-	fúú-	fisu-	fisi-	didi-	fisu-	*pitu
'eight'	*walú	wanú-	walú-	walú-	walú-	wali-	wanú-	walu-	*walu
'nine'	*diwa	ttiwa-	tiwa-	ttiwa-	tiwa-	tiwa-	tio-	diwa-	*(n)siwa

The form for 'one' given above only occurs in the serial counting system. It requires an *e- prefix, which is almost certainly cognate with Tongan _'e_- 'prefix to numbers', Fijian and elsewhere _e_- 'number prefix', all of which, however, occur before all numbers and not just 'one'. When classifiers are used, the root for 'one' is *te-, which may be cognate with the types _ta_ and _tai_ which are attested in some scattered areas of Vanuatu and of the Southeast Solomons (Codrington

1885; Ray 1926). It is difficult to tell from the data available.

The form for 'four' in serial counting is PMC *fagi,a, PTK *fan,gi, which appears to consist of the root *fa and an unidentifiable suffix. Similar forms are attested in Motu hani and Kove paŋe, so it is possible that the Micronesian forms reflect a rare retention from an early stage of Oceanic.

The development of a complex system of countable bases (counting classifiers) has been recognized for some time as typical of many Micronesian languages and as a possible important Micronesian innovation (Bender 1971; Bender and Wang 1983). Although Marshallese has no such system synchronically, it shows evidence of having had at least a basic system at some time in the past. Kosraean, too, has only a limited binary classificatory system, but Kiribati, Ponapeic, and Trukic each reflect at least thirty such countable bases, many of which are reconstructible for some earlier stage in Micronesian. Within Trukic itself, at least twenty bases can be reconstructed. (See Table 5.)

Some comment needs to be made about the forms given in the table. For example, a gap in the lists does not so much indicate an absence of the form in the given language as it does the fact that relevant data from that language were unavailable. This is especially true of the lists for Mortlockese (MRT) and Pulo Anna (PUA). In the former case, informants were unavailable when the list of classifiers was being compiled, and in the latter the only available source of information (Oda 1971) provides relatively little information on classifiers. In three instances in the table, once for Satawalese and

Table 5

Trukic Countable Bases

Gloss	PTK	TRK	MRT	PUL	STW	WOL	PUA	ULI	External Witnesses
'animate'	*-manu	-mén	-man	-man	-mal	-malÚ	-manÚ	-mal	KIR,MRS,PON
'general'	*-ua	-uw	-uw	-uw	-uw	-uwA	-owA	-ow	KSR,KIR,MRS,PON
'long objects'	*-faco	-fóch	—	-fóŕ	-fórh	-fashO	-dasO	-fac	PON,MOK
'long objects'	*-ai	—	—	—	—	—	—	-yay	KIR
'round objects'	*-fatú	-féw	—	-fay	-fay	-faÚ	(-fadÚ)	-fas	
'blossoms'	*-pau	-pé	-pé	-pé	-pé	-péé	—	—	MOK
'pages; thin, flat objects'	*-cau	-ché	—	-fé	-rhé	-shéé	-saÚ	-cay	PON
'broad leaf, broad object'	*-paa	—	—	—	-pa	-paa	—	-pa	KIR
'small amount'	*-kúta	-kis	-kús	-kús	-kús	-kkútA	—	—	MOK,PNG
'bunch, cluster'	*-(t)um'u	-umw	-umw	-wumw	-wumw	-umwU	—	-womw	PON
'chip, slice'	*-dipa	-tip	-tip	—	-tip	-tipA	—	—	PON
'ground, school'	*-p'i(t)i	—	-pwi	-pwi	—	-bii	—	—	PON
'finger span'	*-aga	-ang	-yang	-yang	-yang	-yangA	-yangA	-yang	
'cubit'	*-m'aluu	—	—	-mwalú	-mwalú	-mwalúú	-mwanú	-mwalo	
'arm length'	*-paú	-péw	—	—	-pay	-paÚ	—	—	
'fathom'	*-gafa	-ngaf	-ngaf	-ngaf	-ngaf	-ngafA	-ngadA	-ngaf	PON,KIR
'tens'	*-gaulu	-ngoon	-ngool	-ngool	—	-ngaulU	—	-ngóól	KIR,MRS,KSR,PON
'tens'	*-(i)ka	-ik	-yik	-yik	-ik	-igA	-ikI	-yeg	PON
'hundreds'	*-p'ukua	-pwúkú	-pwúkú	-pwúkúw	-pwúkúw	-búgúwA	(-pwokoyA)	-buguy	KIR,MRS,KSR,PON
'thousands'	*-garatu	-ngéréw	-ngéréw	-ngeráy	-ngaras	-ngarasI	-ngaladÚ	-ngaras	(KIR)
'ten thousands'	*-nena	—	—	—	(-1)	-nnA	—	-n	PON
'hundred thousands'	*-lop'ɛ	—	—	—	—	-lobA	—	-lop	PON
'high number'	*-garaú	—	—	—	—	-ngerai	—	—	

twice for PUA, forms are provided in parentheses. These forms come from closely related languages (Saipan Carolinian and Sonsorolese, respectively: see chapter 3), and were supplied either because the cogate form for the language could not be found or, in the case of the PUA reflex of *-fatú, because the data provided is suspect. (Oda gives dadǘ 'number classifier for stones, rock, coral', but also provides badǘ 'number classifier for round objects'. In listing the PUA phonemic inventory, however, she includes no mention of the segment b.)

It has been assumed that even a single external Oceanic witness is sufficient to permit the reconstruction of a Trukic proto-form, even when reflexes are rare among Trukic languages. The extreme instances of this policy are the reconstruction of PTK *-ai 'classifier for long objects' on the basis of a single form in Ulithian and the Kiribati cognate -ai 'classifier for sticks and long objects', and the somewhat more questionable reconstruction of *-garau 'classifier for high numbers', which was made on the basis of Woleaian sa-ngerai '100,000,000' (and cognate forms in closely related languages, including Ifaluk -ngalau 'ten millions', Faraulep -ngarei 'millions', and Lamotrek -ngarai 'ten millions' (Krämer 1937)), together with the Proto-Polynesian reconstruction *lau 'countless, indefinite number' (Biggs 1979).[24]

The fact that the forms function as counting classifiers appears to be innovative in almost all cases. The exceptions are *-ua 'general counting classifier' and *-fatú 'classifier for round objects'. The former of these has been reconstructed as POC *pua 'classifier for round objects' (Ross 1981), but also has more general classificatory functions in some dialects of Fijian, where it may be used to count, for example, children (Geraghty p.c.). The type *-fatú (< POC *patu 'stone') is also found in the same dialects of Fijian as a classifier for round stone fish traps, but not as a general round object classifier (Geraghty p.c.).

In addition, the table also provides examples of semantic innovations and at least one formal innovation. The form *-m'aluu 'cubit' is almost certainly a Trukic innovation (cf. Mota m̃aluk 'crook of elbow'), and Trukic *-garatú 'classifier for thousands' is also a clear case of semantic innovation, as POC *Ratu(s) is only attested elsewhere with the meaning 'hundred'. Whether the latter innovation was limited to Trukic depends on the cognacy of Kiribati -ngaa 'thousands', which fails to reflect the final syllable of the Trukic reconstruction, but which may simply indicate a subsequent formal innovation. A formal innovation within Trukic is the form *-aga 'finger span', which almost certainly reflects POC *nsaŋa, but with irregular loss of the initial consonant. Other innovations that appear in the table provide evidence for grouping within Micronesia but not for the establishment of a Trukic subgroup. They will be discussed in chapter 4.

In Trukic languages, unlike, for example, Ponapean, compound number-classifier constructions occur before the nouns that they enumerate. They may also function anaphorically if the identity of the enumerated noun is clear.

In the formation of ordinal numbers, a prefix *ka- is attached to the number root, and a suffix *-ni is suffixed to the classifier. While the prefix has been reconstructed as far back as PAN, the suffix may be innovative. As Pawley (1972:104) notes, Codrington reports a -ni ordinal suffix for Bugotu, Nggela, and Vaturanga in the Southeast Solomons, while Ivens (1933:172) reports Bugotu -gna. Clearly, more needs to be known about these and other languages to determine whether Trukic is unique in replacing POC *-n̄a with *-ni, and if it is not, whether the Solomons forms are instances of parallel innovation, of common retention of an earlier proto-form, or of close genetic relationship with Micronesia.

2.2.2.6 Pre-verbal aspect markers

Every Trukic language has a set of aspect morphemes which follow immediately after the subject pronoun and precede the complex verb. In all Trukic languages except, apparently, Ulithian, only one aspect morpheme may occur in a single clause, although any of them may be followed by one or more preverbal adverbs, many of which also have aspectual content.

In addition to unmarked aspect, which may be used for past, present, or future events, but which is neutral with respect to definiteness, intent, duration, or possible consequences, at least four, and perhaps five aspect morphemes may be reconstructed for Trukic, two of which are affirmative and three negative:

(1) *-ta 'perspective; change-of-state; hortative' (TRK, MRT, PUL, STW -a; WOL, ULI -sa; PUA -da, where reflexes are irregular for

*t, but could derive from no other source). Within Micronesia, this form may be cognate with Marshallese jah 'still, for the time being, now, already, yet', which also has hortative uses, and with Kosraean tuh 'pre-verbal past-tense particle'. However, the Marshallese form frequently occurs in negative constructions, while the Trukic one does not. Not enough is known about the Kosraean form to draw a definite cognacy conclusion. Kiribati a- is reported as almost identical in function with the Trukic form (Harrison p.c.), but is irregular phonologically. Outside of Micronesia, Ross (1982) has reconstructed for Proto-New Ireland a form *ta 'non-habitual aspect', which again may be cognate. Also, Geraghty (p.c.) reports that Fijian sa corresponds in meaning and function with Trukic *-ta, and Kiribati a but formally the forms are not cognate. (The Fijian form derives from an earlier *sa, while the Trukic form suggests a *t initial.)

It is possible that the 'hortative' gloss should be removed from the Trukic reconstruction, and that a second homophonous reconstruction should be made to account for that meaning. In Woleaian there is a contrast between sentences like Si sa mwongo 'we have eaten' and Si ya mwongo 'let's eat', where hortative ya is distinguished from perfective sa. No other Trukic language reflects such a distinction, however, and Woleaian often has inconsistent reflexes of *t (see chapter 3). Therefore, the tentative decision has been made to reconstruct only a single form.

(2) *-p'e 'future; intent' (TRK, MRT, PUL, STW, PUA _pwe_; WOL, ULI _be_.) Kosraean _fah_ 'future tense particle' may be cognate, although Kosraean _fwe_ 'maybe, perhaps' better reflects the Trukic mid vowel and also appears to continue a meaning that is widely attested elsewhere (cf. Nggela, Fijian, Kuanua _ba_ 'perhaps', Rarotonga _pa_ 'perhaps', all apparently from a POC *mpa). Marshallese _belen_ 'perhaps' may also be cognate with this set (Bender p.c.). Very similar forms with the gloss 'future' are also found throughout Oceanic, including Proto-New Ireland *ba 'future tense', Motu _bai_ 'future', Kilivila _bu_ 'irrealis', Nogugu _pwa-nes_ 'when? (future)', and Seimat _po_ 'future sign'. Of these, however, only the last appears to reflect a mid vowel, which suggests that the Trukic form may reflect an innovation. Some additional support for that possibility may be drawn from within Trukic itself. Trukese, Puluwatese, Carolinian, and Woleaiean attest an earlier *p'a(a)p'a 'later, indefinite future', which possibly reflects a reduplication of the future tense morpheme. If it does, then the raising of the vowel in *-p'e may have occurred after the lexicalization of the reduplicated form.

(3) *-tai 'negative' (TRK, MRT, Carolinian _-se_; PUL _-he_; WOL, PUA, ULI _tai_.) A cognate form is found in the Ponapeic languages (Mokilese _joah_, Ponapean _sai-_). Kosraean _tiyac_ may reflect a recent metathesis, as the regular Kosraean reflex of *t before *i and *e is _s_, while it is _t_ before other vowels. Kiribati _tiaki_ might reflect a similar metathesis, although Blust (1982) is correct in observing that the last two syllables of the form

appear to represent a separate morpheme -aki. Harrison (p.c.) points out that the Kiribati negative imperative tai is a more likely cognate. Outside Micronesia, both *taqe and *teqe have been reconstructed as negative morphemes, but neither appears to be a direct source for the Micronesian forms.

(4) *-de 'prohibitive "not"; lest' (TRK, MRT, PUL, STW, WOL -te; ULI -de; PUA -ta may be cognate as well, but appears to have functions overlapping those for -tai in addition to the expected imperative and subjunctive uses.) Ponapean -deh 'negative in imperative sentences' is certainly cognate, but to my knowledge the form is not attested elsewhere.

(5) *-tap'u 'future negative; negative intent' (TRK, MRT -sapw; PUL -hópw; STW sópw.) WOL, PUA, and ULI have noncognate forms (see chapter 3). Marshallese -jab 'preverbal negative' apparently is cognate with the Trukic form but is not restricted to a future meaning. Both forms probably reflect POC *ta(m)pu 'forbidden' (cf. Fijian tabu 'not'), and Seimat tap 'future negative' suggests that the limited meaning 'future' is not restricted to Trukic. Since Seimat po and tap appear to be cognate with Trukic *p'e and *tap'u, respectively, a possibility that needs to be explored is whether there is evidence of a genetic relationship or extended contact between the Admiralties and Trukic.

2.2.2.7 Verb affixes and clitics

A causative prefix *ka- is reconstructed for Trukic, Ponapeic, Marshallese, and Gilbertese which reflects an innovation from POC *pa(ka). Other verb prefixes reflected in Trukic include *ma- 'stative prefix', *ta- 'stative prefix', and *ta- 'negative prefix', all of which reflect proto-forms of considerable antiquity and none of which is productive in the modern languages. They will not be discussed further.

The forms of the object suffixes have already been discussed in section 2.2.2.1. In a transitive construction, one of them is normally suffixed to a transitive verb stem.[25] It is likely that a transitive suffix *-i-, which preceded the object suffixes, must be reconstructed for Trukic and for Proto-Micronesian. This form is presumably cognate with the close transitive suffix *-i reconstructed for PEO by Pawley (1972). As Harrison (1978) has pointed out, however, it is not at all clear that all transitive verb paradigms in Trukic languages can be accounted for by reconstructng a single transitive suffix. On the contrary, there is substantial evidence in Trukic for *-a- as a transitive suffix on a number of verbs, probably reflecting POC *-a 'transitive suffix', which may also be reflected in Ponapeic (Harrison p.c.). (See Starosta, Pawley, and Reid (1981:64,69) for some discussion of earlier *-a.) The morphosyntax of transitive verbs in Trukic languages--indeed, in all Micronesian languages--is extremely complex and will not be discussed further here. The following two verb paradigms from Saipan Carolinian, which are typical of those found in all Trukic languages, provide support for the two reconstructed suffixes, however.

Gloss	PTK	CRL
'meet'	*cuu-g	
'__ me'	*cuug-i-ai	schuungiyey
'__ you'	*cuug-i-ko	schuungugh
'__ him'	*cuug-i-a	schuungiy
'__ NP'	*cuug-i-a	schuungiy
'__ us (in)'	*cuug-i-kica	schuungighisch
'__ us (ex)'	*cuug-i-kamami	schuungighamem
'__ you (pl)'	*cuug-i-kamii	schuungighami
'__ them'	*cuug-i-ira	schuungiir
'search for'	*kudda-	
'__ me'	*kudda-a-(y)ai	ghúttááyey
'__ you'	*kudda-a-ko	ghúttóógh
'__ him'	*kudda-a	ghútta
'__ NP'	*kudda-a	ghútta
'__ us (in)'	*kudda-a-kica	ghúttáághisch
'__ us (ex)'	*kudda-a-kamami	ghúttáághámem
'__ you (pl)'	*kudda-a-kamii	ghúttáághámi
'__ them'	*kudda-a-ira	ghútteer

The form reconstructed by Pawley (1973) as *-(C)aki(ni) 'remote transitive suffix' (but see Harrison 1982 for a quite different analysis) is reflected in two different Trukic forms. PTK *-(a)kini- was apparently used when the relationship between the verb and object was an oblique one, with the object most typically a place or location. PTK (and PMC) *-aki was an 'agentless passive' suffix, and

Harrison (1982:202) has suggested that it may have been a Micronesian innovation in that function. Gedaged -ek 'suffix deriving nouns from verbs' appears to have a passive meaning as well: mamek 'the thing chewed' (cf. mam 'chew'); gazek 'what is written' (cf. gaze 'write'); anek 'what is eaten' (cf. ani 'eat') (Dempwolff, n.d.:24-25), but Micronesia may still be innovative in using *-aki to form passive verbs.

In addition to the above forms, it is also possible to reconstruct two other transitive suffixes for Trukic. PTK *-(i)di- 'to, towards, at' was used with verbs of motion or wanting, as in Carolinian nngaleeti 'to sexually desire s.o.' (cf. nngal 'to have an erection'), mwescheleeti 'to want s.o.', afeeti 'to swim toward s.o./s.t.'. PTK *-ni- derived transitive verbs from nouns, as in *tama-ni- 'to treat s.o. as one's father', *im'a-ni- 'to use s.t. as shelter', *pecee-ni- 'to serve as s.o.'s legs' (cf. PTK *pecee 'leg'). Both forms are apparently widely attested outside of Trukic. (For discussion of *-ni, see Harrison 1982.)

Two sets of postverbal enclitics are also reconstructible for Trukic: a set of directional enclitics, one of which also has an aspectual function, and a small set of verbal prepositions which take object suffixes and which may not, in fact, have been clitics in the proto-language but verbs which were capable of being sequenced after main verbs. This latter set consists of *gani- 'to, toward', *tagi- 'from', and their reciprocal counterparts *fa-gani- 'together' and *fa-tagi 'separately, in different directions'. The form *tagi- is a reflex of POC *tani 'from, source', and the prefix *fa- presumably reflects POC *paRi 'reciprocal prefix', but with loss of the final syllable (also attested in Polynesian). It has been suggested that PTK *gani- reflects POC *paŋa 'give' (Harrison 1977; Geraghty p.c.), but the fact that Trukic regularly retains POC *p as *f before *a--and that PTK *faga 'give, pass' also exists as the expected reflex of POC *paŋa--indicates that this suggestion may be mistaken. Marshallese gan 'to, toward' is clearly cognate with Trukic *gani-, but I am unaware of any other witnesses of the form.

Seven directional enclitics are reconstructed for Trukic; four of them are also attested in all other Micronesian languages. The forms, with supporting evidence, are given in Table 6.

All seven forms except, perhaps, *-logo 'inwards' reflect well-attested POC reconstructions, but only *-lako (POC *lako), *-dake (POC *nsake), *-watu (POC *(w)atu), and *-di(w)o (POC *nsipo) appear to have widespread postverbal directional uses outside Micronesia. A form *potu 'outside, outwards' can be reconstructed for at least the Eastern Oceanic level on the basis of Lakalai potu 'outside', otu 'to go out', Marau Sound wou 'away at sea', and Rotuman -hofu 'toward coast', but only the Rotuman form is clearly a postverbal directional. Rotuman also has a directional -loga 'toward the interior (of an island)', which is probably cognate with Trukic *-logo and certainly so with, for example, Fijian loga 'inside', Bugotu i-longa 'landwards', Vaturanga longa 'ashore, inland, south', and Kove longa 'inside', but only Trukic, Ponapean, and Marshallese reflect a final mid round vowel, perhaps indicating an innovation. More clearly innovative is the same three language groups' reflecting POC *(n)soko 'come, arrive'

Table 6

Trukic Directional Enclitics

Gloss	'away; completive aspect'	'hither'	'upwards, upwind, east'	'downwards, downwind, west'	'inwards, inland, inside, ashore'	'thither, toward addressee'	'outwards, outside, out to sea'
PTK	*-lako	*-doko	*-dake	*-di(w)o	*-logo	*-wa(t)u	*-wo(t)u
TRK	-nó	-to	-tá	-tiw	-nong	-wow	-wu
MRT	(-la)	-to	-tá	-téẃ	-long	-wéẃ	-wew
PUL	-ló	-to	-tá	-tiw	-long	-waw	-wow
STW	-ló	-to	-tá	-tiw	-long	-wow	-wow
WOL	-lag0	-tog0	-tagE	-tiwE	-long0	-waÚ	-waU
PUA	-nak0	-tok0	-takE	-ti0	-nang0	-wow	-wow
ULI	-lóg	-dog	-dag	-diy	-long	-wey	-wey
EXTERNAL WITNESSES:							
PON	(-la)	-do	-da	-di	-long	-wei	-iei
MOK	(-la)	-do	-da	-di	--	-we	--
MRS	-l'aq	-teq	-tak	-te'w	-l'eg"	-waj	--
KIR	-nako	--	-rake	-rio	--	-wati	--
KSR	(-lac)	--	-yak	-i	--	--	-wot

as a directional suffix meaning 'hither', as the other two Micronesian languages, Kiribati and Kosraean, reflect the more expected POC *mai in the same function.

More should be said about the forms and meanings listed under PTK *-lako. First, it is possible that Mortlockese, Ponapean, Mokilese -la, and Kosraean -lac are reflexes not of POC *lako, but of the competing reconstruction *la(ka) 'go, move, walk' (cf. PPN *laka 'go', Fijian lā 'go, walk', Gitua la, Motu la 'go, walk'). Although Mortlockese regularly loses *k before nonhigh vowels (with some exceptions: see chapter 3), it would be expected for the preceding *a to be backed and rounded if the form were a reflex of *lako. Ponapean, Mokilese, and Kosraean rarely lose *k at all (but see below), suggesting *la(a) as a more likely source for their forms. Some additional support for this possibility is the fact that at least four other Trukic languages apparently reflect an earlier *la(a) in addition to *-lako, albeit not as a directional enclitic: Puluwatese, Ulithian la, Pulu Anna na 'go (when preceding another verb)', and the northern dialect of Saipan Carolinian la 'go'. However, Mokilese appears to reflect nominalized verbs with directional enclitics where the *k is retained, for example, soausoau-lako-n 'heaviness-of' (Harrison 1976:283-284), and, furthermore, both Ponapean and Mokilese also lose historic *k in the only other two directional enclitics that reflect it: POC *nsake 'upwards', and Proto-Trukic-Ponapeic-Marshallese *-doko 'hither'.[26] It is, thus, likely that the Ponapeic forms do reflect *-lako, but with a systematically irregular loss of *k in unsuffixed directional enclitics, and therefore possible that the Kosraean and Mortlockese forms might be the result of borrowing or of some other type of irregularity.

Without coming to a conclusion on this issue, let us turn to a quick examination of the gloss assigned to *-lako. All Micronesian languages evidence a completive aspectual meaning in addition to the more expected 'away'. Although POC *lako does appear to be reflected with aspectual meaning elsewhere (cf. Fijian -lako, Rotuman -la'o 'progressive aspect'), a completive meaning appears to be rare. The only clear example of it that I have been able to find outside Micronesia is in Gedaged. Dempwolff (n.d.:11-12) states, "The enclitic -lak is usually found where we use the past, past perfect, and perfect tenses," and gives the following examples: ad i-du-lak 'the sun had set', i-le-lak 'he has gone away'. Much more data will be needed to determine whether Micronesia and Gedaged reflect parallel but independent innovations or a common retention of an earlier meaning that should be reconstructed for POC.

This section cannot be concluded without some discussion of reduplication in the Trukic languages. Goodenough (1963) showed that pre-Trukic must have had a word-initial pattern by which the initial consonant and vowel of the stem were reduplicated, as follows:

(15) $C_1V_1C_2V_2 \ldots \implies C_1V_1C_1V_1C_2V_2 \ldots$

However, no modern Trukic language still retains the copy vowel V_1, so that the modern canonical form for all the languages is $C_1C_1V_1C_2V_2\ldots$, as in forms like *kkagi 'sharp', *ccaa 'blood', *ffauru 'do, make', etc. Although it is possible that the loss of the vowels may have occurred after the break-up of the Trukic languages, and that the vowels should thus be reconstructed for the proto-forms, a more justifiable decision is to assume that they were lost in Proto-Trukic. The fact that the same vowels were also lost in the Ponapeic languages, provides some additional support for the decision.[27]

All Trukic languages also support the rconstruction of a disyllabic CVCV reduplication pattern which probably occurred rightwards, copying the final two syllables of the stem. This pattern can most easily be seen in the names of colors, which are often reduplicated forms of nouns:

Color Term		Source Noun	
PTK	Gloss	PTK	Gloss
*p'ecep'ece	'white'	*p'ece	'coral lime'
*parapara	'red'	*para	'red, red clay'
*ragaraga	'orange'	*raga	'turmeric, ginger'
*aloalo	'light yellow'	*alo	'sun'
*agoago	'yellow'	*ago	'ginger'
*karawarawa	'blue-green'	*karawa	'blue-green'

A third reduplication pattern is found in all Trukic languages today and must be accounted for historically. In this pattern, the initial CV syllable is copied, and then the original first consonant is doubled,[28] as follows:

(16) $C_1V_1C_2V_2 \ldots \Longrightarrow C_1V_1C_1C_1V_1C_2V_2 \ldots$

Unlike the first two patterns discussed above, this pattern is highly productive in all Trukic languages. It provides a meaning of iterative or repeated aspect to a verb, and occasionally it is also used with a noun stem to indicate a distributive meaning, as with Trukese chénú- 'liquid', chéchchén 'wet, watery'. Goodenough (1963) hypothesized that this reduplication developed from the CVCV and CV- patterns mentioned above in a series of steps. First, Goodenough argued, there was a form *canucanu 'wet, watery' with stress on the first and third syllables. Next, the unstressed vowel in the second syllable deleted between homorganic consonants, giving *cancanu. (Such a vowel deletion rule is well attested in Trukic and many other Micronesian languages. An example that does not involve reduplication is provided by Woleaian limmalÚ 'five animates' (< *lima-manu), liffaÚ 'five round objects' (< *lima-fatú). The same or a very similar rule must have caused the initial vowel to be deleted in the CV- reduplication discussed earlier.)

The next stage in Goodenough's proposal was the assimilation of the first homorganic consonant to the second, resulting in *caccanu. Given the existence of external cognates like Kiribati ranran (/ranirani/) 'juicy', the proposal is thus far quite persuasive, and is the most likely explanation for, for example, the forms *caccalo 'black', which would have derived, like the other color terms listed above, from the disyllabic reduplication *calocalo. Quite possibly all instances in Trukic of the de-nominal formation of distributive verbs using this $C_1V_1C_1$- reduplication pattern can be explained in the same way.

Goodenough goes on to suggest that "forms of this type provide a precedent for the [Trukic] type of first syllable reduplication, which may have arisen by analogy with them" [emphasis mine]. Other such "precedents," Goodenough argues, would have arisen where first syllable CV- reduplication had become fossilized and opaque through vowel loss, creating, for example, a stem like *ccanu, and then CV-reduplication was applied to that stem (resulting in *caccanu). "In any event," Goodenough writes, "these two processes, especially if both were operative, would have provided many precedents for developing the method of first syllable reduplication with consonant doubling present in modern Trukese."

There is a problem, however, with Goodenough's proposal that initial CV- and CVCV reduplication combined to set the pattern for productive $C_1V_1C_1$- reduplication in Trukic--a problem related to the meanings and functions of the respective patterns. As mentioned previously, the Trukic $C_1V_1C_1$- pattern has a primarily aspectual function. With the few exceptions mentioned (which probably did come about through the process Goodenough describes), this pattern is applied to verb stems to add an iterative meaning. Both the CV- and CVCV patterns, on the other hand, appear to have had quite different functions from the $C_1V_1C_1$- pattern, with the CV- pattern, among other uses, deriving intransitive verbs from transitive stems or deriving intransitive verbs from nouns, and the CVCV pattern also deriving intransitive verbs from nouns (Jackson, Rehg, and Sugita 1977; Harrison 1973).

Jackson (1979) observed that Kiribati has two patterns of initial syllable reduplication that have a function similar to the productive Trukic one. One pattern is formally similar to the CV- one described earlier for Kiribati, while in the second the reduplicated vowel is lengthened. Examples of the two patterns are shown below.

Kiribati CV- Reduplication

Stem	Gloss	Reduplicated form	Gloss
takaakaro	'to play'	tatakaakaro	'to be playing'
kiree	'to flirt'	kikiree	'to flirt often'
korongorongo	'to write the news'	kokorongorongo	'to occasionally write the news'
matuu	'to sleep'	mammatuu	'to regularly sleep (somewhere)
akawa	'to fish'	aakawa	'to be a fisherman'
taetae	'to speak'	tataetae	'to tell a story'

Kiribati CVV- Reduplication

Stem	Gloss	Reduplicated form	Gloss
tang	'to cry'	taatang	'to cry continuously'
tangira	'to want'	taatangira	'to like'
tena	'to bite'	teetena	'to bite regularly'
kipa	'to hop'	kiikipa	'to hop regularly'
korom	'to husk'	kookorom	'to husk as a living'
m'aiee	'to dance'	m'aam'aiee	'to dance (in competitions)'
matu	'to sleep'	maamatu	'to sleep (at regular times)'
nim	'to be sticky'	niinim	'able to be stuck to things'

Stem	Gloss	Reduplicated form	Gloss
mate	'to die'	maamate	'to be progressively weakening'
tata	'to cut'	taatata	'to be a cutter'

Functionally, these Kiribati patterns appear to resemble closely the Trukic $C_1V_1C_1$- pattern, as all the reduplicated forms include the meaning of repeated or iterative action. Their formal cognacy, however, depends on being able to account for the geminate consonant in the Trukic pattern. I believe that a start toward this can be made by taking into account the close relationship in Trukic between long vowels and geminate consonants. E. Quackenbush (1968) observed that there are several cognate sets in Trukic where one language exhibits a form with a double consonant and short vowel, while another language has a form with a single consonant and long vowel. Even within a single language, there are often doublets showing the same relationship, as in Saipan Carolinian fattabw ~ faatabw 'to run', mmat ~ maat 'to be full', and lesset ~ leeset 'at sea; fishing'. Given such mora-based relationships, it is quite possible that the Trukic reduplication pattern is cognate with the Kiribati CVV- pattern, and that consonant gemination occurred simultaneously with shortening of the vowel in pre-Trukic. Harrison (p.c.) believes that the different Kiribati patterns of initial syllable reduplication are related to mora count, as well, and points out that Kiribati mammatuu 'to sleep regularly' reflects a pattern identical to the Trukic one.

Much more can be said about the functions and forms of reduplication in Trukic and other Micronesian languages. They are complex and interesting. However, no more will be said at this time, other than to note that three reduplication patterns have been reconstructed for Trukic: the derivational CV- and CVCV patterns, and the inflectional $C_1V_1C_1$- pattern with consonant gemination. A discussion of possible sources of the latter pattern has been presented, but no definite conclusion has been reached, and the pattern has been reconstructed in the same form that it takes in the modern languages.

2.2.2.8 Prepositions

Two true prepositions are reconstructed for Trukic. Unlike the prepositional verbs discussed briefly in the preceding section, and the locational nouns discussed in section 2.2.2.2, both of these forms are directly affixed to following nouns (including the locational nouns). The two forms with supporting data appear below.

PTK	*ma-	'from, at'	*la(i)-	'at, in'
TRK	me-		nee-	
MRT	me-		lee-	
PUL	me-		lee-	
STW	me-		lee-	
WOL	me-		le- (following consonant is geminate)	
PUA	ma-		na-	
ULI	mé-		la-/le-	

PTK *ma- reflects POC *mai 'hither'. Prepositional functions of the etymon are attested in Fijian, Polynesian and Kiribati mai, and, in the same form as Trukic, in Kuanua ma- 'from', and Bambatana me- 'from'. Puluwatese lee- and Woleaian le- have been cited by Lynch and Tryon (1983) as support for their Proto-Central Oceanic *le 'locative preposition'. Other forms cited in support of the reconstruction include Banks Islands' Vosina, Nume, Merlav le, Southern Vanuatu Sie, Ura ra, Lenakel le, and New Caledonia Pije, Fwai, Nemi, Jawe le 'in'. A cognate of the Trukic forms that was missed by Lynch and Tryon, however, is Marshallese law-/lew- 'at', which supports a low vowel in the reconstruction and also gives evidence of the two vowels suggested by most Trukic reflexes.

A prenominal locative *i- is also attested productively in Ulithian and Pulo Anna, in addition to several other Micronesian languages. (A probable cognate has already been reconstructed in section 2.2.2.3 as a formative on demonstrative pronouns and interrogative pronouns.) Probably cognate with POC *qi- 'locative', it is difficult to tell whether Trukic *i- is a true preposition. It might be the source of the second vowel reconstructed in PTK *la(i)- 'at, in', in which case a more accurate reconstruction would be *la-(i-), which might in turn make it a more likely reflex of Lynch and Tryon's PCO *le.

2.2.2.9 Conjunctions and complementizers

Trukic data permit the reconstruction of six conjunctions and complementizers, of which two appear to be Trukic innovations. The six forms are:

(1) *ga 'and, but (clause conjoiner)' (TRK, MRT, PUL, STW, WOL nge; PUA nga; ULI ngé). There seem to be several cognates of this form in the Shepherd Islands and Efate of Vanuatu, including Sesake, Nguna, Pwele ŋo, and Lelepa ŋə 'and'. The Polynesian languages of Mele and Fila in Efate also attest ŋo 'and', almost certainly due to contamination from the neighboring non-Polynesian languages (Tryon 1976). The only other possible cognate that I am aware of is Marshallese gey 'if, when (future or irrealis clause conjunction)', which, however, reflects a markedly different meaning.[29]

(2) *ma 'and, with (NP conjoiner)' (TRK, MRT, PUL, STW, WOL me; PUA ma; ULI mé). Clearly a reflex of POC *ma 'and', this form may nonetheless be innovative in its restricted syntactic function as a conjoiner of noun phrases. If so, however, the innovation would appear to have been shared with Marshallese, where the clitic -m/-yem also functions to conjoin NPs. All other reflexes of POC *ma that I am aware of may also conjoin clauses.

(3) *karee 'or, if, whether' (TRK are 'if, when'; PUL nge-yáre, STW nga-are, Woleaian garee, PUA kalee 'if, or, whether'; ULI gare 'or'). So far as I am aware, this form is unique to Trukic.

(4) *p'e,a 'because' (TRK, MRT, PUL, STW pwe; WOL be; PUA pwa; ULI bo). This form is reflected in all Micronesian

languages except Kosraean. It may also be cognate with Oba be 'thereupon, so that' in the New Hebrides.

(5) *p'a 'complementizer following verbs of saying and thinking' (TRK, MRT, PUL, STW pwe; WOL, ULI be; PUA pwa). This form clearly reflects a Proto-Micronesian *p'a 'say, tell' (cf. Marshallese bah, Mokilese pwa, Ponapean pwa, Kosraean fahk, all meaning 'to say'). External cognates in this meaning appear to include Loniu p^way 'say, speak' in the Admiralties (Blust, p.c.), Tongan pe 'say, speak', and Mota βaβa 'say, speak'. The complementizer use is also attested elsewhere in Micronesia, however, in Gilbertese b'a and MOK pwa (Harrison, p.c.), but not, to my knowledge, outside of Micronesia. It is easy to imagine how this use might have developed, of course, beginning with pairs of sequential verbs such as 'speak-say', 'tell-say', or 'think-say'. Later the second verb *p'a 'say' would be reanalyzed as a complementizer. But regardless of the ease with which the change could have occurred, it remains noteworthy that the innovation appears to have been limited to Micronesia.

(6) *la(i) 'complementizer' (TRK ne(e); PUL, STW, WOL le(e); PUA nna; ULI lá). Similar in shape to the *la(-i)- preposition reconstructed in the preceding section, this form has a different function. It appears to be cognate with Kosraean lah 'that, whether (used when the complement contains an interrogative)' and may also be cognate with Rotuman la 'in order to, in order that, that (irrealis)'.

2.2.2.10 Equational and predicative sentences

Like apparently all Micronesian languages, Trukic languages have two distinct types of sentence constructions. Equational sentences consist of two noun phrases, where the second noun phrase functions to identify or provide information about the first. Examples include the following reconstructed sentences:

(17) *ia tama-i		'he is my father'
he father-my		
(18) *m'aane naa-na te-manú palua		'that man is a navigator'
man that one-animate navigator		
(19) *i-naa im'a-na		'that is his house'
pref-that house-his		
(20) *i-faa tina-m'u		'where is your mother'
pref-which mother-your		
(21) *waa-ni itau waa naa-na		'whose canoe is that'
canoe-of who canoe that		

Equational sentence structure is also very frequently used as a topicalizing and focusing device in complex sentences, and must be reconstructed in that function as well for Proto-Trukic. The following is a simple example:

(22) *ia mena-e e-ta faurú-a m'egau-wee
he one-this he-TA make-it food-that
'he is the one who prepared the food'

Predicative sentences in Trukic languages consist obligatorily only of a subject pronoun and verb, while other constituents are optional. The following phrase structure rules describe the order of occurrence of elements in simple predicative sentences as they are reconstructed for Proto-Trukic:

(23) S --> (NP) PredP

(24) PredP --> VP (NP) (Location) (Time) . . .

(25) VP --> SPron (TA) (Adv) Vb (Adv)

(26) Vb --> (Caus) (Red) V (Trans - OPron) (Dir)

(27) NP --> (Art) (Num) N (Dem)

Of the different constituents reconstructed and shown in the above rules, only the status of the Article is questionable (see section 2.2.2.3), All other constituents are securely reconstructed in the positions shown.

Several modern Trukic languages appear to favor a postpositioned subject NP in intransitive sentences, however, although Trukese, at least, does not. Since similar structures are attested in other Micronesian languages (e.g., in Mokilese (Harrison p.c.)), it seems necessary to reconstruct it as a variant for Proto-Trukic as well. In such structures, the subject NP occurs after the VP constituent, as in the following reconstructed sentence:

(28) *e̜ doko-doko malúmalú-wee latúú

it come-hither typhoon-that tomorrow

'the typhoon will arrive tomorrow'

2.2.2.11 Summary of grammatical evidence for a Trukic subgroup

The frequent observations made regarding the grammatical similarity of all Trukic languages have been largely borne out, but the number of clear innovations among grammatical morphemes that occur in all and only the Trukic languages is only somewhat larger than the two which Marck (1975) was able to locate. The following list presents all of the purely Trukic grammatical innovations that were uncovered in the preceding discussion:

(1) Replacement of POC *(n)au (PMC *gau) '1 sg focus pronoun' by PTK *gagu.

(2) Replacement of POC *koe '2 sg focus pronoun' by PTK *ke(e)na.

(3) Replacement of POC *ŋke 'if' and POC *pe 'or' by PTK *karee 'or, if, whether'.

(4) Irregular development of long vowels in the first syllables of PTK *kaamii '2 pl focus pronoun' and PTK *kaamami '1 pl exc. focus pronoun' (from POC *kamiu and PEO *kamami, respectively).

(5) Development of an innovative final syllable in PTK *karapa- 'near, close' (cf. earlier *kara).

(6) Irregular loss of the first consonant from POC *nsaŋa 'finger span' in the PTK counting classifier *-aga.

(7) Innovative use of earlier *kontaa 'eat raw food' as the PTK possessive classifier *kocaa 'raw food'.

Other forms that were identified as innovations, but for which the evidence is not clear whether the innovtion is limited to Trukic, include the irregular loss of POC *p in PTK *ao 'on, above' < POC *papo, the development of PTK *-fatú (< POC *patu 'rock') as a counting classifier for round objects, the development of PTK *-m'aluu as a counting classifier for cubits, the unexpected Trukic reflex of POC *Ratus 'hundred' as PTK *-garatú 'counting classifier for thousands', and the development of a Trukic pattern of first syllable reduplication with geminate consonants.

Of the putative innovtions summarized above, numbers (1) and (2) (and perhaps (3) and (6)) seem especially persuasive as evidence for a Trukic subgroup that is limited to what have been traditionally termed the "Trukic languages." Nonetheless, it is perhaps surprising that so few examples of grammatical innovations that are clearly limited to those languages can be found.

2.2.3 Lexical evidence for a Trukic group

As Blust (1982:5) points out, "There are inherent dangers in the use of lexical data for subgrouping purposes." One such danger is "that a cognate set believed to reflect a shared innovation may in fact reflect a shared retention" (Blust 1982:5). A second danger hypothesized by Blust (1982:8) is that "given a common ancestor with particular morphological and semantic characteristics it is possible that some daughter languages will undergo parallel developments after contact between them has ceased. Such innovations can give the false impression that the languages which share them have experienced a change in common which in fact they have experienced independently." A third danger not mentioned by Blust is that the apparent innovation may have spread among the languages as a result of borrowing.

The first type of danger can be minimized in part if the innovations that are proposed entail either an unexpected formal change in a well-attested proto-form or else the replacement of such a form by a new form (what Pawley 1977 terms "replacement innovations"). Even if a putative innovation appears to meet one of these criteria, however, there is still the danger that it may reflect a doublet of an earlier proto-form. A specific eample from Trukic is the form *ida 'name'. All other Micronesian languages clearly reflect POC *(ŋ)ajan 'name' with a low vowel in the first syllable, suggesting that the Trukic form is a formal innovation. Unfortunately, however, a high front vowel in the form for 'name' is also reflected in a number of other languages, including Lakalai <u>isa</u>, Baetora (Maewo) <u>isa</u>-, Raga (Pentecost) <u>iha</u>-, Akei (Espiritu Santo) <u>isa</u>-, and Sesake and Nguna -<u>ŋisa</u>-, thus demonstrating that the Trukic form is probably not innovative, and apparently requiring the reconstruction of a POC doublet *(ŋ)ija beside the earlier reconstruction for 'name'.

As Blust implies, the only way to be reasonably certain that a particular lexical form is truly an innovation is by examining the lexicons of all other related languages. Given the present paucity of information on almost all Oceanic languages--let alone the non-Oceanic Austronesian languages--such a task is impossible. Indeed, published lexicons for even the best described Oceanic languages rarely exceed 15,000 items, which is obviously only a small number of the total items in the language. I do not mean to suggest that a thorough search for external cognates is not necessary before claiming a given form as an innovation. Obviously it is, and such a search has led to the elimination of several once-promising "innovations" in this study. But the absence of cognate forms in published dictionaries or word lists of other languages can at the same time not be taken as proof that a given form is an innovation. Such absence only shows that the form has not yet been proven not to be innovative.

Under these circumstances, one's only hope is to compile such a large number of potential innovations, after having checked for external cognates, that the statistical probability is that some of the forms, at least, are true innovations. The specific "large number" of putative innovations required before a subgrouping claim can be made with some assurance is, of course, a matter for debate. I know of no *a priori* basis on which such a decision could be made.

Before turning to examine the list of potentially innovative lexical items that have been discovered in Trukic, a brief comment should be made about the third danger which was mentioned above regarding the use of lexical data for potential subgrouping: the danger that the forms might have come to be shared as a result of borrowing. Unlike cases where the languages in question are separated by major geographic barriers so that the chances of regular contact are very small (such as the Micronesian and Cristobal-Malaitan languages, which Blust (1982) has made a case for grouping together), the opportunity for borrowing among Trukic languages is great. Regular contact among neighboring island communities is still the rule rather than the exception, and evidence strongly suggests that long-distance travel occurred far more frequently in earlier times, and that the areas of contact then were considerably larger than they are today (see, e.g., Hezel and Del Valle 1972, Hezel and Berg 1979; Bellwood 1979:294, 297; Gladwin 1974; Riesenberg 1976; McCoy 1976).

Moreover, there is absolute evidence that such borrowing did take place, and that it spread throughout the Trukic chain, in the following list of borrowed etyma. (Forms are given in approximately the orthography used for Proto-Trukic to indicate their probable shape when they were borrowed. They are marked with a double asterisk, however, as they were certainly not present in the putative proto-language.)

(1) **kalufa 'k. of lizard' (TRK kanuf 'large multicolored lizard'; MRT, STW kaluf, WOL galúfA, PUA kanúdA, ULI galufu- 'k. of lizard'; PUL kóluuf 'giant lizard'; CRL ghaluf 'green and black spotted lizard'). Probably from YAP galuuf 'monitor lizard', although perhaps from Palauan chelub [ʔeluβ] 'monitor lizard'.

(2) **kam'uutia 'sweet potato' (TRK kamuti/kamu, MRT kamwééti, PUL kómwuutiy/yómwuutiy, STW kómwuuti, CRL ghómwuuti, WOL gamwuutiyA, ULI kuméétiy). YAP has kamuut and kamoet 'potato', which Jensen (1977) indicates as a loan from Spanish camote. Cantova (1722) quotes a native of Woleai to the effect that camotes were brought from the Philippines by Carolinians.

(3) **kattu 'cat' (TRK kattu/attu, PUL kattu, STW katu, CRL ghattu, WOL gaatuu, ULI gatu). From Spanish gato, probably through Chamorro katu.

(4) **kasiika(a) 'salt' (PUL yásiik/yásiika, STW yassika, CRL asiigha, WOL gasiigaa, ULI gasiiga). Perhaps from Chamorro asiga, where the initial glottal stop is not represented in the

orthography. The Chamorro form is a regular reflex of PMP *qasiRa 'salt' (Blust n.d.).

(5) **kulaaku 'dog' (TRK konaak, PUL kolaak, STW kunaak, CRL ghulóógh, WOL gelaagU 'dog'; ULI kkelóóg 'hungry' (but cf. MRT kamweya, PUA pinisI, ULI pees 'dog', where the latter form appears to be cognate with the type pesi in Espiritu Santo)). From Chamorro gulagu 'dog'.

(6) **lioso 'image, statue, doll' (TRK niyoos 'doll, statue, picture, image, description'; MRT liyoss 'image, doll'; PUL liyosá- 'doll, statue, image, weather charm'; STW nios 'doll'; CRL liyoos 'god, religious image or statue'; WOL liyoosA 'statue, toy, image, doll'; PUA niyosO 'doll, image'; ULI liyoos 'image, doll'). Also attested in Mokilese lioas 'demon', but probably via Trukic, this is almost certainly a borrowing of Spanish dios.

(7) **maluku 'chicken' (MRT malék, PUL malúk, STW malúk, CRL malúgh, WOL malúgÚ, ULI malég). Also found in Ponapean malek, this form may have been borrowed from Palauan malk, as no other nearby language reflects PAN *manuk with an l (cf. Chamorro mannok, YAP moeq). If so, however, it is puzzling that PUA, which has borrowed many other words from the neighboring Palauan community, should have kayangA 'chicken'.

(8) **magaaku 'cloth, clothing' (TRK, MRT mangaak/mangaaku, PUL méngaak, STW mengaak, CRL móngóógh, WOL mengaagU, ULI mangáág). Probably from Chamorro magagu, but with unexpected replacement of the velar stop by a velar nasal.

(9) **pakki 'gun; to shoot' (TRK, PUL pekkiiy, MRT pakkiiy, STW, CRL

pákkiiy, WOL pakkiiyA 'to shoot (vt)'; TRK ppek, CRL pákk, WOL pakkI, ULI pakk 'gun'). Almost certainly from Chamorro paki 'gun, slingshot', this borrowing is also found in Marshallese pakke'y 'big gun, cannon'.[30]

(10) **paaraga 'iron, bell, wire' (STW, CRL paarang, WOL paarangA, Sonsorol palang). Also found in Mokilese pahrang 'metal'. Marck (1977) quotes Blust (p.c.) as stating that to his knowledge this form is only found in a few dialects of Malay.

(11) **p'ap'a(a)ú 'papaya' (TRK kipwaw, MRT pwawúpwaaẃ, PUL pwáyipwáy, STW pwaipwaay, CRL bweibwaay, WOL beibaayA, ULI bwebwae (Lessa 1977)). Perhaps from YAP baabaay or Palauan babai, from an earlier Spanish source.

(12) **p'urako 'smoke' (PUL pwurók, STW pwurók, CRL bwurókk, WOL buraagO, PUA, SNS pwulokO, ULI borag). From an unidentified non-Oceanic Austronesian source (cf. PMP *burak 'white' (Blust n.d.)).

(13) **suup'aa'tobacco' (TRK, MRT, PUL, STW, CRL suupwa). From an unidentified source, but cf. Thai suup 'tobacco'.

(14) **p'ua 'areca cathecu: betel nut and betel nut palm' (TRK, STW, CRL pwpwu, PUL puw, WOL bbuwA, PUA pwuA, ULI bu). This form may be a direct inheritance of POC *(m)pua, but the fact that betel is not chewed elsewhere in Micronesia and the existence of YAP buw suggest a loan. In any event, it is almost certain that Mokilese pwu and Ponapean pwuh are loans, but from Trukic.

Two other examples of loans are of interest despite their relatively narrower distribution in Trukic: **tau-nam'u 'mosquito net' is found in TRK, PUL, CRL, and WOL among Trukic languages, but also in several other Oceanic languages, including Kiribati, Marshallese, and Ponapean in Micronesia, and several Polynesian and Southeast Solomons languages. Persistently irregular reflexes of the initial consonant make it clear that the form is indeed a loan. Also, Trukic languages show three different loans for 'pig': **p'iki from English in TRK and MRT; **paap'ii from YAP, Palauan or Chamorro in ULI and PUA; and *siiloo from an unknown source in PUL, STW, CRL, and WOL. Marck (1977) suggests that the latter form may be from a dialect of Chinese, but thus far no attested source form has turned up.

We shall next turn to a listing of the potential Trukic innovations, but it behooves us as we do so to keep the above list of borrowed forms clearly in mind. It is not impossible that a form could have been innovated in one language within Trukic, and then have spread to the other Trukic languages in the same way that the identified loans must have done.

In presenting the data, putative replacement innovations will be listed first, followed by putative formal innovations, semantic innovations, and, finally, a list of other forms that to my knowledge are not attested outside of Trukic. All forms listed are attested in all or all but one Trukic language. All are also attested in ULI, which was almost certainly the first language to separate (see chapter 3). Complete supporting data for all reconstructions are found in Bender et al. (1983).

2.2.3.1 Putative Trukic replacement innovations

(1) *agaaga 'to work' (Not attested in PUA, which has fiteki 'work', and where the cognate form means 'to measure'.) Replacement for POC *quma 'to work, to plant, to clear ground'.

(2) *itani 'to place, put down; to store, deposit' Replacement for POC *taRu 'put, place' and POC *tuku 'place, let go, let down, leave, release, put down'.

(3) *kapata 'to speak, say; language' (Not attested in PUA.) Replacement for POC *kunu 'speak, tell, say', and also cf. PEO *bosa 'speak, say' (Geraghty 1979a).

(4) *kutú 'to burn (vi); to set fire to' Replacement for POC *tutu 'light, set fire to', and cf. POC *sunu 'singe, burn'.

(5) *macaro 'mud, muddy' Replacement for POC *qodu 'mud, bog'. Fijian daladala (from hypothetical earlier *ntala) may be related to the Trukic form but shows l for expected r and a different final vowel, in adition to failing to show the initial prefix.

(6) *nii 'hit, strike; kill' YAP liiq 'to kill, to beat s.o.' is almost certainly a loan from ULI. Several forms have been reconstructed for POC with this meaning, including *dapu, *mpatu, *punu, and *taa. None is a reasonable source for the PTK form.

(7) *gata 'to breathe' Replacement for POC *mañawa 'breathe, pregnant, belly, heart, to rest', but also cf. PPN *ŋaa 'to breathe, pant' and Fijian gā 'to have mouth open', which may be

related to PTK. Marshallese gai 'fragrant', which also has Trukic cognates, may be related but has a different meaning.

(8) *ggawa 'bad' (Questionably reflected by PUA ngngei 'uncomfortable'.) There are several POC reconstructions with this gloss, including *ala, *lialia, *nsiŋkap, and the widely attested *nsaqat.

(9) *paca 'stick to, adhere; glue, gum' (Not attested in PUA.) Replacement for POC *mpulu 'gum, sap; POC *dokot 'stick, adhere', and POC *d,Rapi 'stick, hold to s.t., adhere'.

(10) *pecee 'leg, foot' (Perhaps questionably reflected by PUA pasapasA 'foot'.) Replacement for POC *waqe 'leg, foot'.

(11) *daa 'intestines, guts' (PUA teey is probably a borrowing from YAP t'aay 'intestines, filth, feces, rust', which appears to reflect POC *taqe 'excrement'.) Replacement for POC *tinaqi 'bowels, intestines' and POC *ŋansa 'intestines'.

(12) *duni-awa 'lips' (Cf. PTK *awa 'mouth'.) Replacement for POC *ŋus,tu 'lips, mouth'.

(13) *úrae 'stick, branch, twig' Replacement for POC *daqan 'stick'.

(14) *waka 'blood vessel, vein, sinew, tendon' Replacement for POC *uRa 'sinew, vein'.

2.2.3.2 Putative Trukic formal innovations

(15) *inadi 'divide, distribute, portion, share' Several Polynesian languages reflect PPN *qinati 'share, portion', which shows an irregular correspondence with Trukic in the penultimate segment (PPN *t derives from earlier *t or *nt, while PTK *d derives

from earlier *s, *z, or *j). Since the form is only attested in Polynesian and Trukic, however, it is not certain which form is the innovative one.[31]

(16) *ko(-)piti 'cut off, lop, break' (Not attested in PUA.) Probable innovation of POC *pinta 'split', which is reconstructed on the basis of Buli pala-pinda-i (Grace et al. 1979). The WOL passive form gopitakI 'cut off' attests the expected final low vowel, but all other Trukic forms, including WOL gopiiyA 'to lop (vt)' and ppisI 'chipped off, cut off', require a final high vowel. In addition, all Trukic forms clearly require the reconstruction of oral grade *t, rather than the nasal grade counterpart.

(17) *kili-fau 'sea hibiscus' The Trukic form represents a compound of the morpheme for 'skin' (< POC *kulit) and the expected reflex of POC *paRu 'hibiscus'. The type **fau 'hibiscus' is not reflected by itself in any Trukic language, however, as the compound form is used in all references to the tree, and not just to the bark of the tree.

(18) *la(a)i 'long, tall' No POC reconstruction has been made with this meaning, but Ponapean reirei, Mokilese roairoai, Lakalai rairai, and Fijian draidrai 'long' require at least a reconstruction of PEO *(n)dai, which makes the initial Trukic consonant irregular. Kiribati ananau 'long' may be related to the Trukic set, but Harrison (p.c.) states that the Kiribati root is anau.

(19) *m'm'ale 'sour (cf. PTK *marata 'bitter')' Probably reflects POC *maliŋ 'bitter, sour', but with an irregulr final vowel reflex and evidence of initial syllable reduplication that is apparently unattested elsewhere. Jay Howard (p.c.) has pointed out Takuu mmara 'sour', but that form is formally more compatible with PTK *marata.

(20) *m'ano 'shaded, secret; to hide from sight, to disappear' Probably reflects POC *ŋmalo 'pass out of sight, disappear, submerge; reef', but with irregular correspondence of PTK *n for POC *l. Gloss may also indicate confusion with POC *maluR 'shade'.

(21) *m'egea 'cross-sibling' (PUA, SNS meyanga show apparent consonant metathesis which is also witnessed in PUL mwéyingang 'opposite sex relative of same or younger generation'; the PUL form has a doublet mwéngeyáng which has the expected correspondences, however.) Milke reconstructed POC *ŋmane 'woman's brother, elder sister, male, husband, spouse, male cross-sibling', which confused two different reconstructions which Grace et al. (1979) have separated as POC *(ŋ)mane 'male, man, male relative' and *maRuane 'man, male' (after Blust 1981). Under *(ŋ)mane, in addition to several forms with the simple gloss 'man, male', Grace et al. list Lakalai male 'woman's brother', Meto II meneke 'brother', Sia mwane 'elder sister, female cousin', and Nenema mwala 'woman's brother, man's sister'. The latter two forms especially suggest that *(ŋ)mane should not be reconstructed only with the meaning

'male'. Pawley (1979a) reconstructs POC *ŋmaqane 'male' on the basis of glottal stops in two Shepherd Island languages, Mataso and Tonga, and on the basis of doublets in Polynesian languages. PPN *taqane 'man, male', Pawley argues, shows loss of the first syllable of POC *ŋmaqane and accretion of a prefix *ta-, but he also demonstrates that Polynesian has a form which may be reconstructed as PPN *tuo-ŋaqane 'woman's brother' which reflects the full POC etymon (cf. TON tuoga'ane, SAM tuagane, MAO tūgāne, HAW kunāne 'brother of a female'). Fijian shows a similar, albeit less obvious, contrast between tagāne 'male' (Wayan tagwāne) and gāne 'woman's brother, man's sister' (Wayan gwāne) (Geraghty p.c.). Kiribati, too, shows a contrast between m'm'aane 'male, man' and m'ane 'brother of a woman, sister of a man'.[32]

The conclusion seems inescapable that there were two proto-forms in POC: *ŋmaqane 'man, male' and *ŋma(qa)ne 'cross-sibling' (where the form of the latter reconstruction is not certain). PTK reflects the former reconstruction as *m'aane 'man, male', and it now seems possible that PTK *m'egea 'cross-sibling' may represent a very irregular development of the latter form, involving a change from *n to *g as well as consonant and vowel metathesis.

(22) *nana 'taste, flavor; to taste' This form may represent an irregular development of POC *namu 'taste, flavor' or of the type represented by PAN *(n)am(n)am 'taste, flavor, try', in either case involving loss of the final syllable and initial

syllable reduplication. This form may be attested outside of Trukic as well, though, as both Marshallese nnan 'moldy, musty taste' and Kiribati nanaa 'baby word for food' appear to be formally compatible (but cf. Marshallese nam 'taste, flavor, odor', Kiribati nanama 'to taste food' where earlier *m is reflected. Trukic shows no evidence of it.) There may also be a relationship between this form and Proto-Micronesian *(ñ)ñau 'delicious, sweet ', which almost certainly reflects POC *ñamu, albeit also irregularly.

(23) *dum'uri 'to lick (vt)' Possibly a very irregular reflex of POC *damwasi 'lick', which has so far been attested only in New Guinea. The development would have involved metathesis of (POC) *d and *s as well as raising and rounding of the vowels.[33]

(24) *tiri 'masturbate' Possible irregular development of POC *sidit 'spurt, semen, masturbation' which may well be related to other irregular developments in PTK *tiri 'urine' < POC *tiRi 'to spurt, urine' (see Jackson in press a, and chapter 3 for discussion). It is possible, however, that PTK *tiri 'masturbate' in fact represents a regular reflex of POC *tiRi, but with a semantic shift. In that case, PTK *tiri 'urine' would have to have derived from a different source. Dyen (1949) argued that that source was PAN *cirit 'spray out, urine', and claimed that the Trukese reflex of that form (TRK siir 'urine') and also the form TRK ssúk 'hicough', which Dyen derived from PAN *ceguk, indicated a merger of PAN *c and PAN

*t in pre-Trukese. Dempwolff claimed that all palatals in PAN were merged in POC as *s/*ns, but Blust (1978) has shown that if Dyen's claim is correct the Trukese (and other Trukic) data disconfirms Dempwolff's hypothesis and leads to the necessity of reconstructing a continuation of PAN *c as a separate phoneme in POC. Further discussion of these and other comparable Trukic forms will be provided in chapters 3 and 4.

(25) *nuru 'shade, shady' Irregular reflex of POC *maluR 'shade' in three respects: loss of the initial syllable, accretion of a final copy vowel, and the substitution of *n for *l. The first two innovations are also reflected elsewhere in Micronesia, but the last is probably restricted to Trukic (Kiribati nuu could derive from either *nuru or *luru, but Marshallese lle'r" and Kosraean lul could only come from a form with an initial *l).

(26) *koro 'pubic hair, underarm hair' (Not attested for MRT.) Irregular reflex of POC *ŋkudu 'curly hair' (< PAN *kudu 'curly hair') in respect to the vowels and the more specific Trukic gloss. I am aware of only one other Oceanic witness of the POC reconstruction, however, Arosi ɡuru, so it is possible that other reflexes more similar to the Trukic form will turn up.

Two other forms which appear to reflect formal innovations of POC etyma should be mentioned, although each is problematical in at least one respect. PTK *p'adu 'scar' may reflect either POC *(m)patu 'knot, excrescence, tumor' or the type *mpandu 'scar', which is reflected in Rotuman patu 'scar', Mokilese pwoas 'scar', and Ponapean pwet 'small scar', pat 'scarred'. In either case, the penultimate segment of the

Trukic form seems to represent an innovation. YAP faath 'scar' suggests that the Trukic form may be a regular reflex of an earlier form, however. Yapese may reflect POC *p or *mp as w, p, b, or f, and Yapese th or ∅ could reflect POC *s, *ns, or *j (Bradshaw 1975; Jensen 1967). The variety of reflexes for these and most other POC phonemes would appear to suggest extensive borrowing into Yapese, and it is known that Yapese has borrowed heavily from at least Palauan and Ulithian. but it is not possible at this time to determine whether this particular Yapese form is a borrowing from Trukic, a directly inherited form, or something else.

PTK *wane 'straight, steady, correct' might be a very irregular reflex of POC *tonu 'right, straight, correct', although the connection is clearly very questionable. However, even if the Trukic form does not derive from the POC one, it is possible that it represents a replacement of the earlier etymon.

2.2.3.3 Putative Trukic semantic innovations

(27) *cuku,a 'mountain' (Attested somewhat questionably in PUA dukU, instead of the expected **sukU. PUA d is the regular reflex of oral grade *t). This form should perhaps have been listed in the previous section as a formal innovation of POC *kodo 'mountain'. However, as pointed out in section 2.1, Fijian attests the form duke 'to protrude, stick out', which is formally compatible with PTK except for the last vowel. If the Fijian form can be shown to be attested elsewhere, then it would be almost certain that the PTK etymon is a semantic innovation.

PTK *cuku is also reconstructed as the name for the group of high islands surrounding Truk lagoon (i.e., for 'Truk'). In that meaning it has been borrowed as Marshallese riq, Kosraean ruk, Mokilese ruk, and Ponapean ruhk. The r reflex in the borrowings suggests that the source of the loan was a Trukic language like Puluwat, Pullap, Satawal, or Namonuito, all of which reflect PTK *c as a retroflex r. It is perhaps noteworthy that the communities which speak those languages are precisely the ones most famed for their deep sea sailing (McCoy 1976; Riesenberg 1976; Gladwin 1974).

(28) *epa 'soft cloth, mat, or diaper for infants' (Not attested in PUA.) Semantic innovation from POC *qe(m)pa 'mat'. The only more specific gloss that I am aware of among other Oceanic cognates is 'grave mat, burial mat' among Polynesian languages.

(29) *ka(t)udu 'finger' Generalization of POC *tu(n)suk 'index finger, to point with finger, to explain, to accuse', also involving the accretion of a *ka- prefix which may be related to POC *(ŋ)ka(ŋ)ka 'finger, toe'. POC *tu(n)suk is also reflected in Trukic, Marshallese, Ponapean, and (more questionably) in Kosraean (PMC *tidi-g 'to point, stick out, face in a certain direction'). Ponapeic languages reflect the same etymon with the meaning 'finger', but with a *ta- prefix (Proto-Ponapeic *ta-tidi 'finger': Mokilese jaid, Ponapean send). Because of this, it might have been better to list this Trukic form as a formal innovation rather than a semantic one.

(30) *manawa 'life, health, existence' (Not attested in PUA.) POC *mañawa has been reconstructed with a range of meanings, including 'belly, heart; to breathe, conceive a child', but although most reflexes appear to refer to a vital organ or function, none refers specifically to 'life'. Indeed, POC *maqudip is securely reconstructed with that meaning. PTK *mauru reflects the latter POC reconstruction, but with the gloss 'flourishing, fresh, alive (of plants)', a meaning which Blust (1982) has pointed out is attested in languages of the Southeast Solomons, Tonga, and Ponapeic languages as well. It seems probable that as the meaning of PTK *maúrú became limited to referring to the health of plants, the meaning of *mañawa changed to fill the semantic gap. If so, this would be an example of what Blust (1982) terms a "semantic equivalent of the better-known phonological 'drag chain'."

(31) *pa(k)a-g 'count, enumerate' (Perhaps questionably reflected by PUA pako. If the PUA form is not cognate, the reconstruction is probably better made as *paa-g.) Semantic and formal innovation of POC *poka 'divide, split, separate'. A similar semantic innovation occurred in Proto-Micronesian *wazewaze 'count', from POC *wanse 'to divide'. Both innovations may be related to the Micronesian development of a complex counting system.

(32) *p'iti 'same-sex sibling' A reconstruction POC *mputu 'beget, foster, raise (children)' is strongly suggested by Roviana butubutu 'tribe, race', Kuanua butu 'copulate', Arosi butu

'copulate', Fijian butu-k 'beget', Marshallese bij 'lineage, family, tribe, crowd', and perhaps Rotuman putu 'tend, foster, bring up, raise' (but where POC *t normally becomes ROT f). PTK *p'iti almost certainly reflects the same form, but with a semantic change.

(33) *dap'a 'to follow, accompany'. Fijian i caba 'companion, friend, contemporary', Arosi tapa-ni 'group of', Sa'a tapa 'pack (of dogs)' together suggest at least PEO *(n)sampa 'company, group', which is formally compatible with the Trukic form. The Trukic reconstruction nonetheless indicates a variant meaning. Kosraean etahwi 'follow, believe, conform' might possibly be cognate, but shows an unexplained initial vowel accretion, the incorrect reflex of *mp (see chapter 4), and an irregular final vowel. In addition, the normal Kosraean correspondence for Fijian c is ∅.

(34) *tam'o(o)lu 'chief, magistrate' Jackson (in press a) argues for the reconstruction of POC *ta-(ŋ)moli 'man' on the basis of Gedaged tamol 'man', Rotuman famori 'human being', and Nguna and Sesake na-tamwoli 'human being', to which may be added Pango na-tamol 'man'. The Trukic form is clearly cognate with these, but represents a more specific semantic innovation. Ponapean samworo 'high priest in traditional Ponapean religion' also may be cognate, despite showing r for expected l and irregular retention of the final vowel, but does not attest the same innovation as in Trukic.

2.2.3.4 Other putative Trukic lexical innovations

The following Trukic lexical items do not appear to have any external cognates with the same meaning, although each has a common meaning that would be expected to be found in any Oceanic community.

(35) *ciku 'basket made of coconut leaves' Fijian druku 'to carry on shoulder' is formally compatible and may be cognate, as a *ciku is often carried at the ends of a pole that is supported across the shoulder.

(36) *coo,a 'ripe coconut, copra' This form is not a replacement for POC *niuR 'coconut', which is reflected in Trukic by *núú 'general term for coconut'. Geraghty (p.c.) has suggested that it may be cognate with Fijian doa 'heartwood'. Kiribati has a form roatana 'to make raft of coconuts or firewood and drag by sea', but while roa- is formally compatible with the Trukic reconstruction, it only exists as a separate word with the glosses 'to catch a fish with rod and line, to ride astride the neck, to anchor a craft'. In addition, there is no indication in either Sabatier (1971) or Bingham (1908) regarding the meaning of -tana.

(37) *ma(a)reare 'kin, relative (not close)' (Not attested in STW.)

(38) *ma'acani 'want, desire, agree to'

(39) *p'edai 'fat, obese, physically large; ripe' (Not attested in TRK.) It is possible that Marshallese betahtah 'very great, exceedingly rare, eminent, majestic' is cognate.

(40) *reeree 'saw, to saw' (Not attested in TRK.) Ponapean rasaras 'to saw' may be cognate, but suggests earlier *ratarata. No Trukic language shows evidence of an earlier *t.

(41) *tafea 'medicine, magic' Geraghty (p.c.) has suggested the possibility of cognacy with his Proto-Central Pacific *tavaya 'water container', presumably because traditional medicine in Oceania often involves a liquid, and Harrison (p.c.) has pointed out Kiribati tabunea 'magic', but noting that it is not formally cognate. No other remotely plausible cognate has been located for this central aspect of Trukic culture.

(42) *wairati 'difficult, difficulty, hardship, trouble' (Not attested in PUA.) The cognate set is slightly problematic in that Mortlockese shows woyirák for expected **woyirei or **woyirás. The likely explanation of this is that the Mortlockese are aware of the Trukese rule *k > s/__i, and have developed analogically a back-formation based on this awareness. However, this scenario suggests that the Mortlockese may have borrowed the form from Trukese weyires.

(43) *weri 'see, encounter' POC *kila 'know, understand, perceive' is reflected by PTK *kula 'know, perceive'. *weri may be cognate with Ponapean idawarih 'say, see (honorific)', but the initial ida- on the Ponapean form is unexplained, and the vowels do not correspond.

The following putative Trukic lexical innovations fail to meet one or more of the criteria that were set up at the bottom of page 84. Specifically, many of the cognate sets listed here do not include an attested Ulithian form, and several others are lacking attestations from two or more of the languages for which data were gathered. Thus, there is no certainty that the reconstructions in fact reflect the putative Proto-Trukic. On the other hand, as was stated in chapter 1, the amount of data available for each of the eight languages examined (including the southern dialect of Saipan Carolinian) varies considerably, with extensive material for Lagoon Trukese and, to a slightly lesser extent, for Puluwatese, Saipan Carolinian, and Woleaian, but with considerably less material available for Mortlockese, Satawalese, Ulithian, and Pulo Anna. Thus, where the reflexes that are lacking are from these four languages, especially, there remains a strong possibility that the reconstructions do, in fact, reflect Proto-Trukic.

A few additional forms are also included in the following list. These are instances where it is difficult to determine whether external forms--usually from elsewhere in Micronesia--reflect the putatively Trukic innovations or not.

All of the following forms are numbered consecutively from 44. Because the case for a Trukic subgroup must ultimately stand or fall on the putative grammatical innovations summarized in section 2.2.2.11 and on the 43 putative lexical innovations listed above, however, the numbers of the reconstructions listed below carry a postscripted x. The languages in which the reconstruction is attested are listed in the standard abbreviations after each gloss. Once again, full supporting data is found in Bender et al. (1983).

(44x) *ali 'to fly' (PUL, STW, CRL, ULI, PUA) Apparently a semantic innovation from POC *qalu 'go, walk' (cf. PPN *qalu 'go', Fijian alu 'go, walk', YAP aen 'go, walk'; Ponapean, Mokilese alu 'walk' are irregular in retaining the final vowel and may represent loans, perhaps from Polynesia).

(45x) *cau(-lapa) 'wide, broad' (TRK, MRT, PUL, STW, CRL, WOL, PUA, ULI) Other Micronesian languages appear to reflect PMC *t'aa(-lapa), but it is possible that Marshallese de-pakpak and Ponapean tee-lap reflect the Trukic etymon by way of an intermediate *cai- (cf. Kiribati raa-baba, Kosraean sra-lahp, Mokilese saa-laplap).

(46x) *cim'a 'head, bundle' (PUL, STW, CRL, WOL, PUA, ULI) There are several competing forms for 'head' in Trukic: MRT, STW, CRL, PUA, SNS reflect earlier *fatu(ku) (presumably from POC *ŋpatu, but with oral grade, which is also attested in Kiribati atuu), where the Sonsorol meaning is restricted to the heads of animals; MRT, TRK, PUL, CRL also attest an earlier *makuru, which is the only form for 'head' in TRK; in addition, all Trukic languages reflect PTK *cam'a 'forehead, house gable' from POC *ndaŋma. The form *cim'a is only missing from MRT and TRK, and it is possible that the development of *makuru caused it to be lost in those languages.

(47x) *fai-togo 'kiss, rub noses' (STW, CRL, WOL, ULI) Proto-Polynesian *soŋi 'rub noses' has been reconstructed, with Nukuoru he-songi 'tough noses, smell' as one of the supporting forms. The Trukic forms appear to reflect *t in place of *s and a different final vowel, but it is possible that what is indicated here is a loan into Trukic from Polynesian.

(48x) *fagi 'platform covering outrigger booms on sailing canoe' (PUL, STW, CRL, WOL, ULI) Cf. YAP faang 'bench, stage, platform, copra-drying hut'.

(49x) *farewaa 'lungs' (PUL, CRL, WOL, ULI, PUA) The STW and MRT forms were not available, but TRK shows ammat 'lungs'. Marshallese and Mokilese clearly reflect an earlier *fara 'lungs', (< PAN *baRaq 'lungs'). The Trukic languages attest an accreted final long syllable, however. Howard (p.c.) points out Takuu farevaa 'uterus', which is formally compatible but semantically strange.

(50x) *fari 'preverbal adverb: rather, somewhat, very' (PUL, STW, CRL, WOL, ULI) Trukese fen 'very, certainly, already' may be cognate despite the irregular final consonant. Geraghty (p.c.) has suggested that the Trukic form may be cognate with his PEO reconstruction *valu 'some', and has also drawn my attention to the Manam postnominal particle -alu 'some, certain'. If these forms are in fact cognate with the Trukic reconstruction, then the Trukese form is regular and the other Trukic forms represent an innovation within Trukic. Possibly cognate with the type *fari, however, is Kiribati ai, which Harrison (p.c.) says is an intensifier in some exclamatory utterances, e.g., ai kaawa raa 'How sad!'.

(51x) *fa(a)da 'string, as of fish' (TRK, MRT, PUL, CRL, WOL, PUA) No forms with this meaning were found for STW or ULI. The reconstruction clearly represents a replacement of the securely reconstructed POC *tuRi(a) 'to thread, to string'.

(52x) *fati 'sexual intercourse' (TRK, PUL, CRL, WOL, PUA, SNS) Ulithian fáás 'penis' is formally compatible and may represent an unsurprising semantic extension of the original meaning. MRT and STW forms were not available. Thus, this reconstruction has a very good chance of being valid for the proto-language. Problematical, however, is whether Ponapean pwes, Mokilese pwoj 'sexual intercourse', and Kosraean tahng-wes 'mode of sexual intercourse, pole for picking fruit' are cognate. The Ponapeic forms appear to reflect an earlier *p'ote or perhaps *p'oti or even *p'ati, although *t is normally lost in Ponapeic before *i. The last syllable of the Kosraean form is entirely compatible with the Trukic reconstruction, but the form tahng- may indicate that it is a very early loan. The second meaning of the Kosraean form suggests strongly that tahng- is a reflex of POC *nsaŋa 'crotch, fork, forked stick'; however, the regular Kosraean reflex of this POC reconstruction is engah 'area between the legs'. Thus, the form tahng- either indicates a pre-Kosraean doublet or else represents a loan, and although I can find no attestation of a hypothetical *daga-fati among the material available on Trukic languages, it is possible that such a form may have existed.

(53x) *fatu,a-g 'to call, summon' (TRK, PUL, STW, CRL, WOL, PUA, ULI) Problematic here is that only WOL, PUA, and ULI appear to reflect the vowel *a, while the other languages consistently reflect a high vowel. It is possible, though, that the western languages' development of a low vowel may be fairly recent. PUA, ULI, and, to a lesser extent, WOL are quite regular in reflecting *t as t before *a and as s (PUA d) before non-low vowels, yet the forms (WOL fasengú, PUA dadangú, ULI ffésèngu) show the reflex of *t that is expected before non-low vowels. Thus, the original PTK form may well have been *fatu-g.

Marshallese yagiyin/yagingin 'call s.o. by name', and Kosraean pahng 'call, summon' have similar glosses but are formally incompatible. Geraghty (p.c.) has suggestd that Tongan fatongia 'tribute, to announce tribute' might easily be cognate, and Kiribati atong 'to name, announce' appears to be cognate with the Tongan form (Harrison p.c.).

(54x) *faunaki 'elevated sitting platform or bench for the navigator of a canoe' (TRK, PUL, STW, CRL, WOL) Forms for the other languages were not available.

(55x) *ka-im'aim'a 'shelter on lee platform of sailing canoe' (TRK, PUL, STW, WOL) Forms for the other languages unavailable.

(56x) *ka-peipei 'driftwood' (TRK, MRT, PUL, STW, CRL, PUA) Forms for other languages unavailable. Kiribati and Ponapeic languages attest an earlier *kai-peti 'driftwood', which derives transparently from POC *kayu 'stick' and early *pati 'float' (cf. PPN *pati). No Trukic language reflects the second vowel in the initial morpheme or the medial *t, which should regularly be reflected as d in PUA.

(57x) *kap'ata 'shout, call, yell' (TRK, PUL, STW, CRL, WOL, PUA) Forms for other languages unavailable. The contrast between this form and *kapata 'speak, say; language' might indicate a morphological function for some consonant velarization in pre-Trukic.

(58x) *kida 'chew and spit out (as betel)' (TRK, PUL, CRL, WOL) MRT, STW and ULI forms not available. PUA attests only ngúú- 'to chew (as of sugarcane)', which is also witnessed elsewhere in Trukic. POC *ndamu,i is securely reconstructed for the meaning 'chew (betel)', so this form is almost certainly an innovation. Problematic is the level that it should be reconstructed for.

(59x) *kup'a 'footprint, foot' (TRK, PUL, CRL, WOL, PUA) Forms for other languages unavailable. Fijian kubukubu 'heel' may be cognate but has an incompatible final vowel. Marshallese kibey 'feces, traces, remains' also may be cognate, but reflects an additional final front vowel, necessary to retain the final *a. The gloss of the Marshallese form is also quite different from that of the Trukic.

(60x) *kudda 'look for, search' (TRK, MRT, PUL, STW, CRL, WOL) Forms for other languages unavailable. Possibly a formal and semantic innovation of the securely reconstructed POC *kita 'see'.

(61x) *li-pici 'unmarried person' (TRK, MRT, PUL, CRL, WOL, PUA) Forms for other languages unavailable. The prefix *li- is almost certainly a reflex of a *li- formative of uncertain function that can be reconstructed for Proto-Micronesian. It is found as a prefix on fish names and human names--usually female--and before stative verbs to give the meaning 'one who is ...'. The second morpheme is formally compatible with PEO *vindi 'spring up, snap' (cF. PMC *pit'i 'bow and arrow, spear), and may represent a figurative use of that etymon.

(62x) *lúúlúú 'eat, chew' (TRK, MRT, PUL, STW, CRL, WOL) Forms for other languages unavailable. TRK <u>nú</u> 'regurgitate' is almost certainly a reflex of POC *luaq 'vomit, spit', and TRK <u>núúnú</u> 'chew, eat, masticate' is apparently related to <u>nú</u>. If so, this form would appear to represent a significant semantic innovation of the POC etymon.

(63x) *m'aki 'sp. of long, slender fish: probably needlefish' (WOL, PUA) Although attested in only two languages, this form appears to represent a formal innovation of an earlier *ŋmaka 'needlefish, halfbeak', reflexes for which are attested in Fijian <u>gaka</u> 'hemiramphus far: halfbeak' and Marshallese <u>m'ak</u> 'needlefish'.

(64x) *m'eli 'sheet attached to boom for adjusting sail angle' (TRK, PUL, STW, CRL, WOL) Forms for other languages unavailable.

(65x) *gudi/*gido 'squid, cuttlefish' (*gudi: TRK, MRT, STW, CRL, ULI; *gido: PUL, WOL, PUA) Both POC *nu(n)si and *nu(n)so have been reconstructed with the meaning 'squid'. Trukic reflects both POC reconstructions, but with a velar nasal initial which is unattested elsewhere in Micronesia (cf. Marshallese <u>ne't</u>, Mokilese <u>nuhd</u>, Ponapean <u>nuhd</u>). Blust (1982) suggests that a Lau (Malaita) variant ŋuto 'squid' may reflect a shared innovation with Micronesia, but notes that the comparison is "difficult." Since the Lau variant is the only example of the velar nasal in Malaita (cf. Are-Are nuto, Arosi nito/nuto, Sa'a nuto, and Lau nuto), and it is only reflected in Micronesia among the Trukic languages, a better solution is probably to consider the Lau and Trukic forms as parallel innovations.[34]

(66x) *oko 'caught, captured (esp. of prey)' (TRK, MRT, PUL, STW, CRL, WOL) Forms for other languages unavailable. Possible formal innovation of POC *nsoko 'ensnared, caught', involving irregular loss of the initial consonant.

(67x) *perou 'k. of large rock' (TRK, PUL, CRL, WOL, PUA) Forms for other languages unavailable. Marshallese bar 'rock' is unlikely to be cognate, as its initial vowel is low, and the construct form barin shows that the vowel after the r is short and high.

(68x) *p'ala 'again, more, also' (TRK, MRT, PUL, STW, CRL, WOL) ULI wa 'again, also' and PUA panA 'again, also, another' appear to be cognate in function but only questionably so in shape. PUA panA is irregular only in failing to reflect a velarized labial initial, however, while ULI wa, if cognate, fails to reflect both the stop initial and the final syllable. Partially supporting the ULI form's cognacy, however, is TRK pwayi 'also, too, again, more', which, when compared to TRK pwan, the regular reflex of *p'ala, would appear to suggest the existence of a morpheme PTK *p'a- 'again, more, also', and to thereby suggest that *p'ala is bimorphemic.[35] This possibility, in turn, would appear to provide a principled explanation for Marshallese bar 'again, more, also', which appears to be cognate with PTK *p'a-, but with a different final syllable. Harrison (p.c.) points out that Mokilese pel 'again, also' and Kiribati naba 'also' (but with metathesis) may also be cognate, but fail to reflect the labiovelar initial. Kosraean pac 'also' is irregular in the same way. Reid (p.c.) has pointed out PAN *pa' 'yet, since, still' and the presence of forms reflecting the type *la 'just' in Philippine languages, and has suggested that they may be the source of Trukic *p'ala. The labiovelar initial may still be a Trukic-internal innovation, however.

(69x) *p'aro 'box, crate, strong container' (TRK, MRT, PUL, STW, CRL, WOL, PUA) PPN *pusa 'box, case' is securely reconstructed, but is phonologically quite irregular with respect to the Trukic form. Kiribati b'aro 'box, hutch, silo, safe, attic', where Kiribati r may derive from POC *s, *ns, *nt, or *nd, but never from POC *d, is problematic. It may be cognate with the PPN form, but reflecting vowel metathesis, or it may indicate a borrowing from Trukic. A third possibility, of course, is that Trukic borrowed the form from Kiribati, and that the form then spread across the Trukic chain in the same way that was discussed in section 2.2.3.

(70x) *p'ili 'cowrie shell' (TRK, MRT, PUL, STW, CRL, WOL) Forms for other languages unavailable. All Oceanic languages attesting POC *mpuli,e 'cowrie' are consistent in reflecting *u in the first syllable except for Trukic and Ponapean. However, the retention of the final vowel in PON pwili is suggestive of a loan.

(71x) *p'ulla 'heart (of person); central hull and keel (of a canoe)' (PUL, STW, CRL, WOL, ULI) Forms not available for PUA and MRT; the TRK form with this meaning is a cognate of the type *ineki 'body, hull', which is also reflected elsewhere in Trukic. Fijian bula 'live, life' appears to be cognate, as does Mokilese pwurroa 'seat of emotion (3ps)'.[36] The meaning of the Trukic form, however, may be unique.

(72x) *duno 'talk, tell about, tell a story' (TRK, CRL, WOL, PUA) Forms for MRT, STW, and ULI not available; PUL does not appear to attest the form.

(73x) *toa 'cross-seat in canoe' (TRK, PUL, STW, CRL, WOL, ULI) Forms for other languages not available. Formal innovation of POC *so(ŋ)kar 'canoe rib' (< PAN *seŋkar 'cross-seat in a canoe') involving the irregular reflex of POC *s as PTK *t (but see chapter 3).

(74x) *ufa 'cloth, clothing' (TRK, PUL, CRL, PUA, SNS) Forms not available for MRT, STW, and ULI; apparently not attested in WOL. Apparently a formal innovation of PEO *kavu 'covering, clothing', which is attested in PPN *kafu, Nguna kavuti 'wrap, cover', Are-Are 'ahu 'wrap, cover', and, by metathesis, in

Rotuman ha'u 'wrap up, clothe'. The innovation involves loss of *k and metathesis of the two vowels. It must have occurred at a very early time, as *v is regularly lost before round vowels in Proto-Micronesian. Thus, despite the fact that no other Micronesian language appears to attest this form, it may be better reconstructed at the PMC level.

2.2.4 Lexicostatistical evidence for a Trukic group

Quantitative evidence of the type provided by lexicostatistics is now generally held to be inadequate by itself for purposes of subgrouping. Too much evdence has been published which shows that languages do not lose basic vocabulary at the same rate (see, for example, Bergsland and Vogt 1962; Grace 1967, Blust n.d.; Guy 1983), while other evidence has shown that cognate retention may be inflated due to contact (Grace 1967). Other problems, of course, arise from the theoretically simple but actually often complex task of deciding whether two forms are in fact cognate. (For example, Blust (p.c.) reports that he has had to revise several cognate decisions for several Micronesian languages a number of times in the preparation of a forthcoming paper on retention rates among Austronesian languages (Blust n.d.).) Such problems probably account for most of the differences occurring in the lexicostatistical tables which appear below.

Despite these serious problems, lexicostatistics may serve a valid function in helping to confirm a subgrouping hypothesis formulated by other means (or to raise questions about such a hypothesis), especially when the hypothesis refers to a sizeable group of languages. That is, if all members of a putative subgroup can be shown to share a greater percentage of cognates with each other than any language in the group shares with any language outside the group, then this fact should be interpreted as providing support for the subgroup.

Such is the case with the putative Trukic subgroup. The tables on the following pages provide four different computations of cognate percentages among several Micronesian languages. The first, from Bender (1971:432), shows Dyen's computations of percentages among "Trukic" (presumably Trukese, which Dyen worked on extensively (Dyen 1965a)), Ponapean, Marshallese, and Kusaiean (Kosraean). The second shows E. Quackenbush's (1968:87) computations of "shared retentions of basic vocabulary" among several Trukic languages, based on a 200-word list. The third shows cognate percentages among three Trukic languages and other Micronesian languages as prepared from a 200-word list by a group of graduate students at the University of Hawaii who were actively investigating those languages in 1972. The fourth was prepared by myself using the Malayo-Polynesian 200-word list developed by Blust (n.d.) for his paper on retention rates. It is the only set of computations that was able to utilize the regular Micronesian sound correspondences partly established by Marck (1977) and subsequently revised by several other scholars (Bender et al. 1983; Bender and Wang 1983; Jackson in press a; and chapter 4 of the present work).

Despite the greatly varying percentages among the four tables, they are remarkably consistent in showing the Trukic languages as having significantly higher percentages of cognates within the group than with any non-Trukic Micronesian language, and the last two tables show that the rates of Trukic languages are very consistent for each external language. Finally, although the figures are not given in these tables, all Trukic languages have higher percentage rates with (at least) Ponapean, Marshallese, and Mokilese than they do with any other Oceanic language (from a sample that includes Kapingamarangi, Tongan, Fijian, Rotuman, Mota, Nggela, Marau Sound, Wuvulu, Loniu, Lakalai, Kove, Roviana, and Motu: see Jackson (in preparation) for discussion of these figures and other evidence relating to external relationships of Micronesian languages.)

Table 7

Percentages of Cognates Shared by Some Pairs of Languages in Micronesia (Information provided to B. W. Bender by Isidore Dyen and reported in Bender 1971)

	Trukic				
Ponapean	36.1	Ponapean			
Marshallese	29.0	32.5	Marshallese		
Kiribati	23.2	25.9	21.3	Kiribati	
Kosraean	22.2	25.7	23.8	15.3	Kosraean

Table 8

Percentages of Shared Retention of Basic Vocabulary among Trukic Languages (Adapted from E. Quackenbush 1968)

	Sonsorol						
Ulithi (ULI)	78	Ulithi					
Woleai (WOL)	69	82	Woleai				
Satawal (STW)	66	75	86	Satawal			
Pulusuk	64	70	77	88	Pulusuk		
Satawan (MRT)	61	63	67	69	80	Satawan	
Moen (TRK)	58	59	62	67	75	83	Moen

Table 9

Cognate Percentages in Micronesian Languages (As computed by graduate students at the University of Hawaii, 1972)

	Woleaiean						
Trukese	85	Trukese					
Mortlockese	93	91	Mortlockese				
Ponapean	66	62	64	Ponapean			
Mokilese	61	57	61	81	Mokilese		
Kosraean	54	51	53	51	51	Kosraean	
Kiribati	46	44	44	41	41	36	Kiribati

Table 10

Cognate Percentages for Micronesian Languages That Were Computed Using the 200-Word List Developed by Blust (n.d.)

	Ulithian									
Pulo Anna	.84	Pulo Anna								
Woleaian	.84	.83	Woleaian							
Carolinian	.79	.80	.95	Carolinian						
Trukese	.74	.72	.85	.87	Trukese					
Mokilese	.52	.53	.56	.54	.54	Mokilese				
Ponapean	.51	.52	.55	.53	.51	.72	Ponapean			
Marshallese	.47	.47	.50	.49	.47	.44	.44	Marshallese		
Kiribati	.42	.44	.46	.42	.42	.41	.38	.38	Kiribati	
Kosraean	.41	.42	.44	.42	.40	.47	.42	.36	.33	Kosraean

2.3 Summary of the evidence for a Trukic subgroup

In this chapter the case has been made for a Trukic subgroup of Oceanic. Although there are no phonological innovations that are uniquely shared by all Trukic languages, it has been possible to identify at least seven probable innovations in grammatical forms, of which at least two are very persuasive and two others only slightly less so. These innovations are reapeated here in a slightly different order from the way they were listed in section 2.2.2.11. The revised order attempts to rank them in terms of their relative strength as subgrouping evidence. All of the following putative innovations except (3), which could not be elicited for MRT, are attested in all the Trukic languages for which data were collected.

(1) Replacement of POC *koe '2 sg focus pronoun' by PTK *kena.

(2) Replacement of POC *(n)au (PMC *gau) '1 sg focus pronoun' by PTK *gagu.

(3) Replacement of POC *ŋke 'if' and POC *pe 'or' by PTK *karee 'or, if, whether'

(4) Irregular loss of the initial consonant from POC *nsaŋa 'finger span' in the PTK counting classifier *-aga.

(5) Development of an innovative final syllable in PTK *karapa- 'locational noun: near, close' from earlier *kara.

(6) Irregular development of long vowels in the first syllables of PTK *kaamii '2 pl focus pronoun' and PTK *kaamami '1 pl exc. focus pronoun'.

(7) Development of the PTK possessive classifier for 'raw food' from the type 'kontaa 'to eat raw food', itself an innovation from POC *qonta 'raw food'.

In addition, 43 putative lexical innovations that are attested in all or all but one Trukic language have been presented, and a further 31 slightly more problematical putative innovations have also been listed. Of these, the following ten are perhaps especially persuasive, but others have weight as well. All but the last form in the following list are attested in all Trukic languages, and the last is lacking forms only for MRT and PUA, for which data were not available. (Numbers following the reconstructions refer to the original number when the form was first presented.)

(8) *kutú 'to burn (vi); to set fire to' (4) (Replacement for POC *tutu 'light, set fire to'.)

(9) *nii 'hit, strike, kill' (6) (Replacement for several POC etyma.)

(10) *úrae 'stick, branch, twig' (13) (Replacement for POC *daqan 'stick'.)

(11) *waka 'blood vessel, vein, sinew, tendon' (14) (Replacement for POC *uRa 'sinew, vein'.)

(12) *m'ano 'shaded, secret; to hide from sight; to disappear' (21) (Formal innovation of POC *ŋmalo 'pass out of sight, disappear, submerge, reef.)

(13) *m'egea 'cross-sibling' (22) (Formal innovation of POC *ŋma(qa)ne 'cross-sex sibling'.)

(14) *ka(t)udu 'finger' (31) (Formal and semantic innovation of POC *tu(n)suk 'index finger, to point with finger, to explain, to accuse'.)

(15) *p'iti 'same-sex sibling' (34) (Semantic innovation of POC *mputu 'beget, foster, raise (children)'.)

(16) *coo,a 'ripe coconut, copra' (38) (Common gloss that is apparently unattested elsewhere.)

(17) *toa 'cross-seat in canoe' (75) (Formal innovation of POC *so(ŋ)kar 'canoe rib'.)

Finally, lexicostatistical evidence has been presented which shows that any Trukic language shares a markedly higher percentage of cognates with any other Trukic language than with any non-Trukic language, and that, moreover, all Trukic languages have very similar cognate percentages with any one non-Trukic language.

This evidence, together with the often remarked fact that the grammatical systems of these languages are remarkably similar--as shown, for example, by the relative ease with which the grammar of the putative proto-language was reconstructed in section 2.2--makes it impossible not to conclude that these languages have shared a period of common development, and that they do indeed form a subgroup within Oceanic.

Much the same thing could be said of the Fijian languages; however, Paul Geraghty, in his important 1979 dissertation on the history of the Fijian languages, has shown, to quote Pawley (1979b:13), that "there is no Fijian subgroup exclusive of Polynesian." That is, that Polynesian developed out of one area of the Fijian dialect chain, which has continued to develop and, in many instances, converge since the departure of the ancestors of the Proto-Polynesians. Polynesian, in turn, has gone on to develop its own innovations, quite different from those of Fiji, during the ensuing three millennia (Geraghty 1979:324-360).

I believe that a similar sequence of events may have ocurred in Trukic, and that it may be wrong to speak of a Trukic subgroup within Micronesia that does not also include the Ponapeic languages, but that the latter languages separated from the "other" Trukic languages so long ago that they have developed a number of distinct innovations of their own. At the same time, the Trukic languages, through a process of regular and constant contact by means of their speakers' superb sailing canoes, have continued to develop along such similar lines that they now apper to be a separate group, much as the Fijian languages so appear.

Evidence for this hypothesis will be provided in chapter 4, but first it is necessary to examine the internal developments of the Trukic languages exclusive of Ponapeic. That examination is presented in chapter 3.

NOTES TO CHAPTER II

[1]Fr. Cantova actually included the languages of Yap and Palau together with those of the Trukic chain in his statement. It is clear, however, that he had no personal experience with those two languages. He was presumably misinterpreting information given him by Trukic islanders.

[2]The PTK reconstructions are my own. Marck does not provide reconstructions for his proposed Trukic innovations.

[3]Several of Marck's citations are incorrect according to the standard reference works for these languages. The correct forms are given below.

[4]The reconstruction PTK *kaú,i indicates that some Trukic languages appear to reflect a type *kaú, while others appear to reflect a type *kai. The same type of notation is used elsewhere in this work.

[5]Woleaian gaangÚ '1 sg focus pronoun' is irregular in reflecting a velar stop initial for the expected velar nasal. Other instances of this irregularity are found in Woleaian, however, and it is most probable that they represent a relatively recent development. Old Mapian, which appears to have been a Trukic language, fails to reflect *ke(e)na, however. (See sections 4.5 and 4.6.)

[6]All Micronesian languages show loss of the historical medial stop in forms for 'to sharpen'. Marshallese and Ponapeic languages share with Trukic the loss of Ross's *nj in the forms for 'road' and 'outrigger boom', while Kiribati and Kosraean fail to exhibit cognate

forms for the former etymon and apparently reflect the type *kiaso 'outrigger boom' for the latter.

[7]Evidence for dual and trial forms is found in Ponapeic and Marshallese, however, and apparently in Kosraean. Assuming a Micronesian group, it is an interesting question whether this situation has resulted from independent but parallel development in those three languages, or from loss of an earlier proto-system in Trukic and Kiribati. This particular problem is by no means limited to Micronesia, however.

[8]Pawley (1972:63) reconstructs PEO *na, *∅, but his table of cognates includes, in addition to Kiribati e, Nguna (t)e, Sesake e, u, tu, Sa'a e 'non-time', Bugotu, Nggela, Vaturanga e, as well as several apparently bimorphemic forms of the shape Ce. Kwaio also attests the form e (Keesing 1975:xxvi).

[9]See discussion in section 2.1.

[10]Pawley (1972:64) reconstructs *-mami. From his table of cognates there appears to be evidence for a PEO doublet *mi, however, as a continuation of PAN *mi, which is reflected in TRK and ULI -m.

[11]Kubary (1889) recorded ṅaṅ as the first person singular form for the language spoken on Mapia, approximately 100 miles north of West Irian. The position of Mapian is problematical, and as the language recorded by Kubary is no longer spoken there, we are unlikely to have more information about it than the few forms which Kubary recorded. Quackenbush (1968) quotes Topping as showing that the language recorded by Kubary was actually spoken by migrant Sonsorolese

workers, but Bender (1975) raises questions about that suggestion by showing that Kubary recorded forms that he collected on Sonsorol quite differently from those he recorded on Mapia. Goodenough and Sugita (1980) include 'Old Mapian' in their Eastern Trukic branch (and Sonsorolese in Western Trukic), but without any explanation. The position of Mapian will be briefly explored in chapter 4.

[12]Oda (1977) cites only <u>kamami</u> for PUA. There is evidence, however, that Oda may not have been consistently accurate in recording long vowels, e.g., PUA <u>mwane</u> 'man' for PTK *m'aane (and POC *ŋmaqane).

[13]Harrison (p.c.) points out that Ponapeic languages reflect a nominalizing suffix of the type *-pa, and suggests that PTK *karapa may reflect that suffix. This may be true, but it remains noteworthy that Trukic languages fail to reflect *kara without the *-pa increment.

[14]Evidence will be presented in chapter 4 that suggests that the PTK form for 'on, above' was actually *fao, and that the initial consonant has subsequently been lost in all Trukic languages, presumably because of rounding being read on to the first vowel. In that case, the loss of POC *p does not constitute evidence for the Trukic group.

[15]There is no evidence in Trukic for the *t provisionally reconstructed in PTK *na(t)u- 'classifier for offspring, pets'. Marshallese, Kiribati, and Kosraean reflect the earlier *t, however, and the possibility exists that all Trukic languages may have lost the consonant since the break-up of the proto-community. A similar situation is found in the Trukic reflexes for POC *-(w)atu 'toward

addressee' and in other less well-attested forms. A lengthy discussion of the somewhat problematic Trukic reflexes of earlier *t is provided in chapter 3.

[16]ULI and PUA also reflect the type *nima- 'possessive classifier for drinks', which is cognate with a Proto-Micronesian reconstruction of the same form and function. Lynch and Tryon (1983) attempt to relate these Micronesian forms to their Proto-Central Pacific reconstruction *(ŋ)ma- 'possessive marker for things to be drunk, or for wet foods to be eaten', and suggest that Anejom lumwa- is similar to the Micronesian forms in showing an "initial accretion of l or r (< POC *l?)." As stated above, however, the Micronesian languages are reasonably consistent in reflecting the type *nima-, although Marshallese does attest a doublet lima- (cf. PUA núma-, ULI lema-, Ponapean nima-, Kosraean nihmac-, Marshallese nima- 'possessive classifier for drinks', Kiribati nima- 'drink (n.)'). Since all the non-Trukic languages also reflect a verb *nima 'to drink', a more likely source for these forms is the POC verb *inum.

[17]Reconstructed for PTK only because of the apparent cognacy of the PPN form.

[18]Support for the POC reconstruction *li,epuka 'middle' includes Fijian levuka, Gitua livuga 'trunk, middle', Proto-Southeast Solomonic *levuxa (Levy n.d. a), Kuanua livua 'waist, middle', Lenakel neluk, Oba livugi, Tangoa livu'a 'middle'.

[19]See note 16 above.

[20]I am unable to determine whether a palatal nasal reflex in the form for 'when?' is restricted to Trukic and Ponapean (and cf.

Mokilese *ngehd* for evidence of the velar nasal in Ponapeic as well). Of the other languages which would be expected to distinguish POC *ñ from *n that I have sufficient data for, Bugotu *ingiha* reflects the form with a velar nasal, and Loniu *tukehe* is presumably not cognate. Additional investigation is needed.

[21]Lynch and Tryon (1983), following Pawley (1972), reconstruct Proto-Central Oceanic *pia 'where?'. Part of their supporting evidence is drawn from such Micronesian forms as Puluwat *yiya*, Ulithian *yiiyaa*, Woleaian *iiya*, Sonsorol *iia*, Kiribati *iia*/*iaa*, and Marshallese *ia*, but they fail to note that Trukic languages regularly retain *p before nonround vowels. They also cite Kosraean *piyac*, which, although it might appear to support their reconstruction, is problematical in at least two respects (see below). Some other data cited would appear to suggest that PTK (and PMC) *(i-)iaa 'where?' should be reconstructed for an earlier level. Speaking of Southern Vanuatu languages, Lynch and Tryon report that several "reflect forms with the phoneme combination *ia*, but show *irregular loss* of the initial *p" [my emphasis]. A clear example which they cite is Sie *iya*. Dehu (Loyalty Islands) is also reported as having the form *iæ* 'where to?'.

[22]Harrison (p.c.) suggests that Mokilese *ipah* 'near him' is formally and syntactically compatible with PTK *i-faa, despite not being an interrogative. However, the Mokilese root is given as *ipa-* by Harrison, who also notes that the form takes possessive suffixes. Although further investigation is needed, this fact appears to make it less likely that the Trukic and Mokilese forms are cognate.

[23]And see note 21.

[24]The correspondence of PTK *r and PPN *l is regular.

[25]Harrison (1978) presents a persuasive argument that most Proto-Micronesian object pronouns were not suffixes but reflexes of the absolute (or focus) pronouns functioning as object NPs, and that the development of these forms as suffixes in the modern languages has been the result of "verb-object attraction," which was instigated by a regular rule of final vowel deletion. Harrison's analysis has not been adopted for PTK in the present work, but that does not mean to imply that I consider Harrison to be incorrect.

[26]Marshallese also loses historic *k in *nsake under certain conditions.

[27]The situation for other Micronesian languages with respect to this pattern of reduplication is not clear. Kosraean has sra 'blood', lahl-kuhng 'smart, clever, sharp', which seem to reflect the unreduplicated roots of POC *(n)daRa and PMC *kagi. However, the Kosraean dictionary fails to cite any examples of forms with initial geminates, so it is possible that Kosraean may have simplified geminates that resulted from vowel loss in reduplicated forms. The modern language does have a pattern of CV- reduplication which apparently indicates gradualness, but it would appear to be a more recent development. Kiribati attests the early CV- pattern in such forms as raraa 'blood', kakang 'sharp', but has not lost the vowels. The Marshallese dictionary cites ddah (and dah) 'blood', kkag 'sharp', indicating that reduplication had occurred, but the authors (Abo et al. 1976) explain that these citations are a sort of neutral

presentation of forms that are actually pronounced yeddah and yekkag in the western Ralik dialect and dedah and kekag in the eastern Ratak dialect. The question that arises from these data is whether pre-Marshallese had already lost the vowel in these forms, so that each dialect had to find its own method of coping with the initial geminates, or whether the Ratak forms retain the reduplicated form without vowel loss, which might have occurred only in Ralik.

[28]Oda (1977:127) reports of Pulo Anna that "gemination of initial consonant after the reduplication of #CV- seems optional in Pulo Annian. And younger people seem to have lost this rule almost completely except before a certain number of consonants." I take this to mean that there is evidence of this pattern of reduplication in PUA, but that a sound change involving simplification of the geminate clusters is underway. A similar development appears to have occurred in ULI.

[29]Lynch and Tryon (1983) attempt to relate both the Marshallese and Trukic forms to their Proto-Central Oceanic *ŋke 'preverbal particle marking conditional. TK and Marshallese lose *ŋk, however, as does Kiribati, and their reflex of oral grade *k is k, and never the velar nasal. On the other hand, Kosraean ke 'when (subordinating conjunction)' may be cognate.

[30]Roviana has the form paka 'gun', which suspiciously resembles the Trukic forms. I am unable to tell, however, whether there is other evidence to suggest that this form, contrary to appearances, might be directly inherited, or, if the Roviana form is also a loan, what the source of that loan might be.

[31]Paul Geraghty (p.c.) has strongly suggested that this form might reflect a loan from Polynesian, and particularly from Tongan inasi (where *t > s/__i). The Trukic reflexes are completely regular for the PTK reconstruction, however, including ULI dental fricative in yilidiy 'to portion, share (esp. food), so I believe that borrowing is an unlikely explanation. Blust (1976) has pointed out other instances where Polynesian *t appears to correspond to reflexes of earlier *s in other languages.

[32]Sabatier (1971) cites both forms as mane, but indicates in parentheses that the form for 'male, man' is actually m'āne. No similar notation is indicated for mane 'cross-sibling', but Harrison (p.c.) has pointed out several other examples where Sabatier is inaccurate in transcription and states that the form is actually m'ane, without vowel length. Indeed, my own brief elicitations of Kiribati have made me aware that cited m'āne 'man, male' in fact has a geminate initial nasal: m'm'āne.

[33]The forms provided by Grace et al. (1979) in support of the reconstruction POC *damwasi 'lick' are: Gitua damozi, Yabem $damo_3e_3$, Motu demaria, and Numbami ndomosi, all with the meaning 'lick'. Although both vowels in the first two syllables of the reconstruction are low, it is perhaps noteworthy that all the supporting languages show a mid vowel--usually o--in one or both syllables. If the correct reconstruction is actually *domwosi, then the cognacy of PTK *dum'uri becomes more likely. It is perhaps also worth mentioning the secure POC reconstruction *damu 'to chew areca nut; lime spatula', which is reflected in Yabem as dom (Grace et al. 1979). It may be possible

that *damu and the putative *damwasi are in fact related, perhaps suggesting the reconstruction *damwusi 'lick', which would also be more compatible with the PTK form.

[34]PPN *ŋuu 'squid' has also been reconstructed with an initial velar nasal, in competition with the more widespread *feke. It is not compatible with PTK *gudi or *gido, however, as it fails to reflect the medial consonant.

[35]Ken Kuroiwa (n.d.) in a class paper at the University of Hawaii has observed that Trukic and Ponapeic languages frequently have n at the ends of preverbal adverbs, and has suggested that these accretions are probably related to the construct suffix *-ni. The final syllable in PTK *p'ala, if a separate morpheme, does not correspond with Kuroiwa's reconstruction, however.

[36]There are other instances in the data of Mokilese reflecting *l as r, or *r as l.

III. INTERNAL DEVELOPMENTS IN TRUKIC

The previous chapter has presented a body of evidence that the languages which have traditionally been termed "Trukic" constitute a single subgroup of Oceanic. Although there is also some evidence that the Ponapeic languages of Micronesia may be members of this group as well, that evidence will not be discussed until the end of the next chapter.

The present chapter examines the phonological, grammatical, and lexical developments among the traditionally Trukic languages since the break-up of the Proto-Trukic community, and proposes subgroupings within Trukic. Specifically, it is argued that Ulithian (ULI) was the first language to separate from Proto-Trukic, and that Woleaian (WOL), Satawalese (STW), Saipan Carolinian (CRL), Puluwatese (PUL), Mortlockese (MRT) and Lagoon Trukese (TRK) constitute a single subgroup within Trukic. It is further argued that WOL was the first language to separate from that internal subgroup, and that the language ancestral to STW and CRL separated next from the remaining community. The position of Pulo Anna (PUA), it is argued, is more problematic, with some evidence suggesting that it subgroups with ULI, and still other evidence suggesting a closer relationship between PUA and the "Nuclear Trukic" group of WOL-STW-CRL-PUL-MRT-TRK.

The chapter begins with a discussion of geographic and demographic factors which have affected the Trukic-speaking populations, and explores briefly some historical contact relationships among Trukic communities which appear to have affected the developments of the different languages. The next section summarizes previous studies dealing with the internal developments of Trukic languages, with special attention to the works of E. Quackenbush (1968) and Sohn et al. (1977).

Section 3.3 examines at some depth the developments of the PTK consonant system among the different Trukic languages and also briefly considers some vowel developments. Consonant developments, particularly of PTK *d, *t, and *k, are shown to provide significant evidence for subgrouping within Trukic. Section 3.4 explores some grammatical developments within Trukic, especially with reference to systems and forms reconstructed in chapter 2. Section 3.5 presents lexical support for the subgroups proposed but also explores lexical evidence for other internal groupings. Section 3.6 examines lexicostatistic evidence, and the final section summarizes the evidence for subgrouping within Trukic.

3.1 Background

It is helpful in considering the developments to be discussed below to first refresh our knowledge of some pertinent facts regarding the communities in which the languages are spoken. First, the great majority of Trukic communities are extremely small. According to the preliminary figures from the 1980 Trust Territory Census, the Trukic populations of only eight islands or atolls exceed 1,000 people. Of those eight, six are in Truk lagoon, one (Nama, with a population of 1,021) is in the Mortlocks, and the other is Saipan, where there are from 2,000-3,000 Carolinians.[1] The numbers of speakers of the languages which provided most of the data for this study are as follows (as of 1980):

Lagoon Trukese (TRK)	28,523
Dublon	3,233
Eot	189
Fala-Beguets	441
Fefan	3,096
Moen	10,373
Param	226
Romanum	457
Tol	6,781
Tsis	324
Udot	1,083
Uman	2,320
Mortlockese (MRT)	5,696
Ettal	440
Losap	587
Lukunor	668
Moch	622
Nama	1,021
Namoluk	329
Oneop	485
Satawan-Kutu	1,250[2]
Ta	294
Puluwat (PUL)	495

Satawal (STW)	386
Saipan Carolinian (CRL)	3,000[3]
Woleai (WOL)	659
Pulo Anna (PUA)	50[4]
Ulithi (ULI)	720

According to the Census, mot of the other Trukic communities are even smaller than these, with none having a population greater than 400.

Such a situation is understandable when it is realized that all Trukic communities except those in Truk Lagoon and the one on Saipan (and the more or less transient ones that have developed recently on Ponape, Yap, and Palau) exist on atolls, many of which have considerably less than a square mile of land. There simply is not room for many people on such islands. The consequences, however, are far-reaching.

Many important items cannot be grown or raised on a small atoll and must be obtaind from high island communities or done without. In addition, the combination of a small population base and strict incest restrictions often makes it necessary for young atoll-dwellers to find mates on other islands, and once family members have moved to those other islands it is natural to want to visit them. Under these situations, it is understandable that a great sailing tradition developed and has been largely maintained among the Trukic atolls. As Gladwin (1974), Riesenberg (1976) and McCoy (1976) have pointed out, Trukic navigators in the central Carolines think nothing of 100-mile voyages, go on occasional trips of 400-500 miles, and have learned and memorized traditional instructions for even longer voyages, as far as

Ponape, Kosrae, and even some of the atolls in Kiribati and the Marshalls. This navigational capacity helps to explain the spread of loans in the Trukic chain, noted in section 2.2.3.

Goodenough (1953) states that upon reaching their destinations navigators probably traditionally shared navigational information with their brethren on that atoll, and has demonstrated that the navigational systems, as tyupified by the names of crucial stars, are remarkably similar from one end of the Trukic chain to the other. Indeed, there is even evidence that significant parts of the Trukic navigational systems have been borrowed by the Polynesians on Nukuoru and Kapingamarangi and have spread as far as the Polynesian Outliers of Ontong Java and Takuu in the Solomons (Goodenough 1953; Jay Howard p.c.).

3.1.1 The "Yapese Empire"

Lessa (1966; also cf. Bellwood 1979) has described a network for the exchange of goods and intangibles that presumably developed in the central Carolines partly as a result of the lack of resources on atolls compared to high islands, and of the navigational skills of the Trukic islanders. This network, which Lessa terms the "Yapese Empire," involved the flow of tribute and gifts from all the Trukic islands west of Truk through Woleai and then Ulithi to Yap. The chart on the following page shows the chain of authority in the Yapese Empire, and demonstrates clearly that Yap communicated with the other Trukic islands only through Ulithi, which in turn communicated Yap's desires to the more eastward-lying atolls only through Woleai. The

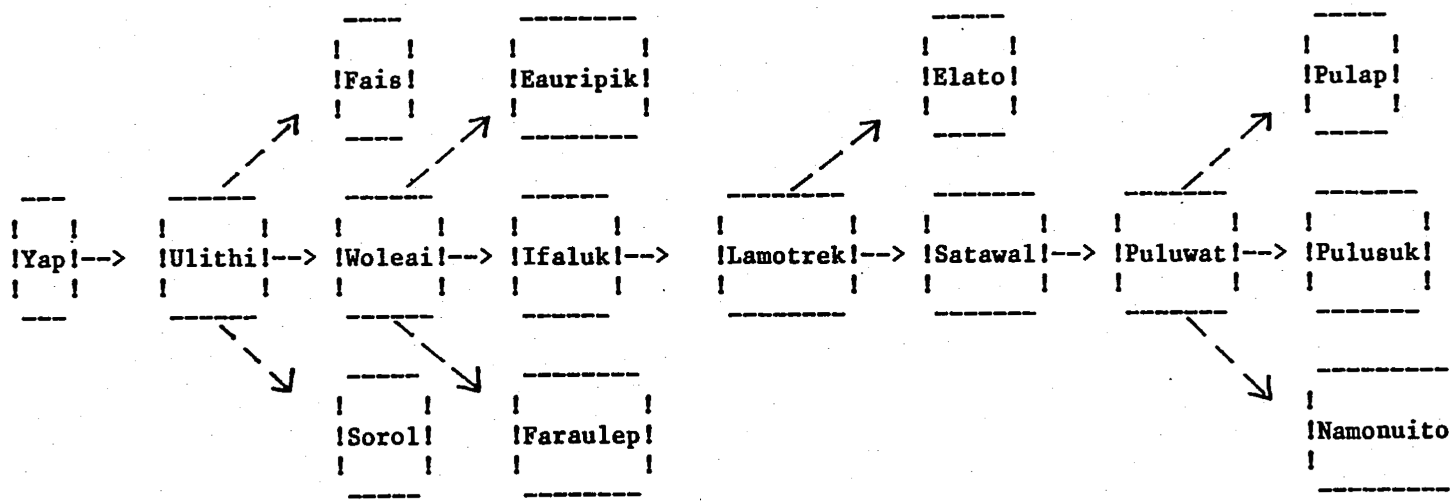


Figure 2. The chain of authority within the Yapese Empire (Lessa 1966:39)

flow of tribute was in a reverse direction, first coming to Woleai, then Ulithi, and thence to Yap.

Two questions suggest themselves: Why did the Trukic islanders submit to Yap's demands for tribute (i.e., how did the Yapese Empire get started)? And, why were the more eastward-lying Trukic atolls subservient to Yap, and not to Truk, which is much closer? There are no definite answers to either of these questions, but Lessa suggests some possible reasons, the geography of the area may suggest some other ones, and still others are suggested by historical information.

Lessa (1966:72-73) observes that the Ulithians have great fear of the magical powers of the Yapese--particularly of the ruling Gagil clan--and suggests that this fear might account in part for their subservience. But he also notes (1966:36-39) that the Yapese normally provide the Ulithians and other Trukic islanders with high island gifts that are otherwise unavailable on atolls in exchange for the tribute. Moreover, although the Trukic islanders are referred to as "children" and clearly treated as social inferiors by the Yapese, they are also permitted to visit Yap and are given shelter and food when they do so. Marck (p.c.) has said that this fact may suggest the most solid basis for the relationship: the possibility of a secure refuge in times of natural disaster. It must be remembered that all of the islands of the central Carolines are in the "typhoon belt," where they are subject to frequent and devastating storms. Such storms cause major damage on high islands, but on the low atolls they can be completely ruinous, destroying all vegetation and leaving the survivors to face famine conditions. It was just such typhoons which caused Trukic islanders to migrate to Saipan during the last century (Spoehr 1954), and it is easy to imagine that a similar need may have been partly responsible for the long-standing relationship with Yap.[5] As Lessa writes, "If anything, the inferior unit has more to gain than to lose through the arrangement" (1966:36).

3.1.2 Relations between the atolls and Truk Lagoon

The second question still requires an answer: Why wasn't a similar arrangement made with the communities on the high islands of Truk Lagoon, where the people are culturally and linguistically closely related to the central Carolinians, rather than with the considerably more alien Yapese? Although he does not deal with the question directly, Hezel (1973) nonetheless provides a possible answer in his review of western contact with Truk. It appears that at the time of first European contact with Truk the Trukese were probably not significantly involved in the deep-water sailing activities that charcterized the atolls, either as participants or as a destination. Hezel quotes Lütke and d'Urville as observing that while the people of the neighboring Mortlocks and Namonuito were quite familiar with and sophisticated about Western goods, those of Truk were not, being completely unfamiliar, for example, with firearms and pigs. Hezel quotes John Eagleston, the captain of a barque that visited Truk in 1832 as observing that the people of Truk "have had little or no intercourse with other nations" (Hezel 1973:59-60). Part of the reason for this apparent obstracism of Truk by other Trukic islanders might have been the fact that Truk "lacks . . . abundant fresh water sources . . . . its produce is more characteristic of low atolls than the richer and more diversified crops of most high islands" (63). But a more important reason was probably the endemic factionalism and constant warfare that characterized—and, on a less violent level, still characterize--the communities in Truk Lagoon.

Hezel writes:

> [Truk's] social system was organized almost entirely around relatively small kin groups and lacked any effective type of supra-familial authority. The lack of political cohesiveness among the peoples of Truk meant, in the concrete, the continual realignment of factions and multi-sider [sic] hostilities; any alliances tended to be very fragile and quite likely short-lived. The greatest threat to the outsider in all this was not that he would be instantly cut down because his presence was resented or his goods coveted, but that once associated with a particular group he would unwarily find himself implicated in local quarrels and become the target of this group's enemies. Kubary observes of the Trukese tht 'while almost any tribe would welcome a foreigner . . . yet he would be in the eyes of the natives identified with that tribe and could not have access to other tribes.' (Hezel 1973:70-71)

Hezel's point is that such factionalism was one of the major factors which dissuaded European explorers and merchants from visiting Truk, but could it not be that it also served to discourage visits by other Trukic islanders? Some evidence for this possibility is suggested by Don Luis de Torres, Vice-regent of Guam (quoted in Hezel 1973:63), commenting to d'Urville in 1838 that "the natives of Truk have a bad reputation, even among their own compatriots."

But whatever the causes, it seems certain that at the time of first Western contact, and probably for a great many years before that, the Trukic islands were united by a vast sailing network, which, however, appears to have included Truk Lagoon only peripherally. In order for such a network to continue to function, it was vital that at least minimal intelligibility be maintained among the languages spoken on the different islands. This would have been especially true among communities that needed to deal with each other frequently, such as, for example, Woleai and Ulithi.

3.2 Previous work on internal relationships within Trukic

The most encompassing previous work on the internal relationships of the Trukic langages is that of E. Quackenbush (1968), about which more shortly. Bender (1971:442-448) provides what he terms a "highly arbitrary" classification of the Trukic languages into three languages: "Ulithian," including the "three major dialects" of Sonsorol, Ulithi, and Woleai;[6] "Carolinian," including the "dialects" of Satawal, Pulusuk, Puluwat, Pulap, Namonuito, and Saipan Carolinian; and "Trukese," with the "dialects" of Truk Lagoon, the Hall Islands to the north of Truk, and the upper and lower Mortlock Islands. Bender provides no concrete evidence for his grouping decisions, which are based largely on Quackenbush's data, and makes it clear that they are quite impressionistic. In their recent excellent dictionary of Trukese, Goodenough and Sugita (1980) provide a chart of what they term the "Micronesic Division of Oceanic languages," under which they include a "Central Micronesic" group consisting of the Ponapeic and Trukic languages. Trukic is further divided into an eastern and western subgroup, with the languages of Lagoon Trukese, the Mortlocks, Old Mapian, and Puluwatese (including Pulusuk, Puluwat, Tamatam, Pulap, Namonuito, and the northern dialect of Saipan Carolinian) assigned to East Trukic, and Sonsorolese (including Tobi, Merir, Sonsorol, and Pulo Anna), Ulithian (including Ulithi, Fais, and Sorol), and Woleaian (including Satawal, Lamotrek, Elato, Ifaluk, Woleai, Faraulep, Eauripik, and the southern dialect of Saipan Carolinian) assigned to West Trukic. (Goodenough and Sugita 1980:xi-xiii). Again, however, no supporting evidence is provided, so it is difficult to evaluate the authors' claims.

3.2.1 The subgrouping analysis of Sohn et al. (1977)

Using data from the three Trukic languages of Woleai, Ulithi, and Sonsorol, plus some additional knowledge of Trukese, Sohn et al. (1977) have presented another argument for subgrouping among the four languages. Their argument is based entirely on phonological developments from POC and from their proposed Proto-Ulithic among the four languages, and particularly among the three western ones. Their Proto-Ulithic (PU) refers to essentially the same ancestral language that we have designated as Proto-Trukic.

The consonant phonemes that Sohn et al. reconstruct for PU are identical in all respects but one to those reconstructed by Jackson (in press) and listed in Table 2 in chapter 2. The one difference is that where I reconstruct a dental fricative (here represented by *d), Sohn et al. reconstruct PU *s. Their argument is that PU *s reflects POC *s and *ns, while I noted that POC *ns may well have been, in fact, phonetically a dental fricative and also presents other justification for my reconstruction (see Jackson (in press a) and section 3.7 below for further discussion). The consonant phonemes reconstructed by Sohn et al. are listed below with the orthographic symbols for PTK also provided in parentheses when they differ from Sohn et al's.

PU Consonant Phonemes (Sohn et al. 1977:19)

*p		*t	*c	*k
*pw (*p')				
	*f	*s (*d)		
		*l	*r	
*m		*n		*ng (*g)
*mw (*m')				

Sohn et al. (1977:22) propose that the following (unordered) sound shifts have occurred in the three languages:

(1) PU *k > /x/ singly in SNS, ULI, WOL

(2) PU *pw > /ƀw/ singly in SNS, WOL, and in all occurrences in ULI

(3) PU *n > /l/ singly in SNS, WOL, and in all occurrences in ULI

(4) PU *c > /s/ singly in WOL

(5a) PU *t > /s/ except /__*a in PU (where /s/ is distinct from PU *s)

(5b) PU /s/ > /θ/ in SNS

(6) PU *c > /s/ in SNS

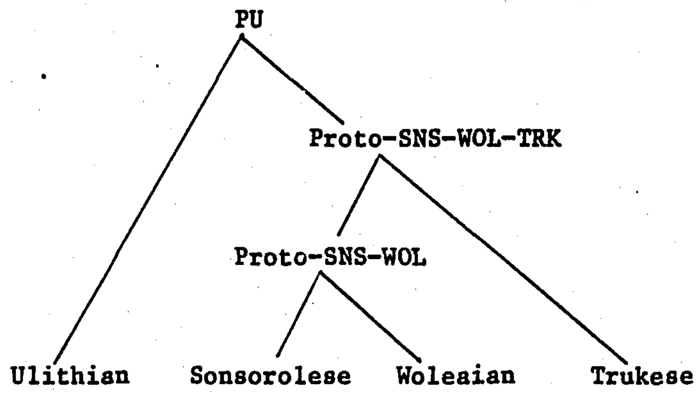
(7) PU *r > /l/ in SNS

(8) PU *s > /θ/ in ULI, but > /t/ in SNS, WOL

(9) PU *l (and apparently /l/ < *n) > /r/ in SNS

With respect to rules (5a) and (5b), Sohn also notes that in Trukese /s/ < PU *t is lost, and /t/ < PU *t becomes s.

On the basis of the above rules, they propose that Ulithian was the first language to break off from PU, followed by a later split between Trukese and Sonsorol-Woleai. The genetic tree is diagrammed by them as follows:



According to these authors, the initial split occurred when PU *s > ULI θ but Proto-SNS-WOL-TRK t; evidence for TRK being the next language to separate is the loss in TRK of PU /s/ < PU *t, the related "weakening" rule whereby remaining PU /t/ became s in TRK, and the hypothetical sequence whereby PU *c > SNS-WOL *s > SNS s. Since PU *pw and *k remain stops in TRK, they suggest that the similar spirantization of those segments in SNS-WOL and ULI (where the stops are not spirants if geminate in SNS and WOL) was the result of areal diffusion from ULI. A similar explanation is given for the merger of PU *n and *l in all three languages.

Although some of Sohn et al.'s conclusions appear to be valid, their specific arguments--and especially aspects of some of the rules on which those arguments are based--now appear to be somewhat mistaken. Evidence for this statement will be presented in section 3.3, after the following discussion of E. Quackenbush's (1968) important contribution to our knowledge of the Trukic languages.

3.2.2 Edward Quackenbush's (1968) study of the Trukic languages

E. Quackenbush (1968:4-5) states that he was struck by the following related questions posed by Dyen (1965a:x), and that his motivation for researching the Trukic languages was to attempt to find answers to them:

> What is the linguistic relationship of the languages or dialects lying between Truk and Ulithi? Is there only a gradual increase of differentiating features in the languages or dialects as one progresses in one direction through the islands lying between those two? Is the gradual increase of differentiating features only such that the languages or dialects which are somewhat remote from each other are mutually unintelligible while those which are geographically neighbors are always mutually comprehensible or nearly so? In either case, how many different languages are there?

To attempt to answer these questions, Quackenbush elicited from speakers of seventeen different Trukic communities, extending from Sonsorol and Tobi in the west to Satawan in the Lower Mortlocks in the east, a total of 585 lexical items and several short sentences. In addition, he also interviewed his informants, who were chosen with some care, regarding their impressions of the intelligibility of the languages spoken on neighboring islands. The seventeen linguistic communities that Quackenbush elicited data for, and the islands that he assumed to be included in each community (or "dialect area," as Quackenbush puts it) were as follows (Quackenbush 1968:23):

(1)	Sonsorol	Sonsorol, Pulo Anna, Merir
(2)	Tobi	Tobi
(3)	Falalap, Ulithi	Ulithi area: Ulithi, Fais, Ngulu, Sorol
(4)	Mogmog, Ulithi	(Added for additional perspective on (3))

(5)	Falalap, Woleai	Woleai area: Woleai, Euripik, Lamotrek, Faraulep, Elato, Ifaluk
(6)	Ifaluk	(Added for additional perspective on (5))
(7)	Satawal	Satawal
(8)	Saipan	All Saipan dialects
(9)	Puluwat	Puluwat
(10)	Pulusuk	Pulusuk
(11)	Pullap	Pullap
(12)	Ulul, Namonuito	Namonuito
(13)	Murilo	Hall Islands
(14)	Nama	Upper Mortlocks
(15)	Moc, Satawan	Lower Mortlocks
(16)	Fanapanges	Eastern Truk Lagoon dialects
(17)	Moen	Western Truk Lagoon dialects

There are two major focuses in Quackenbush's analysis of the data.[7] The first is the establishment of phonological isoglosses among the seventeen language areas, and the second is the determination of cognate percentages[8] among the same languages. Although Quackenbush concludes that both the phonological and lexical data lead to essentially the same conclusions, they will be discussed separately here.

3.2.2.1 Quackenbush's phonological analysis

Quackenbush does not reconstruct a proto-language _per se_, but he does provide cover symbols for each set of correspondences that he identifies, and those cover symbols bear a strong resemblance to reconstructions (as he notes: 58-59). In fact, the only substantial differences between the cover symbols set up by Quackenbush and the Proto-Trukic consonant system that we have been assuming are that Quackenbush has a cover symbol for a palatal glide (J) and that he sets up two cover symbols (T and S) for the sets of correspondences that we have reconstructed as PTK *t.

We shall now list the consonant correspondences proposed by quackenbush, but in a somewhat different order from that of the original work (1968:60-71). To avoid unnecessary confusion, the correspondences will be described in terms of the symbols that we have been using for Proto-Trukic, but Quackenbush's cover symbols will also be provided in parentheses. Reflexes in the modern languages are given in the orthography used by Quackenbush and are underlined.

(1) PTK *p, *f, *m, *m', *w, and the palatal glide (QB: P,F,M,MW,W,J) are reflected consistently in all seventeen languages as p, f, m, mw, w, and j, respectively, although Quackenbush notes that there is a small but significant amount of cross-over between the glides (e.g., Falalap, Ulithi wuuc ~ Mogmog, Ulithi juuc 'banana'), and also that the palatal glide is frequently missing or at least difficult to detect in the languages of Truk Lagoon.

(2) PTK *p' (QB: PW) is reflected as bw in Sonsorol, Tobi, both areas of Ulithi, both areas of Woleai, Satawal, and Saipan. It is reflected as pw in all other languages. Quackenbush (1968:60) says, however, that although this isogloss is "discrete phonemically, . . . the actual pronunciation changes in a smooth continuum from a voiced fricative in the west to a voiceless stop

in the east." He claims phonemic discreteness for the voiced stop in the west on the basis of simplified originally geminate stops which are voiceless in those languages. He notes elsewhere, however, that consonant gemination is often very difficult to detect, especially in initial or final position (1968:37).

(3) PTK *d (QB: TH) is reflected as a dental fricative th in both Ulithi languages, but as t in all other languages. Quackenbush notes three etyma, however, where all languages that reflect the form have t, including Ulithi: (1) SNS gutufA, TBI gutuf, ULI gytof, MOG-ULI gutof, WOL gattuf, STW jòttuf, CRL jattuf, PUL jòttuf, Pulusuk, Pullap, Ulul jattuf, MUR jattif, jattof, NAM jattyf, MOC jàttef, FAN jattuf, TRK jattof 'spittle'; (2) SNS, TBI tejiteji, ULI teeji, all others teete 'sew'; (3) FAL-ULI tyyg, MOG-ULI tuug, WOL, STW, CRL tuug, PUL tuuk, FAN suuk 'to hit'.[9]

(4) PTK *c (QB: C) is reflected in Sonsorol as s, in Tobi, both Ulithi areas, the Upper Mortlocks, and both Lagoon Trukese areas as a postalveolar stop c, in both Woleai areas, Saipan, and Nama as a postalveolar fricative sh, and in Satawal, Puluwat, Pulusuk, Pullap, Ulul, and Murilo as a retroflex liquid ṙ. Quackenbush notes that "some speakers in the Woleai area use c in free variation with sh in all words" (1968:67), and suggests that the use of the stop is spreading outward from Ulithi (and also from Truk).

(5) PTK *g (QB: NG) is sometimes reflected as n in Murilo and both areas of Lagoon Trukese before historical final *i, but is reflected as ng in all other cases.

(6) PTK *r (QB: R) is reflected as l in Sonsorol, as g in Tobi, and as r in all other languages.

(7) PTK *n and *l (QB: N,L) remain distinct (as n and l) in Puluwat, Pulusuk, Pullap, Ulul, Murilo, and the Upper and Lower Mortlocks; they are merged as n in both areas of Lagoon Trukese, as r in Sonsorol and Tobi, and as l in both areas of Ulithi and Woleai, in Satawal, and in Saipan Carolinian. With respect to Woleai and Satawal, however, Quackenbush notes elsewhere (1968:48) that n "usually occurs in free variation with l, but there are many words in which n cannot be substituted for l . . . and there are a few words in which most speakers appear to use n exclusively . . . . But the distribution of n and l in these words is not systematic with regard to their distribution in [those Trukic languages that maintain the historic distinction between *n and *l]."[10]

(8) PTK *k (QB: K) is consistently reflected as g in Sonsorol, Tobi, and both areas of Ulithi and Woleai. East of Woleai, *k is sometimes reflected as g in Satawal and Saipan Carolinian and as k in all other languages, and is at other times lost or reflected as a semivowel in all these languages (although there are apparent instances of the latter correspondence set where *k is retained as g or k sporadically in some languages). In addition, *k frequently changes to s before a high front vowel in Murilo

and Truk Lagoon, and more sporadically in Pullap, Namonuito, and the Mortlocks. These latter cases are attributed by Quackenbush to "dialect diffusion outward from Truk" (1968:64).

(9) PTK *t (QB: T,S) has the most complex sets of correspondences. In one set it is retained as <u>t</u> in Sonsorol, Tobi, Ulithi, and Woleai, but reflected as <u>h</u> in Puluwat, Pulusuk, Pullap, and Namonuito, and as <u>s</u> in Satawal, Saipan, Murilo, the Mortlocks and Truk Lagoon. In four instances of what is putatively this correspondence set, however, Woleai has <u>s</u> for expected <u>t</u>. In a second set, Sonsorol has <u>th</u> while all other languages have <u>s</u>. In the third set, *t is reflected as <u>th</u> in Sonsorol, as <u>s</u> in Tobi, Woleai, and Ulithi (and sporadically in Satawal and Saipan Carolinian), and is regularly lost or reflected as a semivowel in Lagoon Trukese, the Mortlocks, Murilo, Namonuito, Puluwat, Pulusuk, Pullap, and, most frequently, in Carolinian and Satawal.

In addition, Quackenbush notes that in Truk Lagoon all four nasal phonemes are regularly denasalized and are thus phonetically voiced oral stops. for the apical and velar nasals he reports this rule only when the consonant is sngle, but he states that it applies to the two labial nasals when they are both single and geminate (1968:42-43, 49). He does not report the same phenomenon for any other language.[11]

Quackenbush gives rather short shrift to the vowel correspondences, which are admittedly quite complex. He notes that Sonsorol, Tobi, and the two Woleaian witnesses retain historic final short vowels as devoiced vowels, while the same vowels are lost in all other languages. He also observes that all of the languages east of

Woleai have identical nine-vowel systems (with high, mid, and low front, central, and back vowels),[12] while in Sonsorol, Tobi and Woleai the low front and low back vowels appear to be conditioned allophones of a. For Ulithi, the high central vowel is unattested in Mogmog and extremely rare in Falalap, but Quackenbush records two mid central vowels for both dialects of Ulithi, with Ulithi ø corresponding to the sequence aiy or awy in other languages (1968:72), and Ulithi ė apparently corresponding to the mid central vowel in the other languages.

Following his identification of isoglosses, Quackenbush concludes:

> Most of the phonological isoglosses . . . are what could be called "sharp": that is, . . . the isogloss neatly splits the whole language area into two parts, each of which is consistent within itself. . . . and there is . . . no transitional zone, or area of divided usage. In effect, no island is a transition zone in regard to any one feature. But on the other hand, these isoglosses are more or less evenly dispersed from one end of the area to the other, so that every island can be considered to be a transition zone in that the set of features it shares with the islands to the west of it differs from the set of features it shares with the islands to the east of it. Perhaps no metaphor describes this kind of situation better than that of a "chain." (Quackenbush 1968:75)

Quackenbush's chart of phonological isoglosses, which led him to the above conclusion, is reproduced on the following page. The numbers in the chart refer to the language areas, listed above on pp. 139-140, for which Quackenbush obtained data. In examining this chart, it might be noted that Quackenbush's characterization of the isoglosses being "more or less evenly dispersed from one end of the area to the other," while true in the sense that putative isoglosses may be found

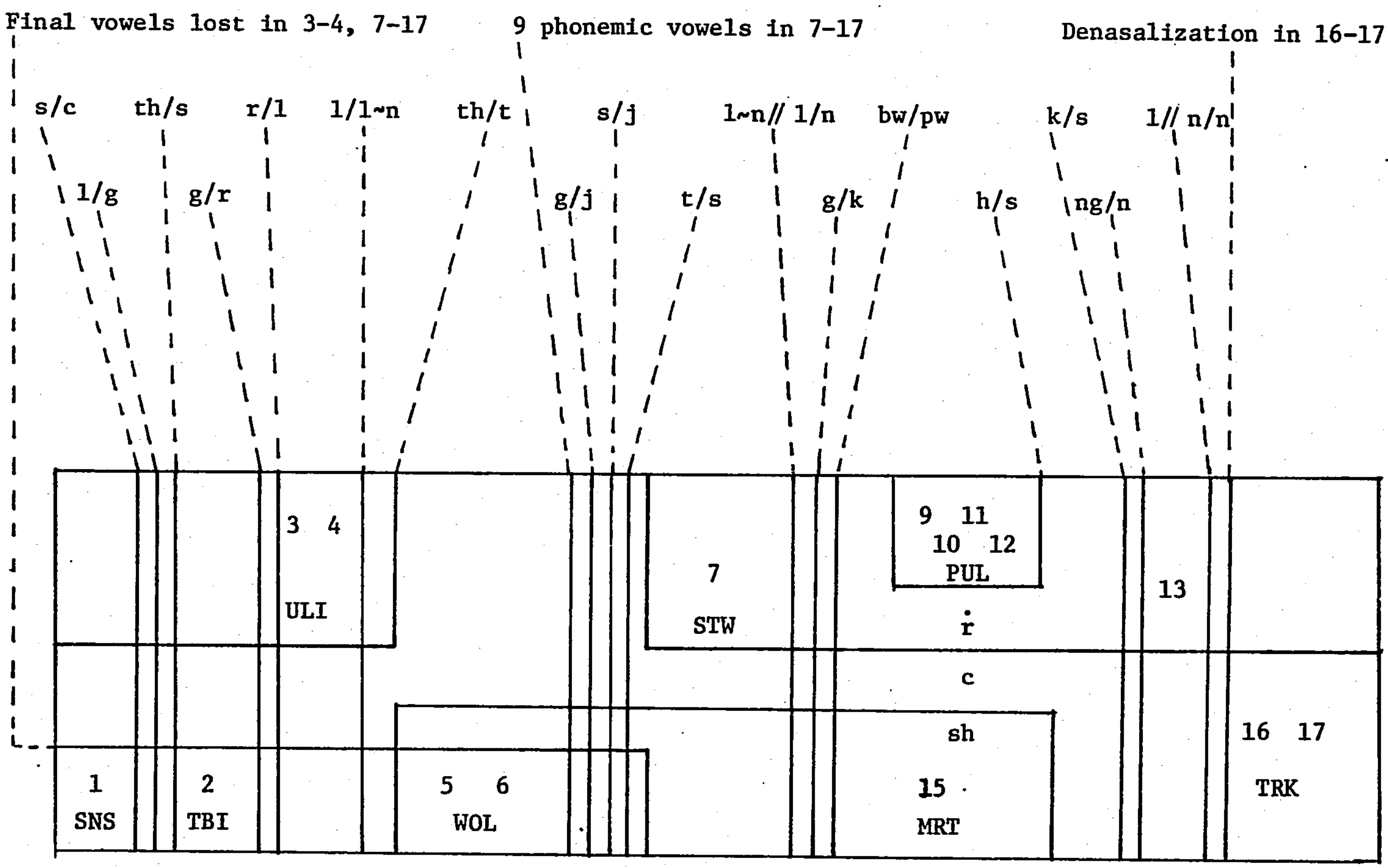


Figure 3. Major phonological isoglosses (E. Quackenbush 1968:76)

throughout the "chain," is somewhat misleading in another sense. that is, some pairs of languages are separated by more isoglosses than others, and four languages--Puluwat, Pulusuk, Pulìap, and Ulul (nos. 9, 10, 11, and 12, respectively)--have no isoglosses separating them. Thus, for example, Quackenbush identifies only three isoglosses between the following pairs of languages: Sonsorol-Tobi; Truk Lagoon-Murilo; Moc-Puluwat, etc.; Nama-Murilo. In contrast, he identifies four isoglosses between Woleai (nos. 5-6) and Ulithi (nos. 3-4), and six between Woleai and Satawal (no. 7), the most for any two adjacent pairs of languages. Although he does not remark on it specifically, it is clear from a later comment that Quackenbush considers this large number of isoglosses between Woleai and Satawal to be important. In discussing the probability of Satawal having borrowed a word from Yapese, Quackenbush (1968:86) writes, "This word, and others that fit the same pattern, are evidence that Satawal is being drawn out of the orbit of Trukese, to which it clearly belongs." Along the same line, he still later observes (1968:104) that the 86% percentage of cognates that he had computed between Satawal and Woleai is "disproportionately high when considered in relation to the really fundamental phonological differences which separate the two islands."[13]

3.2.2.2 Quackenbush's lexical analysis

Discussion of Quackenbush's analysis of his lexical data requires less time than the above review of his phonological analysis. On the basis of the ratio between the number of unique lexical items in a single language and the number of cognates exclusively shared between two geographically adjacent languages, he determines that the two languages from the Ulithi area, the two languages from the Woleai area, and the two languages of Puluwat and Pulusuk each represent a single language. He also decided for unstated reasons to exclude Saipan Carolinian from his lexical analysis. Thus, from the original seventeen Trukic communities, Quackenbush identifies thirteen distinct "languages."

For these thirteen languages, Quackenbush determines the unique and exclusively shared items, as shown in Table 11. He also notes that of the 585 items, 159, or 27%, are cognate throughout the thirteen languages, and that if single discontinuities and only partially cognate items are treated as cognates, the total is raised to 228 (39%). Using a 175-word adaptation of the Swadesh 200-word list of basic vocabulary, Quackenbush next computes cognate percentages for each pair of languages among the thirteen (see Table 12). He draws two important conclusions from the above procedures:

(1) "Virtually all of the significant blocks of exclusively-shared vocabulary are contiguous" (1968:84).

(2) "Islands which are close together geographically tend to have higher [cognate] percentages than those which are at a greater distance, and all the languages are connected by a chain of percentages which are in excess of 80 with the exception of the link between Tobi and Ulithi, which is 78%" (1968:88).

Quackenbush refers to Swadesh's recommendation that dialects sharing 81% or more of their basic vocabulry should be considered as belonging to the same language (Swadesh 1954:326), and observes that

Table 11

Unique and Exclusively Shared Items (E. Quackenbush 1968:85)

Note: Unique items are shown beneath the languages.

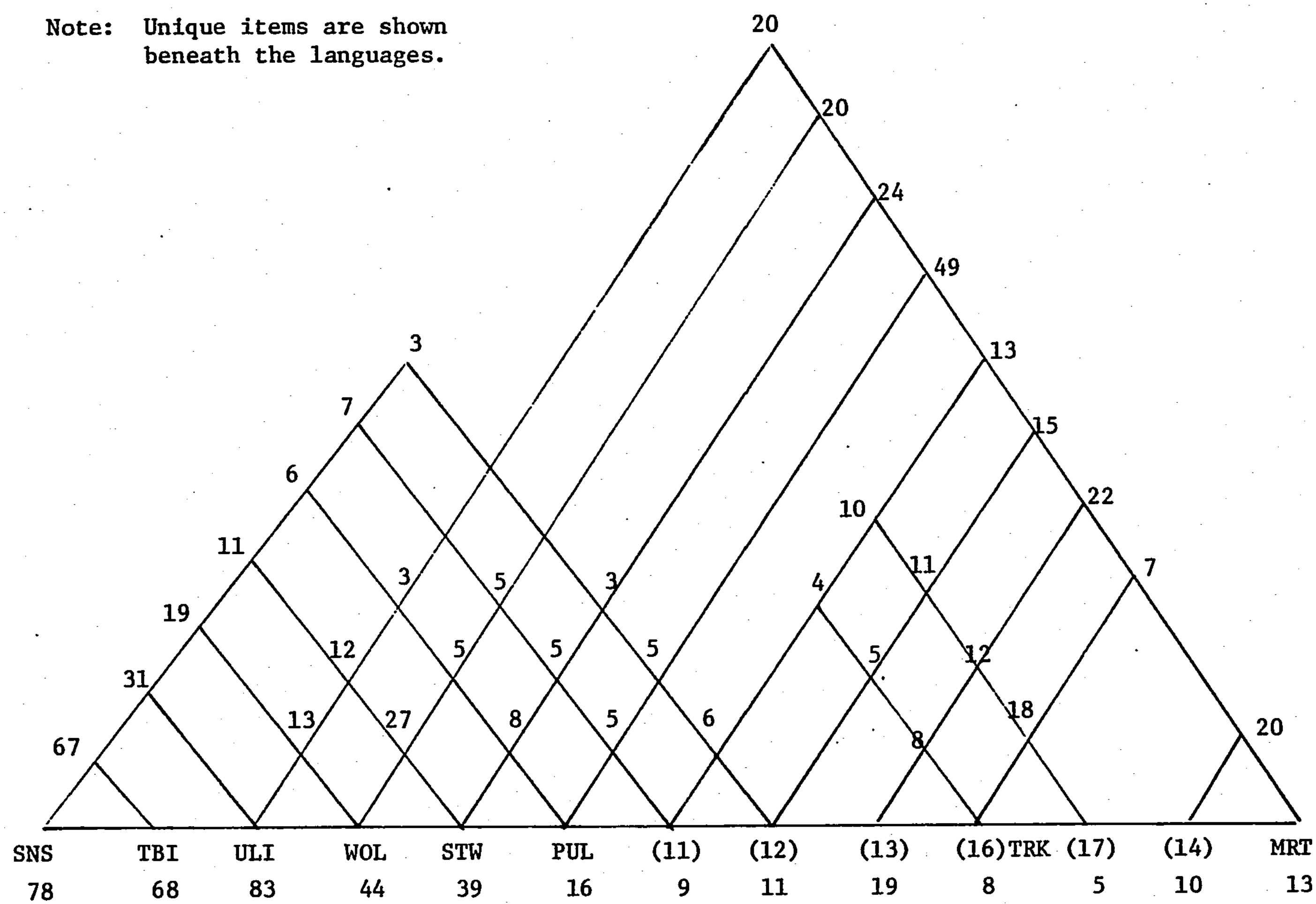


Table 12

Percentages of Shared Retentions of Basic Vocabulary (Quackenbush 1968)

	2 Tobi	3 Ulithi	5 Woleai	7 Stwl.	10 Plsk.	11 Pllp.	12 Nmto.	14 Nama	15 Stwn.	13 Murilo	16 Fan.	17 Moen
Sons.	87	78	69	66	64	63	62	60	61	60	58	58
Tobi		78	69	65	63	63	62	61	61	60	57	58
Ulithi			82	75	70	67	64	62	63	61	59	59
Woleai				86	77	72	68	67	67	64	62	62
Satawal					88	81	73	71	69	68	67	67
Pulusuk						92	83	80	80	78	75	75
Pullap							91	85	85	85	80	80
Namonuito								87	87	90	85	85
Nama									94	90	84	87
Satawan										88	84	83
Murilo											91	93
Fanapanges												97

each contiguous pair of Trukic languages (except Tobi and Ulithi) shares at least that high a percentage of cognates. Thus, he concludes, the phonological and lexical data both suggest that the Trukic languages be characterized as a chain of interlocking dialects.

3.2.3 Summary

Although Quackenbush (1968) concludes that the Trukic group consists of a chain of dialects, he also presents evidence which suggests that some of those "dialects" are more closely related than others. In particular, as noted above, he appears to believe that there are two central areas in Trukic, one at Truk Lagoon and one in the Ulithi-Woleai area, with the historical dividing line falling between Woleai and Satawal. Goodenough and Sugita (1980) agree with Quackenbush in proposing two internal Trukic groupings, but assign Satawalese to the western grouping with Woleai. As noted above, however, they present no evidence for their proposal.

In contrast, although Sohn et al. (1977) tacitly accept the phonological correspondences proposed by Quackenbush, they come to the conclusion that Sonsorolese and Woleaian subgroup with Trukese against Ulithian. They also propose, however, that diffusion outward from Ulithi has affected the phonologies of both Woleaian and Sonsorolese.

Since Quackenbush's study, a great deal more information has appeared on five of the languages that he identifies: Lagoon Trukese (Moen), Puluwatese, Woleaian, Ulithian, and Pulo Anna. Supplementing this information wth elicitations from speakers of Lower Mortlockese, Satawalese, and both dialects of Saipan Carolinian, we are now in a position to determine (1) whether Quackenbush is accurate in his description of the phonological and lexical relationships among the languages, (2) whether grammatical information can help to clarify those relationships, and (3) whether on the basis of this new information it is possible to evaluate the different subgrouping proposals and to clearly establish subgroups within Trukic.

The following section examines the phonological relationships among the Trukic languages and demonstrates that while Quackenbush's (and Sohn et al.'s) observations are generally accurate, the isoglosses are not so clear-cut as he suggests, particularly with respect to reflexes of PTK *k and *t. The section begins with a summary of the phonetic facts for the eight Trukic languages from which the majority of data have been drawn for the current work. Next, the consonant correspondences among those languages are established, and it is demonstrated that the reflexes of *t indicate that a process of "lexical diffusion," as described by, for example, Wang (1979), has been present in Trukic. Evidence that appears to require the reconstruction of another apical obstruent in Proto-Trukic is also examined. A brief examination is then made of some aspects of vowel developments in Trukic. The section concludes with a summary of phonological developments and of the internal subgroupings that are implied by those developments.

Subsequent sections discuss grammatical innovations within Trukic, based on the grammatical system reconstructed for Proto-Trukic in section 2.2.2 of chapter 2. Sections 3.5 and 3.6 examine the lexical data within Trukic, both in terms of attempting to reconfirm Quackenbush's lexicostatistical computations with a larger body of data, and also in terms of attempting to identify lexical innovations within Trukic, and section 3.7 will summarize the evidence for subgrouping within Trukic.

3.3 A more detailed look at phonological and phonetic developments within Trukic

The basic phonetic facts for the eight languages for which data have been gathered are presented in the following subsection.

3.3.1 Basic phonetic information

3.3.1.1 Lagoon Trukese

The phonemic inventory for Lagoon Trukese as established by Goodenough and Sugita (1980:xiv-xvii) and Sugita (n.d.) is as follows:

Trukese Consonant Phonemes

p pw	t	ch	k
f	s		
m mw	n		ng
	r		
(w)		y	w

Trukese Vowel Phonemes

i	ú	u
e	é	o
á	a	ó

All vowels and consonants (except _w_ and _y_ in some dialects) may be doubled. There are no phonetically doubled consonants at the ends of words, however. All Trukese consonants are unreleased word-finally.

The following observations can be made about the phonetic qualities of individual Trukese phonemes:

(1) All undoubled Trukese oral stops are phonetically voiced in intervocalic position but otherwise voiceless. All stops are unaspirated.

(2) The complex stop (or affricate) _ch_ is retroflex in most dialects, but with laminal contact. In some dialects it is an alveolar affricate [t^s].

(3) The two labiovelar consonants, _pw_ and _mw_, have velar constriction in all environments, but only show accompanying lip rounding when preceded or followed by back rounded vowels.

(4) All nasal consonants tend to be denasalized intervocalically unless geminate, thus approaching merger with the oral stops in that position.

(5) The liquid _r_ is an alveolar trill, voiced between vowels, but tending to be voiceless before or after a pause.

(6) The glide _w_ is unrounded except when preceded or followed by a back rounded vowel.

(7) The vowels _ú_ and _é_ are high and mid central unrounded vowels.

All other Trukese phonemes are phonetically predictable from the orthography.

The only permissible consonant clusters in native words in Trukese are geminate consonants. Similarly, there are no phonetic sequences of unlike vowels; phonemic sequences are separated by excrescent glides.

3.3.1.2 Mortlockese

No intensive work has been done on Mortlockese, and the following information is the result of several short elicitation sessions with two speakers from the Lower Mortlocks and two sessions with a speaker from Losap in the Upper Mortlocks. Unless specifically noted, the following refers to the language of the Lower Mortlocks.

Mortlockese Consonant Phonemes

p pw	t	ch		k
f	s	sh		
m mw	n			ng
	l r			
w		y	ẃ	

Mortlockese Vowel Phonemes

i	ú	u
į	(ų́)	(ų)
e	é	o
á	a	ó

It appears likely that all consonants except sh and all vowels except, perhaps, į, ų́, and ų may occur both singly and doubled. It is not certain whether final geminate consonants are possible. In the Upper Mortlocks final consonants are apparently not released, but release is at least optional in the Lower Mortlocks. More specific comments:

(1) The stop consonants *p*, *pw*, *t*, and *k* appear to have fricative allophones in medial position, although this is more pronounced in the Lower Mortlocks than in the Upper.

(2) The phoneme *sh*, which is a retroflex fricative, occurs only in the Lower Mortlocks. It corresponds to the retroflex affricate *ch* in the Upper Mortlocks. *ch* may occur singly in the Lower Mortlocks as well, but relatively rarely, and the likelihood is that its occurrence is due to contact with Truk or with the Upper Mortlocks. Geminate *chch* occurs in both areas.

(3) Nasal consonants are not denasalized medially.

(4) The glides *w* and *ẃ* clearly contrast in final position, where *w* is rounded and *ẃ* is not, and the tongue is apparently less retracted for *ẃ* than for *w*: e.g., *naaẃ* 'child', *faaw* 'stone'. It is not certain whether the same contrast occurs initially.

(5) The vowels *i*, *ú*, and *u* are described by Goodenough and Sugita (1980:xvii) as high mid front, central, and back vowels, respectively. It is almost certain that the first of these is phonemic in the Lower Mortlocks, while the status of the other two is less certain. However, so far as I am aware, none of these vowels occurs doubled, perhaps suggesting synchronic conditioning factors.

3.3.1.3 Puluwatese

Elbert (1974:1-13) describes the following phonemic system for Puluwatese. (All phonemes are represented in Elbert's orthography except the two r sounds, on which the diacritic has been reversed. Thus, Elbert's r is here written r, and Elbert's r is here written as r. As explained earlier, this change has been made to facilitate comparisons with other Trukic languages; according to Kimiuo Kimeuo, Director of the Truk Bilingual Project and a member of the Trukese Orthography Commission, the same change has also been made in the official Puluwat orthography.)

Puluwatese Consonant Phonemes

p pw	t	c		k	
f	s				h
m mw	n			ng	
	l r	ŕ			
w			y		

Puluwatese Vowel Phonemes

i	ú	u
e	é	o
á	a	ó

As in Trukese, all vowels may occur both singly and doubled. All consonants except the two glides may also be geminate, but Elbert notes that long r, ŕ, and s are rare. Also as in Trukese there are no geminate clusters phonetically before a pause; they are present phonemically, though. Elbert (1974:4) notes that "/-t -k/ are sometimes unreleased before a pause," perhaps implying that other consonants are normally released in that position. The following more specific observations may also be made:

(1) All stops and fricatives are generally voiceless initially and finally but are often weakly voiced between vowels, unless geminate.

(2) While single c is not rare, it is found predominantly in clear loans and in words that have the same form in Trukese, suggesting that it may be intrusive. Geminate cc is clearly directly inherited, however, and it usually has a morphophonemic relationship with ŕ. Phonetically, c is described as an alveolar affricate.

(3) The phoneme s appears to occur only in loans, but Elbert (1974:5) notes that it is also frequently heard in songs and suggests that this fact might "indicate that it is an older form."

(4) The phoneme r is a "double-tap trill" (1974:7), while ŕ is a retroflex approximant with the tongue often raised toward the hard palate.

(5) All sonorants are always voiced, and apparently there is no sign of the denasalization of nasal consonants found in Trukese.

(6) Vowels are as in Trukese.

As in Trukese, there are no phonetic sequences of unlike vowels, but apparently unlike Trukese occasional clusters of unlike consonants can occur at morpheme boundaries. In Puluwatese, also, all words must begin with a consonant.

3.3.1.4 Saipan Carolinian

There are two quite distinct dialects subsumed under the name Saipan Carolinian, and the two will be treated separately here. The southern dialect (CRL) has evolved from the languages spoken by natives of Pullap, Elato, Lamotrek, and, especially, Satawal who migrated to Saipan during the last century. Two subdialects exist, with one distinguishing historical *n and *l and the other merging those phonemes as <u>l</u>. No other important difference exists between the two, although there are a few lexical differences. The following consonant inventory is that of the latter subdialect:

Saipan Carolinian (CRL) Consonant Phonemes

p bw	t	tch	k(k)
f	s	sch	gh
m mw			ng
	l r		
w		y	

Vowels are as in Trukese and Puluwatese. All consonants and vowels may occur both singly and geminate except <u>tch</u> and <u>k</u>, which are only found geminate in native words (see below). Geminate consonants occur word-finally. All Carolinian consonants are obligatorily released in final position. Also:

(1) The voiceless stops p, t, and k are not voiced medially, but remain voiceless in all positions.

(2) The phoneme bw is a voiced labiovelar stop; it has a fricative allophone between vowels, especially when the preceding vowel carries greater stress than the following. When geminate, it is normally voiceless and fortis.[14]

(3) The phonemes sch and gh are a voiceless retroflex postalveolar fricative and a voiceless velar fricative, respectively. both may only occur geminate medially, and only in initial syllable reduplication. For some speakers, gh has a voiced allophone medially.

(4) The consonant tch is a geminate retroflex affricate, usually with laminal contact as well. It is morphophonemically related to the fricative sch.

(5) The phoneme k only occurs singly in borrowed words. Geminate kk is related morphophonemically to the single velar fricative gh.

(6) All sonorants are always voiced; nasal stops are never denasalized.

(7) The liquid r is a trill. Geminate rr only occurs medially.

(8) The glide w is always rounded. It may occur geminate medially and, for some speakers, initially in a very few words. The phonemic status of y is somewhat unclear. For some speakers it is clearly phonemic and may occur geminate medially in initial syllable reduplication.

The only permissible consonant clusters are geminate consonants. As with Puluwatese and Trukese, all sequences of unlike vowels have epenthetic glides phonetically, although the orthography does not always represent them (see Jackson in press b).

Speakers of the northern dialect of Saipan Carolinian (CRN) are descendants of natives of Ulul and other areas of Namonuito who immigrated to Saipan early in this century after spending time on both Guam and Tinian. Vowel phonemes are identical to those for Trukese, Puluwatese, and CRL. Consonant phonemes are as follows:

Saipan Carolinian (CRN) Consonant Phonemes

p	t	tch	k(k)	
bw	d		g	
f	s(s)			h
m mw	n		ng	
	l r	rh		
w		y		

All vowels and most consonants occur geminate (see below). Geminate consonants occur word-finally phonemically, but most, if not all, cases appear to be degeminated phonetically. Release of word-final consonants appears to be optional. Other comments:

(1) The phonemes p, t, and k are pronounced as in CRL.

(2) The phoneme bw is also pronounced much the same as in CRL, although there is no evidence of a fricative allophone in CRL.

(3) The phoneme g is a voiced velar stop. There appears to be a voiced fricative allophone for some speakers in medial position, and also a voiceless fricative allophone for the

same speakers before a pause. When geminate, it is phonetically _kk_.

(4) The phoneme _d_ is a voiced alveolar stop. It occurs in many loans, but also as the first segment in initial syllable reduplication that involves the consonant _tch_. For example: _dótchól_ 'black', _detch_ 'shake', _datchan_ 'wet, soaked', _detcháág_ 'thin' (cf. CRL _schótchól_, _schetch_ for the first two forms).

(5) The consonant _tch_ is a geminate retroflex affricate, as in CRL. It is morphophonemically related to the single phoneme _rh_ (and see (4) above).

(6) The glottal approximant _h_ only occurs singly. Morphophonemic geminate _h_ is realized phonetically as _ss_. Single _s_ is rare, occurring primarily in loans and as the first segment in reduplicated words that involve _ss_.

(7) The phoneme _rh_ is a retroflex approximant that is pronounced the same as Puluwat _ŕ_. It does not occur geminate, but relates morphophonemically to the geminate _tch_.

(8) All sonorants are voiced, except _r_ before pause; nasal stops are never denasalized.

Only geminate consonant clusters occur, except in recent loans. Sequences of unlike vowels are permitted, however, when the first vowel is nonhigh and the second high.

3.3.1.5 Satawalese

Phonetic information on Satawalese is somewhat more limited than on most of the other languages to be considered, but it appears in most respects to be quite similar to CRL. Vowels are the same as Carolinian; the consonant phonemes are as follows:

Satawalese Consonant Phonemes

p	t	ch	k
pw			
f	s		
m	(n)		ng
mw			
	l r	rh	
w		y	

All vowels and most consonants occur geminate (see below). Apparently geminate consonnts may occur before pause. Final obstruents, at least, are obligatorily released. Other comments:

(1) The oral stops *p*, *pw*, *t*, *ch*, and *k* are voiceless initially and finally and when geminate, but *pw* and *k*, at least, appear to have fricative allophones medially and, in some words, finally. *pw* may apparently be voiced medially as well.

(2) The consonant *ch* is a geminate retroflex affricte that is pronounced the same as Carolinian *tch*. It alternates morphophonemically with *rh*.

(3) The phonemes *l* and *n* appear to be in almost free variation. It is not clear whether this situation reflects a breaking down of the historical distinction or, as Sugita (p.c.) has suggested, dialect mixture from neighboring Puluwat, which has maintained the distinction.

(4) The phoneme *rh* is a retroflex approximant that is pronounced the same as in Puluwat and CRN. It only occurs singly. Marck (p.c.) has said that he understands that there is a dialect on Satawal which has a retroflex fricative similar to CRL *sch* in place of this sound, but I have found no other reference to it in the literature, nor has any Satawalese spoken of it to me.

(5) There does not appear to be any evidence of denasalization in Satawalese.

3.3.1.6 Woleaian

Sohn (1975:11-23) reports the following phonemic consonants and vowels for Woleaian:

Woleaian Consonant Phonemes

p		t		ch	k
b	f	s		sh	g
m		n			ng
		l	r		
w				y	

Woleaian Vowel Phonemes

i	ú[15]	u
e	é	o
	a	ó

All Woleaian words end in vowels. Historically final short vowels in polysyllabic morphemes are devoiced before a pause, while final long vowels are shortened in the same environment. Final short vowels in monosyllables are retained. For comments on geminate consonants and vowels, see below:

(1) The stop consonants p, t, ch, and k are always voiceless and appear not to have fricative allophones. ch and k are always geminate in native words, while p and t may occur both singly and geminate. According to Sohn, ch is articulated with the tongue blade against the hard palate; it is apparently not reflex.

(2) The fricatives f, s, b, and g are phonemically voiceless, but the velarized bilabial fricative b and the velar fricative g are phonetically voiced in medial position. Geminate b and g are phonetically the voiceless stops pwpw and kk, respectively.

(3) Sohn describes r phonetically as a voiced retroflex slit fricative, and sh as a voiceless retroflex sulcal fricative. When geminate, both sounds merge as ch.

(4) Single n occurs only in loans, but geminate nn occurs in native words (see (5)).[16]

(5) The phoneme l is an alveolar flap with no lateral air flow. When geminate, it is phonetically nn.

(6) The bilabial glide w may occur doubled in medial position, but the palatal glide y only occurs singly.

(7) All vowels may occur singly or doubled except é and ó, which apparently are always long.

(8) Both é and ú are described as rounded central vowels, unlike the unrounded central vowels in all the other languages so far described.

(9) All vowels may occur as final voiced vowels, but only i, e, ú, u, and o occur phonetically as final voiceless vowels. Historically final short a is raised to e after a nonback vowel, and to o after a back rounded vowel.

(10) The vowel á [æ] occurs phonetically as an allophone of long a before a consonant that is followed by voiceless i.

All words in Woleaian begin with a high vowel, consonant, or glide. Clusters of unlike consonants do not occur in native words; sequences of unlike vowels may occur, though, if the first vowel is nonhigh and the second is high.

3.3.1.7 Pulo Anna

Oda (1977:9-20) presents the following phonemic system for Pulo Anna:

Pulo Anna Consonant Phonemes

p		t		
pw	d	s		k
m		n		ng
mw				
		l		
w			y	

Pulo Anna Vowel Phonemes

i	ú[17]	u
e	é	o
	a	

As in Woleaian, all words end in a voiced or voiceless vowel. Apparently all vowels and consonants, except, perhaps, w and y may occur both singly and geminate. Further comments:

(1) The stop phonemes p and t are always voiceless.

(2) The phoneme pw is phonetically a voiced labiovelar fricative $[\beta^{w}]$ when single. Geminate pw is a voiceless labiovelar stop.

(3) The phoneme k is singly a voiceless velar fricative, with a voiced allophone in medial position. When geminate, it is a voiceless velar stop.

(4) The phoneme d is an interdental fricative. It is apparently always voiced, although Oda does not treat the issue directly.

(5) When single, the phoneme n is a denasalized alveolar flap which is apparently phonetically identical with Woleaian single l (and denasalized n in Lagoon Trukese). When geminate, it is nasal nn. The flapping rule apparently does not apply to the other nasal consonants, however.

(6) Phonetic á occurs as an optional allophone of short a followed by the high front vowel i.

As in Woleaian, clusters of unlike consonants do not occur in native words, while sequences of unlike vowels are permitted provided that the first vowel is nonhigh and the second is high. In Pulo Anna, however, words may begin with either a consonant or vowel.

3.3.1.8 Ulithian

Sohn and Bender (1973:17-83) present the following phonemic analysis for Ulithian:[18]

Ulithian Consonant Phonemes

p			t		c	k
b	f	d	s			g
m			(n)			ng
mw						
			l	r		
w					y	

Ulithian Vowel Phonemes

i			u
e	é		o
á		a	ó

At a phonemic level, Sohn and Bender argue that most, if not all, Ulithian words end in vowels. Phonetically, however, final short vowels are deleted before a pause except for some retentions of back vowels after the velar fricative g. All vowels may occur singly or doubled. Information on consonant gemination is given below:

(1) The consonants p, t, c, and k are voiceless stops without fricative or voiced allophones. The alveopalatal c apparently has affrication, but is not retroflex. All four stops may occur singly or geminate, although single k is relatively rare, being confined in large part to loans and rule-governed simplifications of geminate kk.

(2) The phoneme b is a voiced labiovelar fricative. It has a voiceless allophone before a pause, but is never realized phonetically as a stop, even when geminate.

(3) The phoneme d is a voiced interdental fricative. Like b, it has a voiceless allophone before pause but is never a stop, even when geminate.

(4) The phoneme s is a voiceless alveolar fricative with no apparent allophonic variation. Sohn and Bender (1973:19) assign it the feature [- anterior], perhaps suggesting a slightly retracted variety. It may occur singly and geminate.

(5) The voiceless labiodental fricative f and the voiceless back velar fricative g have voiced allophones in medial position. g apparently has a voiced stop allophone as well, but conditioning factors are not stated. While f may occur singly or geminate, geminate gg is realized phonetically as kk.

(6) The consonant n is described as "quasi-native," and appears to occur primarily in borrowed words.

(7) The phoneme r is an alveolar trill. It is apparently always voiced, and may occur both singly and geminate.

(8) The phoneme l is an alveolar lateral liquid that assimilates very readily to following and preceding consonnts and vowels. There is clear allophonic variation between plain and velarized l depending on the following vowel. It, too, may occur singly and geminate.

(9) The glides w and y may both occur geminate, as well as singly. It appears, however, that geminate yy only occurs medially, while ww may also occur initially.

(10) Although there is no phonemic high central vowel, Sohn and Bender state that ú occurs as an allophone of u when it is preceded by

one of the consonants d, s, ɟ, or m and not followed by one of the labiovelars b, mw, or w.

(11) The vowel a [a] has a fronted allophone when followed by a syllable with a front vowel i, e, á, and é.

(12) The vowel é is a mid front rounded vowel.

All words in Ulithian except loans and some interjections begin with a consonant. Clusters of unlike consonants are frequent in medial position, although an excrescent vowel optionally intervenes if the consonants are not homorganic or if the first consonant in the cluster is not one of l, n, or ng. Final geminates are described as occurring phonemically but not phonetically.[19] It appears that all consonants are released before pause, and the four voiceless stops are also slightly aspirated in that position.

This concludes our discussion of selected phonetic details in the eight Trukic languages. In the following subsections we shall examine the correspondences among the phonemes of each of the languages and the phonemic system reconstructed for Proto-Trukic.

3.3.2 Consonant correspondences

The reflexes of the following seven PTK phonemes are extremely regular in all Trukic languages:

PTK	TRK	MRT	PUL	STW	CRL	WOL	PUA	ULI
*p	p	p	p	p	p	p	p	p
*p'	pw	pw	pw	pw	pw	b	pw	b
*f	f	f	f	f	f	f	d	f
*m	m	m	m	m	m	m	m	m

PTK	TRK	MRT	PUL	STW	CRL	WOL	PUA	ULI
*m'	mw	mw	mw	mw	mw	mw	mw	mw
*g	ng,n	ng	ng	ng	ng	ng	ng	ng
*w	w	w	w	w	w	w	w	w

Phonetically, PTK *p is reflected as a voiceless bilabial stop in all eight languages, with some medial voicing in TRK and PUL. PTK *m and *m' are reflected as a bilabial nasal and labiovelar nasal, respectively, in the eight languages, with some denasalization of the single forms, especially medially, in TRK. Reconstructed PTK *w is consistently reflected as w in the languages (in such forms as, e.g., *wakara 'root', *waa 'canoe', *we(e) 'demonstrative enclitic, *wane 'straight, correct'), although all languages also have phonetic w's that do not derive from PTK. PTK *f is reflected as a labiodental fricative in all languages except PUA, where it has merged with one of the reflexes of PTK *t as an interdental fricative.[20] The PTK velar nasal *g is reflected as a velar nasal everywhere except in TRK, where *g > n/__i in many cases.

Phonetic reflexes of PTK *p' vary considerably among the eight languages. In all languages except ULI, the reflex is a voiceless labiovelar stop when geminate. Single reflexes of *p' are also voiceless labiovelar stops in TRK, MRT, PUL, and STW, but with some voicing medially in TRK and PUL, medial spirantization in Lower Mortlockese and Satawalese, and some medial voicing in Satawalese as well. In CRL *p' is reflected as a voiced labiovelar stop, with some spirantization medially. Woleaian b is a voiceless labiovelar fricative, but with medial voicing, while PUA and ULI reflexes are voiced labiovelar fricatives. In ULI, geminate reflexes of *p' are also voiced fricatives. ULI also has a devoiced allophone before pause.

3.3.2.1 Reflexes of PTK *c

Reflexes of PTK *c are also regular, but are complex enough to benefit from separate treatment:

PTK	TRK	MRT	PUL	STW	CRL	WOL	PUA	ULI
*c	ch	sh/chch	ŕ/cc	rh/ch	sch/tch	sh/ch	s	c

TRK, PUA, and ULI have no phonetic contrast between single or geminate reflexes of PTK *c. In TRK it is most commonly a retroflex affricate, with some dialects having a palatoalveolar affricate and others an alveolar affricate. Sohn and Bender (1973) report an alveopalatal stop for ULI, but with some fricative release. PUA s is an alveolar fricative.

Lower Mortlockese, CRL, and WOL have a retroflex spirant as the single reflex of *c, and an affricate as the geminate reflex. The affricate in MRT and CRL is normally also retroflex, while in WOL it is apparently palatal. It is possible, as Sohn et al. (1977) suggest, that PUA s may have developed out of an intermediate stage of a retroflex spirant like those attested in MRT, CRL, and WOL.

PUL and STW (and CRN) also report a retroflex stop as the geminate reflex of *c, but have a retroflex approximant as the single reflex.

Because of the quite consistent geminate reflexes of *c as a noncontinuant, it is almost certain that the phoneme was a stop or affricate in the proto-language, and that all languages except TRK and ULI reflect phonetic innovations. This type of innovation is considerably less valuable for subgrouping arguments than merger, split, or loss, but should still be noted.

3.3.2.2 Reflexes of PTK *n, *l, and *r

It is useful in discussing the Trukic reflexes of PTK *n, *l, and *r to include data from Sonsorol (SNS) and Tobi (TBI) in addition to the eight languages that we have been examining. (Information on these two languages is taken from Quackenbush (1968), Capell (1969), H. Quackenbush (1970), and Sohn et al. (1977).) Those reflexes are as follows:

PTK	TRK	MRT	PUL	STW	CRL	WOL	PUA	SNS	TBI	ULI
*n	n	n	n	l n	l	l/nn	n	r/nn	r/nn	l
*l	n	l	l	l n	l	l/nn	n	r/nn	r/nn	l
*r	r	r	r	r	r	r/ch	l	l	g	r

For PTK *r, all languages except WOL, PUA, SNS, and TBI reflect a trill singly and when geminate. As noted previously, WOL r is a voiced retroflex slit fricative, and the WOL reflex of *r merges with that for *c when geminate. Oda (1977) decribes PUA l as an alveolar lateral sonorant. Quackenbush (1968:47) describes SNS l as a "voiced laterally-released pre-velar stop," a characterization that Capell (1969) and H. Quackenbush (1970) agree with. Sohn et al. (1977) do not comment on its phonetic quality. In TBI, *r has apparently merged with *k as a voiced velar fricative (E. Quackenbush 1968:59).

Although all four of these languages have clearly been innovative, it is difficult to determine whether they may all have shared a single original innovation and then developed separately later, or whether each has innovated separately. It is certainly tempting to assume that SNS and TBI have shared an innovation leading to a velar reflex of *r, but the WOL reflex is also postalveolar and could represent an intermediate stage for the other developments. (It is also possible, however, that the postalveolar reflexes in WOL, SNS, and TBI are continuations, as Marshallese r is retroflex and Ngatikese reflects earlier *r as a velar fricative.)

Reflexes of PTK *n and *l are merged in all languages except MRT and PUL (and CRN), where they remain distinct. In STW, as noted earlier, l and n are in essentially free variation, and it is difficult to decide whether the present situation represents the collapse of the historical distinction or dialect-mixing. CRL and ULI clearly have merged *n with *l as l, while TRK has merged *l with *n. In the case of WOL, PUA, SNS, and TBI, the direction of the merger is not so clear.

As remarked previously, WOL l is a nonlateral alveolar flap. PUA single n has the same articulatory description. Both E. Quackenbush (1968) and H. Quackenbush (1970) describe SNS r as a voiced alveolar tap. Sohn et al. (1977:24) describe SNS r as a "resonant," however. E. Quackenbush (1968:43) describes TBI r in the same way as SNS r.

It was noted earlier that Goodenough and Sugita (1980:xvi) characterize single TRK n, which is denasalized, as "like an alveolar flap," that is, phonetically identical with WOL l and PUA n. If

Quackenbush is accurate in his characterization of SNS r and TBI r, then those sounds, too, are very similar, if not identical, to the TRK, WOL, and PUA phones. When we next consider the fact that the geminate reflex of *n and *l is nasalized nn in WOL, PUA, SNS, TBI, and TRK, it would seem very likely that all those languages shared the historical rule *l > n, and another rule denasalizing single *n.

Considerable other evidence suggests that this group of languages did not form a closed subgroup within Trukic, and it is very clear that CRL, for example, cannot be subgrouped with ULI, despite the evidence of the merger of *n with *l. Yet the apparently identical developments in TRK, WOL, PUA, SNS, and TBI cannot be simply explained away as "parallel developments" without other evidence which clearly shows that such a grouping is untenable.

3.3.2.3 Reflexes of PTK *k

Reflexes of PTK *k are quite complex, and cannot be shown in simple tables such as the ones we have used before. In determining the various correspondence patterns, it is necessary not only to consider whether the reflex is single or geminate or the nature of the following vowel--both of which factors were also discussed briefly by Marck (1977)--it is also necessary to consider the quality of any preceding vowel. Moreover, even after these factors have been taken into consideration, there still remains a small number of apparent exceptions. Those exceptions will be discussed at the end of this subsection.

The geminate reflex of *k is a lengthened velar stop kk in all Trukic languages. The single reflex is either ∅[21], s (in very restricted environments in TRK and MRT), or a velar obstruent. The phonetic nature of the velar obstruent in the different languages is as follows (cf. section 3.3.1): TRK k and PUL k (voiceless velar stop, with allophonic voicing medially); MRT k (voiceless velar stop, with allophonic spirantization medially); STW k (voiceless velar stop, with some spirantization medially and finally); CRL gh (voiceless velar fricative, with some medial voicing); CRN g (voiced velar stop, with some spirantization medially and, for some speakers, finally, when it is also typically devoiced); WOL g and PUA k (voiceless velar fricative, with allophonic voicing medally); ULI g (voiceless back velar fricative, with allophonic voicing medially).

3.3.2.3.1 Reflexes of PTK *k before high vowels

Before the historical high vowel *i, the single reflexes of PTK *k are as follows:

TRK	MRT	PUL	STW	CRL	CRN	WOL	PUA	ULI
k,s	k	k	k	gh	g	g	k	g

The two different reflexes in TRK appear to represent an example of lexical diffusion (cf. Wang 1969, 1979; Chen and Wang 1975). There is no possible source for "dialect mixture," and there do not appear to be any conditioning factors. As the following list of all the TRK reflexes of *k before *i shows, spirantization has occured in about 30% of the etyma.

PTK	Gloss	TRK	Gloss
	*k > k		
*kia	'mat'	kiyeki	
*kica	'1 pl incl foc pron'	kiich	
*kica	'1 pl incl obj pron'	kich	
*kiau	'outrigger boom'	kiyó (& siyá)	
*kinaia	'17th phase of moon'	kiney	'20th phase of moon'
*kinata	'wound'	kinas	
*kinie	'mat'	kini (& sini)	
*kida	'chew & spit out'	kiteey	
*kita	'little, small amount'	-kús	
*kini	'pick, pluck, harvest'	kiniiy 'cut, segment, pick'	
*kili-awa	'banyan'	kiniaw (cf. *kili 'skin')	
*ciki	'small, young, little'	-chik	
*liki-d	'leave, leave alone'	nikiti	
*madaki	'pain, ache'	metek	
*maluaki	'forget'	ménnúúki	
*fadoki	'to plant'	fótuki	
*dauki	'climb, crawl'	tééki (& téési) 'invade, infest, crawl on'	
*tuuki	'open'	suuki	
*pitaki	'belongings, goods'	pisek	
*paiki	'side, direction'	peeki-	
*akiaki	'think, ponder'	ekiyek	
*diki	'k. of vine'	ó-tik	
*rakici	'calophyllum inophyllum'	rekich	

PTK	Gloss	TRK	Gloss
	*k > s		
*kili	'skin, bark'	siin	
*kiep'u	'spider lily'	siipw (& kiyopw)	
*kinie	'mat'	sini (& kini)	
*piki-r	'slap, clap, hit'	pisiri	
*patiki	'hold breath for long time underwater'	ppeyis	
*-aki	'passive suffix'	-es	
*dauki	'climb, crawl'	téési (& tééki)	
*macaraki	'easy, comfortable'	mecheres	
*raki	'breadfruit season; year'	ráás	'breadfruit harvest season'
*ineki	'body, hull'	inisi-	
*faunaki	'elevated sitting platform on canoe'	foones	
*ku,ili-fau	'sea hibiscus'	sinifé	
*kiau	'outrigger boom'	siyá (& kiyó)	

Weinreich, Labov, and Herzog (1968) have argued that a prerequisite for change is the presence of variation. If so, then the large number of doublets that appear in the above list may be further evidence of a change in progress.

It should also be noted that MRT attests one form with an s reflex of *k in this environment: siye 'outrigger boom' (< *kiau). In the absence of other forms, it is possible that this is a loan from one area of TRK.

Single reflexes of *k before the high back vowel *u or the high central vowel *ú are reasonably straightforward:

TRK	MRT	PUL	STW	CRL	CRN	WOL	PUA	ULI
k,(s)	k	k	k	gh	g	g	k	g

For this correspondence set, however, there are only two instances of an s reflex in TRK, and both have a doublet with k: sineey 'know, know how', kúna 'see, behold' (< *kula 'know, perceive, behold, understand'); wúsi 'pound, grind, mash', sukuuw 'pound, beat' (< *tuku 'pound, beat, mash'). MRT also has a single s reflex in the form for 'pound, beat': úse. Again, it appears possible that this form is a loan from TRK.

TRK wúúk 'fingernail, toenail, claw' (wúkkú-n 'fingernail of') may represent irregular loss of initial *k from PTK *kukú, but may also reflect a case of consonant-vowel metathesis. Two other instances of irregular loss of *k in this environment appear to be attested in the data: (1) PTK *kúp'a 'footprint, foot' is apparently reflected as PUA kupwa 'leg', WOL giibA 'footprint', CRN a-ibweibw 'foot, footprint', CRL a-ibwiibw 'foot, footprint' and ghúúbw, ghuubw, ghiibw 'footprint (dialectal variants)', PUL yipwa- 'footprint', TRK iipw 'instep, sole of foot, footprint'; (2) PTK *(k)uru 'play, game, loaf, relax' is apparently reflected in MRT uruur 'play', TRK wur 'play, loaf, visit, take a walk', PUL wukkur 'play' (with initial syllable reduplication), STW wuur 'game', CRL ukkur 'play', WOL urU 'play'. Evidence for PTK *k in the second form comes less from the Trukic reflexes than from the non-Trukic cognate Marshallese qqire'y 'play, game, drama, sport', as the medial kk in the PUL and CRL forms could derive from a -kk- infix that occurs in the reduplication of vowel-initial verbs in TRK, MRT, and STW as well as in those two languages (see Goodenough 1963). It is possible, then, that the correct PTK reconstruction is *uru, and that Trukic either lost the initial *k reflected in Marshallese in the proto-community, or that the Marshallese form is actually a borrowing of a reduplicated Trukic form.

3.3.2.3.2 Reflexes of PTK *k before *a

Single *k before the low vowel *a is almost always retained as a velar obstruent in ULI, PUA, and WOL, while it is most commonly lost in TRK, MRT, PUL, STW, and CRL, unless it is also preceded by a high vowel, in which case it is retained in those languages as well. Table 13 below provides several representative cognate sets, of which perhaps one of the most striking is the set for *m'akarikari 'the Pleiades', where the first *k was lost in the five more eastern languages while the second *k, which is preceded by *i, is retained.

The data show several exceptions to this pattern, however, and although possible explanations for some exceptions suggest themselves, it is impossible to identify phonetic conditioning for the others. The exceptions are of two types: (1) where *k is unexpectedly lost before *a in one or more of the three western languages; and (2) where *k is unexpectedly retained in the same environment in one or more of the five eastern languages. Each type will be discussed separately.

WOL unexpectedly loses *k in a reflex of the causative prefix *ka- in the respect-language synonym for 'feces', *ka-llowa, where

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Table 13

Sample Cognate Sets Showing Regular Reflexes of PTK *k before *a

Gloss	PTK	TRK	MRT	PUL	STW	CRL	WOL	PUA	ULI
'near, close'	*karepa	arapa-	arapa-	yarapa-	arapa-	arap	garepA	kalepA	garepa-
'blood vessel'	*waka	waa	waa	waa	—	waa	waagA	wakA	waag
'doorway'	*katama	asam	asam	yaham	asam	asam	gatamA	katamA	gatam
'true giant taro'	*p'ulaka	pwuna	pwula	pwula	pwula	bwula	bulagA	pwunakA	bulag
'toddy, tuba'	*kacii	áchi	yashi	yáfi	—	aschi	gashii	kasi	gaci
'evening'	*fakaafi	fááf	fááf	fáf	fáff	fááf	fegaafI	dakadI	fagaaf
'sennit'	*kalokalo	—	ólóól	yólóól	yólóón	—	galogalO	kanokanO	golgól
'eat'	*kagi	áni	ange	yangiy	ángi	ángi	gangii	kangi	gangi
'throw'	*kace	ácheey	ache	yafeey	yarhey	aschey	gasheey	kase-di	kkace
'cls. for food'	*kana-	ana-	ana-	yana-	yana-	ala-	gala-	kana-	gala-
'1 pl ex subj pron'	*kaú,i	éwú/áyi	ay	yáy	au/yáy	ay	gaI	kaI	ga
'2 pl subj pron'	*kau	owu	áwú	yaw	yów	aw	gaI	kaÚ	ga
'chili pepper'	*m'eika	mwiik	mwmwiik	mwmwiik	mwiik	amweigh	mwmwiigA	—	—
'fish'	*ika	iik	iik	yiik	iik	iigh	iigA	iikA	igg
'locative pref.'	*i-ka-	ike-	ika-	ike-	—	ighe-	iga-	ika-	iga-
'center'	*luuka	nuuka-	luuka-	luuka-	luuka-	luugha-	luugA	nukA	—
'Pleiades'	*m'akarikari	mweeriker	meeriker	mwariker	mwááriker	mwáárighár	mwegarigerI	—	—
'pleased'	*mataika	meseyik	—	mehááyik	mesááik	meseigh	mesaigE	—	—
'1st moon phrase'	*Tikauruu	sikowuru	sukkouru	sikooruuw	sikouru	sighaúrú	sigouruu	—	—

*llowa may be reconstructed with the meaning 'disgusting, repellant, repugnant'. There is no other instance in the data where WOL loses *k in the causative prefix, and as neither PUA nor ULI appears to reflect this form, it is possible that WOL may have borrowed it from STW or PUL. WOL also has doublet reflexes of PTK *kade 'boy, child' and *dakau 'uninhabited low island, reef island': WOL gaatE, yaatE 'child, infant'; WOL téé 'any outer island', Tegaú-lapA 'name of small island in Woleai'. The first of these appears to be an instance of dialect variation, while in the second the more conservative reflex is only retained in the place name. ULI also appears to have doublet reflexes of *dakau: dógó 'long reef' and déé-ngéc 'uninhabited island'. PUA only has the expected takaÚ 'group of islands, archipelago'.

Two of the seeming exceptions among the eastern languages occur among the object suffixes. PTK *k is retained in all five languages in the reflexes of *-kamami '1 pl ex obj pron' and *-kamii '2 pl obj pron', although it is lost in the formally similar focus pronouns. There is a likely explanation for this asymmetry, however. Recall that a transitivizing suffix *-i has been reconstructed as coming between the verb stem and the object suffixes. The presence of this high vowel before the *k would regularly block its loss. A somewhat similar explanation may be made for the failure of initial *k to be lost in the preverbal adverb *kana 'usually, habitually, often'. Such adverbs normally follow immediately after a subject pronoun, the majority of which also end in a high vowel which might have blocked the loss of the *k. Analogy would then have prevented the *k from being lost in this form in other environments.

Another kind of analogy might explain the following reflexes of PTK *karikari 'scratch, scrape': TRK erikeri, PUL keriker, CRL gherigher. Note that the TRK form is regular, with *k retained after the high vowel. It would appear plausible that the initial *k in the other languages might have failed to delete so as to retain formal identity with the second disyllable in the reduplicated form.

Another set of seeming exceptions may be the result of a recent irregular simplification of geminate kk in some of the languages: PTK *kaadu 'itch, itchy' > TRK kkéét, MRT kéét, PUL kéét, CRL kkéét, WOL kkéétÚ, PUA kkatÚ, where MRT and PUL are irregular; PTK *kaeu 'learn, teach' > TRK kayéé-, MRT kayé, PUL kkayé, STW kayé, ULI kkaye, PUA kkaú, where TRK, MRT, and STW are irregular; and PTK *ka-paca 'join, glue' > TRK kkapach, MRT apesha, PUL kapaŕ, STW apparha, CRL appasch, WOL gapeshaa, where PUL is irregular.

However, there remain the following eight forms which have reflexes in one or more languages which do not seem to admit of any phonetic explanation:

(1) PTK(?) *kaccu 'good, beautiful' > TRK yéćh, MRT aash, PUL kaccú-, STW kacc, CRL ghatchú-, WOL gachÚ.

(2) PTK(?) *kam'ee 'giant clam' > TRK kamwe, amwe, MRT amwe, STW amwe, CRL amwe, WOL gamwee.

(3) PTK *kau 'fish hook' > TRK éé, MRT ẃéé, PUL yéé, kéé, STW kéé, CRL ghéé, WOL géé, ULI gaay.

(4) PTK *kaú 'say, tell' > TRK áá-, MRT yááyáá-, PUL yááyá, STW áá-, CRL áá-, ghay, WOL gaaÚ, ULI kkay, PUA kaÚ.

(5) PTK *kata 'speak, talk, word' > TRK kasakas, MRT kasakas, PUL yaha-lap, CRL kkes, WOL kkasA, ULI gase-l.

(6) PTK *(fatú-)mo,aka 'gravel, small stone' > TRK féwúmwo, MRT fawúmó, PUL fawúmwó, STW móók 'field for playing marbles or with small stones', CRN faymóg, CRL fɨyúmó, WOL faumwagE, ULI fasmag, PUA dadúmakA.

(7) PTK *karu-d 'scrape, shave, grate' > TRK éreeti, MRT aréér, PUL kéruuw, STW kérúkér, CRL ghéréétí, WOL géréétii, PUA kalúkalÚ 'coconut grater'.

(8) PTK *kado 'large basket' > TRK óót, PUL wóót, STW kóót, CRL ghóót, WOL gaatO, PUA katO.[22]

In addition, it should also be mentioned that the TRK reflex of Proto-Micronesian *pika 'sand, beach' is, very unexpectedly, pise-, with an s reflex of *k.

3.3.2.3.3 Reflexes of PTK *k before mid vowels

The pattern of *k reflexes before historical mid vowels in Trukic more closely resembles the pattern before *a than that before high vowels, but is even less regular among the five eastern languages, especially in word-initial position. Among those languages, it appears to be generally the case that a single *k before *e or *o is retained if it is preceded by a high vowel, and is lost if it is preceded by a low or mid vowel. There are, however, three exceptions to this generalization: (1) CRL unexpectedly loses *k in the form tuufay 'old' > PTK *dukofai, while the *k is retained in STW tukofay, the only other witness among the five languages (but cf. WOL tugofaI, PUA tikodaI); (2) TRK unexpectedly retains *k in pókó 'shark' < PTK *pakewa, while the *k is lost in PUL, STW, and CRL;[23] (3) TRK, MRT, and PUL unexpectedly retain *k in reflexes of PTK *toko 'pole, cane, stick', while STW has more expected yoo, showing loss of the *k.

As for *k in initial position before a mid vowel, it is lost in each of the five languages in a slight majority of cases, but there seems to be little that can be said regarding conditioning factors. Table 14 displays all of the pertinent forms in the data.

In contrast to the confusing situation among the five eastern languages, the three western languages are quite regular in retaining *k before all mid vowels. The only exception that occurs in the data is WOL too-longO 'enter, come in' > PTK *doko 'arrive', but WOL also has a more expected doublet reflex of the same etymon: togO 'arrive, land, come ashore'.

3.3.2.3.4 Reflexes of *k as subgrouping evidence

It is not completely clear what subgrouping conclusions can be drawn from the complex reflexes of PTK *k. Phonetically, *k is reflected as a spirant in CRL, WOL, PUA, and ULI, and as a stop in the other four languages and in CRN. On the other hand, it is very striking that the five more eastern languages have tended to lose *k in similar environments, where it is more regularly retained in the more western languages. This fact suggests a grouping of TRK-MRT-PUL-STW-CRL. There are, however, four observations that need to be made which complicate the picture somewhat:

Table 14

Reflexes of Etyma with Initial PTK *k before Mid Vowels in TRK, MRT, PUL, STW and CRL

Gloss	PTK	TRK	MRT	PUL	STW	CRL
'dig'	*kẹli-g	sinini	elinge	kelingiy	kelingi	ghelingi
'rat'	*keci	nakkich	eech,keech	keeř	keerh	gheesch
'2 sg focus pronoun'	*ke(e)na	een	een,keen	yeen	eel	eel
'2 sg subj. pronoun'	*ko	ke	o	wo	o	u
'cls. for raw food'	*kocaa-	wochaa-	wushaa-	wořa-	orhaa-	uschaa-
'rain cloud, rain'	*kocou	kuchuu-	woshow	wořow	orhow	oschow
'21st phase of moon'	*kotolagi	wosonáng	oseleng	wosoleng	osoláng	osáláng
'sp. of beach plant'	*koulua	oonu	woolu	wooluuw	ooluuw	ooluw
'hernandia'	(?)*kocale	--	--	--	orhan	oschal
'pubic hair'	*koro	kkor	--	kor	koor	ghoor
'cut off, lop'	*kopi-t	kupiiy	kopii	yopiiy	kopiy	ghopiiy
'catch (fish)'	*kona	--	--	kon	kona	ghola
'husk coconuts'	*kodo	wotey	woteey	wotey	koteey	ghoteey

(1) All Trukic languages reflect geminate *kk as kk, even those that lose single *k. This development leads to such forms as CRL akkabwas 'shout' from earlier reduplicated *kakka-p'ata. A logical interpretation of this is that the loss of *k is relatively recent, an interpretation that is somewhat strengthened by TRK attu 'cat', a recent loan from Chamorro katu, and by the fact that Fritz (1911) recorded the CRL second person singular subject pronoun as go, where the form is regularly u seventy years later.

(2) The fact that there are morphophonemic alternations between ∅ reflexes of *k and geminate kk reflexes, even where the geminate cannot be reconstructed for PTK, is further evidence that the loss of *k is relatively recent (e.g., CRL abwas 'call', akkabwas 'shout'). There is no similar contrast, for example, between geminate and single reflexes of PTK *t, and a *t that has been lost does not alternate morphophonemically with a retained geminate *t (see following section).

(3) Although there are many forms where the five eastern languages agree in losing or retaining single *k, there are also several instances where the five languages fail to agree among each other, as shown above. This fact suggests that some of the cases where *k is lost are language-specific developments that cannot be attributed to any proto-community.

(4) There is also some evidence in WOL of loss of *k, perhaps suggesting that the rule was at least incipient in an early stage

of Trukic, prior to the separation of the putative TRK-MRT-PUL-STW-CRL group.

Perhaps the best conclusion that can be made is that while the reflexes of *k provide reasonably strong support for the putative subgroup, it is also probable that some loss of *k had occurred before the separation of that group, and that additional loss has continued to occur in individual languages since the break-up of the group.

3.3.2.4 Reflexes of PTK *d and *t

PTK *d is regularly reflected in ULI as a voiceless interdental fricative d, and in all other Trukic languages as a voiceless alveolar stop t. (For justification for the reconstruction, see Jackson (in press a) and section 3.7 below.) By contrast, reflexes of PTK *t (< POC *t) are extremely complex. Table 15 below displays the reflexes of *t in all eight languages by listing them according to following vowels and indicating the number of times that a given reflex occurs in each language. Thus, for example, for *t reconstructed before *a, WOL has 3 Ø reflexes, 38 s reflexes, no h or d reflexes, and 59 t reflexes, while PUL has 4 Ø reflexes, 12 s reflexes, 67 h reflexes, no d reflexes, and no t reflexes.

From the table it can be seen that the reflexes of PTK *t and *d generally merge as t in WOL and PUA before *a. It is also apparent from the table that a general weakening of *t has occurred in all Trukic languages. Sohn et al. (1977) have reconstructed for the proto-language an allophonic rule whereby *t was spirantized to s before high vowels, and our data also support that hypothesis. In

Table 15

Frequency of Different Reflexes of PTK *t

Reflex Type	Number of Occurrences of Reflex Type							
	TRK	MRT	PUL	STW	CRL	WOL	PUA	ULI
	I. Before PTK *a							
Ø	3	3	4	4	5	3	1	1
s	77	71	12	72	79	38	Ø	7
h	Ø	Ø	67	Ø	Ø	Ø	Ø	Ø
d	Ø	Ø	Ø	Ø	Ø	Ø	4	Ø
t	Ø	Ø	Ø	Ø	Ø	59	49	44
	II. Before PTK *i							
Ø	19	17	16	13	18	6	3	3
s	6	4	1	8	7	16	Ø	15
h	Ø	Ø	6	Ø	Ø	Ø	Ø	Ø
d	Ø	Ø	Ø	Ø	Ø	Ø	13	Ø
t	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø
	III. Before PTK *u or *u							
Ø	33	36	32	26	30	13	5	4
s	9	4	1	11	12	22	Ø	22
h	Ø	Ø	6	Ø	Ø	Ø	Ø	Ø
d	Ø	Ø	Ø	Ø	Ø	Ø	23	Ø
t	Ø	Ø	Ø	Ø	Ø	2	2	2
	IV. Before PTK *e							
Ø	7	7	7	7	6	3	Ø	2
s	1	2	Ø	1	2	6	Ø	6
h	Ø	Ø	1	Ø	Ø	Ø	Ø	Ø
d	Ø	Ø	Ø	Ø	Ø	Ø	6	Ø
t	Ø	Ø	Ø	Ø	Ø	Ø	Ø	1
	V. Before PTK *o							
Ø	7	6	7	5	7	3	Ø	Ø
s	7	6	1	8	9	10	1	8
h	Ø	Ø	6	Ø	Ø	Ø	Ø	Ø
d	Ø	Ø	Ø	Ø	Ø	Ø	5	Ø
t	Ø	Ø	Ø	Ø	Ø	1	Ø	1

fact, in the following forms it appears that the *t, which must be reconstructed at least for pre-Trukic for external reasons, may have been lost as early as in the proto-language:

(1) PTK *-wa(t)u 'toward addressee' > TRK -wow, MRT -wéẃ, PUL -waw, WOL -waÚ, ULI -wey.

(2) PTK *-wo(t)u 'outwards, out to sea' > TRK -wu, PUL -wow, STW -wow, CRL -wow, PUA -wow.

(3) PTK *na(t)ú 'child, offspring' > TRK néwú-, MRT naẃú-, PUL nawú-, STW nayú-, CRL layú-, WOL laaI, PUA naÚ, ULI léé-.

(4) PTK *pa(t)u 'empty' > TRK pé, MRT péé-, PUL pé, STW ya-péẃ 'to empty', CRL péé-, WOL péé, PUA péé, ULI péé-l.

(5) PTK *(t)um'u 'bunch, cluster (as of coconuts)' > TRK wumwu-, MRT umwu-, PUL wumwu-, STW wumwu-, CRL umwu-, WOL umwU, ULI womw (cf. Marshallese jim' 'bunch of dried pandanus leaves for thatch', Kosraean tu-n 'bunch (of coconuts)').

(6) PTK *(t)elu 'three, in abstract or serial counting' > MRT yeel, PUL yéél, STW yeel, CRL eel, WOL yeelI, ULI yeel (where *t is retained in WOL, PUA, and ULI in classifier counting).

(7) PTK *(t)ili 'sprout, shoot, sucker' > TRK ini-, MRT ili-, PUL yiil, STW ini-, CRL ili-, WOL iilI (cf. Marshallese jil" 'shoot, bud, sprout').

Such evidence makes it almost certain that rules spirantizing and even deleting *t were in effect in PTK. (Indeed, evidence will be presented in chapter 4 that spirantization of *t before at least the high front vowel occurred in the Proto-Micronesian community.) Since the rules are not an innovation of any specific group of Trukic languages, but have only applied to a greater or lesser extent in each language, it is difficult to know how to use them for purposes of subgrouping. In the remainder of this subsection, however, we shall explore aspects of the patterning of these rules in the Trukic languages to attempt to determine whether they might be suggestive of the historical relationships.

Except for PUL h and the PUA interdental fricative d, all reflexes of *t in the Trukic languages are Ø, s, or t. It is almost certain that PUL h is a secondary development from earlier s, as the normal geminate reflex of *t in Puluwat is not hh, but ss. Although there are apparent single s reflexes of *t in PUL, it is likely that they reflect either borrowings from a neighboring language or else the fossilization of the s reflex in certain specialized lexical items related to navigation or other esoterica. (Recall that Elbert has observed a large number of s forms in traditional PUL chants and songs.) Although there is no similar corroborating evidence in PUA, it appears very likely that the d in that language is also a secondary development from s, and not a direct development from *t. Thus, we can almost certainly assume PUL h and s, PUA d, and s in the other languages to be coequivalent.

Table 15 above indicates that the numerically most frequent reflexes of PTK *t before *a are s (including PUL h) in TRK, MRT, PUL, STW, and CRL, and t in WOL, PUL, and ULI. Before the high vowels and *e, the most frequent reflexes are Ø in TRK, MRT, PUL, STW, and CRL, and s (including PUA d) in WOL, PUA, and ULI. Before *o, the most frequent reflex in WOL, PUA, ULI, and also STW and CRL is s, while TRK, MRT, and PUL have ∅ and s in equal proportions. Henceforth, we will, somewhat arbitrarily, term these most frequent reflexes as the "regular reflexes" for each language.

Of the 101 cognate sets in the data where *t is reconstructed before *a, 53 have "regular" reflexes in all the languages that attest the forms. Of the 26 cognate sets with *t reconstructed before *i, 11 are completely "regular." Seventeen of the 45 cognate sets with *t reconstructed before *u̇ or *u are "regular," and only two of the eight cognate sets with *t reconstructed before *e are completely regular. None of the 16 cognate sets with *t before *o is "regular," even if double reflexes are permitted for TRK, MRT, and PUL. Thus, of the 196 cognate sets containing *t, only 83, or 42%, are completely regular in the attesting forms, and some of those sets have only two or three attestations. In the following table, the *t-reflexes in all eight languages for all the 113 cognate sets with one or more irregular reflex are displayed. (The complete cognate sets with the lexical forms for each language are found in Bender et al. (1983).)

All of the "regular" reflexes of *t (except for those before *o, which are ambivalent) suggest a grouping of TRK-MRT-PUL-STW-CRL against a more conservative WOL-PUA-ULI. However, it is striking that almost two-thirds (62%) of the cognate sets that contain irregular reflexes of *t include an irregular reflex in Woleaian. Indeed, since WOL does not attest all the reconstructions in the irregular list, WOL has irregular reflexes of almost 69% of all of those forms that it attests at all. Moreover, of the 46 "irregular" comparisons

Table 16

Cognate Sets Containing One or More "Irregular" Reflex of *t

Gloss	PTK	TRK	MRT	PUL	STW	CRL	WOL	PUA	ULI
I. Where *t is reconstructed before *a									
'placenta'	*taúú	–	–	–	–	s	s	–	–
'tradewind, wind'	*parata	–	s	–	–	–	s	d	–
'octopus'	*kúúta	s	s	s	s	s	s	t	t
'belly'	*taka	s	–	–	–	–	s	–	–
'child'	*tari	s	–	h	–	–	s	–	t
'ashes'	*peata	–	s	h	–	s	s	–	–
'speak, say'	*kata	s	s	h	s	s	s	–	s
'barracuda'	*tarawa	s	s	h	s	s	s	–	t
'squirrelfish'	*taraa	s	s	–	s	s	s	–	–
'sea voyage'	*taai	s	–	h	s	s	s	–	–
'fragrant'	*gata	–	–	h	–	s	s	–	–
'watch, guard'	*mata	s	ss	h	–	s	s	t	–
'small knife'	*taru	s	s	h	s	s	s	–	s
'oyster shell'	*taru	–	–	h	–	–	s	–	–
'breathe'	*gata	s	s	h	–	s	s	d	s
'put down, place'	*itani	s	s	h	s	s	s	t	t
'egg'	*takullu	s	s	h	s	s	s	t	–
'navel'	*p'uta	–	–	–	–	–	s	t	–
'pleased, happy'	*mataika	s	–	h	s	s	s	–	–
'laugh'	*ffata	s	–	h	s	s	s	–	–
'star: Aquarius'	*taudaa	s	–	h	s	s	s	t	t
'star in Corvus'	*tarep'alu	s	–	h	s	s	s	t	s
'3rd phase of moon'	*mataliga	s	s	s	s	s	s	–	–
'4th phase of moon'	*mataanu	s	s	s	s	s	s	–	–
'5th phase of moon'	*matafitu	s	s	s	s	s	s	–	–

Table 16. (Continued) Cognate Sets Containing One or More "Irregular" Reflex of *t

Gloss	PTK	TRK	MRT	PUL	STW	CRL	WOL	PUA	ULI
'6th phase of moon'	*matawali	s	s	s	s	s	s	–	–
'7th phase of moon'	*matadiwa	s	s	s	s	s	s	–	–
'phase of moon'	*taopaca	s	s	s	s	s	s	–	–
'plumeria'	*taawuru	s	s	s,Ø	s	s	s	–	s
'calophyllum inoph'	*tafaga	–	–	–	s	s	s	–	–
'prefix to clan names'	*tau-	s	s	h	s	s	s	t	t
'sea, saltwater'	*tadi	s	s	h	s	s	s,t	t	t
'earth, ground'	*tano	s	s	h	s	–	s,t	d,t	t
'upper, high, top'	*ata	s	s	h	s	s	s,t	–	t
'village, place'	*tap'o	s	s	h	s	s	s,t	–	–
'chief, magistrate'	*tam'oolu	s	s	h	s	s	s,t	t	t
'little, small amount'	*-kita	s	s	s	s	s	t	–	–
'star: Alpha Centauri'	*macemeata	s	–	h	s	Ø	t	–	–
'phase of moon'	*karotaniafenaki	–	–	s	s	s	t	–	–
'mammea odorata'	*lifauta	–	s	–	s	s	–	–	s
'canoe sail'	*u(t)a	–	–	–	Ø	Ø	Ø	–	Ø
'perfective aspect'	*-ta	Ø	Ø	Ø	Ø	Ø	s	d	s
'hortative aspect'	*-(t)a	Ø	Ø	Ø	Ø	Ø	Ø	–	Ø
'who?'	*itau	Ø	Ø	Ø	Ø	Ø	t	t	t
II. Where *t is reconstructed before *i									
'sprout, shoot'	*(t)ili	Ø	Ø	Ø	Ø	Ø	Ø	–	–
'school, flock'	*p'i(t)i	Ø	Ø	Ø	Ø	Ø	Ø	–	Ø
'to have intercourse'	*fati	Ø	Ø	Ø	–	Ø	Ø	Ø	(s)[24]
'star: Altair'	*matilapa	Ø	Ø	Ø	Ø	Ø	Ø	d	Ø
'star name'	*maticiki	Ø	Ø	–	–	Ø	Ø	d	Ø
'star: Arcturus'	*aromauti	Ø	Ø	Ø	s	Ø	Ø	d	s

Table 16. (Continued) Cognate Sets Containing One or More "Irregular" Reflex of *t

Gloss	PTK	TRK	MRT	PUL	STW	CRL	WOL	PUA	ULI
'to float'	*peti	∅	∅	∅	∅	∅	s	d,∅	s
'driftwood'	*ka-peti	∅	∅	∅	∅	∅	–	∅	–
'1 pl inc subj pron'	*ti	s	s	h	s	s	s	d	s
'sneeze'	*m'otia	s	s	h	s	s	s	d	s
'fart'	*tigi	s	–	h	s	s	s	d	s
'urine'	*tiri	s	s	h	s	s	–	–	–
'difficulty, trouble'	*wairati	s	k	h	s	s	s	–	s
'tell lies'	*mitimiti	–	–	h	s	s	s	–	s
'1st phase of moon'	*tikaurua	s	s	s	s	s	s	–	–
III. Where *t is reconstructed before *u or *u									
'toward addressee'	*-wa(t)u	∅	∅	∅	–	–	∅	–	∅
'outwards, to sea'	*-wo(t)u	∅	–	∅	∅	∅	–	∅	–
'child, offspring'	*na(t)u	∅	∅	∅	∅	∅	∅	∅	∅
'empty'	*pa(t)u	∅	∅	∅	∅	∅	∅	∅	∅
'bunch, cluster'	*(t)um'u	∅	∅	∅	∅	∅	∅	–	∅
'phase of moon'	*arofi(t)u	∅	∅	∅	–	∅	∅	–	–
'pull, extract, yank'	*utú	∅	∅	∅	∅	∅	∅	d	s
'broken off, separated'	*m'etu	∅	∅	∅	–	∅	∅	d	–
'bite'	*kutu	∅	∅	∅	∅	∅	∅	d	s
'stone'	*fatu	∅	∅	∅	∅	∅	∅	d	s
'weave, plait'	*fatú	∅	∅	∅	∅	∅	∅	∅,d	s
'tomorrow'	*latuu	∅	∅	∅	∅	∅	∅	d	s
'light, tend a fire'	*kutu	∅	∅	∅	–	∅	∅	∅	s
'num cls for round obj'	*fatú	∅	∅	∅	∅	∅	∅	d	s
'pound, beat, mash'	*tuku	s,∅	∅	–	s,∅	s,∅	s	–	–
'seven'	*fitu	s,∅	s,∅	s,∅	s	s	s	d	s

Table 16. (Continued) Cognate Sets Containing One or More "Irregular" Reflex of *t

Gloss	PTK	TRK	MRT	PUL	STW	CRL	WOL	PUA	ULI
'to be born'	*tup'u	∅	∅	∅	s,∅	∅	s	–	s
'catch, capture'	*tup'eri	s	s	h	–	s	–	–	–
'long-tailed bird'	*tuku	–	∅	∅	s	s	s	–	–
'to open'	*tuuki	s	s	h	s	s	s	d	s
'to ejaculate'	*kutu	s	s	–	s	s	s	–	–
'cls for thousands'	*-garatú	∅	∅	∅	s	s	s	d	s
'large tridachna'	*túma	s	–	h	–	s	s	–	–
'depart, leave, scram'	*túú	s	∅	h	s	s	–	–	–
'blow nose'	*guturi	–	–	–	s	s	s	–	–
'jump'	*lutu	s	–	h	s	s	t	t	t
'blow out from mouth'	*kutu-f	s,∅	s	h	s	s	t	t	t

IV. Where *t is reconstructed before *e

Gloss	PTK	TRK	MRT	PUL	STW	CRL	WOL	PUA	ULI
'three, in serial counting'	*(t)elu	∅	∅	∅	∅	∅	∅	–	∅
'thick'	*matelu	∅	∅	∅	∅	∅	∅,s	d	s
'Belt of Orion'	*(t)elu(t)elu	∅	∅	∅	∅	∅	∅	∅	∅
'liver'	*ate	∅	∅	∅	∅	s	s	d	s
'one, in cls counting'	*te-	∅	∅,s	∅	∅,s	∅,s	s	d	s
'left-over, remainder'	*luute	ss,∅	ss	hh	–	–	–	–	–

V. Where *t is reconstructed before *o

Gloss	PTK	TRK	MRT	PUL	STW	CRL	WOL	PUA	ULI
'sugarcane'	*(t)ou	∅	∅	∅	∅	∅	∅	–	–
'goatfish'	*(t)oomea	∅	–	–	–	∅	∅	–	–
'ripe, strong, hard'	*matoa	∅	∅	∅	∅	∅	∅,s	d	s
'pole, cane, stick'	*toko	∅	∅	∅	∅	–	s	s	s

Table 16. (Continued) Cognate Sets Containing One or More "Irregular" Reflex of *t

Gloss	PTK	TRK	MRT	PUL	STW	CRL	WOL	PUA	ULI
'boil, abcess'	*loto	–	–	∅	∅	∅	s	d	s
'whale'	*rato	∅	∅	∅	∅	∅,s	s	d	s
'pile together'	*itoito	∅	∅	∅	–	∅	–	–	–
'mangrove'	*togo	∅	∅	∅	∅	∅	s	–	s
'thatch'	*ato	s	s	h	s	s	s	d	s
'alight, land'	*toka	s	s	h	s	s	–	–	–
'soak, immerse'	*too	s	s	h	s	s	–	–	–
'angry'	*tooga	s	s	h	s	s	ss	d	s
'mornong'	*tora	s	s	h	s	s	s	–	–
'kiss, rub noses'	*faitogo	–	–	–	s	s	s	–	s
'21st phase of moon'	*kotolagi	s	s	s	s	s	s	–	–
'canoe cross-seat'	*toa	ss	–	h	s	ss	tt	–	t

which have an attesting form in ULI or PUA and in at least one of the more eastern languages, and where the reflexes are not uniform across all the Trukic languages, WOL agrees with the eastern languages in 28 instances (61%).

It may be tempting under these circumstances to blame the irregular WOL reflexes on "dialect mixture" from the east. As mentioned earlier, WOL has frequent and regular contacts with, for example, STW as part of its role in the Yapese Empire. However, there are at least three arguments why that was probably not the case. First, Woleaian contact with Ulithi is at least as significant as its contact with Satawal, and probably a great deal more so as ULI is in a superior role to WOL, while STW is in an inferior one. Under these circumstances it is more likely that WOL would borrow from ULI and that STW would borrow from WOL, rather than the reverse.

Second, there is no evidence at all in WOL of the borrowing of other more typically Satawalese phonological forms. For example, there is no evidence of the STW retroflex approximant rh being borrowed into WOL in any lexical items, or of more than the one or two possible instances already mentioned of STW forms with a deleted *k having been borrowed. Surely, if STW influence on WOL has been as heavy as the lists in the previous table might sugget, it would not appear only in forms that happen to reflect PTK *t. In contrast, however, there is evidence of loans from ULI into WOL. Recall, for example, that Quackenbush (1968) observes that sh and ch appear to be in free variation in many forms in WOL. Native WOL ch is always geminate, while the corresponding ULI phone, the affricate c, may occur both singly and geminate.

The third reason is related to the nature of the words which have "irregular" reflexes in WOL. It appears that many of these words, and especially those that have reflexes of *t more typical of the more eastern Trukic languages, are, contrary to what might be expected, older in their phonologies than some of the "regular" forms. For example, the Woleaian dictionary indicates saatI 'sea, ocean' as "archaic," and notes that the "modern" form is taatI. Anthony Tawerilmang, one of the coauthors of the dictionary, has stated (p.c.) that this and other similar annotations in the dictionary are used to identify the forms of words as they occur in traditional chants and songs or in place names. Other examples of the same types of reflexes as occur in these archaic forms are found in the names of stars important to navigation, in the names of phases of the moon, and in the names of fish and plants, all of which might reasonably be expected to have been retained with little change over a long period.

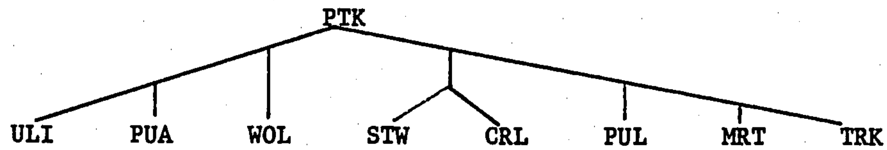
If this analysis is correct, then WOL must in several lexical forms have retreated to a more conservative phonology from a more innovative one. Why might this have occurred? Although it is impossible at present to arrive at a definite answer to this question, it would appear that a plausible reason would be the Woleaians' need to deal regularly with Ulithi. That is, given the existence of a change in progress, which has clearly been diffusing through the lexicon in a manner similar to that described by Wang (1969), Chen and Wang (1975), Krishnamurti (1978), and Janson (1983), the Woleaians made the decision to return in a large number of lexical items to a phonetic form that is closer to that of their most important neighbor, Ulithi. (Labov 1963 describes a comparable situation for Martha's Vineyard.)

3.3.2.4.1 Diffusion of rules affecting *t and subgrouping

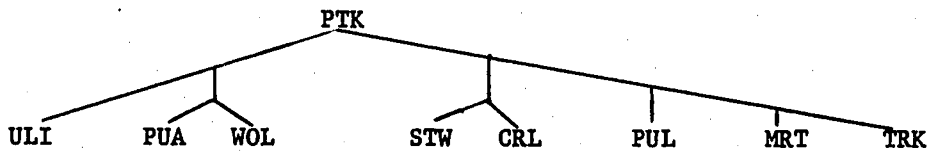
Additional support for the theory that a sequence of events very like the one just described actually happened comes from the application of a procedure recently developed by Krishnamurti et al. (1983) for the establishment of subgrouping hypotheses. This procedure requires the existence of a clear case of lexical diffusion of a sound change within a genetically related group of languages. In addition, it also requires a sizeable set of cognates for which at least one language has undergone the change and at least one other language retains the reconstructed phoneme. These two criteria are met in the Trukic reflexes of PTK *t before *a, where there are 65 cognate sets in which at least one language has a s̲ (or h̲ or d̲) reflex of *t and at least one other language has a t̲ reflex.

Krishnamurti et al.'s procedure next requires the listing of all mathematically possible family trees for the languages in question, so that each tree may be evaluated against all the other trees. For the eight Trukic languages, however, this would mean well in excess of 20,000 mathematically possible trees, many of which would include such unlikely subgroups as PUA-CRL or MRT-ULI. Since our major concern is to attempt to determine whether WOL subgroups with ULI and PUA against the other languages, as suggested by the "regular" reflexes of *t, it was decided to design only nine linguistically plausible trees for evaluation by the procedure. These nine trees are shown below.

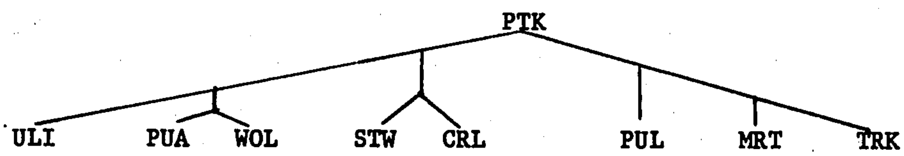
I.



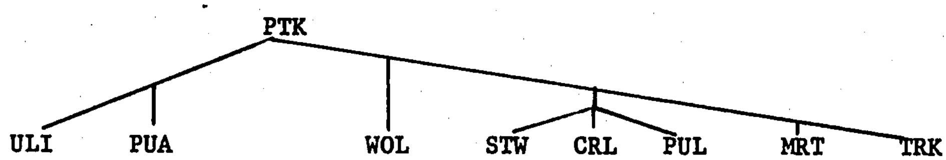
II.



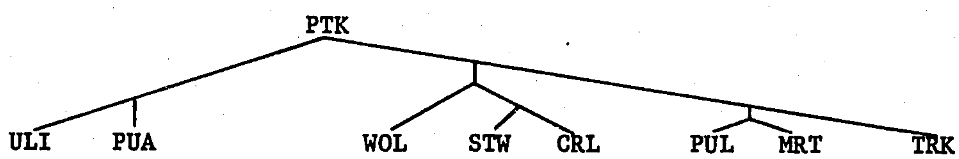
III.



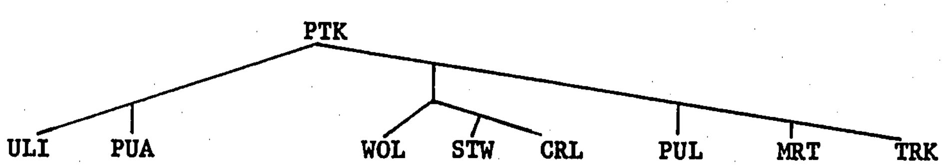
IV.



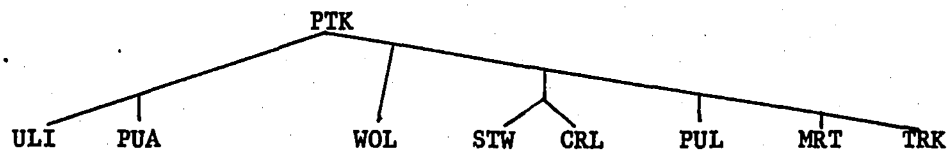
V.



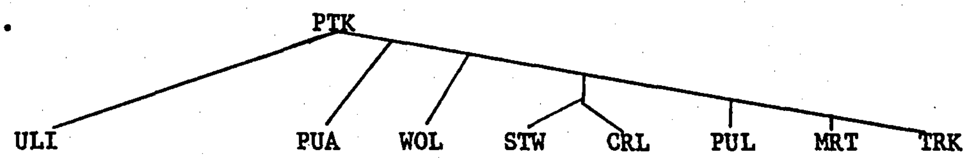
VI.



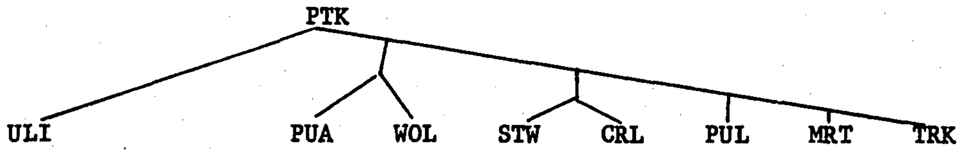
VII.



VIII.



IX.



As can be seen, three of the above trees subgroup ULI-PUA-WOL apart from the other five languages. Of these trees, No. III places STW-CRL in a higher order subgroup with ULI-PUA-WOL. This tree attempts to match Goodenough and Sugita's (1980) subgrouping hypothesis. Trees IV-VII subgroup ULI-PUA apart from the other six languages, and trees VIII and IX subgroup only ULI apart from the others.

The next stage in the evaluation procedure is to determine the number of distinct occurrences of the sound change for each lexical item that would be required in each tree. For the case that we are investigating, the change in question is PTK *t > s (or h or d, which we have argued must have undergone the s change first).

As an example, let us consider tree No. IX above and the following cognate sets:

(1) *tano 'earth, ground': TRK s, MRT s, PUL h, STW s, CRL -, WOL s, PUA d, ULI t;

(2) *kúúta 'octopus': TRK s, MRT s, PUL h, STW s, CRL s, WOL s, PUA t, ULI t;

(3) *tap'o 'end, part, half': TRK s, MRT s, PUL h, STW s, CRL s, WOL t, PUA t, ULI t.

In order to derive the first cognate set through the sequence of genetic splits represented by tree No. IX, the change *t > s need only have occurred once--at or prior to the time when PUA-WOL split off, but after ULI had already split off. Similarly, cognate set (3) would require only one occurrence of the change, but in this case it must have occurred after the hypothetical split of PUA-WOL and before STW-CRL split. On the other hand, cognate set (2) would require a minimum of two occurrences of the change, once in WOL after PUA had split off from that small subgroup, and once during the common development of the group STW-CRL-PUL-MRT-TRK. If we now examine tree No. III in terms of the number of occurrences of the change necessary to derive the same three cognate sets, we see that cognate set (1) would require three changes: one in the common development of PUA-WOL, one in the common development of STW-CRL, and one in the development of PUL-MRT-TRK. Similarly, cognate set (2) would also require three distinct changes, and cognate set (3) would require two.

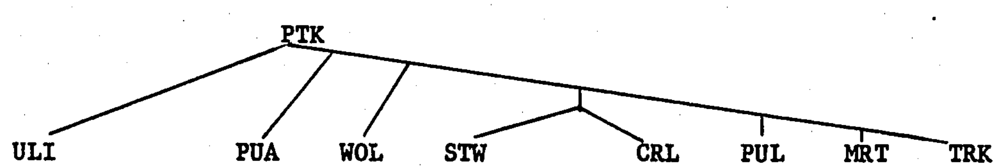
Krishnamurti et al. reason that the tree that would require the smallest number of distinct changes to derive all the relevant lexical items is the tree that is most likely to represent the actual genetic relationship. Based on a variant of the principle of economy, this hypothesis assumes reasonably that as a sound change diffuses through a lexicon over time, some of the applications of the change will occur during periods when languages share a common development, so that when the languages split from the parent community each one will inherit the same changed and unchanged lexical items. Later, of course, some of the inherited unchanged forms will also undergo the change in each language, so that each one has a somewhat different body of forms that have undergone the change.

Krishnamurti et al. tested their hypothesis on six languages of the South-Central subfamily of Dravidian which are undergoing the diffusion of a rule of consonant-vowel metathesis. Out of the 945 mathematically possible family trees for these six languages, the authors found that the one tree which their procedure weighted the most highly (i.e., the tree which required the smallest number of total occurrences of the change in order to account for the forms of all the relevant lexical items) was identical with the one selected on other grounds by traditional comparative methods. We are, thus, justified in feeling that the procedure has promise.

When the procedure is applied to the 65 Trukic cognate sets that fit the criteria, it is found that three trees are weighted equally highly, each with a total of 67 necessary occurrences of the change *t > s: trees No. IV, VII, and VIII, each of which subgroups WOL away from ULI and together with STW-CRL-PUL-MRT-TRK. By contrast, trees I, II, and III, which subgroup WOL together with PUA and ULI, require 83, 82, and 145 changes, respectively. The number of changes required by the three other trees are as follows: tree No. V, 115; tree No. VI, 115; and tree No. IX, 81.

Of the three most highly weighted trees, two group ULI together with PUA (IV and VII), and one groups PUA together with WOL-STW-CRL-PUL-MRT-TRK. To attempt to further distinguish among these three trees, it is reasonable to consider the secondary change of s > ∅ before high vowels, where s̲ is taken as an unchanged reflex and ∅ as a changed reflex. The data hold 42 cognate sets where *t is reconstructed before a high vowel and where the sets of comparisons include at least one language with a changed ∅ reflex and at least one other language with an unchanged s̲ reflex.

When the three trees weighted most highly by the first application of the procedure are further evaluated using the data from these 42 cognate sets, tree No. VIII emerges as the most highly weighted of all, with 47 changes. By contrast, tree IV would require 55 changes, and tree VII would require 50. (Trees I, II, and III would require 62, 58, and 61 changes, respectively.) Thus, the application of Krishnamurti et al.'s procedure rather strongly suggests that a family tree very like No. VIII is the most likely description of the genetic splits that have occurred in Trukic. That tree is repeated below.



We shall wait until the end of this section before attempting to see how well this tree matches with the evidence of the other phonological changes that have been discussed, but it is probably appropriate at this time to note that it is quite compatible with the reflexes of PTK *d discussed earlier in this subsection, where the ULI interdental fricative d contrasts with the voiceless alveolar stop t in all the other languages. In the context of the above tree, the ULI reflex might be a retention from the proto-language, and the change *d > t would have occurred in the ancestral community of the other languages.[25]

3.3.2.5 Another apical obstruent in PTK?

As we have seen, the only clearly identified source for a t reflex in STW, CRL, PUL, MRT, and TRK is PTK *d, which is in turn reflected regularly in ULI d. However, there are several forms in Trukic where all languages, including ULI, have t reflexes, a pattern of correspondences that cannot be accounted for directly by the proto-forms and diachronic rules established so far. The examples of this set of correspondences that are witnessed in the data are as follows:

(1) TRK ngaat, PUL ngaat, STW ngaat, CRL ngaat, WOL ngaatA, PUA ngatA, ULI ngaat 'hole' (cf. Gele', Admiralties, ngat 'hole' (t < *t)).

(2) TRK ppet, MRT pet, PUL ppet, STW pet, CRL ppet, WOL petE, PUA petE, ULI pet 'shallow' (cf. Mokilese poadpoad, Ponapean pedeped, both suggesting earlier *s, and Marshallese pijpij, suggesting earlier *t; also cf. Motu pose 'shallow (of box, cup, breath)').

(3) TRK *pwótowu-* 'general term for basket', MRT *pwotow*, PUL *pwótóówo*, STW *pwotaaw*, CRL *bwotów* 'small basket for personal belongings', PUA *pwotaw* 'large Ulithian type basket', PUA *pwataO* 'large basket', ULI *butów* 'basket' (cf. Gilbertese *b'ara* 'small cap-like basket', Kosraean *fohtoh* 'basket' (both reflecting a Proto-Micronesian *p'asa(V)), Ponapean *ohdou* 'basket' (reflecting hypothetical Proto-Micronesian *oosau), and Marshallese *bejaw* (from hypothetical Proto-Micronesian *p'otau).)

(4) TRK *téttén*, MRT *talú*, STW *talú*, CRL *talúw*, ULI *tala* 'wash, scour' (cf. Kosraean *tahltahl* 'wash').

(5) STW *a-tapatap* 'help, give help', CRL *tepangi*, WOL *tepangii*, PUA *tapangi*, ULI *tépéngi* 'help, assist, aid, support' (cf. MRT *sapa* 'support s.o., as at a meeting', STW *sepa* 'support, hold up'; also cf. Marshallese *jipag* 'help, aid, benefit, pension', Kosraean *taptap* 'help', Fijian *tabani* 'help', Arosi *abani*, Uvean *tapa* 'join with, join sides with', all of which reflect PEO *t).

(6) TRK *mwit-tir*, MRT *mwet-tir*, PUL *mut-tir*, CRL *mwet-tir*, WOL *ttirI*, ULI *ttir* 'fast, speedy' (cf. Fijian *siri* 'be fast, quick (of swordfish, garfish, canoe)').

(7) TRK *tuku-* 'beat s.o., daub s.o. with s.t.', MRT *tukuuw*, PUL *tukuuw*, CRL *tughuuw*, WOL *tugU*, ULI *túgúy* 'hit, strike with fist, punch' (cf. PUA *duku* 'hit (with fist)', Kosraean *tok* 'hit', both of which apper to reflect POC *tuki 'strike, beat, knock').

In addition to the above forms, there are two others where some eastern Trukic languages have *t*, and although there is no cognate

ULI form, other Micronesian and/or Oceanic languages reflect earlier *t. These forms are:

(8) STW maat, CRL maata-, WOL maatA, PUA maatA 'farm, clearing, garden' (cf. Kiribati maataata 'cleared space', Marshallese mahaj 'cleared space, open field, pasture', Mokilese mahjahj 'well-kept, cleared, not overgrown', Ponapean mahsahs 'cleared of vegetation').

(9) CRL mwaat, WOL mwaatA 'earthworm' (cf. Kiribati m'ata 'worm', Marshallese m'aj 'eel, intestinal worm', Kosraean wet 'worm', Mokilese mwaj 'worm', Ponapean mwahs 'worm', POC *nmata 'snake').

The question that must be answered regarding these nine cognate sets is whether it is necessary to establish an additional Proto-Trukic phoneme to account for them, or whether they can be explained in some other principled way. The approach that will be taken here is to suggest plausible explanations for each of the forms, but to leave open the possibility that they reflect an unreconstructed proto-segment.

For form (5), the external evidence is unanimous in suggesting PEO *tapa-n 'help, assist', a reconstruction that is also supported in Trukic by MRT sapa and STW sepa. In fact, the only Trukic forms attested that fail to agree with a PTK *tapa-g 'help, assist, support' are STW a-tapatap and CRL tepángi. Since it is known that the rule *t > s has been diffusing through the lexicons of Trukic languages at different rates, it is plausible that these two forms reflect instances where the rule has not yet applied. Similar explanations might account for the Trukic forms in (1), (8), and (9), where the external evidence is again unanimous in suggesting earlier *t.

In form (4), the ULI final vowel fails to agree with those witnessed in the other Trukic forms, and it is possible that ULI reflects an earlier *tala 'wash', while the other forms reflect earlier *dalu 'wash, scour'. Kosraean tahltahl 'wash' could reflect either form.

The Fijian cognate of (6) suggests a PEO *siri 'fast, quick', so it is possible that ULI has borrowed ttir from neighboring WOL. Similar borrowing may have occurred in (2), where the Motu form and the Ponapeic witnesses agree in suggesting PTK *pede 'shallow'. The Marshallese form pijpij would still be aberrant in suggesting earlier *t, but Bender and Wang (1983) have identified other instances where Marshallese appears to reflect *s with the regular reflex for *t, and vice versa.

Of the two remaining forms, the reflexes of (3) are sufficiently irregular in Trukic and externally--in terms of vowel length and quality, the grade of the initial consonant, and the medial consonant which is under consideration here--to suggest the possibility of a loan from an unknown source. Geraghty (p.c.) has brought Lau Fijian vaka-pōlāsawa 'small personal basket' to my attention, which he believes to be a loan from Polynesian. If so, it is possible that Micronesian languages may have borrowed a similar form from a Polynesian language.

Form (7) is considerably more problematic than the others. PTK *túku 'pound, beat, mash', which is presumably cognate with PMP *tuktuk 'pound, beat', has already been reconstructed for a different cognate set. However, ULI *susu* 'pound' and PUA *dúúdúú* 'pound', which are semantically compatible with that set, are formally irregular in failing to reflect *k. On the other hand, PUA *dúku* 'hit (with fist)' is formally compatible with PTK *túku, but matches semantically better with the set shown in (7), which, except for ULI *túgúy*, strongly suggests a PTK *duku 'hit, strike with fist, punch'. Moreover, as noted above, ULI regularly reflects *t before *u as either *s* or ∅, but not as *t*. Perhaps this is another instance where ULI has borrowed from WOL, yet the ULI form is phonetically quite dissimilar from WOL *tugU*.

There is some data in CRL, however, that suggests that this latter explanation may be correct. CRL has a form *tughumi* 'to wrap something into a bundle' which is etymologically related to PTK *duku-m, which in turn is cognate with Kiribati *rukuma* 'to wrap' and, probably, somewhat irregularly with Kosraean *srokomi* 'to wrap'. CRL *tughutugh* 'to wrap things into bundles; any tightly wrapped bundle, a base (as in baseball)' is also clearly related to PTK *duku-m, as, almost certainly, are CRL *tugh* 'bag, sack' and CRL *tuugh* 'closed fist'. It is this last meaning that suggests a connection between PTK *duku-m and the Trukic forms in (7). As ULI *dukumi* 'to wrap a bundle' is a regular reflex of *duku-m, it is not impossible that ULI *túgúy* is also related to the same form, but by indirect inheritance.

The possibility of another proto-segment for PTK is more strongly suggested by the forms given in Table 17. All of these forms have been reconstructed with PTK *t, but somewhat unexpectedly fail to lose

Table 17

Cognate Sets Showing Unexpected Reflexes of PTK *t before Nonlow Vowels

Gloss	'urine'	'fart'	'1 pl inc s pron'	'1st phase of moon'
PTK	*tiṛi	*tigi	*ti	*tikaurua
TRK	siir	sing	si	sikowuru
MRT	siir	--	si	sukkouru
PUL	hiir	hing	hi	sskooruuw
STW	siir	sing	si	sikouru
CRL	siir	sing	si	sikaúrú
WOL	--	singI	si	sigouruu
PUA	--	dingI	di	--
ULI	--	sing	si	--

Gloss	'seven'	'k. bird'	'catch, capture'	'large tridachna'
PTK	*fitú	*túku	*tup'el,ri	*tuma
TRK	fúús	wúúk	supwuri	siim
MRT	fúús	úúk	supwule	--
PUL	fúús	wúk	hipweliy	hiim
STW	fúús	wúúk	--	--
CRL	fiis	súúgh	subwuri	siim
WOL	fiisI	súúgÚ	--	súúmA
PUA	didi-	--	--	--
ULI	fisu-	--	--	--

Gloss	'flee'	'jump'	'spit, blow f. mouth'	'ejaculate'
PTK	*túú	*lutu	*kutu-f	*kutu
TRK	sú	nus	kusufi	kkus
MRT	--	--	kusufe	kus
PUL	húú-	lúh	kuhufiy	--
STW	sú	nnus	kusufi	kus
CRL	súú-	llus	ghusufi	kkus
WOL	--	lútÚ	gutufii,gusufii	kkusU
PUA	--	nútÚ	kutude	--
ULI	--	lut	gutéfi	--

Gloss	'cross-seat in canoe, canoe thwart'
PTK	*toa
TRK	ssó
MRT	--
PUL	hóó-
STW	sóó
CRL	ssó
WOL	ttóó
PUA	--
ULI	tó

the *t in all of the more eastern Trukic languages before a nonlow vowel. The fact that one of the cognate sets contains TRK <u>siir</u> 'urine', which Dyen (1949) related to PAN *cirit 'to spurt, to squirt' (Dempwolff: *ḱilit 'spritzend Entleeren'), makes these forms especially interesting. As stated earlier, Dempwolff claimed as one of the major innovations of Proto-Melanesian (POC) the merger of all the PAN palatals. Blust (1978) has already shown that PAN *j (Dempwolff: *ǵ) was retained as a distinct segment in POC, contrary to Dempwolff's hypothesis, so if Trukic can be shown to distinguish PAN *c as well, one of the more important defining innovations of POC would be lost.

Unfortunately, no Trukic form except that for 'urine' has been found which may reflect PAN *c.[26] Thus, there is no simple way to confirm or disconfirm Dyen's claim. On the other hand, however, there is no obvious counterevidence in Trukic.

Of the thirteen irregular forms listed in Table 17, three have external cognates that clearly suggest an historical *t: PTK *fitú 'seven' (POC *pitu); PTK *ti '1 pl incl. subj. pronoun' (Nguna and Sesake <u>tu</u>, Bugotu <u>ati</u>, Wayan <u>ti</u>, Kiribati <u>ti</u>); and PTK *túú 'flee, depart' (Proto-Polynesian *laatuqu 'depart suddenly by night'). These forms presumably reflect the failure of the *t > s (> ∅) rules to diffuse to them. Two other forms have clear cognates only in the Ponapeic languages, where they are irregular in the same way as within Trukic: PTK *lutu 'jump' (Mokilese <u>luj</u>, Ponapean <u>lus</u>); PTK *tup'el,ri 'catch, capture' (Mokilese <u>jipoar</u> 'catch'). Two others are attested only in Trukic: PTK *tikaurua '1st phase of moon'; and PTK(?) *túma 'large tridachna' (but cf. POC *kima 'giant clam'). Since there is evidence that the Ponapeic languages subgroup with Trukic (see chapter 4), the evidence from Ponapeic is disregarded here.

Six of the thirteen forms, however, have external reconstructions with a palatal consonant. Since PTK *t is an unexpected reflex of a palatal (PTK *d would be expected), it is worth examining these forms in some detail.

PTK *tiri 'urine' has already been mentioned. The three western Trukic languages which fail to reflect it each has a cognate of PTK *ka-laulau 'to make puddles' in the meaning 'urine, to urinate'. A probable reason for the development of this euphemism is suggested by the forms WOL sirI, ULI sir 'to masturbate', which reflect a PTK *tiri 'to masturbate' (TRK, MRT, PUL, STW, CRL ir, by regular development). Note, however, that if the Trukic reconstructions for 'urine' and 'masturbate' are both correct and both refer to the proto-language, then both forms were homophonous in that language, a situation that does not occur in any daughter language and which would appear to be unthinkable in any language.

Among other languages in Micronesia, Marshallese has jiir 'slippery, lubrication', Kiribati tii 'to jet, to spout, to gush, to spurt, to squirt' and the causative ka-tii 'to eject, to squirt, to draw from a tap, to shoot with a gun, to fire on', and Kosraean iri 'to masturbate', which is, however, suspect in that Kosraean more regularly reflects *r (or *R) as l and does not lose *t. Yapese has the doublet siir and tiirtiir, both with the meaning 'to masturbate'. All of these forms point to an earlier *tiri 'to masturbate', although the meaning of the Marshallese form makes it, perhaps, a questionable cognate, and the Kosraean form, if directly inherited, could also have derived from an earlier *zir,Ri (see chapter 4).

Outside of Micronesia, both POC *tiRi 'to spurt' and POC *sidit 'pollution, to spurt out, semen, masturbation' have been reconstructed (Grace et al. 1979), but the supporting evidence is rather weak. For the first reconstruction, Grace et al. list Trukese *sir* [sic] 'urine', Kiribati *tii* given above, Sia *tiri* 'to spurt', and Proto-Admiralties (PAM) *tiri 'to urinate'. For the second, only Gedaged *siz* 'to draw water, to rise to the surface' is given as an Oceanic reflex, although Grace et al. clearly believe that this form is a continuation of PAN *cirit. Dempwolff's original reconstruction included as supporting data Toba-Batak *sirit*, Javanese *tírit*, Malay *tírit*/*téret* 'to have diarrhea', Ngaju-Dayak *să-sirit* 'to spurt out in a jet', Hova *siritră'* 'urine', which means that both of the putative etyma reconstructed by Grace et al. have the glosses 'to spurt, urine' within their histories. Moreover, if putative PTK *tiri 'urine' in fact derives from POC *tiRi 'to spurt', as Grace et al. claim, it is difficult to see what source there might have been for the regular PTK *tiri 'to masturbate'. Let us turn from these comparisons for the moment to examine the others.

PEO *ziki 'to fart, break wind' has been reconstructed by Geraghty (p.c.) on the basis of Nggela *higi*, Kwaio *si'i*, Fijian *ciki* (and cf. Levy (n.d. a) reconstruction of Proto-Southeast Solomonic *ðiɣi in the same meaning). It appears very likely that the etymon reflected in Micronesia by putative PTK *tigi, Kiribati *ting*, Marshallese jig, Kosraean sucng, Mokilese jing, and Ponapean sing, all of which have the gloss 'to fart', is related to this PEO reconstruction, despite the fact that the medial consonants in the Micronesian forms are irregular. If so, however, this is a second possible instance where an early palatal is reflected differently in Micronesia from other palatals. Moreover, the Ponapeic languages share with the eastern Trukic languages the retention of the initial consonant in this form as a spirant, a reflex which would be irregulr if the Micronesian forms in fact reflected a Proto-Micronesian *tigi.

Putative PTK *kutu-f 'blow out from mouth, spit' and PTK *kutu 'ejaculate, spit' appear to be reflexes of POC *kusupe 'to spit', which is attested in Tokunu kuruvi, Tami magidjub, and Misima kuruvi.[27] Ponapean kus 'to gush, climax, ejaculate', Mokilese kuj 'to gush, semen', and Pingilapese kusukus 'to spit' almost certainly reflect the same etymon, and with the same unexpected reflex of the medial consonant that is seen in Trukic. Note, however, that the WOL, PUA, and ULI reflex of the medial consonant in PTK *kutu-f is t, while it was s for the initial consonant of putative PTK *tigi. This added irregularity (if the PTK consonant were really *t) may be a function of the different vowels following the consonants in question. The same Trukic (and Ponapeic) reflexes that occur for the putative *t in *kutu-f also reflect the putative *t in *lutu 'jump'.

The fifth irregular Trukic form is putative PTK *toa 'cross-seat in a canoe, canoe thwart'. As observed in the previous section, it is difficult to term any Trukic cognate set where *t is reconstructed before *o as "irregular" due to the sporadic effects of lexical diffusion; however, it is noteworthy that this form is one of only three where putative *t is reconstructed before a nonlow vowel and where the reflexes in WOL, ULI, and PUA are t. The other two are *lutu 'jump' and *kutu-f 'blow out from the mouth, spit', which are discussed above. The ancestor of PTK *toa appears to be PAN *seŋkar 'cross seat in a boat', which is reconstructed by Blust (1972:67) on the basis of Malay sĕŋkar 'thwart, cross-seat', Iban seŋkar 'cross-piece, thwart of a boat', Tagalog saŋkal 'bracket in a boat serving as a seat', and Fijian soka 'ribs of a boat'. Of these, Fijian is irregular in failing to show prenasalization on the medial consonant, but the Trukic form does attest the nasal grade reflex. (Recall that POC *ŋk is regularly lost in Trukic, while *k is retained.) The PAN reconstruction for this form has *s, of course, and not *c, but it would appear noteworthy that the Trukic reflexes are consistent with the other four forms that we have been discussing.

The last irregular form is somewhat different from the others. Putative PTK *túku 'k. of bird with long tail' is a possible cognate of Proto-Fijian-Polynesian *ciko 'kingfisher', which is reconstructed by Blust (1976:355) on the basis of Efate siko, Wayan siko-rere, Tongan siko-taa, Samoan ti'o-tala 'kingfisher', Tokelauan tiko-tala 'legendary bird'. In this comparison, the Efate and Wayan forms suggest an earlier palatal, while the Polynesian forms reflect PPN *t. The Trukic reflexes are irregular for a PTK *túku only in that STW and CRL fail to lose the initial consonant, while TRK, MRT, and PUL do lose that consonant. This pattern of reflexes is quite different from the one observed in the five previous comparison sets, where the putative *t is reflected as s in all five of the more eastern Trukic languages. Elsewhere in Micronesia, the cognates are Kosraean sihk 'white-tailed bird', Mokilese jik, Ponapean sihk 'k. of bird', where the Ponapeic forms are irregular for an earlier palatal or for earlier *t, in the same way that we have seen above.

It is difficult to know what to make of these data. Only two of the etyma have PAN etymologies, and in those two the palatal consonants that have been reconstructed fail to agree, suggesting that whatever the source of the Trukic (and, in some cases, Micronesian) consonant, the irregularities probably cannot be accounted for by positing a simple and direct inheritance of PAN *c. Nonetheless, the patterning of the Trukic reflexes in these six forms, where non-Micronesian languages strongly suggest a palatal in cognate forms, and the similar patterning in the four Trukic forms for which cognate forms fail to be attested outside of Ponapeic lead inevitably to the conclusion that there was probably another apical obstruent in Proto-Trukic. I will label that consonant *T, and will reconstruct it in the following forms: PTK *Tiri 'urine', PTK *Tigi 'fart', PTK *kuTu-f 'blow out from mouth, spit', PTK *kuTu 'ejaculate', PTK *luTu 'jump', PTK *Toa 'cross-seat in canoe, canoe thwart', PTK *Tuma 'large tridachna', PTK *Tup'el,ri 'catch, capture', PTK *Tikaurua '1st phase of moon,' and, more tentatively, in PTK *Túku 'bird with long tail'. As noted, several of these forms are also witnessed with similarly peculiar reflexes in Ponapeic languages, and at least two, *Tigi 'fart' and *Túku 'k. of bird', have cognates in other Micronesian languages, as well, suggesting that *T may also need to be reconstructed for Proto-Micronesian. I will leave unanswered the question whether PTK *T should be reconstructed for as deep a level as PEO or POC.

3.3.3 Some aspects of vowel developments

Among the Trukic languages, only WOL, PUA, SNS, and TBI consistently reflect morpheme-final short vowels before pause in forms that are reconstructed with more than one syllable. In those languages, such vowels are reflected as whispered or voiceless vowels. However, in all languages except TRK and Upper Mortlockese, final consonants are normally obligatorily released before pause, and it is very possible that this phonetic fact is indicative that final short vowels have been lost relatively recently in such languages as MRT, PUL, STW, CRL, and ULI. Indeed, Marck (p.c.) has reported that a few elderly CRL speakers appear to articulate final voiceless vowels in that language in a few forms, and Elbert (1974) and Sohn and Bender (1973) have observed the voiceless retention of final *o in PUL and ULI, respectively, especially after a velar consonant. Additional evidence that the loss of these vowels is comparatively recent is seen in the fact that word-final glides vary considerably from one language to another, so that, for example, there are numerous cognate pairs in the two dialects of Saipan Carolinian such as CRN <u>fénéély</u>, CRL <u>féléév</u> 'advise, instruct, counsel' (< PTK *fanau). It is unlikely that such differences would develop after the loss of the final vowels.

On the other hand, all Trukic languages, including those that have final voiceless vowels, occasionally fail to attest the historically correct final vowel, even when it surfaces as a fully voiced vowel before a suffix or enclitic. It seems likely that such loss of information regarding vowel quality can best be explained if the devoicing of final vowels has been in effect for a very long time. Indeed, it seems most probable that all final short vowels were devoiced before pause in Proto-Trukic, and there is some evidence in Kiribati that final short high vowels may have been devoiced after sonorants as early as Proto-Micronesian (see chapter 4). Partly supporting these hypotheses is the fact that all Micronesian languages regularly shorten final long vowels before pause,[28] suggesting that such a shortening rule probably also applied in Proto-Micronesian.

Dyen (1949) provides an elegant explanation for the development of the nine phonemic vowels in Trukese, which with minimal alterations, can also account for most of the vowel reflexes in other Trukic languages. Among the diachronic rules hypothesized by Dyen are the following (altered slightly to refer to PTK instead of PMP):

(1) Compensatory doubling in disyllabic nouns[29]

$$\text{V} \;>\; [\text{+long}] \;/\; \# \left[(\text{C}) \;\_\_\_\; (\text{C}) \;\; \text{V} \right]_{\text{N}} \;\#$$

(2) Assimilation of short vowels:

(a) *i > u / __C u where C is not a labiovelar

(b) *i > u / __C u where C is a labiovelar

(c) *u > ú / __C $\begin{Bmatrix} \text{u} \\ \text{a} \end{Bmatrix}$ where C is not a labiovelar

(d) *u > i / __C i # where C is not a labiovelar

(e) *u > ú / __C i where C is not a labiovelar

(f) *a > é / __(C)ú

(g) *a > e / __C i

(h) *a > ó / __(C)o

(i) *a > o / __C u where C is a labiovelar

(j) *a > á / __(C)e

(3) Assimilation of long vowels and vowel clusters

(a) *ii > úú / __C u

(b) *iu > úú

(c) *uu > úú / __C $\begin{Bmatrix} u \\ a \end{Bmatrix}$ where C is not a labiovelar

(d) *uu > úú / __C i

(e) *ui > úú

(f) *aa > éé/ __C u

(g) *aa > áá / __(C) $\begin{Bmatrix} i \\ e \end{Bmatrix}$

(h) *aa > óó / __(C) o

Most of these rules are also attested in other Trukic languages, with the following apparent exceptions:

(4) In ULI, rules (2a), (2c), (2e), and (3a-e) apparently only applied when the preceding consonant was *d, *l, *n, *t, or *m.

(5) In MRT, CRL, and STW rules (2g) and (2i) apparently only fronted or backed *a, and did not change its height.

(6) MRT also appears to have had a rule lowering a high vowel to a mid vowel in stressed position before a low vowel, although there are some exceptions. It is not clear how the high-mid vowels of MRT have developed.

(7) Rules (2g), (2i), (3g), and (3h) appear to be only allophonic in WOL and PUA, where final voiceless vowels are retained, and have not given rise to new phonemes.

Although generally reliable, these rules also have several exceptions, and other aspects of Trukic vowel developments are even more complex. To provide one example of this complexity, let us consider the modern Trukic reflexes of the PTK vowel sequence *au, as shown below:

	Gloss	PTK	TRK	MRT	PUL	STW	CRL	WOL	PUA	ULI
(1)	'sun, season'	*tau	éé-	éé	--	éé	--	aú	--	--
(2)	'tie, bind'	*fau	éé-	éé-	éé-	--	éé-	éé	--	--
(3)	'arm, wing'	*pau	éwú-	aẃú-	awú-	ayú-	ayú-	aú-	aÚ	éé
(4)	'new'	*fau	é	é	é	é	é	éé	aÚ	oy
(5)	'catch'	*tau-k	éé	éé	--	ee	ei	--	--	--
(6)	'sweep'	*pau(pau)	oo-	éé-	éé-	éé-	éé-	éé	--	--
(7)	'delicious'	*nnau	é	é	é	é	é	éé	aÚ	oy
(8)	'pool, pond'	*laulau	éé	éé	éé	éé	éé	éé	éé	oo
(9)	'yes'	*au	éé	aa	óó	óó	óó	óó	oo	óó
(10)	'climb, crawl'	*dau-k	éé	éé	éé	éé	éé	éé	aú	éé
(11)	'buy, sell'	*mau	éé	éé	éé	éé	éé	éé	--	--
(12)	'sea hibiscus'	*kulifau	é	é	é	é	é	éé	aÚ	éy
(13)	'leaf'	*cau	éé	éé	éé	éé	éé	éé	aÚ	éé
(14)	'pound food'	*p'p'au	o	o	o	--	o	oo	aO	--
(15)	'fishpole'	*p'au	óów	óów	ówo	aaw	óów	aaU	aU	aaw
(16)	'massage'	*caucau	--	--	éé	--	éé	éé	aÚ	--

	Gloss	PTK	TRK	MRT	PUL	STW	CRL	WOL	PUA	ULI
(17)	'num cls: flat objects'	*-cau	é	--	é	é	é	éé	aÚ	ay
(18)	'fishhook'	*kau	éé	éé	éé	éé	éé	éé	--	aay
(19)	'2pl s pron'	*kau	owu	aẃú	aw	ów	aw	aI	aÚ	a
(20)	'say, tell'	*kaú	áá	áá	áá	áá	áá	aaÚ	aÚ	ay
(21)	'1pl ex s pron'	*kaú	éwú	ay	áy	au/áy	ay	aI	aI	a
(22)	'low island'	*dakau	éé	éé	éé	éé	éé	éé	aÚ	éé
(23)	'k. of mat'	*tapakau	--	--	awo	aw	--	aU	aÚ	óu
(24)	'eat'	*m'egau	é	o	é	o	o	oo	aÚ	oy
(25)	'k. of tree'	*ggau	é	é	é	é	--	éé	--	oy
(26)	'good, seemly'	*m'aau	aaw	aaw	aay	aay	aay	aaÚ	aÚ	aay
(27)	'placenta'	*tauu	--	--	--	--	éé	éúú	--	--
(28)	'cold'	*fauu	ééw	ééw	--	ééy	ooy	ééú	ééú	oy
(29)	'current'	*auda	éwú	aẃú	awú	aú	--	aú	--	éú
(30)	'whirlwind'	*auniara	éwú	awú	awú	áwú	ayú	--	--	--
(31)	'porcupine fish'	*tautu	éé	éé	--	--	oo	aú	aú	éé
(31)	'sing'	*kaulu	éé	éé	éé	éé	éé	--	--	uu
(32)	'ten'	*-gaulu	oo	oo	oo	--	--	au	--	óó
(33)	'itchy'	*kaudu	éé	éé	éé	--	éé	éé	--	a
(34)	'nose'	*p'audu	éé	oo	oo	oo	oo	oo	aú	óó
(35)	'do, make'	*fauru	éé	éé	éé	éé	éé	oo	aú	éé
(36)	'south'	*auru	éé	éé	éé	éé	éé	éú	--	é
(37)	'flourishing'	*maúrú	áá	áá	áá	awú	áá	aú	aú	--
(38)	'left side'	*maugu	éé	--	ééyú	--	--	--	--	--
(39)	'battle'	*maaunu	óówu	óówu	awo	óówu	óówu	aau	au	aau

	Gloss	PTK	TRK	MRT	PUL	STW	CRL	WOL	PUA	ULI
(40)	'sitting platform on canoe'	*faunaki	oo	--	oo	óó	éé	éé	--	--
(41)	'east'	*kaudiwa	éé	--	éé	--	--	oo	a	--
(42)	'wide, broad'	*caulapa	éé	éé	éé	éé	éé	éé	aú	ayé
(43)	'mosquito net'	*daunam'o	owu	--	ów	--	óu	au	--	--
(44)	'whistle'	*ka-uaa	owu	au	óó	--	au	au	--	--
(45)	'expert'	*tau-	owu-	awú-	aw-	ówu-	óu-	au-	--	oo
(46)	'hit, beat'	*wau-d	--	--	--	awu	óu	au	au	--

In their analysis of somewhat similar but rather less complex data in Fijian, Geraghty and Pawley (1981) demonstrate that the vowel in a vowel cluster that is lost is the vowel that was historically unstressed. It appears that stress has been a factor in the development of the Trukic data as well. It is almost certain that Trukic had a pattern of alternating stress, beginning with the penultimate mora and assigning stress to every second mora to the left of that one. Thus, it is likely that the items in the above list numbered (1-26) and (40-46) probably had stress on the vowel *a in the sequence *au, while the items numbered (27-39) probably had stress on the *u.

It can be seen in the above list that the reflexes of *au in ULI and PUA are quite different from those in the other six languages, and from each other. Those in ULI will be disregarded for the moment, but it is noteworthy that in PUA 22 of the 28 reflexes are retentions of the <u>au</u> cluster. Meanwhile, in the languages from TRK to WOL, the two most common reflexes are the monophthong <u>é(é)</u> and the cluster <u>au</u> (or aw, awu, ó(w)u, o(w)u, or é(w)u). In all six of these languages, the monophthong é(é) is the reflex approximately 60% of the time when the initial vowel *a was probably stressed, but from less than 10% (WOL) to approximately 50% (TRK) when the second vowel *u was probably stressed. In contrast, a vowel cluster reflects *au when the *a was stressed (in items 1-26) from 21% of the time (TRK) to 32% (WOL), but from 30% (TRK) to 73% (WOL) when the *u was probably stressed. Although they are not as clean as one might like, these figures suggest that there has been a tendency in these six languages for monophthongal é(é) to reflect *au when the *a was stressed and for a cluster beginning with a nonhigh vowel and ending in a high vowel to reflect *au when the *u was stressed.[30]

It is clear, however, that other factors have been involved as well. The length of the *aa in *m'aau (26) appears to have blocked that vowel from assimilating in all languages, although the labiovelar initial may have been a factor also. Other instances where a preceding labiovelar appears to have had a backing and rounding effect are (14) *p'p'au 'pound food', (15) *p'au 'fishpole', (34) *p'audu 'nose', and, apparently across another syllable, (24) *m'egau 'eat'. However, the forms reflecting (32) *-gaulu 'ten', (39) *maaunu 'battle', and (40) *faunaki 'sitting platform on a canoe' show similar backing and rounding without the presence of a labiovelar.

It should also be noted that four of the forms in the list have been reconstructed with *aú rather than *au. This has been done because the reflexes of some languages are more suggestive of *ai. It is possible that a better reconstruction of these forms would be *aú,i, and that a distinction between *au and *aú in the proto-language (or some later stage) might account for other of the observed irregularities. For example, the reconstruction of *aú in some stage of ULI is probably necessary in order to account for the large number of Vy reflexes in that language, and it is possible that the quite different reflexes of *kau 'fishhook' (18) and *kau '2 pl subj pron' (19) might be able to be explained if the former form were reconstructed as *kaú. However, such an explanation only requires another one in turn for pre-Trukic. Clerly, the full understanding of vowel developments in these languages, and their interaction with glide formation, will require a period of long and intensive research.

3.3.4 Summary of phonological developments

Table 18 summarizes the major phonological and phonetic developments that have affected the Proto-Trukic consonant system as reflected in the different Trukic languages. For reference, the PTK consonant system is repeated here:

*p		*t		*T	*c	*k
*p'						
	*f	*d				
*m		*n				*g
*m'						
		*l	*r			
*w						

In the presentation of information in Table 18, if a rule has applied in a language either all or most of the time, the column is marked with an XX. If the rule applies frequently, but less than half

Table 18

Phonological and Phonetic Developments of the PTK Consonant System in Each Trukic Language

Diachronic Rule	TRK	MRT	PUL	STW	CRL	WOL	PUA	ULI
(1) *d > t	XX	XX	XX	XX	XX	XX	XX	
(2) *c > [+ continuant] / when single		XX	XX	XX	XX	XX	XX	
(3) *sh (< *c) > rh			XX	XX				
(4) *sh (< *c) > s							XX	
(5) *n > l				?	XX			XX
(6) *l > n	XX			?		XX	XX	
(7) n > [- nasal] / when single	XX					XX	XX	
(8) *r > l							XX	
(9) *f > d							XX	
(10) *g > n / __i usually	XX							
(11) *k > s / __i sometimes	XX							
(12) *k > Ø / __ $\begin{bmatrix} \text{V} \\ \text{- high} \end{bmatrix}$ (by diffusion)	XX	XX	XX	XX	XX	x		x
(13) *t > s / __ $\begin{bmatrix} \text{V} \\ \text{+ high} \end{bmatrix}$	XX	XX	XX	XX	XX	XX	XX	XX
(14) s > Ø / __ $\begin{bmatrix} \text{V} \\ \text{+ high} \end{bmatrix}$ (by diffusion)	XX	XX	XX	XX	XX	X	x	x
(15) *t > s / __ $\begin{bmatrix} \text{V} \\ \text{+ low} \end{bmatrix}$ (by diffusion)	XX	XX	XX	XX	XX	X	x	x
(16) *T > s / __i	XX	XX	XX	XX	XX	XX	XX	XX
(17) *T > s / __ $\begin{Bmatrix} \text{u} \\ \text{o} \end{Bmatrix}$	XX	XX	XX	XX	XX	X		
(18) *T > t / __ $\begin{Bmatrix} \text{u} \\ \text{o} \end{Bmatrix}$						X	XX	XX
(19) s (< *t or *T) > d							XX	
(20) *k > [+ continuant] / when single				X	XX	XX	XX	XX
(21) *p' > [+ continuant] / when single				X	X	XX	XX	XX
(22) *p' > [+ continuant] / when geminate								XX

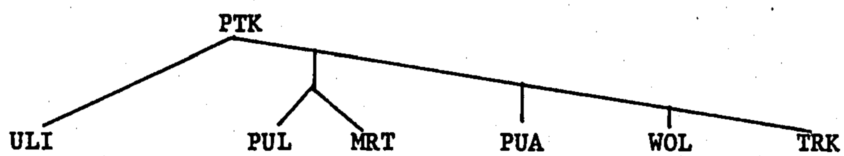
the time, the column is marked with an X. And if the rule applies rarely or only under special circumstances, the column is marked with an x. The indication ? under STW is to indicate the uncertain status of *n and *l in that language. The nature of each rule has been discussed in section 3.3.2.

An examination of the table reveals the probability that both TRK and PUA have undergone relatively extended periods of isolation. TRK, for example, is the only language to have undergone rules (10) and (11), by which velars are fronted before *i, while PUA is the only language to have undergone rules (4), (8), (9), and (19). Rules (9) and (19) are especially striking in that they have resulted in the partial merger of PTK *t and *f.

During our discussion of reflexes of PTK *t (section 3.3.2.4), it was seen that the application of a subgrouping procedure developed by Krishnamurti et al. (1983) suggests the probable genetic isolation of ULI from the other languages. It was also observed that the reflexes of PTK *d in those other languages suggest an innovation *d > t in which ULI did not share. Further evidence that ULI was the first language to split off from PTK may come from the fact that ULI is the only language to show a spirant reflex of PTK *p' both singly and geminate (rules 21-22). As previously noted, the apparent similarity of ULI reflexes of PTK *t and *k with those for WOL and PUA is probably the result of (1) lexical diffusion that, in the case of *t at least, almost certainly commenced in the proto-language, (2) the fact that the more eastern languages have innovated more than the western, and (3) the social need for WOL to remain intelligible with ULI, due to the roles of the two communities in the Yapese Empire.

But aside from the initial separation of ULI and the extended isolation of PUA and TRK, what other hypotheses can be made about subgrouping within Trukic? It is known from historical documents (e.g., Spoehr 1954) that the CRL population came largely from Satawal about 165 years ago, so it is necessary to subgroup CRL with STW. This fact, in turn, suggests that rule (3), which derives the retroflex approximant <u>rh</u> from spirantized *c, is a very recent development in STW, since CRL attests only the spirant <u>sch</u>. Perhaps STW <u>rh</u> has developed through frequent contacts with PUL. Moreover, the more or less free variation in STW between <u>l</u> and <u>n</u> is not attested in CRL, where *n is reflected as <u>l</u> both singly and doubly. This implies that either CRL has merged the two since separation from STW, or else the occurrence of STW <u>n</u> is a comparatively recent phenomenon which may again have been due to contact with PUL (or perhaps even with WOL).

In section 3.3.2.2 it was suggested that TRK shares with WOL, PUA, SNS, and TBI a pair of rules merging *l with *n and denasalizing the resulting single <u>n</u>. For these languages to form a subgroup, however, would require the early separation of MRT and PUL, which retain the distinction between *l and *n, from the Trukic community. That is, disregarding the position of STW-CRL, the genetic splits within Trukic would have had to be similar to the following:



Using Krishnamurti et al.'s procedure, however, such a tree has the very low weighting of 115 with respect to the diffusion of the rule *t > s / __*a, as compared with the weighting of 67 for the more favored tree. The reason for the low weighting is that the putative genetic splits described by this tree would entail a minimum of at least two occurrences of the change *t > s in the development of most forms: once in pre-PUL-MRT and once again in either pre-WOL-TRK or pre-TRK. A similar scenario would be necessary to account for the reflexes of *T before back round vowels and for reflexes of *k.

In the face of these facts, a subgrouping of TRK-WOL-PUA-SNS-TBI would appear untenable. It therefore follows that the apparent merger of *l with *n in those languages must have occurred more than once, and probably at least three times: once in TRK, once in WOL, and once in PUA-SNS-TBI. The fact of this many occurrences of this merger, in addition to the similar but unrelated merger of *n with *l in both CRL and ULI, suggests the likelihood that PTK *n and *l were phonetically very similar.[31] A possible cause of that similarity would be the existence of a denasalization rule in PTK which has since been lost in, for example, PUL and MRT.

Another rule that would appear to have occurred several times in the history of the Trukic languages is the spirantization of *c. As shown in Table 18, that rule has occurred in all languages except TRK and ULI, yet for the same reasons as those given in the above discussion of *l and *n, a subgroup consisting only of MRT-PUL-STW-CRL-WOL-PUA is otherwise unsupportable.

On the following page is drawn the family tree that is most strongly suggested for the Trukic languages by the phonological data. The numbers in the tree refer to the numbered rules in Table 18. Since several of those rules are apparently diffusing through the lexicons of the languages, the following annotations are employed: (1) if a rule number is written with a minus after it, then although there is some evidence of the rule at that stage it had affected very few lexical items; (2) a rule number with an asterisk after it indicates that the rule had applied at that stage to several lexical items, but not the majority; (3) a rule number with a plus after it indicates that the rule had applied at that stage to considerably more than the majority of forms, but not to all; and (4) a rule number with no diacritic indicates that the rule had applied to all or almost all of the eligible forms at that stage.

In chapter 4 a discussion will be presented regarding the practical historical and geographic implications of the PTK genetic tree, but it should be remarked at this time that the tree apparently disagrees in at least one respect with the oral history of one Trukic group. Goodenough (1953:41) makes reference to Eilers' statement that the people of PUA, SNS, and TBI traditionally derive themselves from Ulithi, whereas our tree shows the separation of ULI before that of PUA, on the basis of Krishnamurti et al.'s procedure and the fact that PUA shares with all languages except ULI the putative rule *d > t and fails to share with ULI the rule spirantizing geminate reflexes of

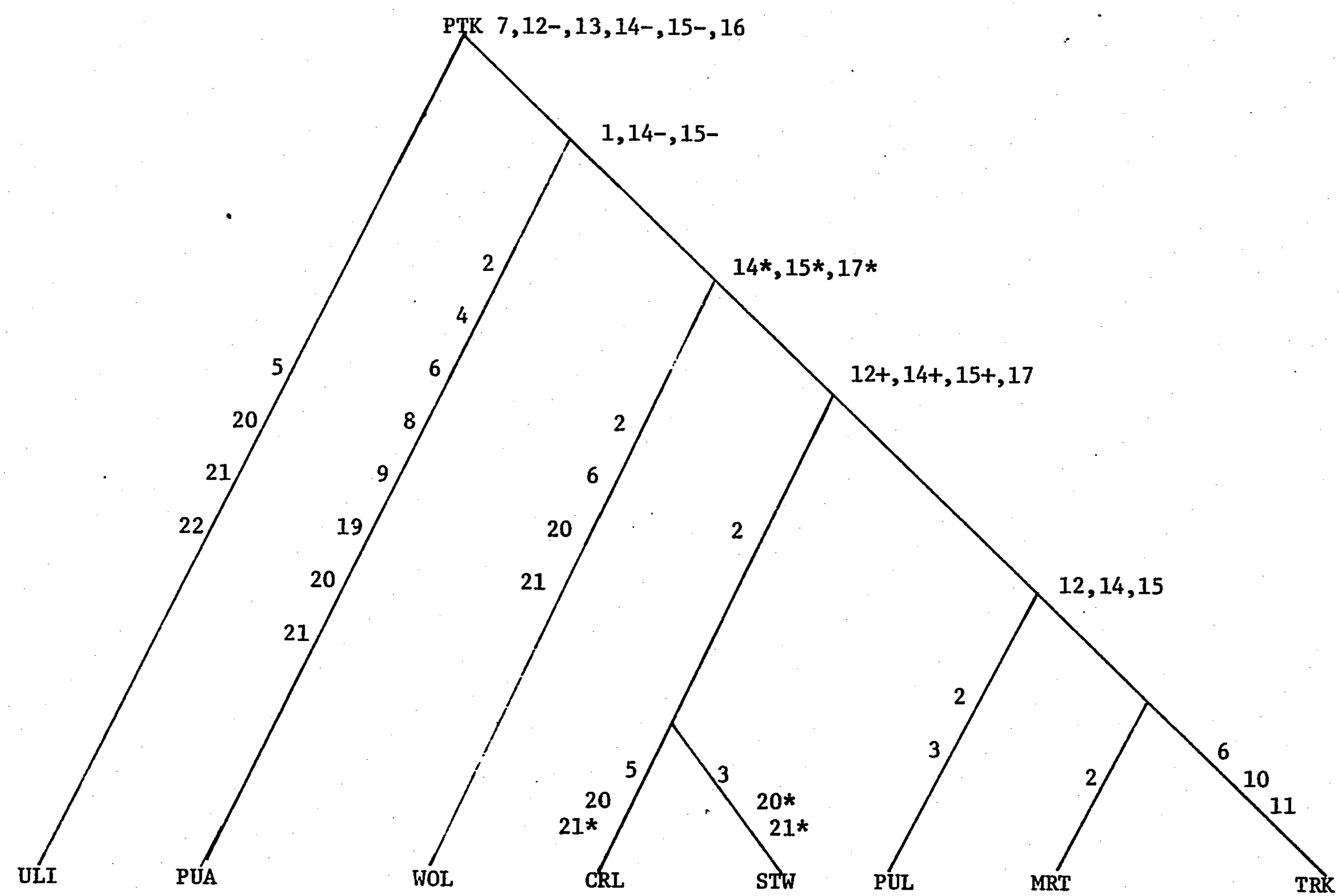


Figure 4. Trukic family tree, as suggested by diachronic phonological developments

*p'. Aside from the possibility that either the oral traditions or our analysis is incorrect in this respect, there are three possible explanations of this apparent contradiction: (1) the PUA traditions refer generally to the "Ulithi-area," including WOL, and not specifically to ULI; (2) immigrants from ULI did go to PUA, but after earlier settling from another area; or (3) original immigrants from ULI were followed by later immigrants from other Trukic areas, with the language of the community accommodating to the newcomers. With current resources it is probably impossible to determine which, if any, of these explanations is correct.

In the following sections of this chapter, examinations will be made of the grammatical, lexical, and lexicostatistical evidence for subgrouping within Trukic. It will be concluded that these kinds of evidence, in total, are largely supportive of the subgrouping decisions that have been made in this section on the basis of phonological information.

3.4 Some grammatical developments in Trukic

It has already been remarked that the grammatical structures and morphemes of the Trukic languages are very similar. Over the course of time, however, some differences have developed which are pertinent to subgrouping, and they will be examined in this section. In the following four subsections we shall examine systematic innovations that have developed among the Trukic aspect markers, demonstrative morphemes, pronominal object markers, and the syntax of stative predicates. In the final subsection we shall discuss innovations related to certain grammatical morphemes.

3.4.1 Developments among preverbal aspect morphemes

In section 2.2.2.6 we have reconstructed for Proto-Trukic the following preverbal aspect markers: PTK *-ta 'perfective; change-of-state; hortative'; PTK *-p'e 'future; intent'; PTK *-tai 'negative'; PTK *-de 'prohibitive "not"; lest'; and PTK *-tap'u 'future negative; negative intent'. All of these forms except the last two are clearly reflected in all Trukic languages, and all are reflected in at least one non-Trukic language. In the same section, it is also stated that TRK, PUL, CRL, and WOL reflect a form *p'a(a)p'a 'later, indefinite future'. This form is almost certainly not reflected in either ULI or PUA, as the grammars of those two languages would be expected to mention it. It is not known whether the form is attested in STW or MRT, however, as there is no published grammar for either language and there was no opportunity to try to elicit the form from native speakers. Thus, we may tentatively consider this form as an innovation of the group WOL-STW-CRL-PUL-MRT-TRK.

More problematic for our subgrouping hypotheses, however, are the following negative aspect morphemes which are attested in ULI, PUA, and WOL:[32]

Gloss	ULI	PUA	WOL
'no longer'	tay	taaI	taaI
'not yet'	teed	--	teitI
'future: "will not"'	towe	towaI	tewaI
'future: "will no longer"'	--	--	tewaaI
'future: "will not yet"'	--	--	tewaitI

If our subgrouping hypothesis is correct, these forms would appear to require the reconstruction for PTK of at least *taai 'no longer' and *tawai 'future negative', and perhaps also of a PTK *taidi 'not yet'. The necessary corollary would be that the first two forms were lost in the group TRK-MRT-PUL-STW-CRL, and that the latter, if a PTK form, was lost in those languages and in PUA as well. How likely is it that those events occurred?

CRL has a form saa 'no longer' which is attested in some areas of MRT as well. There is no evidence of the form in TRK or PUL, however, and it is unknown whether it exists in STW. If the MRT and CRL forms are not independent developments, they must reflect an earlier *taa. Such a form is sufficiently similar to the putative *taai to make it plausible that the two are related, but with the CRL-MRT form failing to show the final vowel.

We have reconstructed PTK *tap'u with the same meaning and function as the putative *tawai, despite the fact that it only occurs in TRK, MRT, PUL, STW, and CRL, on the basis of its likely cognacy with POC *ta(m)pu 'forbidden' and with Marshallese jab 'preverbal negative'. It is possible, however, that *tawai was the earlier form and that *-tap'u replaced it in pre-TRK-MRT-PUL-STW-CRL. Kiribati has a form tuai 'not yet' which may be cognate with *tawai (Harrison p.c.). In addition, there are other instances in the literature where POC *ta(m)pu has developed an aspectual meaning, including Fijian tabu 'not' and Seimat tap 'future negative', in addition to the Marshallese form cited above. Moreover, there is one other fact that would appear to support this hypothesis: while ULI, PUA, and WOL have clear reflexes of the POC etymon in the meaning 'taboo, ban, forbidden' (WOL taabU, PUA tapwU, ULI taab), only STW of the other Trukic languages reflects the form, and the STW form is the causative a-sópwusópw 'stated proscriptions'. A likely cause of the form's absence in the other languages is that it innovated semantically to take on the future negative aspectual meaning.

The final form, putative PTK *taidi, may have been borrowed into WOL from ULI, but there is some evidence to suggest it may have been PTK. MRT sáán, PUL háán, and CRL sáál 'not yet' reflect an earlier *taani in the same meaning and function as *taidi, while no form in that meaning is attested in TRK or PUA and the situation for STW is, again, uncertain. Also, Mokilese jaudi 'nominal negator' is formally very compatible with *taidi (Harrison p.c.). Thus, it is possible that the ULI and WOL forms reflect a PTK form that was replaced in the more eastern languages and lost in PUA.

3.4.2 Developments in the demonstrative system

In section 2.2.2.3 we reconstructed for PTK the following three demonstrative morphemes: *e(e) 'close to speaker', *na(a) 'close to hearer', and *we(e) 'away from both speaker and hearer'. We also reconstructed the postdemonstrative suffixes *-na and *-i, both with apparently emphatic meanings, but noted that the suffix *-na is not attested in ULI, implying that it was a post-PTK development.

ULI has also accreted an initial l- onto the *e(e) form, probably by analogy with ULI la < PTK *na(a). This accretion is not attested in any other Trukic language.

All Trukic languages have now limited the meaning of reflexes of *we(e) to 'out of sight of both speaker and hearer', and it is likely that this meaning was available in PTK as well. In all languages except ULI, the reflex of the demonstrative *na(a) with the suffix *-na has developed the meaning 'in sight, but away from speaker and hearer', so it is likely that this was an innovation of the putative TRK-MRT-PUL-STW-CRL-WOL-PUA subgroup. After PUA separated, another morpheme was innovated with a deictic meaning: *m'uu 'this, near hearer', presumably by analogy with the second person singular possessive pronoun *-m'u. The form is attested in all languages except ULI and PUA.

It was noted in section 2.2.2.3 that in all Trukic languages except TRK and MRT demonstrative morphemes which modify nouns are postnominal enclitics. Although there are some grammatical structures in TRK and MRT where demonstratives function as postclitics--primarily in certain possessive structures and in fossilized noun-demonstrative compounds like TRK <u>ono-we</u> 'that fellow'—most demonstrative constructions are preposed to the nouns that they modify. The following phrases from TRK are typical: <u>eey mwáán</u> 'this man (near the speaker)'; <u>ena mwáán</u> 'that man (near the hearer)'; <u>enaan mwáán</u> 'that man (in sight, but away from speaker and hearer)'; <u>ewe mwáán</u> 'the man (out of sight, but known to speaker and hearer)'; and <u>ekkewe mwáán</u> 'those men (out of sight, but known to speaker and hearer)'.

It is clear that these structures are innovations of TRK-MRT. However, it is interesting to speculate how they might have developed. It has already been suggested that the TRK-MRT pre-demonstrative prefix e-, clearly seen above, may be a reflex of an otherwise vanished in Trukic Proto-Micronesian article *te, but that does not explain how the demonstrative became preposed. A possible explanation of that is suggested by sentences in other Trukic languages like the following one from WOL (Sohn 1975:223):

(1) Ye te tai filewas iyeel sar!
he adv not capable PRO-this-emph child
'How incapable the child is!'

In this sentence, the words iyeel sar are not a single noun phrase, but an equational sentence with the rough meaning 'this one (is) a child'. Thus, the more literal meaning of sentence (1) is something like: 'This one is a child who is indeed incapable!' However, it is easy to imagine how a structure like iyeel sar could be reinterpreted as a single noun phrase with a prenominal demonstrative. It is very likely that such a reinterpretation occurred in MRT-TRK.

3.4.3 Developments among the object pronouns

Harrison (1978) has claimed that the Proto-Micronesian third person plural object pronoun *-ira was almost certainly restricted to only human objects. Harrison reconstructs PMC *-i before expressed plural noun phrase objects and also anaphorically for plural nonhuman objects. Harrison also notes that PUL, WOL, and PUA show evidence of a suffix of the type -ni anaphorically for plural nonanimate objects, which he treats as probably innovative.

Evidence in Trukic suggests that Harrison is essentially correct, although later developments have somewhat obscured the proto-system, and the history of the -ni [sic] suffix might be older than he suggests. A brief discussion follows of aspects of third person object marking in the Trukic languages. We shall begin with PUA, where the situation is clearest.

In PUA, there are four morphemes which mark pronominal objects. The morpheme -ilA is used anaphorically to mark plural human objects, and also when plural human objects are expressed in a noun phrase. Similarly, the morpheme -nni is suffixed to verbs to mark plural nonhuman objects, both anaphorically and with expressed noun phrases. The suffix -A marks most singular objects, whether human or nonhuman, but some verbs apparently take an -I suffix with singular objects. (Oda (1977:102-104) provides a list of nineteen such verbs.) It is tempting to relate this last suffix to Harrison's PMC *-i, but the fact that the PUA form is only used with singular objects makes that questionable, as does the fact that the PUA verbs which take the -I marker include such forms as tapangi-I 'to help (him)' and nikiti-I 'to leave (it/him)', both of which may take human objects.

In WOL, a distinction is made between anaphoric object marking and marking before an expressed noun phrase. Anaphorically, -VrA is used for animate plural objects and -nI [-nnI] for nonanimate plurals; for singular objects the most common suffix is -A, but, as in PUA, there are several verbs which apparently have an -I singular object marker, including weri-I 'see it', gutufi-I 'spit on it', tepangi-I 'help him', and many others. Before an expressed plural human noun phrase object, either -VrA, -A, or -I (where the choice between the latter two forms depends on the verb) may be used; before a plural animate nonhuman expressed object, any of the four suffixes discussed above may be used; and before an expressed nonanimate plural object any suffix may be used except -VrA.

In both CRL and CRN, the situation is more similar to WOL. Anaphorically, the plural suffixes are -Vr for animate objects and either -ll (CRN -nn) or the normal third person singular suffix for inanimate objects. It is not completely clear in either language that the two singular suffixes attested in PUA and WOL exist in the modern languages, as final vowels are lost. However, some problematic data before directional enclitics suggests that both forms might have existed in pre-CRL. In fact, pairs of sentences like the following from CRL may suggest that the two suffixes contrasted semantically:

(1) E úlúmaa-ló alangal suubwa kkelaal.
he drink-it-away all-of cigarette those
'He smoked up all the cigarettes.'

(2) E úlúmii-ló alangal suubwa kkelaal.
he drink-it-away all-of cigarette those
'He smoked all the cigarettes.'

As we shall see, similar distinctions apparently exist in STW (Marck p.c.).

With expressed plural noun phrase objects, it is most common in CRL for the singular suffix to be used. If the object is animate, however, it is fairly common to use the suffix -Vr, while -ll is rare, but not impossible before expressed plural inanimate objects.

For PUL, Elbert (1974) indicates a -Vr suffix for plural animate objects. He states that a suffix -n is a "variant" of -Vr, but all examples have -n referring to nonanimate objects (43-44). Several sample sentences provided by Elbert (1971, 1974) also suggest that before expressed plural inanimate objects a singular object marker may be used:

(3) Hi kán fáyingaa ŕak iteer. (Elbert 1974:42)
we adv call-it just name-their
'We then just called their names.'

(5) Limetaa mwo yi-kkewe. (Elbert 1971:83)
clean-it adv Pro-pl-that
'Please explain the things.'

(6) Yaa yánganiyai i pwe le ngéreey ákkááw paap. (Elbert 1971:83)
he-TA ask-me I TA saw-it some-cls board
'He asked me to saw some boards.'

Several examples are provided by Elbert that show variation in third person singular object forms between what must be reconstructed as *Verb-i-a and *Verb-a-a, where the latter form occurs most commonly before directional enclitics.[33] However, there are a few items where the latter form occurs without a following directional. No meaning difference is indicated. The following are some examples:

*Verb-i-a	*Verb-a-a	Gloss
weriy	weraa	'to see it'
wúnúmiy	wúnúmaa	'to drink it'
fáyingiy	fáyingaa	'to call him'
fééri	feraa	'to make it'

Such pairs are not related, however, to the two singular suffixes in WOL and PUA. Both members of each PUL pair reflect the third person singular object suffix *-a. The formal difference between the two in PUL is apparently the result of different transitive suffixes (see section 2.2.2.7).

Very little data is available regarding object suffixation in STW, and almost none regarding possible contrasts between anaphoric and nonanaphoric object marking. It is clear, however, that STW attests a contrast between the suffix -Vr for plural animate objects and the suffix -nn for plural inanimate objects. In addition, Marck (p.c.) has recorded the following sentences which appear to show a semantic contrast between singular suffixes of the type *-i and *-a:

(7a) E pwe pwilisi waa we.

'He's going to glue the canoe (engage in the general act of gluing it).'

(7b) E pwe pwilisa waa we.

'He's going to glue the canoe (patch some specific part that needs gluing).'

(8a) E pwe nimey waa we.

'He will bail the canoe (but he is not at the canoe now).'

(8b) E pwe <u>nima</u> waa we.

'He will bail the canoe (and he is at the canoe now).'

(9a) E pwe <u>luwey</u> iimw we.

'He will clean the house (but he is not at the house now).'

(9b) E pwe <u>luwa</u> iimw we.

'He will clean the house (and he is at the house now).'

(10a) E pwe <u>suukiiló</u> asam we.

'He will open the door (for a temporary reason).'

(10b) E pwe <u>suukaaló</u> asam we.

'He will open the door (for an extended period).'

(11a) E pwe <u>úlúmiiló</u> rhaan we.

'He will drink the water until he's full.'

(11b) E pwe <u>úlúmaaló</u> rhaan we.

'He will drink all the water.'

However, although these and other similar sentences are very interesting, the nature of the putative semantic contrast is not clear. Also, the fact that such apparent contrasts have only been attested in the closely related STW and CRL makes it problematic whether the same type of contrast existed at some earlier stage.

None of the other Trukic languages attests the type -<u>nni</u> inanimate plural suffix. In TRK and, apparently, MRT only the third person singular suffix may occur before any expressed noun phrase object, whether singular or plural. If the suffix is anaphoric and the object is plural and animate, the form is -<u>Vr</u>. For anaphoric inanimate plural objects it is most common to use the singular object suffix, although there are apparently some speakers who will accept

-Vr here as well. It appears that third person singular suffixes in TRK reflect only *-a, but in MRT there is some evidence of the type *-i as well. For example, MRT fadoke 'to plant it' would appear to derive from historical *fadok-i-a, where the *-i- is the transitive suffix and the *-a is the object suffix. In contrast, MRT afiti 'carry a child on the hip' probably derives from *afid-i-i 'to carry it under the arm or on the hip', where the final *-i is the object suffix that is elsewhere reflected in, for example, WOL and PUA -I.

In ULI, the third person plural object suffix -Vr is used both anaphorically and before an expressed noun phrase object for all plural objects, whether animate or inanimate. However, Sohn and Bender (1973:348) state that the plural object suffix may be "optionally changed to singular" before any expressed noun phrase object. To mark singular objects, Sohn and Bender (1973:316-320) propose -ya as the systematic phonemic form, where the a is deleted word-finally and the glide is lost in certain environments, such as after a low vowel. However, Sohn and Bender also indicate that there are several transitive verbs which only optionally take transitive suffixes (1973:320, ff.), among which are the following (in Sohn and Bender's phonologically abstract orthography): yulemi 'drink', fėėru 'do', weri 'see', lixidi 'to leave off', mammagi 'to remember', yilidi 'to share', and supi 'to cut'. It is not completely clear what the phonetic quality is of such verbs when they, in Sohn and Bender's terms, do not take an object suffix. Final vowels are lost in ULI, so it is possible that they are phonetically yulem 'drink', fėėr 'do', wer 'see', etc. However, in discussing a phonological rule of glide deletion, Sohn and Bender (1973:65-66) state, "It should be noted that attributive suffix yi [y] 'I' does not drop, **while object suffix ya [y] may**" [my emphasis]. Among the examples that they provide are xusu(y) 'to bite it', dabe(y) 'to follow', and faxo(y) 'to miss', where the (y) is from the object suffix -ya and is optionally deleted.

If Sohn and Bender are referring to this optionality of the final palatal glide when they state that some verbs are only optionally followed by an object suffix (1973:320), then it seems quite plausible that the data in fact reflect not an optional object suffix, but a contrast in form between the two singular suffixes that are attested in WOL and PUA. The fact that ULI has many other verbs where the "object suffix is obligatory" suggests even more strongly that this may be the case.

Before summarizing the developments of object suffixation in Trukic, it is important to consider the inanimate (or nonhuman) suffix -nn(I). As we have seen, this suffix is attested in only PUL, STW, CRL, CRN, WOL, and PUA among Trukic languages. In addition, there is no evidence of it in any other Micronesian language. If only this much information is considered, then it is strongly suggested that a form *-nini was innovated in this function after the separation of ULI from the Proto-Trukic community, and that it was subsequently lost in MRT-TRK. However, there is some evidence of a cognate form in the Southeast Solomon Islands.

Ivens (1929:349) states that the language of Marau Sound has a set of postnominal plural suffixes that are used only "of things," among which is a form ni. In his study of Florida (Nggela), the same author states, "A plural noun suffix ni is used of 3rd pers. plur. (of things) with certain nouns instead of dira: vula 'moon', 'month', vulani 'their season'; niulu 'year', niuluni 'their seasons'; na suleni 'the big ones'; na pileni 'the small ones'. There is a similar use of ni in Bugotu, Sa'a, and Ulawa" (Ivens 1937:1083). In his earlier study of Bugotu, however, Ivens had written in the context of a discussion of postverbal "anticipatory objects": "There is no plural ni used of things in Florida" (Ivens 1933:153). The conclusion is inescapable that, at one time at least, Ivens believed Nggela to have a postverbal inanimate plural object suffix ni. It is possible that he later decided that the form was actually a noun suffix, and not a verb suffix, but in that context it is very difficult to know how to interpret his comments on the presence or absence of Bugotu ni. That is, in his study of Nggela Ivens states clearly that Bugotu has a postnominal ni, while in his study of Bugotu he states that that language fails to attest a postverbal ni that is witnessed in Nggela.

There is a body of evidence which suggests that the languages of the Southeast Solomons may be quite closely related to those of Micronesia (see Blust 1982, and Jackson in preparation). If Nggela does attest a postverbal inanimate plural object suffix ni, then it is quite likely that that form is cognate with Trukic *-nini, and that such a form was therefore inherited into Proto-Micronesian (and subsequently lost in all languages and language groups except Trukic, where it is retained in at least six languages). Indeed, even if there is no postverbal ni in Nggela, but only the postnominal ni in that and other languages, it still seems probable that that form is cognate with the Trukic form.[34]

We conclude, therefore, that the PTK third person object suffixes were probably the following:

(12) *-ira 'third person plural animate (or possibly human) anaphoric object suffix'

(13) *-nini 'third person plural inanimate anaphoric object suffix'

(14) *-a 'third person singular object suffix, probably used both anaphorically and before expressed noun phrase objects'

(15) *-i 'third person object suffix, probably only used before expressed objects'

It is possible that even as early as PTK the two plural object suffixes began to be used optionally before expressed noun phrase objects, with *-ira leading the way. After the separation of ULI from the proto-community, that language lost the suffix *-nini and expanded the use of *-ira until it marked all plural objects. However, it was still optionally possible for ULI to use *-i before an expressed plural noun phrase object. With the loss of final vowels, though, the historical distinction between *-i and *-a became opaque.

In PUA, the semantic of *-nini became broader, including all nonhuman plural objects, while the semantic of *-ira became narrowed to only human objects.[35] The scope of both forms came to include not just anaphoric objects but also expressed noun phrase objects. As a result of this development, the original distinction between *-i and

*-a became opaque and reflexes of each form became restricted only to certain verbs, a restriction that may have begun before the separation of PUA.

In the ancestral community of the remaining six languages, there was relatively little further development. It is possible that STW-CRL innovated a semantic distinction between reflexes of *-i and *-a after their separation, but further study is needed to confirm that hypothesis. After the break-up of that community, however, it appears that MRT-TRK substituted their reflex of *-i for *-nini, which was lost.

3.4.4 Stative *mai in MRT-TRK

TRK and MRT have developed an innovative aspectual morpheme *mai before stative verbs and to assert the truth of a condition (Sugita n.d.). The forms are TRK meyi and MRT mii. It is noteworthy that MRT mii, like other aspect morphemes, normally occurs with a preceding subject pronoun. (The pronoun is not obligatory, however.) In TRK, on the other hand, meyi may not be preceded by any subject pronoun. The following sentences from Sugita (n.d.) provide an idea of the range of uses of TRK meyi.

(1) Ermes meyi tipácchem.

'Ermes is intelligent.'

(2) Ngaang meyi sineey pwe Mineko ese saaniyey.

'I know that Mineko does not like me.'

(3) Meyi wor rúwofóch piin nnón eey pwóór.

'There exist two pencils in this box.'

(4) Ermes meyi nniiy ewe feefin.

'Ermes killed the woman (and it is the fact).'

Usage in MRT is very similar.

Reid (p.c.) points out that Tagalog and other Philippine languages reflect a type *mai 'existential verb', which in turn is probably related to earlier *ma 'stative marker' and *i- 'NP marker'. The chances of the TRK-MRT form being a continuation of this etymon are rather weak, however, due to the fact that no other Trukic or other Micronesian language reflects it, and also to the fact noted by Reid (p.c.) that the syntax of the Trukic particle is quite different from that of the Philippine forms.

3.4.5 Innovations in some grammatical morphemes

In section 2.2.2.7 we have reconstructed as directional enclitics both PTK *-wa(t)u 'towards addressee' and PTK *-(w)o(t)u 'outwards, outside, out to sea', both of which reflect etyma at least as old as PEO. Of the eight Trukic languages that we have been considering, however, only two clearly retain a formal and semantic distinction between the two forms: TRK and PUL. MRT has one form, but attests both glosses. All other languages have a single form and the single gloss 'outwards, out to sea'. It is not completely clear, however, that it is the reflex of *-wa(t)u that has been lost in those languages. Let us examine the various forms: TRK -wow 'toward addressee', -wu 'outwards, etc.'; PUL -waw 'toward addressee', -wow 'outwards, etc.'; MRT -wéẃ 'outwards, toward addressee'; STW -wow 'outwards, etc.'; CRL -wow 'outwards, etc.'; WOL -waÚ 'outwards'; PUA

-wow 'outwards'; and ULI -wey 'outwards'. Except in TRK, where short low vowels regularly raise to mid before high vowels and short mid vowels to high in the same environment, it is almost certain that the -wow forms reflect PTK *-(w)o(t)u. Thus, PTK *-wa(t)u must be assumed to have been lost in STW, CRL, and PUA. The forms for MRT, WOL, and, probably, ULI are formally more compatible with *-wa(t)u, however, implying that *-(w)o(t)u was lost in those languages and that in WOL and ULI *-wa(t)u's original meaning was replaced by 'outwards, etc.'.[36] These facts in turn imply that the collapse of the original PTK distinction has been a relatively recent language-specific development. That is, except in the case of STW-CRL, the loss of one form or another ocurred in the development of each individual language, and cannot be assigned to any of the subgroups within Trukic.

The PTK verb *unu-m 'to drink' is clearly a reflex of POC *inum. In section 2.2.2.2 we reconstructed PTK *únuma- as the possessive classifier for drinkable objects on the basis of cognates in all Trukic languages except PUA, which has núma-. It is possible, however, that *únuma- is not a PTK form.

All other Micronesian languages which have possessive classifiers attest forms that reflect a PMC *nima- 'possessive classifier for drink' (cf. Marshallese nima-, lima-; Kosraean nihmac; Ponapean nima-). Even Gilbertese, which has no possessive classifiers except the general a-, has the deverbal noun nima- 'drink', and no clear reflex of POC *inum. These forms are almost certainly cognate with the PUA form. In addition, within Trukic, ULI has the form lema-

'possessive classifier for drink' as an alternant with yuluma-, with the same gloss. In fact, Elbert (1947) provides only lem as the ULI noun for 'drink, which may well suggest that lema- is the more common of the two forms.

There are two possible explanations of this situation. One is that both *nima- and *únuma- existed in PTK, presumably with somewhat different meanings, and that *únuma- was later lost in PUA while *nima- was lost in the ancestral community of WOL-STW-CRL-PUL-MRT-TRK. The second explanation is that only *nima- was attested in PTK and that it was replaced in WOL-STW-CRL-PUL-MRT-TRK by the form *únuma-, presumably by analogy with the verb *unu-m. Under this hypothesis, the form yuluma- in ULI would have developed through contact with WOL. My belief is that the second hypothesis is more likely to be correct, as I find it difficult to imagine any language with two classifiers for 'drinkable object'.[37] In terms of subgrouping, however, it does not really matter which hypothesis is correct, as both involve an innovation in the proto-community of the languages from WOL through TRK.

It was observed in section 2.2.2.5 that the serial counting form for 'four' in Proto-Micronesian is reconstructed as *fagi,a, while the cognate form in PTK is reconstructed as *fan,gi. It was noted at the same time that Motu has hani 'four', while Kove has paŋe 'four', demonstrating both that the PMC form is of considerable antiquity in Oceanic and that confusion between a velar and alveolar nasal is attested outside Trukic. Once the distribution of Trukic forms with *n and with *g is examined, however, it becomes probable that the forms with *n are not retentions of an earlier extra-Trukic form, but indications of an innovation within Trukic.

Other Micronesian languages are consistent in reflecting a velar nasal: Gilbertese aanga, Kosraean ahng, Mokilese oa-poang, Ponapean e-peng (where the prefixes in the Ponapeic languages are reflexes of PMC *e- 'numeral prefix', which is attested in PTK *e-da 'one (serial counting)' and in several non-Micronesian languages: see section 2.2.2.5). The forms in Trukic are: TRK fáán, MRT fáán, PUL fáán, STW fáán, CRL fáál, WOL faangI, ULI fááng. No data is available on the PUA form.

Phonologically, TRK could reflect either PTK *n or *g, and it is possible that PUA has a form reflecting earlier *n. Keeping these possibilities in mind, however, the available data suggest that the PTK form was *fagi, and that the form *fani was an innovation of the ancestral community of STW-CRL-PUL-MRT-TRK, that is, that the form was innovated after the separation of WOL.

Another form which may have been an innovation of STW-CRL-PUL-MRT-TRK can be reconstructed as *-cai 'counting classifier for small numbers of animate creatures'. This form is attested in STW -rhay, CRL -schay, CRN -rhay 'counting classifier for 1-3 animates', PUL -ráy 'counting classifier for 1-4 animates', and on some islands of the Lower Mortlocks as -shay 'counting classifier for 1-3 animates'. In all these languages, after the upper numerical limit is reached (i.e., after three or four), the classifier changes to a reflex of PMC *-manu.

Noticeably absent from the above list, of course, is a reflex from TRK. Thus, the form cannot be securely reconstructed for the subgroup in question, and it is possible that it may have developed in one language and then spread through contact to other communities. Yet the fact that it is apparently in the process of disappearing in MRT--apparently it is only attested among older speakers there (Mikeas Olap p.c.)--is evidence of a sort that it may have been lost earlier in TRK.

3.5 Lexical developments in Trukic

Seven subgroups have been tentatively identified on the basis of phonological developments within Trukic, and have been largely supported by the grammatical evidence. Henceforth, we shall assign the following names for these putative subgroups, with the understanding that the naming of the groups is not intended to imply the certainty of their validity:

(1) For the putative group consisting of only Mortlockese and Lagoon Trukese, we shall use the name Mortlockese-Trukese (MRT-TRK);

(2) For the putative group consisting of the above two languages and PUL, we shall use the name Eastern Trukic (ETK);

(3) For the putative group which consists of ETK and the languages of STW and CRL (which group we shall continue to refer to as STW-CRL), we shall use the name Central Trukic (CTK);

(4) For the putative group consisting of CTK and WOL, we shall use the name Nuclear Trukic (NTK);

(5) For the putative group consisting of NTK and the languages of PUA and SNS (and probably TBI as well, but the data are insufficient to make a definite judgment), we shall use the name Sonsorol-Trukic (STK); and

(6) For the putative group consisting of all and only the Trukic languages, we shall continue to use the term Trukic (TK), and the assumed proto-language will continue to be termed Proto-Trukic (PTK).

In the remainder of this section, lexical evidence will be presented which supports the major proposed subgroups of ETK, CTK, NTK, and STK. (Evidence for PTK was presented in chapter 2.) At the end of this section, some problematic data which appear to suggest other groupings will be examined.

3.5.1 Lexical evidence for STK

Lexical evidence for the putative STK is extremely weak, but that is perhaps understandable. Such evidence should consist of innovative forms that are attested from PUA through TRK, where ULI clearly attests a continuation of an earlier etymon in the same meaning. It is not sufficient for the ULI form only to be different, but without external attestation, for ULI might have innovated its form during its period of separate development. It has already been stated that the data available for both ULI and PUA are considerably fewer than for some of the other languages, due to the fact that native speakers of these languages were not available for consultation. Thus, the likelihood of finding the kinds of forms that are needed is relatively small, especially so if the period of separate development for the putative STK was brief.

The fact that no form has been located that meets the strict requirements just stated for supporting an STK subgroup is discouraging, however. The following comparisons are each problematic in at least one respect, but may offer some support for the putative STK group.

(1) PSTK(?) *ka-tawaa' to crack, to hatch (as an egg)': PUA *kattawa*, WOL *gatewaa-lii*, CRL *assawa*, STW *yassewa*, MRT *asewaay*. ULI has only *towa* 'to hatch, crack', which reflects the noncausative verb root. WOL *tewaa* 'to be broken, cracked, smashed, wrecked' also reflects the same root, but with a somewhat different gloss. None of the other languages reflects the noncausative form at all. Ponapean *kasawa* 'to hatch' is clearly cognate with *ka-tawaa, but may not negate the possibility that the form is an STK innovation, as evidence suggests that Ponapeic languages may have separated from the Trukic community after the separation of ULI, PUA, and probably WOL as well. Thus, it is possible that the causative *ka-tawaa, together with loss or change of meaning of the unprefixed root, was a PSTK innovation.

(2) PSTK(?) *ka-m'acu 'to hold, grasp': PUA *kamwasú*, WOL *gemmwashúú*, CRL *amwaschúw*, PUL *yamwarúy*, MRT *yamwashé*, TRK *émwéchú*. ULI has *géélú* 'to hold', which is cognate with PTK *kaukau 'to tie up', but does not appear to have a form cognate with *ka-m'acu. It is possible that ULI may have lost its reflex of *ka-m'acu and innovated a new meaning for the type *kau- 'tie', in which case

*ka-m'acu is not PSTK but PTK, but it is also possible that the form is a PSTK innovation.

The following forms are potentially PSTK innovations in that they are attested in PUA and in other STK languages and apparently not attested in non-Trukic languages. They may, however, be PTK, as Oceanic forms with these glosses are not found in the ULI sources.

(3) PSTK(?) *kúp'a 'footprint, foot': PUA kupwa 'leg', WOL giibA 'footprint', CRL a-ibwiibw, ghubwa- 'footprint', CRN a-ibweibw 'footprint', PUL yipwa- 'footprint', TRK iipw 'instep, sole of foot, footprint'. Fijian kubukubu 'heel' may be cognate, but has a different final vowel and gloss.

(4) PSTK(?) *(k)ka(a)du 'itch, itchy'; PUA kkatÚ, WOL kkéétÚ, gettÚ, CRL kkéét, PUL kéét, kóót, MRT kéét, TRK kkéét. POC *kasi 'scrofulous swelling, k. of disease, abscess, scabies, itch' may be cognate, but has a different final vowel. Also, if the long vowel is attested in PUA, that might also be an innovation of PSTK.

(5) PSTK(?) *faada 'string, as of fish': PUA datA, WOL ffaatA, CRL ffaat, PUL fááteniy 'to string, as of fish', MRT faat, TRK faata-. POC *tuRi(a) is very securely reconstructed in the meaning 'to thread, to string (as fish)'.

(6) PSTK(?) *dúno 'tell about; story': PUA tittino 'about, story about', WOL túttúlA 'talk about someone, gossip', CRL tittillap

'tell a story, story', TRK túno 'express or make known in speech', túttúnnap 'tell a story, story'.

(7) PSTK(?) *perou 'k. of large rock': PUA polowu, WOL poroU, CRL porow, PUL poroow 'sandstone', TRK piru.

(8) PSTK(?) *caucau 'massage': PUA saúsaÚ, WOL shééshéé, CRL schéésché, PUL fééfé.

(9) PSTK(?) *kap'ata 'shout, call': PUA kkapwatú, WOL gebatA, CRL abwas, STW akkabwas, PUL yapwah, TRK apwas. PTK *kapata 'speak, say; language' is securely reconstructed. *kap'ata looks suspiciously like an innovation from the earlier one, with a different but related meaning.

(10) PSTK(?) *li-pici 'unmarried person': PUA nipisI, WOL -lipishI, CRL lipisch, PUL lipiif, MRT lipich, TRK nipich.

3.5.2 Lexical evidence for NTK

There is considerably more apparent lexical evidence for this subgroup than for the putative STK:

(1) PNTK *cao-p'udo 'woman, older woman': WOL shóóbutO 'woman (age 40-50)', CRL schóóbwut, CRN rhaabwut, STW rhóópwut, PUL fóópwut, MRT shóópwot, TRK chóópwut 'woman'. PTK *faifine is securely reconstructed in the meaning 'woman', and the above form, which consists of the morphemes PTK *cao 'person' and PTK *-p'u'do 'bad, defective', is attested in no other languages.

(2) PNTK *ka-ani-pau 'fan; wave, beckon': WOL gaalipéé, CRL alipé, CRN háánúpé, PUL yáánipé, MRT aalúpéw, TRK áánipé. PMC *alo 'beckon' (< POC *qalop) and PMC *iri 'fan' (< POC *qidip) are

both securely reconstructed. PUA has úlúpaÚ 'fan', and Elbert (1947) gives ULI ripöü 'fan', both of which almost certainly reflect PMC *iri 'fan' and PMC *pau 'hand, arm, wing'. Although the PNTK form also reflects *pau, the central morpheme *-ani- in *ka-ani-pau is not cognate with either PMC form or with any external form of which I am aware.

(3) PNTK *lam'o 'earlier, in ancient times, long ago': WOL lóómwO, CRL lóómw, PUL lóómw, TRK nóómw. PUA monO 'old days' may be cognate with POC *muna 'first, ancient'. The ULI form is musuwe.

(4) PNTK *lima-d 'to clean, make neat': WOL limetiA, CRL limeti, STW limeti, PUL limááti, MRT limate, TRK nimeti. Elbert (1947) lists ULI kölil, wöl 'to clean, clear'; PUA has dakea, wene 'to clean, straighten'. The second forms of both languages are almost certainly cognate with PTK *wane 'straight, steady, correct'.

(5) PNTK *mataika 'happy, pleased, contented': WOL mesaigE, CRL meseigh, STW messáik, PUL mehááyik, TRK meseyik. ULI has rray, and PUA kkelE, kadaiemaÚ in this meaning.

(6) PNTK *takullu 'egg': WOL súgúnnÚ, CRL sóghull, STW sókunn, PUL hakúll, MRT sókkull, TRK sókunnu-. ULI has fediel 'egg', and PUA and SNS have sakaI in the same meaning. The PNTK form may reflect the metathesis of the first two consonants in POC *katolu 'egg, but the PUA form nama-takúnú 'circle, round' may also suggest a different source. It should be noted that Sa'a sa'olu 'egg', which Grace et al. (19˜3) list as cognate with POC *katolu, while formally similar to the PNTK form (Sa'a regularly reflects POC *k as glottal stop), appears to reflect POC *s or

*ns as the initial consonant. According to Pawley (1972:27), POC *t is regularly lost in Sa'a.

(7) PNTK *kaccu 'good': WOL gaccÚ, CRL ghatch, STW kach, PUL kaccú-, MRT aash, TRK yéech. The only attested form in ULI with the meaning 'good' is mommaay; PUA has nakúnakÚ 'good, of conduct' and maÚ, mmakO 'good'. Kosraean kahto 'beautiful, pretty, cute' may appear cognate with the PNTK form, but is actually irregular in both the medial consonant and in failing to lose the final vowel. It is very unlikely that it is actually cognate.

(8) PNTK *fici 'good, well, well done': WOL fishI, CRL -fisch, STW ffirh, PUL fiŕifiŕ, MRT fish, TRK fich. The meaning of this form is equivalent to those of ULI mwaaw and PUA maÚ.

(9) PNTK *fata 'laugh, ridicule': WOL ffasA, CRL ffas, STW ffas, PUL fahákiniy 'laugh at', TRK -ffas 'object of laughter'. Both ULI mmali- and PUA mmani reflect POC *mali 'laugh', cognate forms of which in NTK mean 'to smile'.

(10) PNTK *faia 'ray fish': WOL faiyA, CRL ffayi, STW fayi, PUL fáyi, MRT faye, TRK ffeyi. This form reflects a formal innovation of POC *paRi 'ray' that is not attested in ULI faay or PUA dailA (the latter of which shows a different innovation). It is likely that this innovation developed to avoid homophony with the reflex of PTK *fati 'to have sexual intercourse' after the loss of the *t in PSTK.

(11) PNTK *epaepa 'lee platform on sailing canoe': WOL yepeepA, CRL epeep, STW epeep, PUL yepeepá-, TRK epeep. Cf. ULI ngïs 'lee platform on sailing canoe' (Elbert 1947).

(12) PNTK *akiaki 'think, ponder, consider': WOL yagiyagI, CRL ághiyágh, STW yakiak, PUL yekiyek, MRT ákiyek, TRK ekiyekiiy. Cf. ULI mangi- 'think, remember', l̈il̈wal 'think, consider', and PUA mengi 'to think about it', ka-singisingi 'to think about it hard'.[38]

(13) PNTK *am'a 'struts connecting outrigger boom to outrigger float': WOL yaamwA, CRL aamw, STW yaamw, PUL yaamw, TRK aamw. Cf. ULI laad and POC *patoto, in the same meaning. This form is distinct from PTK *dama (< POC *nsama) 'outrigger float'.

(14) PNTK *tap'o 'village': WOL taabO, saabO (archaic), CRL sóóbw, STW sóópw, PUL hóópw, MRT sóópw, TRK sóópw. PMC *tap'o is securely reconstructed in the meaning 'place, land, spot', and has external cognates in Fijian tavo 'area, to the side' and Nukuoru daho 'at the side' (both reflecting oral rather than nasal grade of the medial consonant, however). The PNTK form appears to reflect a semantic innovation in this etymon. It is possible, though, that this innovation occurred in PTK, as the ULI and PUA forms for 'village' are yiréét and wotaotA, respectively, which appear to reflect subsequent innovations. Cf. also ULI lúli- 'place', PUA daúlúminE 'place', pwunodú 'place, area'.

(15) PNTK *taai 'voyage, trip (by canoe) outside lagoon': WOL saaI, CRL sááy, STW sááy, PUL hááy, TRK sááy. WOL also has the form waiyA 'sailing trip, voyage', which is cognate with PUA waiA 'trip, journey', and ULI wway 'travel'. Kosraean ai 'come, arrive, sail in' makes it likely that this latter form is PMC and

can be reconstructed as *(w)aia, which in turn makes it probable that *taai is innovative. Ponapean sahi 'fleet of canoes, trip by sea, ocean voyage' also reflects *taai, but, as noted earlier, it is possible that Ponapeic languages separated from Trukic after the separation of PUA. If that was not the case, this form is obviously not a PNTK innovation.

(16) PNTK *noko 'stay, be, remain': WOL logO, CRL loo-, CRN noo-, STW lo, PUL no, MRT no. TRK nómw, in the same meaning, is a further innovation. WOL also has milA 'to stay, live', which is cognate with ULI mil and PUA minE, in the same meaning. Kiribati mena 'stay, live, be' is also almost certainly cognate with these latter forms, as are Mokilese mine and Ponapean mie, which suggests that *me,iña 'stay, live, be' can be reconstructed for some pre-Trukic stage of Micronesian. *noko is thus almost certainly an innovation of PNTK.[39]

(17) PNTK *pacca 'thunder': WOL pachA, CRL patch, STW ppach, PUL pacc, TRK paach. MRT has innovated shopwulap 'thunder'. ULI, PUA, and SNS reflect PMC *parara 'thunder', which is also attested without the final syllable in many areas of the northern and central New Hebrides, and probably in Fijian parara 'to roar (of fire)'. Somewhat problematic is the fact, noted earlier, that WOL regularly reflects geminate *r as cc, and thus could also reflect *parara as well as PNTK *pacca. In that case, this innovation would be PCTK, and not PNTK.

The following forms will be presented with little comment, as either ULI and PUA forms with the same meaning are unavailable, or else it is obvious that the ULI and PUA forms that exist are themselves innovations. Thus, it is possible that the following forms are PTK. Some of them may, however, be PNTK.

(18) PNTK *male 'cleared area, to clear of brush': WOL malemalE, CRL málimál, STW máletiy, PUL málemál, MRT malamal, TRK á-mánámáná. ULI milay 'garden, farm' is almost certainly a borrowing of Yapese milaey', with the same meaning. Directly inherited Micronesian forms appear to reflect POC *malala 'cleared ground, spacious'.

(19) PNTK *cakaai 'chase, hunt': WOL shageeyI, CRL faa-scheey, MRT sheey, TRK cheey.

(20) PNTK *kam'ee 'giant clam': WOL gamwee, CRL amwe, STW amwe, PUL yaamweey (Elbert 1972 suggests this is a loan from TRK), MRT amwe, TRK amwe, kamwe. Cf. POC *kima 'large tridachna', which is clearly attested in Kiribati and more problematically in other Micronesian languages.

(21) PNTK *Túma 'large tridachna': WOL súúmA, CRL siim, PUL hiim, TRK siim. Cf. comments for (19) above.

(22) PNTK *tora 'morning': WOL -sorA, CRL -sor, STW -sor, PUL hora-, MRT soor, TRK soor. Cf. PUA manienI. Ponapean sohrahn 'before dawn' is formally and semantically very similar, but Rehg and Sohl (1979) state that the form is actually bimorphemic, with a negative prefix and a reflex of POC *daqani 'day': literally, 'not day'. If the Ponapean form could be shown to be more widely attested, it might be argued that the PNTK form represents a reanalysis of it.

(23) PNTK *p'ul(l)ú 'break, be broken': WOL búnnúúwA, CRL bwullúúw, STW pwúnnú, PUL pwúllú, MRT pwúllú, TRK pwúnnúúw.

(24) PNTK *pitaki 'belongings, goods; to be wealthy': WOL pitegI, CRL pisagh, PUL pihekihek, TRK pisek. Ponapean pisek 'free, idle, untroubled' may be cognate.

(25) PNTK *niwa 'afraid, scared, timid': WOL lúwA, CRL a-lúw 'frightening, scary', STW núw, PUL niweti, MRT nuwó-kkus, TRK niw.

(26) PNTK *m'iici 'meeting, to go meet': WOL mwúúchÚ 'to go visit', CRL mwúúsch, CRL mwiirh, PUL mwiiŕ, TRK mwiich.

(27) PNTK *magarigari 'rough, coarse, bristly (of a surface)': WOL mengaringerI, CRL mwengerenger, PUL mengeringer, MRT mwangerenger, TRK mwarangarang (with metathesis). Mokilese mwangaingai 'rough (of a surface)' and Ponapean mwangaingai 'bumpy, rough, not smooth' appear cognate but show unexpected loss of *r.

(28) PNTK *makku 'break off, break away; partition (at birth)': WOL makkÚ, CRL makk, PUL makku-ló, MRT mékk.

(29) PNTK *lúúlúú 'eat, chew': WOL lúúlúú, CRL lúúlúúw, STW lúúlú, PUL lúúlú, MRT lúúlú, TRK núúnú. This is almost certainly an innovation of POC *luaq 'vomit, spit'.[40]

(30) PNTK *kudda 'look for, search': WOL gúttaa, CRL ghútta, STW kútta, PUL kútta, MRT kútta, TRK kútta.

(31) PNTK *kade 'boy, child': WOL gaatE, yaatE, CRL atte-, STW áát, PUL yáát, MRT áát, TRK áát.

(32) PNTK *faunaki 'elevated sitting platform for navigator of sailing canoe': WOL féélagI, CRL féélágh, STW fóólák, PUL foonák, TRK foones.

(33) PNTK *tano-m 'catch water in a container': WOL talomii, CRL solomi, STW sólomi, MRT sanome. Fijian taloci 'pour water', Sa'a taloa wa'i 'pour water into' may be cognate but have incompatible medial consonants. The Fijian thematic consonant also does not correspond to PNTK *m.

3.5.3 Lexical evidence for CTK

There are not as many lexical innovations for CTK as for NTK. Several of the forms, however, are quite persuasive:

(1) PCTK *p'uka 'navel': CRL bwuugh, STW pwuuk, PUL pwuuk, MRT pwuwa-, TRK pwuwa-. WOL buusA and PUA pwutA are cognate with the type *p'uta attested in Marshallese, Kosraean, Ponapeic, and, externally to Micronesia, Lau in the Southeast Solomons (Blust 1982). SNS pwuutO and Gilbertese buto reflect POC *mpus,to, suggesting that there may have been a doublet in PMC. No other language, however, reflects the type *p'uka.

(2) PCTK *ka-mara-a 'sail': CRL amara, STW amara, PUL yamara, MRT ammara, TRK amara. WOL gammaraa 'to make it go fast (of a canoe)' suggests the probable etymology of this form, for the WOL verb root marA 'fast, swift' almost certainly reflects POC *maRa 'light in weight'. The PT: reconstruction for 'canoe sail' is *úa, which is probably reflected in Gilbertese ie. (Marshallese

we'j-lay 'canoe sail' suggests that the correct PMC reconstruction may be *uta, however.)

(3) PCTK *para 'red': CRL parapar, STW parapar, PUL par, MRT parapar, TRK par, parapar. The PMC (and PTK) reconstruction for 'red' is *caa(caa), from the form for 'blood' (cf. Kosraean sruhsrah, Ponapean wei-tahta, Mokilese wah-ssa, ULI cca, PUA lo-saasaa, WOL chaa).

(4) PCTK *nama 'authority, power, supernatural power': CRL lemalem, STW naam, PUL nema-, MRT namanam, TRK neme-niy. This form looks very like a formal innovation of POC *mana, but that etymon is also reflected in the same Trukic languages and elsewhere in Micronesia as the type *manamana 'supernatural power, divine authority'. The etymology of PCTK *nama is, thus, not completely certain.

(5) PCTK *taaú 'sad, shy, embarrassed': CRL sááw, CRN hááw, STW sááw, PUL háwo, MRT sááw, TRK sááw. Other Trukic languages reflect either POC *mayaq or POC *maRa in this meaning, as does Gilbertese. TRK and CRL also reflect the POC etymon, but only in archaic forms that are infrequently used.

(6) PCTK *tai 'penis': CRL see, PUL hee, MRT see, TRK see. No form has been reconstructed in this meaning for PMC, but Marshallese qilaylay 'penis (child speech)', Mokilese koaloa 'penis', PUA kkulA, SNS kkuul 'penis' suggests that the reconstruction *kula can be made for some level in Micronesian. (ULI has fáás 'penis', which is probably related to PTK *fati 'to have sexual

intercourse'; both WOL and a second PUA form reflect a type *kai 'penis', which may be related to POC *kayu 'stick' (PTK *kai).)

(7) PCTK *makura 'head': CRL <u>móghur</u> CRN <u>magúr</u>, PUL <u>makúr</u>, MRT <u>makúr</u>, TRK <u>mékúr</u>. All other Trukic languages reflect PTK *cim'a and many reflect PTK *fatu(ku), the latter of which has a Gilbertese cognate <u>atuu</u>, in this meaning.

(8) PCTK *fiiou 'wrestle, fight': CRL <u>fiiyow</u>, STW <u>fiiyow</u>, PUL <u>fiiyo</u>-, MRT <u>fiiyow</u>, TRK <u>fiyuuw</u>. Other Trukic languages reflect the type *fidaki in this meaning. WOL also attests the type *fiiou (WOL <u>fiiyowU</u>), but in the meaning 'embrace tightly'. It is possible, thus, that the PCTK semantic is an innovation.

(9) PCTK *ineki 'body; hull (of canoe)': CRL <u>ileghi</u>-, CRN <u>inigi</u>-, STW <u>yineki</u>-, PUL <u>yineki</u>-, TRK <u>inisi</u>-. WOL and ULI reflect the type *kaloga in this meaning. That type is also attested in STW-CRL, but with the meaning 'all'.

(10) PCTK *p'uu 'to flow (esp. of fresh water)': CRL <u>bwuubwu</u>, STW <u>pwu</u>, PUL <u>pwu</u>, MRT <u>pwu</u>, TRK <u>pwu</u>. This form may reflect POC *pupu 'leak, drip, spill out', but with a nasal grade initial and a different meaning. WOL, PUA, and ULI reflect the type *tere in this meaning.

(11) PCTK *p'ulua 'spouse, to marry': CRL <u>bwúlúw</u>, STW <u>púlúwa</u>-, PUL <u>púlúwa</u>-, TRK <u>pwúnúwa</u>-. ULI <u>rii</u>-, PUA <u>lii</u>, and Marshallese <u>rii</u>- suggest pre-Trukic *rii in this meaning. WOL <u>fitiyA</u> appears to be a separate innovation. It is possible, however, that the PCTK form is a retention, rather than an innovation, as somewhat

similar forms are attested in the Admiralties (cf. GEL ñe-bulu, Loniu ñapulu-, Bipi pulu-). Blust, however, has said that in his opinion the Admiralties forms are probably best reconstructed as a trisyllable with initial *ña- (i.e., *ña-mpulu 'spouse'), so the CTK and AD forms may not be cognate (Blust p.c.).

The following forms are certainly CTK, but may not be innovations of that group:

(12) PCTK *(t)ura 'say, speak': CRL ira, STW úra, PUL wúra, MRT wuró, TRK úrá. WOL, PUA, SNS, and ULI reflect the type *teru in this meaning, but it is not certain which form was PTK.

(13) PCTK *lai-i- 'amidst, among, between': CRL leeyi-, STW neeyi-, PUL leyi-, TRK neeyii-. Cf. WOL lúwelú-, ULI luwélu-.

(14) PCTK *ka-fakura 'child of male member of clan': CRL afaghúr 'reference to lineage of a child through father (not true lineage); half-breed (of foreign father)', STW afakúr 'child of male member of clan', PUL yafaakúr 'brother's child; to be born to a foreign father but local woman', MRT yafakér 'child of male member of clan', TRK éfékúra- 'child of male member of matrilineal lineage'. WOL ga-fegirA 'tamed, domesticated' may indicate the original meaning of this form (cf. PTK *fakira 'tame').

(15) PCTK *madawudawu 'smooth, shiny': STW mótawutawu, PUL mótówotowo, MRT mótawutaw, TRK mwotowutow. Cf. PMC *mas,zali 'smooth'.

(16) PCTK *ppala 'hill': CRL ppal, STW ppan, MRT ppal, TRK ppan. This form may be related to the type *palia 'side, edge, crown, slope', which is attested throughout NTK and also in Ponapeic.

(17) PCTK *p'aap'aa 'happy, pleased': CRL a-bwáábwá 'to honor s.o.; to amuse, entertain oneself', STW pwaapwa 'happy', PUL ya-pwaapwaay 'to honor, respect s.o.', TRK pwaapwa 'happy'.

(18) PCTK *udda 'men's house, canoe house': CRL utt, PUL wutt, TRK wutta-. (MRT and STW forms were not elicited.) In other Trukic languages, the form with this meaning is a reflex of POC *fale 'building, house'.

3.5.4 Lexical evidence for ETK

There are several forms that provide lexical evidence for ETK; among the most persuasive are the following:

(1) PETK *cuu-r 'meet, encounter': PUL ŕuuri, MRT shuure, TRK chuuri. All other Trukic languages and Ponapeic languages reflect the type *cuu-g, with a different thematic consonant.

(2) PETK *kagaraapa 'sp. of tuna': PUL yangarap, MRT yangaraap, TRK angaraap. All other TK languages and Ponapeic reflect a different order of the medial consonants *g and *r: *karagaapa.

(3) PETK *kiaa 'boundary, limit, border': PUL ya-kiyánn, MRT kiyá, TRK kiyáá-. CRL , WOL, and ULI all suggest PTK *tiaa in this meaning.

(4) PETK *cili-lapa 'old (of people)': PUL cillap, MRT shillap, TRK chinnap. STW-CRL, WOL, and PUA reflect PTK *dukofai in this meaning, with which Gilbertese ikawai 'old, adult, mature' is a

likely cognate, although the correspondences are somewhat irregular. The ULI form for this meaning is lap. The initial morpheme of the PETK form may reflect PMC *t'ili 'sty (of the eye)', which is also reflected in TRK chiin 'sty'.

3.5.5 More problematic lexical sets

There are several lexical sets that appear to suggest subgroups different from those that we have proposed. Those lexical sets will be presented and discussed in this section.

3.5.5.1 Lexical data suggesting a ULI-PUA subgroup

(1) ULI paca-, PUA pasA 'tail'. Other TK languages clearly reflect POC *iku in this meaning, as does Ponapeic. It may be noteworthy, however, that the WOL, STW, and MRT reflexes strictly limit the meaning to 'tail of bird'. In addition, CRN arhapa- and CRL aschipe-, both with the meaning 'tail', appear to be possible cognates of the ULI and PUA forms, but with consonant metathesis and an initial vowel accretion that may derive from causative *ka-. It is, thus, possible that there were two forms for 'tail' in PTK, with the reflex of POC *iku restricted to birds.[41]

(2) ULI yódo-, PUA yoto- 'deep'. PMC *lalo 'deep' is reflected in all other Micronesian languages.

(3) ULI gúw, PUA kuu 'dull, blunt'. The form *kap'u can be reconstructed for a fairly early period of Micronesian, and is reflected in all other TK languages.

(4) ULI áliwec, PUA núweisI 'child'. Several forms are reflected in Micronesian languages with the meaning 'child': PMC *natu 'child, offspring', PMC *tari 'child', PNTK *kade 'child, boy'. I know of no other cognate of the ULI and PUA forms, however.

(5) ULI duwal, PUA tiwenE 'choose, select'. All other TK languages reflect POC *pili 'choose'. Harrison (p.c.) notes that Kiribati rine 'choose' may be cognate with this form, however, although the number of syllables would be irregular.

(6) ULI suusu, PUA dúúdúú 'pound, beat'. These forms appear to reflect loss of medial *k from POC *tuku (PMP *TukTuk). The *k is retained in all other Micronesian languages.

(7) ULI gilemara-, PUA kurumaalA 'right side'. No PTK reconstruction can be made with this meaning, for which forms in other languages have glosses like 'correct side', or 'male side'. Thus, it is possible that the ULI and PUA forms may reflect PTK, rather than a shared innovation. It should be noted, too, that ULI gilcegul and SNS kurusekirI 'left side' are also cognate, but that the same problems already noted for reconstruction occur in the forms for other TK languages.

These forms, especially (2-6) are powerful evidence that there has been contact between ULI and PUA. Indeed, this much is already known from the traditional histories of PUA (see section 3.3.4). The question that must be asked, however, is whether these innovations and the relative lack of lexical evidence for the putative PSTK subgroup are sufficient to cause us to disregard the proposed phonological innovation PTK *d > t, which is attested in all Trukic languages except ULI, and other phonological developments discussed in section 3.3. A tentative answer will be given in section 3.6.

3.5.5.2 Lexical data suggesting a ULI-PUA-WOL subgroup

(1) WOL buu-togO, ULI buu-dog, PUA pwi-tokO 'come'. Other TK languages reflect PTK *i-doko in this meaning, cognates of which are attested in Ponapeic and Marshallese. The source of the first morpheme in the WOL-ULI-PUA form is not known, but it also combines with other directional enclitics in at least WOL and PUA, and is glossed in those languages as 'go, come'. It may be cognate with Kiribati boo 'all-purpose verb of motion' (Harrison p.c.), in which case it is likely that the absence of this morpheme in CTK is the result of loss there, rather than of a separate innovation in ULI, WOL, and PUA.

(2) WOL bugotA 'family, home, home village, possessed land, estate', ULI bogat 'home', PUA pwukotA 'family, relative, home, estate'. This type is unattested elsewhere in TK, to my knowledge.

(3) WOL kkaléélée, ULI galééléey, PUA kanaúnaÚ 'urine, to urinate'. As previously observed, this form, which has the literal meaning 'to make puddles', has replaced PTK *Tiri 'urine' in these languages. The probable reason for loss of *Tiri was to avoid homophony with reflexes of PTK *tiri 'to masturbate'. The same euphemism for 'urine' is also available in CRL, although uncommon, together with other euphemisms which translate as 'to stand up' and 'to take a break'.

It should also be noted in this subsection that both WOL and PUA unexpectedly reflect the initial consonant of PTK *gan(n)a 'to give' as an oral velar obstruent. All other TK languages, including ULI, reflect the velar nasal. As previously observed, WOL (but not PUA) also reflects the initial consonant of PTK *gagu '1 sg focus pronoun' as a velar obstruent.

Although of interest, the lexical evidence for subgrouping WOL with ULI and PUA is far less impressive than that for grouping WOL in NTK. When grammatical and phonological evidence are also considered, it is clear that WOL belongs to NTK.

3.5.5.3 Lexical evidence for a "Carolinic" subgroup

Somewhat surprisingly, no clear lexical evidence for Bender's (1971) "Carolinic" subgroup, consisting of STW, CRL, and PUL, appears in the data. There is a small amount of data to support a group of those three languages with WOL, however:

(1) WOL baaÚ, CRL bwaay, STW pwaay, PUL pwaay 'k. of dance (esp. by women)'.

(2) WOL pechaaÚ, CRL petchaay, STW pechay, PUL paccawú 'hungry'. (Cf. TRK fiyon 'hunger'.) It seems likely, however, that CRN parhaw, MRT pashaw, TRK pachaaw, all with the meaning 'shark', are cognate with this form (cf. PTK *pakewa 'shark'). Interestingly, the ULI form for 'hungry' is cognate with other languages' form for 'dog'. PUA 'hungry' is dúngA.

3.5.5.4 Other problematic lexical data

The TK forms for 'turtle', 'squid', and 'when?' are quite puzzling:

	'turtle'	'when?'	'squid'
TRK	woong	ineet	niiti-
MRT	woon	ingeet	ngúút
PUL	woong	yingeet/yineet	ngiito-
STW	wongi-	ileet	ngúút
CRN	woong	ineet	ngúút
CRL	woong	ileet	ngúti-
WOL	woongI	ileetA	ngiitO
PUA	wonÚ	ingaetA/wangaetA	ngitO
ULI	wool	yingád	ngidi-

All forms for 'squid' reflect an unexpected velar nasal (recall that in TRK *g > n/__i), but the vowel correspondences make it necessary to reconstruct *gido for PUL, WOL, and PUA, and *gudi for the other languages. Thus, TK appears to reflect both forms of the POC doublet implied by the reconstruction *nunsi,o, but with an innovative initial consonant.

The forms for 'turtle' and 'when?' are at least equally as problematic, with MRT agreeing with PUA and ULI against the other languages in both forms, and the PUL doublet for 'when?' siding with both camps. (The PUA doublet reflects a difference between past and future forms, respectively.)[42] It is possible, however, that the confusion in the two forms is the result of the fact that they both historically involve palatal nasals (cf. POC *poñu for 'turtle', and see section 2.2.2.4 for the evidence for a palatal nasal in the form for 'when?'). Although all other evidence that I am aware of indicates the merger of POC *ñ with *n in all modern Trukic languages, the possibility that the Ponapeic languages--which retain a distinction between *ñ and *n--are, in effect, Trukic languages implies that the two sounds may not have been merged in PTK.[43] Thus, it is possible that the velar and alveolar nasal reflexes in these two forms reflect irregular and language-specific developments of a PTK *ñ.

3.6 Lexicostatistic evidence for grouping within Trukic

Table 12 in section 3.2 shows the cognate percentages among TK languages that were computed by E. Quackenbush (1968) on the basis of a 175-word adaptation of the Swadesh 200-word list of basic vocabulary. As noted, Quackenbush obtained the forms he used by elicitation. Recently, Blust (n.d.) has devised a 200-word list for Austronesian languages, where each meaning on the list has at least one reasonably secure PMP reconstruction. Blust's list was designed as part of a study of varying retention rates among Malayo-Polynesian languages, but it seems reasonable to use it to determine cognate percentages, as well.

Several items in Blust's list are either not found in TK languages or are attested in only one or two languages. These are No. 57 'husband', 58 'wife', 106 'snake', 126 'lake', 132 'fog', and 190 'other'. For 'husband' and 'wife', I have substituted 'spouse', but I have not made any substitutions for the remaining four items. The remaining 195 items on the list are realized by 241 overlapping cognate sets, where each cognate set is attested in at least two TK languages. That is, an item is considered to be realized by two cognate sets (and thus is counted as two items) if one or more languages has forms attesting both sets. If the two (or more) sets are in complementary distribution, they are counted as one item.[44]

It is striking that 113 of the 241 "items" or 47% are cognate throughout the eight TK languages that we have been examining. Such a high figure must be at least partly caused by the long-standing need to remain in contact among the various TK communities. The cognate percentages for pairs of TK languages as computed following this procedure are shown in Table 19.

The "chain" phenomenon observed by Quackenbush (see section 3.2) can still be observed in these figures, but other patterns are observed as well. for example, the figures for WOL tend to reconfirm our impression that that language has more in common with the languages to the east of it than with its immediate neighbor ULI or with PUA, although the effect of the regular contact with ULI is clearly seen, too. As regards other putative subgroups, TRK-MRT is strongly supported, although the figure may be somewhat inflated due to contact. The figures are also consistent with an ETK group, when the very regular sailing contacts between PUL and STW are taken into consideration along with the existence of the Yapese Empire. CTK, too, is compatible with these figures if historical facts are kept in mind.

Table 19

Cognate Percentages among Eight Trukic Languages

	TRK	MRT	PUL	CRL	STW	WOL	PUA
MRT	.856						
PUL	.814	.833					
CRL	.779	.813	.880				
STW	.794	.820	.881	.949			
WOL	.750	.778	.824	.882	.884		
PUA	.665	.713	.691	.720	.720	.768	
ULI	.678	.721	.724	.740	.770	.803	.782

Note: Percentage of items cognate in all eight languages: .469

But what of PUA? Given that its highest cognate percentage is with ULI, are its figures consistent with the putative STK group? Perhaps the best answer is that they are not necessarily inconsistent with it. We have already observed that there must have been contact at some time between the speakers of ULI and those of PUA; the lexical evidence is sufficient to demonstrate that. This fact, together with the relative paucity of lexical data in ULI and PUA, especially as compared to, for example, WOL, CRL, and TRK, is probably sufficient to account for the somewhat higher cognate percentage with ULI. Among the NTK languages, the PUA cognate percentage with TRK is relatively low, that with WOL is relatively high, and those with MRT, PUL, CRL, and STW are very consistent with each other. We have seen that TRK has innovated sufficiently to suggest a fairly extended period of individual development, while the people of the atolls have stayed in regular contact with each other. The comparative isolation of TRK probably accounts for its somewhat lower percentage with PUA, and also with other languages. On the other hand, the relatively high figure for WOL is probably due to its being somewhat more conservative than the other languages, and also, perhaps, to its regular contacts with ULI. Note that the WOL cognate percentage with ULI is higher than that of any other language, as would be expected of two neighboring languages in regular contact.

Thus, although the lexicostatistic evidence cannot be said to confirm our subgrouping hypotheses--it could hardly be expected to, given the small populations and frequent contact--it also does not raise any major doubts about them.

3.7 Summary of internal developments in Trukic

The subgroups in TK that have been proposed, and a summary of the evidence for each one, are as follows:

(1) Mortlockese-Trukese: We have only mentioned two specific innovations in support of this group, but both are quite persuasive. Both occur in the grammatical system: the development of preposed demonstrative modifiers, and the development of a stative aspect marker *mai. Although we have not specifically listed lexical innovations for this group, they are not difficult to find. For example, cognates in MRT and TRK that appear to be innovative and that occur in the Blust 200-word list include MRT, TRK áá 'swim' (cf. PTK *afa), MRT semireit, TRK semiriit 'child' (cf. PTK *taru), MRT kurow, TRK kirow 'rotten' (cf. PTK *maaca), MRT, TRK topw 'dust' (cf. CRL ppwot), and MRT moonsen, TRK meyinisin 'all' (where no PTK reconstruction can be made). In addition, if CRN (the ancestral speakers of which came from Ulul, to the northwest of TRK, early in this century) is also included in this group, the innovation of *pac(c)aau 'shark' from NTK *paccaaú 'hungry' is also evidence. A high cognate percentage is also supportive.

(2) Eastern Trukic: Phonological evidence for this group consists of the very close agreement among PUL, MRT, and TRK in reflexes of PTK *t and *k. Separating any one of these languages from the other two results in a significantly lowered (i.e., less favorable) weighting from the Krishnamurti procedure. No grammatical evidence for this group has been found, but four reasonably persuasive lexical innovations have been presented for it.

(3) Central Trukic: This group, consisting of STW, CRL, and the ETK languages, is quite firmly established. Phonological evidence consists of the close agreement among the languages of reflexes of PTK *t and *k (but where ETK loses some reconstructed phonemes that are retained in STW-CRL), and the regular reflex of PTK *T as s (PUL h) before back round vowels. Probable grammatical innovations include the development of *-tap'u 'future negative aspect marker', *taani 'aspect marker: "not yet"', *fani 'four, in serial counting', and, perhaps, *-cai 'counting classifier for animates'. In addition, eleven apparent lexical innovations have been presented, together with another seven possible lexical innovations. Lexicostatistic evidence is also supportive.

(4) Nuclear Trukic: This group, consisting of WOL and CTK, is also firmly established, although the only phonological evidence for it again involves the diffusion of rules affecting PTK *t. That evidence, however, is relatively strong, as we have seen that it is the more archaic forms in WOL that agree in their reflexes of *t with the languages to the east, while the more modern forms agree with ULI. In addition, application of the Krishnamurti procedure is clear in indicating that WOL subgroups in NTK, due to the fact that there are several forms where WOL agrees with all the CTK languages against PUA and ULI.

Grammatical innovations in NTK include the development of *p'a(a)p'a 'distant future aspect marker', *-m'uu 'deictic demonstrative modifier with the meaning "close to hearer"', and, probably, *ú́numa- 'possessive classifier for drinkable objects'.

Sixteen very promising lexical innovations were also presented, together with another seventeen potential innovations. Lexicostatistic evidence is also consistent with this subgroup.

(5) _Sonsorolese-Trukic_: The major evidence for this subgroup is the rule PTK *d > t, which is attested in PUA (and SNS and TBI) and all NTK languages, but not in ULI. Because it is so important in determining the historical development of these languages--and also of other Micronesian languages--the need for postulating this rule will be discussed in some detail.

The historical source for PTK *d is the merger of the POC palatal consonants *s, *ns, and *j (and Geraghty's PEO *nj, written *j in Geraghty 1979:143 ff.). For the first two of these reconstructed POC phonemes, all Oceanic reflexes that I am aware of, except the following, are fricatives. The exceptions are Wuvulu and Aua in the Admiralties, which reflect both phonemes as _t_, Motu, which reflects *ns as _d_ (but *s as _s_), the Cristobal-Malaitan languages, which reflect both phonemes as _t_ before nonhigh vowels and as _s_ before high vowels and nonhigh vowels in some forms, Kosraean in Micronesia, which merges *s (and *nj) with POC *t as _s_ before *i and *e and as _t_ elsewhere (and loses *ns and *j), and also Marshallese and the Ponapeic languages of Micronesia, which reflect all four protophonemes as _t_, as in all Trukic languages but ULI (see more on the Micronesian languages below). Levy (n.d. a) reconstructs Proto-Southeast Solomonic (PSS) *č initially and *s medially for POC *s, and PSS *ǯ for POC *ns, suggesting that the stop reflex in Cristobal-

Malaitan is a relatively recent development. Thus, the vast majority of the Oceanic reflexes of POC *s and *ns are continuants.

The reconstruction of POC *j is based almost entirely on forms in the Admiralties, where it is reflected as a velar stop or fricative (Blust 1978). Geraghty's PEO *nj is based on the correspondence set Fijian s, PPN *t, PSS *d, Rotuman j, where three of the four reflexes are noncontinuants.

In terms of general probability, then, the pre-Micronesian reflexes of POC *s and *ns are more likely, but not certain, to have been spirants, while the reflexes of POC *j and PEO *nj may have been either stops or spirants. Let us now examine the regular reflexes of these four proto-phonemes in the five demonstrably Micronesan languages or language groups:

	*s	*nj	*ns	*j
Kosraean (KSR)	t~s	t~s	∅	∅
Kiribati (KIR)	r	r	r	r
Marshallese (MRS)	t	t	t	t
Ponapeic (PP)	d[t]	d[t]	d[t]	d[t]
Trukic	*d	*d	*d	*d

Trukic *d, as we have seen, is reflected as a voiceless interdental spirant d in ULI, and as a voiceless alveolar stop in all other TK languages. All Ponapeic languages and Marshallese also have voiceless alveolar stop reflexes. The Phoneme r in KIR is a voiced alveolar flap. In addition to reflecting the above four proto-phonemes, KIR r is also the regular reflex of POC *nt and *nd. (POC *d and *R are lost in KIR.) We have already described the KSR reflexes of the four phonemes (and see section 4.2.2).

The only clearly fricative phoneme that can be reconstructed for Proto-Micronesian (PMC) is *f (< POC *p). It may be of interest that this phoneme is lost everywhere in KSR, like the PMC reflex of POC *ns and *j. This fact, perhaps, slightly increases the chances that the PMC reflex of those two phonemes was also a fricative, and I will tentatively reconstruct it as PMC *z.[45]

All the MC reflexes of POC *s and PEO *nj are either stops or stop-like except ULI d and the KSR s allophone, which increases the likelihood that the PMC phoneme was also a stop. But what kind of stop? Already reconstructed for PMC are the following stop phonemes: bilabial *p, labiovelar *p', alveolar or palato-alveolar *t, post-alveolar *t', velar *k. To these, we have already added the probability of another stop *T (cf. MC cognates of PTK *Tigi 'fart' noted in section 3.3.2.5), which must have been phonetically similar to, but distinct from, PMC *t. If we add another stop to the PMC inventory, then we will have reconstructed seven stops and only two fricatives for that language (three, if PMC *x was a fricative: see section 4.2). For the moment, let us use Marck's (1977) reconstruction of PMC *s for the Proto-Micronesian reflex of POC *s and PEO *nj, but keeping in mind that it may phonetically have been pronounced as some kind of coronal noncontinuant.

All Micronesian languages except KSR have merged PMC *s and *z, and in all those languages except ULI the reflex of that merger is either a stop or stop-like. May it not follow, then, that ULI has been innovative in developing a fricative reflex, and that PTK *d was a stop?

If such was the case, then it entails the necessity of reconstructing seven distinct stops for PTK and only one fricative. Moreover, it also involves, as Jackson (in press a) has pointed out, the postulation of a sequence whereby a POC fricative became a stop in MC and then became a fricative again in ULI. On the other hand, the postulation of a pre-ULI stop becoming a fricative during the development of ULI is not inconsistent with other developments in that language. We have already seen that PTK *p' and *k have become fricatives in all environments in ULI (although the latter is a stop when geminate), and that PTK *t had developed a fricative allophone in the proto-language which has diffused to other lexical items in the developments of the daughter languages. PTK *T also has fricative reflexes.

Sohn et al. (1977) reconstruct Proto-Ulithic (PTK) *s on the basis of its correspondence with POC *s and *ns, but hypothesize that ULI developed <u>d</u> due to contact with neighboring Yapese, where, they say, POC *s and *ns are reflected as an interdental fricative <u>th</u>. Jackson (in press a) points out some problems with this idea as it is stated, and other problems appear when one realizes that YAP is by no means consistent in its reflexes of *s and *ns (Bradshaw 1975), but it may be possible that the phonetic nature of the ULI reflex is in part due to Yapese influence.

Although the foregoing discussion cannot be said to have demonstrated that PTK *d was a stop, it has shown that to have been a very real possibility. Moreover, if PTK *d was a stop, it follows that PMC *s must have been one as well.[46] Therefore, I hereby suggest the use of the symbol *d for the PMC phoneme that has heretofore been written as *s. The symbol *d is less restrictive in its phonetic implications than *s, and its use may also help to suggest the historical relationship of the phoneme represented by *d to PMC *t (as indicated by the merger of PMC *d and *t in KSR, and by the stop reflexes of proposed PMC *d in MRS, PP, and TK) and also to PMC *t' (as seen in the merger of PMC *d and *t' in KIR).

We began this discussion in an attempt to better understand the proposed PSTK rule *d > t so that we might be able to evaluate the evidence for the putative STK subgroup of Trukic. As stated above, this proposed rule is the only major evidence for that subgroup. There is some other potential evidence for it, however, which should be summarized before concluding our discussion of PTK *d.

Other phonological evidence for STK consists of the fact that PUA agrees with WOL in reflecting the application of the rule s > Ø /__ high vowels in a few forms where ULI retains s, which accounts for the fact that the Krishnamurti subgrouping procedure weighs a family tree where PUA is subgrouped with NTK slightly higher than one where it is subgrouped with ULI. Grammatical evidence consists of the fact that only STK languages reflect the demonstrative suffix *-na 'emphasis', and the fact that STK languages are the only ones in TK to reflect the inanimate plural object suffix *-nini. No solid lexical evidence was identified, although ten possible innovations were presented.

It is quite possible, though, that the STK-proposed grammatical evidence consists of common retentions rather than innovations. The demonstrative suffix *-na may be reflected as part of the Ponapean emphatic suffix -kenen and as the last element in KIR anne '2 sg demonstrative', albeit opaquely, and the inanimate suffix *-nini, as we have seen, may be cognate with the form -ni in the Southeast Solomons. If that is the case, and ULI has lost the forms, then the remaining phonological and lexical evidence is not very persuasive.

In addition, we have seen that there is a small but significant amount of lexical evidence for subgrouping PUA with ULI, and, moreover, that such a subgroup would agree with the PUA population's traditional history.

Let us return now to our discussion of PTK *d and of the putative rule *d > t in STK. If PTK *d was a fricative, then this rule has significance and is probably sufficient to justify the proposed subgroup. On the other hand, if PTK *d was a coronal stop of some kind and ULI has innovated a rule of spirantization, then the rule *d > t is of considerably less significance,[46] much of the justification for the STK group is lost, and it becomes more probable that PUA subgroups with ULI.

It is not possible at this time to determine which hypothesis is correct. Perhaps as more data become available on ULI, PUA, and PUA's neighbors Sonsorolese and Tobi, additional evidence for subgrouping PUA with ULI or with NTK will turn up, as well. (If it does, such evidence may also prove useful in determining the phonetic nature of PTK and PMC *d.) Meanwhile, let us propose the name Western Trukic

(WTK) for the possible subgroup of ULI and PUA (and, presumably, SNS and TBI), and set it up as an alternative to the earlier proposed STK subgroup. The two alternative genetic trees for TK are shown below.

Whichever hypothesis proves correct eventually, however, it is clear now that both ULI and PUA have had relatively extended periods of independent development.

(6) <u>Proto-Trukic</u>. The PTK language had at least the following consonants and vowels:

<u>PTK Consonant Phonemes</u>

*p		*t	*T	*c	*k
*p'					
		*d			
	*f				
*m		*n			*g
*m'					
		*l	*r		
*w					

<u>PTK Vowel Phonemes</u>

*i	*u	*u
*e		*o
	*a	

Of the consonants, *d may have been either a stop or fricative, but must have been phonetically fairly close to *t. Both *t and *T had fricative allophones--probably <u>s</u>--before the high front vowel, and *t had the same allophone before the high back vowels and, in a few instances, before nonhigh vowels, as well. In fact, PMC *t may have

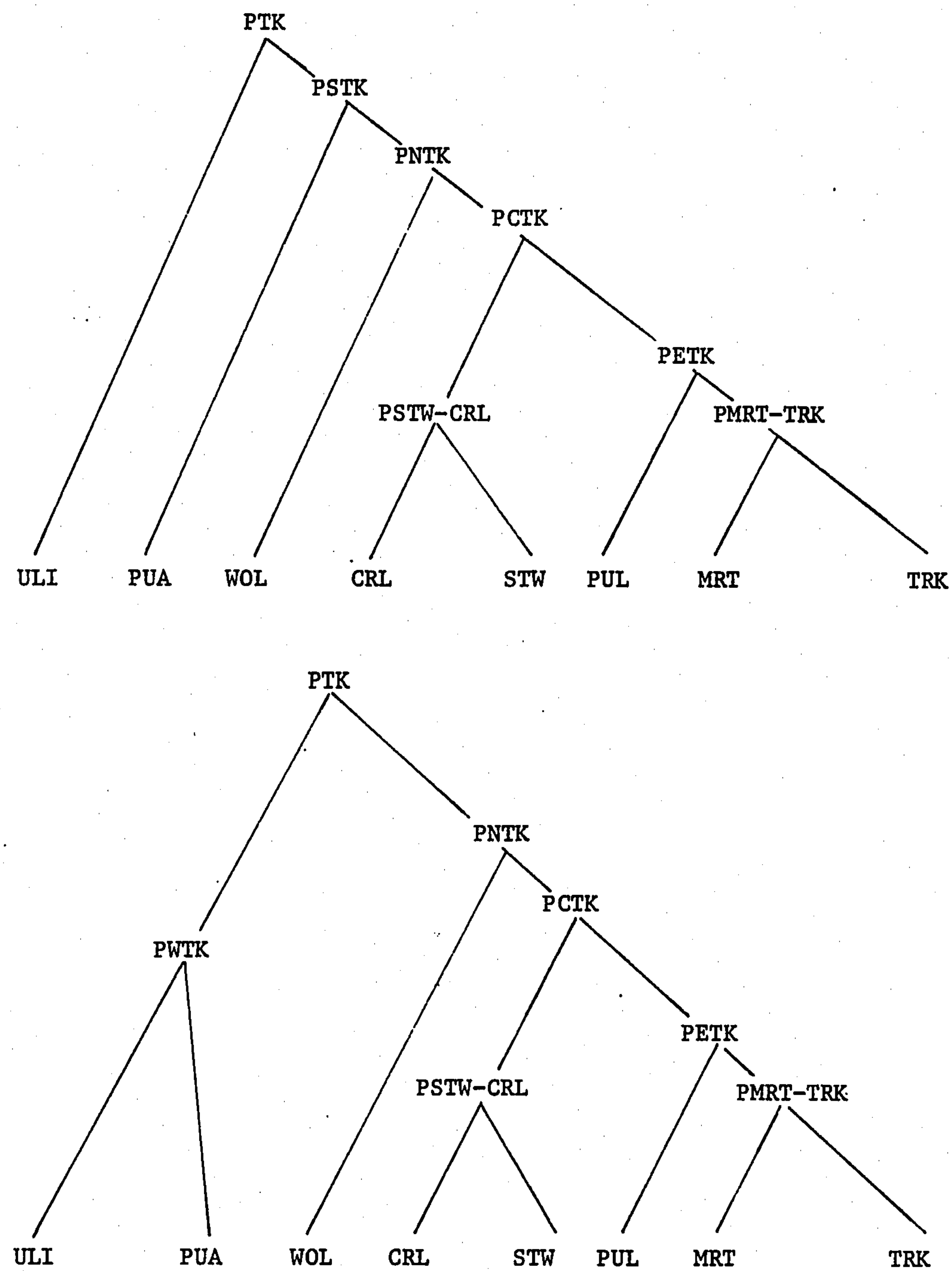


Figure 5. Alternative family trees for the Trukic subgroup

been lost in PTK before high vowels in a few forms. There is also a possibility that *n was denasalized when single in PTK, but that is not certain.

Still less certain is PTK vowel phonology, but it seems very probable that a rule devoicing final short vowels before pause was already in effect. It also is probable that considerable vowel allophony occurred in the proto-language, so that, for example, both *i and *u frequently merged with *ú in certain vowel environments. In addition, a rule of glide epenthesis probably occurred to break up at least some vowel clusters, perhaps especially high-vowel-low-vowel clusters, where the phonetics of the glide were determined by the preceding vowel.

One aspect of PTK vowel phonology that is reasonably clear is that there was a rule lengthening the first syllable of bimoric forms in phrase-initial position. This rule, described in detail by Rehg (in press a), must be reconstructed for an earlier stage in Micronesian.

For aspects of the PTK grammatical system and a discussion of lexical innovations in PTK, see chapter 2.

NOTES TO CHAPTER III

[1]This number is an estimate. As of this writing, there is no clear figure for the Carolinian population of Saipan.

[2]This figure combines the populations of the Satawan and Kutu municipalities in Truk State. Both municipalities are located in Satawan atoll.

[3]See note 1.

[4]The figure for the population of Pulo Anna is from Oda (1977:1,4), who reports that Pulo Anna island was inhabited by about eighteen people in 1977, but that there were more than thirty speakers of PUA living in Echang village, Koror, Palau. The preliminary Census figures indicate a population of 79 for Sonsorol municipality, which also includes Pulo Anna, but does not provide information on the total numbers of PUA speakers.

[5]The letter written by Fr. Cantova in 1922 indicates that the Yapese Empire was well-established at that time.

[6]Also included within Bender's "Ulithian" are Pulo Anna, Tobi, and the languages spoken on several atolls near Woleai.

[7]Quackenbush (1968:88-93) also presents a very brief discussion of a few aspects of morphosyntax in Trukic, such as the demonstrative and directional enclitic systems.

[8]Quackenbush regularly refers to "retention rates" in discussing his lexicostatistic computations, but as he does not reconstruct any Proto-Trukic forms or refer to any other reconstructions that might be retained in the modern Trukic

languages, it seems that a better term for what Quackenbush has computed is "shared cognate percentages."

[9]In set (1), Quackenbush confuses reflexes of PTK *ka-dduf- 'spit out, as particles from the mouth' (< POC *kasup) and PTK *kuTuf- 'blow out from mouth, spit'. The sets cited by Quackenbush are, nevertheless, problematic, and an attempt to account for them and other similarly irregular cognate sets is provided in section 3.3.2.5.

[10]See section 3.3.2.2 below.

[11]Goodenough and Sugita (1980), Sugita (n.d.), and my own work with Trukese indicate that Quackenbush is mistaken in claiming that any geminate nasals become denasalized in Trukese, although single nasal stops do lose their nasalization.

[12]It now seems certain that Lower Mortlockese has more than nine distinct vowel qualities (see section 3.3.1.2).

[13]It now appears that Woleai is closer phonologically to Satawal than Quackenbush thought. Section 3.3.4 below provides a summary of phonological developments in Trukic.

[14]In the standard Carolinian orthography, geminate <u>bw</u> is written <u>ppw</u>.

[15]The vowel symbols <u>ú</u>, <u>é</u>, and <u>ó</u> are not part of the standard Woleaian orthography, which instead uses <u>iu</u>, <u>eo</u>, and <u>oa</u>, respectively. I have substituted the former symbols both to permit more efficient comparison with the other Trukic languages and to enable vowel length to be shown conveniently. In the Woleaian

orthography, the digraph symbols ambiguously represent both short and long vowels.

[16]In the Woleaian orthography, geminate (nn) is written n. It will be written nn in the present work, however.

[17]Oda (1977) uses the symbols ɨ and ə̇ for the vowels that I have written ú and é, respectively.

[18]Minor changes have been made in Sohn and Bender's orthography. The symbol g has been substituted for their x, ng has been substituted for their g, and mw has been substituted for their ṁ. Vowel symbols are comparable, although Sohn and Bender used dots as diacritics rather than accents.

[19]My own brief informant work with a speaker of Ulithian has led me to believe that final geminates do occur phonetically, however. For example, the final consonant in the following forms is almost certainly geminate: tadd 'sea, seawater', mwaall 'man of', igg 'fish'.

[20]This is apparently a fairly recent development, however, as closely related Sonsorolese reflects f for PTK *f.

[21]It often appears that a glide is actually the reflex of *k in some languages (e.g., PUL yaham 'doorway' < PTK *katama). Other evidence makes it clear, though, that the *k was lost and the glide is prothetic.

[22]Paul Geraghty (p.c.) has suggested that PTK *kado 'large basket w. handle' may reflect an early Polynesian loan (cf. PPN *kato 'basket'). Gilbertese kora 'counting classifier for baskets' agrees with Trukic, however, in appearing to reflect a medial

palatal consonant rather than *t, and Gilbertese does not normally borrow Polynesian *t as r. Blust (1976) has pointed out other instances where PPN *t corresponds to palatal reflexes in other languages.

[23]TRK also attests pachaaw 'shark' which is an innovative development of an earlier *paccaaú 'hungry'. It is possible that TRK pókó 'shark' reflects a loan from Ponapean pako.

[24]The probable ULI cognate of PTK *fati 'to have sexual intercourse' is fáás 'penis'.

[25]There is another possibility, of course: that ULI d is innovative and the other languages retain an earlier stop. Implications of this possibility are explored at the end of this chapter.

[26]Dyen (1949) suggests that TRK ssúk 'hiccough' reflects PAN *ceguk, but that is very questionable. See section 4.1 for discussion.

[27]Grace et al. (1979) reconstructs only POC *kasup 'to spit', but include these three forms as witnesses. Trukic languages reflect POC *kasup as PTK *kadduf- 'spit, blow out from mouth'. The form in question here is different, and appears reconstructible for POC as well.

[28]Such shortening is not always obvious, however, especially in reflexes of disyllabic nouns like, for example, PMC *paa 'bait', due to the effects of a regular lengthening rule (see Rehg in press a).

[29]See Rehg (in press a) for an insightful discussion and explanation of this rule that is quite different from Dyen's.

[30]It is likely that consideration of affixation and cliticization, both of which have the potential to alter stress patterns, will assist in explaining some of the more irregular reflexes of PTK *au. For example, number (3) *pau 'arm, wing' has quite irregular reflexes of *au if it is assumed that the *a is stressed, but relatively regular reflexes if the stress falls on *u. Since *pau is an inalienably possessed noun, it most often has a possessive suffix, and since all the singular possessive suffixes in Trukic (and the construct suffix *-ni) are monosyllabic, any one of them would shift the stress onto the *u. That is, the reflexes of *pau in the table may reflect the suffixed form of the morpheme rather than the unsuffixed form. Indeed, Harrison (1977) argues that suffixed forms of inalienably possessed nouns are lexically distinct from unsuffixed forms. Similarly, the reflexes of PTK *kau '2 pl subject pronoun' and *kaú,i '1 pl exclusive subject pronoun', both of which are presumably regular if the second vowel in the cluster was stressed rather than the first, may be a result of the fact that subject pronouns are bound phonologically to the following form in the verb phrase.

[31]A close phonetic similarity between *n and *l may well have been characteristic of Proto-Micronesian as well, as Kiribati has merged them as n, and Marshallese reports several instances of doublets with n and l (Bender p.c.).

[32]These languages also reflect negative aspect markers of the type *ta, *tai, which are reconstructible for PTK.

[33]Hiroshi Sugita (p.c.) has also observed sequences of the type *Verb-a-a before directional morphemes in TRK, but has analyzed them as the result of an unusual type of regressive vowel assimilation that applied to the historical sequence *Verb-i-a. This is a possible solution, of course, but I know of no other instance in TRK or any other TK language where the sequence *ia assimilated to aa, and Sugita's proposal also fails to account for the forms in PUL that occur without following directional suffixes.

[34]It should be noted that TK *-nini is apparently reduplicated and thus might represent a formal innovation even should the Nggela form be cognate.

[35]An alternative analysis is that PUA -ilA reflects the PMC semantic in being restricted to human reference, and that the other TK languages have expanded the scope of PTK *-ira. Harrison (1978) appears to prefer this analysis.

[36]E. Quackenbush (1968:92) indicates that Ifaluk, a dialect of WOL, and Satawan in MRT also distinguish reflexes of PTK *-wa(t)u and *-(wo)o(t)u. The forms he provides are Ifaluk wayI 'out, towards the ocean', and wéyI 'toward the listener', and Satawan wéwU 'out, towards the ocean', wéwÚ 'toward the listener'. In my own work with speakers of WOL and MRT, however, I was unable to elicit these or similar forms. If valid, the Ifaluk forms listed by Quackenbush are somewhat problematical for the PTK reconstructions.

[37]The fact, of course, is that ULI does reflect both forms. It is unfortunate that there is no indication whether there is any distinction between the two forms in ULI.

[38]ULI mangi- and PUA mengi reflect PEO *mani 'think, remember', which is also reflected elsewhere in TK as the type *magi.

[39]Another possibility should be mentioned: that the CTK forms actually reflect POC *nopo 'stay, squat' and that WOL is independently innovative in developing a medial velar obstruent in logO. The fact that no other Micronesian languages appear to reflect *nopo, however, suggests that this alternative is perhaps less probable than the one proposed.

[40]Goodenough and Sugita (1980) indicate that TRK nú 'to regurgitate', which is almost certainly a reflex of POC *luaq 'vomit, spit', is reduplicated as TRK núúnú 'chew, eat, masticate'. Other TK languages reflect only the reduplicated form.

[41]Riesenberg (1976:105) cites the PUL form peŕá-n ayúfál 'tail of Ayúfál' in his discussion of Puluwat navigation terms. The form peŕa- is almost certainly cognate with the ULI and PUA forms, and thus suggests PTK *paca 'tail'.

[42]It is possible that PUA wangaetA 'when? (future)' is cognate with Nogugu pwa-nes, which has the same gloss. If so, then the irregular development of PUA wa- from earlier *p'a 'future' suggests the possibility that PUA towaI 'future negative', together with cognate forms in WOL and ULI (see section 3.4.1), may derive

historically from a compound *ta-p'a, where *ta- is a negative morpheme and *p'a is the future aspect marker.

[43]Data from Old Mapian, a now extinct language that was spoken until the end of the last century on Mapia (Kubary 1889) and appears to have been Trukic, suggests that the merger of *ñ̃ and *n may not have occurred in PTK. See section 4.5.

[44]For example, PTK *faifine 'woman' is reflected in TRK, WOL, PUA, and ULI, while PNTK *cao-p'udo 'woman' is reflected in all NTK languages, including WOL and TRK. Because of the overlapping, these forms are counted as two items. In contrast, all NTK languages reflect the type *kkap'u 'dull, blunt', while PUA and ULI reflect only the type *kua in the same meaning. Because of the complementary distribution, this set is counted as a single item.

[45]The choice of the symbol *z is partly due to the phoneme's correspondence to Geraghty's PEO *z (Geraghty 1979).

[46]The argument runs as follows: if PTK *d was a stop, it also corresponds to stop reflexes in Ponapeic, Marshallese, and Kosraean, and an r reflex in Gilbertese. Given these reflexes, it is very unlikely that the PMC phoneme could have been other than a stop.

[47]The rule would still be necessary, as *d and *t could not have been merged in PTK or even as recently as PCTK. (Note that while reflexes of *t are normally spirants before low vowels in CTK languages, *d is always reflected as t.) The rule would only have entailed a slight phonetic shift, however, and could have occurred independently in the different languages.

IV. TRUKIC AS A MEMBER OF THE MICRONESIAN SUBGROUP

In this chapter, it is established that the Trukic languages group together with Kiribati, Marshallese, Ponapeic, and Kosraean as the Micronesian subgroup of Oceanic. Phonological, grammatical, and lexical evidence is presented as support for that subgroup. Evidence is also presented for the following subgroups within Micronesian: (1) Central Micronesian consisting of Kiribati, Marshallese, Ponapeic, and Trukic; (2) Western Micronesian, consisting of Marshallese, Ponapeic and Trukic; and (3) Trukic-Ponapeic. In addition, some phonological evidence is examined which suggests that the Ponapeic languages may have derived from within Trukic rather than as a coordinate branch of a Trukic-Ponapeic group. The chapter concludes with a very speculative account of population dispersals within Micronesia.

4.1 Overview

The probability that certain languages within geographical Micronesia are very closely related to each other has been recognized by American linguists since shortly after World War II, when Matthews (1950) considered five languages in Micronesia and decided that the Chamorro and Palauan languages were of "a marginal Indonesian type," while the languages of Ponape, the Marshalls, and the Gilberts comprised a "nuclear non-Indonesian type." In his review of the Micronesian language situation, Bender (1971:429) adopted Matthews' term "nuclear," and proposed that the nuclear Micronesian group consisted of the languages of the Gilberts, the Marshalls, Kosrae, Trukic, and Ponape together with its neighboring atolls of Mokil, Pingelap, and Ngatik. Chamorro and Palauan were specifically excluded from the nuclear group, and Yapese and Nauruan were listed as "questionably nuclear" (1971:434-435).

On concluding his article, Bender (1971:457) wrote, "Most of the languages in Micronesia constitute a distinct subgroup of the Austronesian family. . . ." But he went on to state that no clear evidence for the integrity of that group had been located. "No doubt," wrote Bender (1971:458), "lexical innovations will be found when they are searched for systematically."

In the ensuing twelve years, however, despite the efforts of several linguists working intensively on various Micronesian languages and the publication of extensive grammars and/or dictionaries on several of those languages, no such innovations or other solid evidence for nuclear Micronesian have been recognized and presented. Marck (1975:9-13) proposed eleven Proto-Micronesian (PMC) lexical innovations, of which two--*lewe 'tongue' and *pike [sic] 'sand'--still appear to be valid, but two possible innovations are clearly insufficient evidence.

In a later paper, Marck (1977) presents what he had identified as the regular consonant correspondences among Micronesian languages, and establishes reconstructions for each set. Marck's correspondence sets and reconstructed phonemes are repeated in Table 20.

Table 20

Micronesian Consonant Correspondences, with Tentative PMC Reconstructions (after Marck 1977)

PMC	*p	*p'	*f	*m	*m'	*t	*t'	s	*S
KIR	b	b'	∅	m	m'	t,∅[b]	r	r	r
MRS	p	b	y	m	m'	j	d	t	t
KSR	p	f	∅	m,∅	m	t,s[c]	sr	t	∅
MOK	p	pw	p[a],∅	m	mw	j,∅[d]	s	d	d
PON	p	pw	p[a],∅	m	mw	s,∅[d]	t	d	d
TRK	p	pw	f	m	mw	s,∅[e]	ch	t	t
PUL	p	pw	f	m	mw	h,∅[e]	ŕ,cc	t	t
CRL	p	bw,ppw	f	m	mw	s,∅[e]	sch,tch	t	t
WOL	p	b,ppw	f	m	mw	t,s[e]	sh,ch	t	t
ULI	p	b,ppw	f	m	mw	t,s[e]	c	t	t
SNS	p	bw,ppw	f	m	mw	t,d[e]	s,cc	t	t

PMC	*l	*n	*r	*k	*x	*ŋ	*ñ
KIR	n	n	∅	k,∅[b]	∅	ng	n
MRS	l,l'[a]	n,n'[a]	r	k	∅	g	n
KSR	l	n	l,r[h]	k	k	ng	∅,l[a]
MOK	l	n	r	k	r	ng	∅
PON	l	n	r	k	r	ng	∅
TRK	n	n	r	k,s[f],∅[a]	∅	ng,n[g]	n
PUL	l	n	r	k,∅[a]	∅	ng	n
CRL	l	l	r	gh,kk	∅	ng	n
WOL	l,nn	l,nn	r	g,kk	∅	ng	n
ULI	l	l	r	g,kk	∅	ng	n
SNS	l	r	l	g,kk	∅	ng	n

[a]before *a
[b]either *t or *k is normally lost when the other phoneme occurs in the same word in KIR
[c]before *i and *a
[d]before *i, *u, and *e
[e]before nonlow vowels
[f]before *i (occasionally)
[g]before *i
[h]less prominent than <u>l</u>, but not rare

Several corrections need to be made to the TK correspondences proposed by Marck before discussing more substantive issues. Evidence for these corrections was presented in chapter 3. The ULI geminate reflex of PMC *p' is not a geminate stop, as Marck indicates, but a geminate fricative. TK reflexes of PMC *t, as we have seen, are not at all as clearcut as Marck suggests. The CRL reflexes of PMC *k are normally ∅, gh, kk, where ∅ is the reflex before low vowels if the *k is not also preceded by a high vowel. The geminate reflex of PMC *r in WOL is ch. TK reflexes of PMC *ñ are as follows: TRK n, PUL n, CRL l, WOL l, nn, ULI l, SNS r. That is, they are the same as for PMC *n. Other corrections for Marck's suggested correspondences among the other MC languages will be brought up later in this chapter.

Marck states that he reconstructed a distinction between PMC *s and *S solely on the basis of KSR, where *S is lost, but notes that *S often appears to correspond to POC *ns. He reconstructs PMC *x solely on the basis of reflexes of POC *waŋka 'canoe', but states that he "felt it more prudent to suggest that this single etymology gave the basic outline" of the Micronesian reflexes of POC *ŋk. Subsequent evidence has proved him correct in this decision.

Although he does not specifically reconstruct them, Marck also suggests the strong possibility of one additional PMC phoneme, and perhaps another one as well. The putative proto-phoneme that has the most support of those two is credited by Marck to Goodenough. According to Marck, Goodenough claims that TRK has systematically retained a distinct reflex of Dempwolff's PAN *ḱ before nonlow vowels.[1] In support of this claim, Marck states that Goodenough has proposed the following cognate sets:

(1) PAN *ḱiḷit 'to squirt out': TRK siri- 'urine', PUL hiri- 'urine'.

(2) PAN *ḱəguk 'to hiccough': TRK ssúk 'hiccough', PUL hhék 'hiccough'.

(3) PAN *ḱamuk 'to take care in eating': TRK ssomw 'omnivorous, fond of all kinds of food, not particular about food', Mokilese (MOK) wosomw 'ravenous, voracious'.

It is worth taking time to discuss these sets in some detail.

It was stated in section 3.3.2.5 above that although PAN *c (Dempwolff: *ḱ) may be reflected in PTK *Tiri 'urine', no other forms in TK have been found that clearly reflect the PAN phoneme. That claim is still made; both of Goodenough's other proposed cognate sets almost certainly do not reflect the PAN etyma in question.

Blust (1978) has suggested that TRK ssúk 'hiccough' may reflect a different PAN etymon: *C,t,Teguk 'gulp'. That possibility, however, is not necessary in order to question the comparison suggested in cognate set (2). The first meaning given by Elbert (1975) for PUL hhék is 'to have diarrhoea'. As such, the form is clearly cognate with CRN ssúg 'to have diarrhea; sound of an explosion of air or liquid, sound of a hiccough' and CRL ssúgh 'to have diarrhea, to have watery stool' and the CRL variant ssigh 'expression of surprise or alarm; to spurt out, especially of blood; sound of an explosion of air or liquid; sound of a hiccough'. Speakers of both Carolinian dialects whom I have consulted are adamant that the respective forms do not refer to the act of hiccoughing, but only to the explosion-like sound of a hiccough. The form for 'to hiccough' in CRL, CRN, and all other TK languages except TRK and MRT is a reflex of PTK *maderu 'to hiccough', which is cognate with GIL marei and reflects POC *sedu 'hiccough'. (Other Oceanic languages that reflect a *ma- prefix for this form include Rotuman masori, Gitua mederuru, and Fijian macedru, all with the meaning 'hiccough'.)

The Carolinian forms for 'diarrhea, etc.' are consistent in reflecting a pre-Carolinian high vowel, which could also be reflected by the TRK form ssúk. None of the vowels in any of the TK cognates of this form could conceivably reflect a POC *o, which would be the expected development of PAN *e (Dempwolff: *ə). Thus, there are three reasons for rejecting this proposed comparison: (1) the TK forms are formally incompatible with *ceguk in that all languages except PUL suggest CTK *t,Tuku; (2) the glosses of all TK languages except TRK suggest that the original meaning of the form was something like 'explosion of liquid or air, diarrhea'; and (3) other TK and MC languages show that the directly inherited form for 'to hiccough' was PMC *mad,zeru, a reflex of POC *(ma-)sedu.

The proposed cognate set for PAN *camuk 'to take care in eating' is suspect at face value, in that the glosses for TRK and MOK are rather different from Dempwolff's reconstructed gloss. That is, they imply lack of care in eating (cf. Rotuman jamjamu 'to eat sparingly', Tongan hamu 'to eat only one kind of food'). In addition, the initial syllable of the MOK form wosomw has no obvious source unless it is the causative prefix *ka-, but *k is normally retained in MOK.[2] Two forms in other TK languages that are cognate with TRK ssomw have been identified: CRN ssomw, CRL ssumw 'to eat a lot, to have a good appetite'. Neither of these languages normally raises the historical vowel *a before *-m'u, but reflects it as o in that environment. Thus, this comparison is formally suspect as well.

The reflexes of both of the etyma just discussed, however, would be irregular if reconstructed with *t, in that PTK *t is most commonly lost in CTK before nonlow vowels. Thus, they are similar to reflexes of PTK *Tiri 'urine' in this respect. Marck lists four other cognate sets which he identifies as having similarly unusual correspondences. These are:

(4) KIR m'atie, MRS m'aje'y, Ponapean (PON) asi, TRK mwesi, PUL mwahey, CRL mwusi, WOL mwosiyA 'sneeze' (to which can be added MRT mwasey, STW mwosi, PUA mwodiA, and ULI mwusi).

(5) KIR ting, MRS jig, KSR sucng, MOK jing, PON sing, TRK sing, PUL hing, CRL sing, WOL singI 'fart' (to which can be added STW sing, SNS dingI, and ULI sing).

(6) KSR sinkac 'wall', TRK sinéw 'wall plate beam', TRK tinéw 'wall plate (longitudinal beam of a house)', PUL hiinéwú 'wall plate in a house, to serve as a wall plate', WOL súnA '?'.

(7) KSR sihk 'white-tailed bird', MOK jik 'sp. of bird', PON sihk 'sp. of bird', TRK wúúk 'white-tailed tropic bird or bo'sun bird (Phaethon lepturus)', PUL wúk- 'tropic bird', WOL súgÚ 'white tropic bird with long tail' (to which can be added MRT úúk 'sp.

of bird', STW súúk 'bird with long tail', and CRL súúgh 'white bird with long tail').

PTK *Tigi 'fart' has already been discussed, and it has been suggested that the non-Trukic reflexes appear to require a PMC reconstruction *Tigi as well (although only TK and PP have reflexes that would be irregular for a PMC *tigi). TK reflexes of the form for 'sneeze' suggest a PTK *m'a,oTia, which could reflect a PMC *m'atia or *m'aTia (the PON form is almost certainly not cognate). Marck's other suggested forms are more problematic. Aside from the TRK doublet in set (6), it is difficult to reconcile the KSR form with those of TRK and PUL, both in terms of the KSR k and of the final vowel. Moreover, the Woleaian dictionary (Sohn and Tawerilmang 1976) does not attest any form súnA, but has the form súúrA 'supporting pole of a house, house post'. That form, however, reflects PTK *tura 'housepost, pillar', which is also attested in MRS.

As noted in section 3.3.2.5, Marck's final set (7) has somewhat different reflexes from the others in that the ETK languages have lost the initial consonant, thus making it more likely that this set involves reflexes of *t. As observed in the same section, however, likely cognates of this form which occur with palatal reflexes in Fijian and Efate, and with reflexes of PPN *t in Polynesian, lead Blust (1976) to reconstruct Proto-Fijian-Polynesian *ciko 'kingfisher'. It is prudent, thus, to reconstruct PTK *t,Túku, PMC *t,Tiku until more evidence is available.

While the evidence for PTK *T is quite strong, and that for Proto-Ponapeic (PPP) *T only slightly less so (see section 3.3.2.5), at present the only strong evidence for PMC *T is the form for 'fart', and the likelihood that the Micronesian forms in this meaning reflect PEO *ziki 'fart', with its palatal initial. Thus, for PMC there are (at least) two possible scenarios. One is that PMC attested *T in *Tigi 'fart' and in a few other forms (including, possibly, a PMC *Tiri 'urine'), perhaps continuing an earlier palatal phoneme or perhaps innovating the *T. The second possibility is that PMC innovated the lexical form *tigi 'fart', and that the development of *T was a later TK-PP occurrence. There are no obvious grounds on which a decision can be made regarding which possibility is more likely to be correct, but let us tentatively reconstruct PMC *T and wait for further evidence to help us determine its true status.

Marck also suggests the possibility of a rounded *k' in PMC, but is able to present only one promising cognate set in support of it: KIR kano-a 'to engage in twisting (sennit) strands', MRS qqal' 'sennit', PON ngkoal 'to make sennit', PUL yólóól 'sennit', WOL galogalO 'sennit' < probable PMC *k'alo 'sennit, to make sennit'. Other TK forms can be added to this cognate set: MRT ólóól 'to twist fiber to make sennit', STW yólóón 'to make sennit', PUA kanokanO 'sennit string', ULI golgól 'sennit'. KSR kokoali 'to twist sennit into a rope' also appears to be cognate with the other MC languages, and its final vowel makes it likely that the MC languages continue an earlier etymon which is also reflected in, for example, Fijian qali 'to braid sennit' and Tongan pa-kali 'to tighten by twisting'.

There is no evidence for a rounded *k' in this form in the KIR, PP, or TK reflexes, but Marck points out that the phoneme q in MRS normally reflects historical *k before a back rounded vowel, which there is no evidence for in this form. In the absence of such a vowel, Marck feels justified in suggesting PMC *k'. The KSR form kokoali may provide further support for Marck's reconstruction in that the first o might reflect an *a that was rounded between two round consonants and the oa is phonetically a centralizing diphthong. However, not enough is known as yet about historical developments of KSR vowels to be certain.

This is very slim evidence on which to reconstruct a proto-phoneme, and although Bender and Wang (1983:29) have stated that there are other instances where MRS q occurs before what are historically nonround vowels (and where MRS k occurs before historically round vowels), it is very possible that these developments are internal to MRS. Accordingly, PMC *k' will not be reconstructed for the present study.

Marck's work (1977) was supplemented by approximately 300 MC comparison sets, each of which potentially reflected a PMC etymon. Since the presentation of Marck's paper, those comparisons have been evaluated, added to, and in some cases discarded, by a group of scholars working at the University of Hawaii. At present, upwards of 1,000 putative PMC reconstructions have been compiled with supporting data (Bender et al. 1983; see also Bender and Wang 1983 for a summary of this work).

On the basis of this work and of individual research, a number of important papers on Micronesian languages have appeared in the last few years, including Bender and Wang (1983), those in Bender (in press), and the separately published works of Harrison (1978 and 1982). Many of these papers have dealt specifically with historical issues, yet none has attempted to provide concrete evidence for a Micronesian subgroup of Oceanic.

Such evidence will be provided in this chapter. In addition, the internal relationships among MC languages will be examined, and an argument will be presented that KSR was the first language to split off from the proto-community, and KIR the second. Further evidence shows that PP and TK subgroup together, and, in fact, may suggest that historically there was no Trukic group that was distinct from Ponapeic.

4.2 Phonological evidence for a Micronesian subgroup

Bender (1971) suggests five branches of his proposed nuclear Micronesian subgroup: Gilbertese (Kiribati: KIR), Marshallese (MRS), Kosraean (KSR), Ponapeic (PP), and Trukic (TK). He also describes Yapese (YAP) and Nauruan (NAU) as "questionably nuclear," primarily due to a lack of data on those languages. Jensen's Yapese-English Dictionary (Jensen 1977a) and Yapese Reference Grammar (Jensen 1977b) have improved the data base for YAP considerably, and it now appears probable that YAP is not a nuclear Micronesian language as the term is used by Bender. The data available for NAU have also somewhat improved (Nathan 1973, n.d.), but not sufficiently to enable one to make a definite decision whether the language is Micronesian or not.

Part of the problem, to quote Nathan (1973:480), is that in NAU "radical phonological changes, particularly loss, make the recognition of cognates difficult [and that] NAU appears to have replaced a large amount of its core vocabulary, in many cases with periphrastic expressions, and in some other cases with borrowings [from, for example, KIR]." These difficulties are multiplied by the general lack of good grammatical and lexical data. However, NAU does appear to attest to a few forms that are typical of other MC languages, including e-bwood 'nose', nima- 'possessive classifier for drinkable objects', and mmwo 'good'. Thus, although not enough is known about NAU to consider its genetic position systematically, we shall examine relevant data from the language whenever possible in the following discussion.

Bender (1975) presented data collected by Kubary (1889) at the end of the last century on the now extinct language of Mapia (called Old Mapian in Goodenough and Sugita 1980), and suggested that much of the data appear "Micronesian." These data will be re-examined at the end of this chapter in the light of the evidence for a Micronesian group.

Among the five branches of MC tentatively identified by Bender (1971), the KIR, MRS, PP, and TK branches show reasonably clear phonological developments, while KSR is quite problematic. In the next subsection, we shall examine the consonant correspondences of the first four branches with respect to Marck's reconstructed PMC and also with POC. Selected developments among the vowel systems of these languages will also be examined. Then, in the following subsection, we shall examine the developments of the KSR consonants from POC, with reference also to PMC. The results of these two subsections will be combined and interpreted in the concluding subsection.

4.2.1 Phonological developments in KIR, MRS, PP, and TK

The consonant correspondences of these four branches of MC to PMC and to POC are given below. MOK and PON represent PP. PTK reconstructions are used to represent the TK branch, but with the understanding that these reconstructions represent a developmental stage that is probably at least 2,000 years earlier than the other witnesses.[3] For subsequent developments of PTK, see chapter 3.

POC	*p		*mp	*ŋp	*k	*ŋk	*q	*m	*ŋm
PMC	∅	*f	*p	*p'	*k	*x	∅	*m	*m'
KIR	∅	∅	b	b,b'	k,∅	∅	∅	m	m,m'
MRS	∅	∅	p	b	k,k',q	∅	∅	m	m'
MOK	∅	p,∅	p	pw	k	r,∅	∅	m	mw
PON	∅	p,∅	p	pw	k	r,∅	∅	m	mw
PTK	∅	*f	*p	*p'	*k	∅	∅	*m	*m'

POC	*n	*ñ	*ŋ	*w	*y	*l	*d	*R
PMC	*n	*ñ	*g	*w	∅	*l	*r	∅
KIR	n	n	ng	w	∅	n	∅	∅
MRS	n,n'	n,n'	g,g'	w	∅	l,l'	r,r"	∅
MOK	n	∅,n	ng	w	∅	l	r	∅
PON	n	∅	ng	w	∅	l	r	∅
PTK	*n	(*n)	*g	*w	∅	*l	*r	∅

POC	*nt *nd	*s	*ns	*j	(*nj)		*t
PMC	*t'	(see comments below)				(*T)	*t
KIR	r	r	r	r	r	t	t,Ø
MRS	d	t	t	t	t	j	j
MOK	s	d	d	d	d	j	Ø,j
PON	t	d	d	d	d	s	Ø,s
PTK	*c	*d	*d	*d	*d	*T	*t,Ø

POC *p was regularly lost in PMC before round vowels, and the remaining reflexes have subsequently been lost in KIR and MRS as well. PMC *f (< POC *p) is also most commonly lost before historical *i in PP, although there are exceptions like MOK, PON <u>pil</u> 'choose, select' (< POC *pili), and PON <u>pir</u> 'turn, spin, twist' (< PMC *fira 'plait, braid, weave'). Elsewhere, POC *p is normally <u>p</u> in PP.[4] (See Rehg (in press b) for a very thorough account of the history of PON phonology.)

POC *mp merged with *ŋp as labiovelar *p' before round vowels in PMC. Reflexes of PMC *p' are remarkably consistent across the four branches. There are 65 cognate sets in the data where at least one language has a labiovelar stop and at least one other branch has a cognate form, of which TK reflects 54 items, PP 50, MRS 50, and KIR 30. Of these reflexes, TK has labiovelar *p' in all but one form (PMC *p'ugu 'fall'), PP has a nonlabiovelar in only two forms (PMC *p'ono 'stopped, blocked', where it reflects *p, and the very problematic form for 'basket' discussed earlier in section 3.3.2.5, where PON <u>ohdou</u> may show loss of *p'), and MRS has a nonlabiovelar only in its reflex of PMC(?) *p'ugu 'correct', where it shows loss. KIR does not distinguish *p from *p' before round vowels, where b is written although it is phonetically velarized. As a result, only twelve apparent KIR reflexes of *p' occur in the data in potentially contrasting environments. Of these twelve, only one is indicated as nonlabiovelar: KIR baba 'foolish, silly, crazy, stupid' probably reflects PMC(?) *p'aip'ai 'stupid'.

MC reflexes of POC *k are quite regular when the internal developments in TK are disregarded (see chapter 3). The different MRS reflexes are determined by vowel environments, so that MRS k' occurs before historical *a, and rounded MRS q occurs before historically rounded vowels (but see Bender and Wang (1983:29) for a brief discussion of some possible irregularities). Marck (1977) pointed out that KIR often loses *k in morphemes that also reflect *t, and although Trussel (p.c.) has since shown that this development is not as regular as Marck had thought, the analysis seems to be generally valid.

MC reflexes of POC *ŋk are also fairly straightforward (at least among the four branches that we are considering). Since Marck's reconstruction of PMC *x was based on only a single form, it is useful here to examine other comparisons that have since been identified:

Gloss	PMC	KIR	MRS	MOK	PON	PTK
'twin'	*p'exa	bwebwe	béw	umwpwoar	mpwer	*p'ea
'canoe'	*waxa	waa	waha-	war	wahr	*waa
'frame'	*waxa	waa	waha-	--	--	*waa
'1 sg poss pron'	*-xú	-u	-hi	-i	-i	*-i
'bathe, bath'	*zuxuzuxu	--	tiwtiw	duhdu	duhdu	*dúúdúú

All but the first of these forms have well-attested PEO or earlier reconstructions with *ŋk (Geraghty 1979:150-151): *waŋka 'canoe', *waŋka 'frame', *-ŋku '1 sg possessive pronoun', and *zuŋku 'bathe'. Thus, it appears that PP languages reflect earlier *ŋk as r before low vowels and lose it elsewhere, while other MC languages lose it everywhere (but see the following subsection for KSR reflexes).

All MC languages lose POC *q in all environments, making it almost certain that it was lost in the proto-community. There is one comparison, however, that appears to show an aberrant reflex of *q in PP and KSR: POC *mayaq 'shy, ashamed' is apparently reflected in PON mahk 'reserved, shy', MOK mehk 'ashamed or embarrassed, bashful, shy', and, even more problematically, in KSR mwekihn 'ashamed, shy, bashful' (cf. KIR maama, PTK *maa). The fact that the *q in this form is a final consonant makes these reflexes doubly irregular, as MC languages regularly reflect POC final consonants only before a suffix, as in transitive verbs. It is, therefore, most probable that the PP and KSR forms given above reflect either innovations or borrowings. Harrison (p.c.) suggests that the PP forms may reflect a fossilized *-aki suffix, but Tongan maa'i 'to be ashamed of', makes the borrowing hypothesis also likely, and suggests that the source was Tongan.

POC *m merged with *ŋm as a labiovelar in PMC in much the same way as was described above for POC *mp and *ŋp. Here, too, the reflexes of the PMC daughter languages are extremely consistent in reflecting the distinction between PMC *m and *m'. There are 36 comparisons in the data where *m' can be reconstructed for PMC or for some other early stage in MC. TK reflects 31 of these, PP 29, and MRS 27, and in each case the labiovelar correspondence is regular. Also regular among these languages are the correspondences with reconstructed PMC *m.

KIR reflects 30 of the 36 etyma with PMC *m', of which 15 occur before a nonround vowel in modern KIR and thus could be expected to reflect the distinction between *m and *m'. Of these 15, 14 are consistent with the other languages. The exception is <u>wau</u> 'good, well, seemly, fitting', which is probably cognate with PON <u>mwahu</u> 'good', PTK *m'aau 'good, proper, attractive, healthy', and KSR <u>wo</u> 'good, becoming, satisfactory, agreeable'. This latter form, which is regular for KSR, suggests that KIR <u>wau</u> may be a KSR loan.[5] There is also one form in KIR where a labiovelar <u>m'</u> appears to reflect PMC *m, although the reconstruction is problematical in some respects. PMC *mara(w)u 'thirsty' has been reconstructed on the basis of PTK *maaru (with metathesis), MRS <u>marew</u>, MOK <u>mareu</u>, KSR <u>maluh</u>, all with the meaning 'thirsty', and KIR <u>m'au</u> 'dry, dried, dehydrated'. Aside from its irregular reflex of the initial consonant, however, the KIR form is also irregular in failing to show a long vowel. These facts, together with the somewhat aberrant gloss, make it questionable that the KIR form is cognate. Even if it is cognate, though, the regularity of the other TK, MRS, PP, and KIR reflexes of PMC *m and *m' remains striking.

PP is the only branch of the four that we are considering in this subsection where the historical distinction between *n and *ñ is reflected in the modern languages. PON loses *ñ in all environments, while it appears that MOK merges *ñ with *n as n after a high vowel and loses it elsewhere (Harrison p.c.). Thus, not all instances of *ñ had been lost before the break-up of PPP. Comparisons supporting this analysis are:

(1) POC *ñamu 'mosquito' > PON amwi-se, MOK amw-je (cf. MRS n'am', PTK *nam'u).

(2) POC *ñoñum 'morinda citrifolia' > PON wei-pwul (cf. KIR non, MRS ne'n, PTK *neni).

(3) POC *poñu 'turtle' > PON wehi, MOK woi (cf. KIR on, MRS we'n, PTK *wonú).

(4) POC *-ña '3 sg possessive pronoun' > PON Ø, MOK -n (after nouns ending with high vowels), Ø (after nouns ending in nonhigh vowels) (cf. KIR -na, MRS -n, PTK *-na).

(5) POC(?) *-ñai(n)sa 'when?' > PON i-ahd (cf. PTK(?) *i-naeda).

(6) PMC(?) *mi,eña 'be, live, stay' > MOK mine, PON mie (cf. KIR mena, PTK *mina).

(7) PMC *ñau 'delicious, sweet' > PON iou 'sweet, delicious, tasty' (cf. MRS nnaw, PTK *nnau).

(8) POC *ñoRa 'yesterday' > PMC *ñañoa > PON, MOK aio (cf. KIR -nanoa, MRS yi-nney, PTK *nanewa).

Paul Geraghty has observed a tendency in MC languages for earlier *n to become a velar nasal in the environment /a__i (Geraghty p.c.). This rule is not regular, however, as Table 21 shows.

As the table shows, doublets occur in some MC languages. In MRS, the doublet is dialectal, with kag 'eat' in the western Ralik dialect and kan in the eastern Ratak dialect. In KIR, the doublet is grammatical, with kang used with plural inanimate objects and kana with singular ones. Note that both KIR reflexes may be regular with respect to the proposed rule, however, as kang attests a final *i while kana does not. Problematic, however, is KIR kanna 'to eat it' < *kani-a. The KSR doublet occurs in different lexical items: lahl=kuhng 'sharp, smart, intelligent (lit.: inside-sharp)' and tu-kunkun 'not sharp', where the initial element probably reflects a negative prefix. Despite the doublets and the failure of MRS to show a velar nasal in its reflex of *tani 'from, source', it is striking that the velar nasal reflex occurs across MC in only the same five etyma and not at all in the other six.

There is one other instances where MC languages agree in reflecting a velar nasal where a coronal nasal has been reconstructed for POC: POC *n,ñunu 'shadow' > PON ngeni-, MOK ngeni- 'soul, spirit, shadow', PTK *genu 'shadow, reflection, image, ghost, spirit', KSR nguhn 'shadow, reflection, spirit'. The height of the first vowel in this proposed comparison is irregular as well, though.

MC reflexes of POC *ŋ are very regular, with the variant reflexes in MRS the result of vowel conditioning. For PMC, the symbol *g is

Table 21

Alveolar and Velar Nasal Reflexes of Earlier *n in the Environment /a__i in MC Languages

Reconstruction	Gloss	KIR	MRS	MOK	PON	PTK	KSR
PEO *tampani	'help'	--	g	--	--	*g	--
POC *tani	'from, source'	ng	n	ng	ng	*g	--
PEO *kani	'sharp'	ng	g	ng	ng	*g	ng,n
POC *kani	'eat'	ng,n	g,n	ng	ng	*g	ng
PEO *mani	'think, remember'	--	g[6]	--	--	*g	ng
POC *daqani	'day'	n	n	n	n	*n	n
POC *tani	'skin disease'	n	n	n	n	*n	n
PEO(?) *pani	'sea cucumber'	n	n	n	n	*n	--
PMC *wa(a)ni	'pumice'	n	n	n	n	*n	n
PTK *itani	'put, place'	--	--	--	--	*n	--
PTK *m'acani	'want, desire'	--	--	--	--	*n	--

used in place of Marck's *ŋ for ease in typing. It continues to represent a velar nasal, as in the PTK reconstructions.

MC reflexes of POC *w, *y, and *l are also quite regular. With respect to the latter proto-phoneme, it should be noted that KIR has merged it with *n and that MRS shows a few n,l doublets. The regular MRS variants of *l are again conditioned by the following vowel.

With a very few sporadic exceptions in MOK, POC *d is also reflected very regularly among these four branches of MC. It is lost in KIR and reflected as r in MRS, PON, MOK, and PTK. The exceptions in MOK are palar 'thunder' > PMC *parara, and woal 'fish gill' < PMC *oro. POC *R is also lost in KIR, but may be lost or merged with PMC *r in the other languages. Table 22 displays all the MC comparisons involving POC *R that have been identified to date. KSR data are also included so that the pattern, which is strikingly consistent, can be seen more completely.

When the table is examined, it is quickly apparent that the TK, PP, and MRS branches agree in every form regarding the loss of POC *R or its merger with POC *d. KIR, of course, loses *R in every form. At first glance, KSR appears to disagree with the other three branches in six of the eighteen forms that it attests. However, two of those forms--KSR acsr 'current of water' and ahlko 'blood vessel'--are very questionable cognates (see following subsection), and the other four appear to be explainable on principled grounds.

KSR tok 'back' is almost certainly cognate with the type *takuru attested by the other languages, but appears to reflect loss of the entire final syllable (cf. KSR tohkoh 'its back'). I believe that

Table 22

MC Comparison Sets Involving Reflexes of POC *R

POC	Gloss	PTK	PON	MOK	MRS	KIR	KSR
*Ruqa	'neck'	*ua	--	--	--	--	--
*Ruja	'load, cargo'	*uda	--	--	--	ura-ki	utuh-k
*Ruŋma	'house'	*im'a	ihmw	imwe-	yim'e-	um'a	yuwac, lohm
*kuRıta	'octopus'	*kúúta	kihs	kihj	qe'ye't[a]	kiika	koet
*ñoRa	'yesterday'	*nanewa	aio[b]	aio[b]	yi-nney	nanoa	ekuh-yoh
*tapuRi	'conch shell'	*tawii	sewi	jowi	--	tau	--
*paRi-	'recip. pref.'	*fai-	pa-	pe-	yayi-	ai-	a-
*paRı	'ray fish'	*fai	peh-	poa	yayi-	--	sii-fac[c]
*paquRu	'new'	*fau	--	--	--	--	--
*nduRi[8]	'bone'	*cuu	tih	si	diyi-	rii	sri
*(n)sakaRu	'reef, coral'	*dakau	deke	doakoa	tekay	rakai	tuhka
*ŋpaRu(n)su[9]	'nose'	*p'audu	--	-pwoahdi-	bawat	b'airi	fwac
*paRu	'hibiscus'	*-fau	--	--	--	ki-aiai	--
*qaRusa	'current'	*auda	ahd	ahd	haye't	aira	acsr(?)[d]
*(n)daRa	'blood'	*ccaa	nta	insa	ddah	raraa	srah
*ŋaRa[10]	'wild duck'	*gaagaa	--	--	nahnah	--	--

Table 22. (Continued) MC Comparison Sets Involving Reflexes of POC *R

POC	Gloss	PTK	PON	MOK	MRS	KIR	KSR
*Rapi	'evening'	*faka-afi	--	--	--	--	ekuh
*uRa	'vein'	*waka	--	--	ye'ke'y	--	ahlko(?)[d]
*qapaRa	'shoulder'	*afara	apara-	aproa[e]	hayera-	--	pahlpahl[f]
*paRat(a)	'NW monsoon'	*parata	nan-par	--	--	--	--
*Ratu(s)	'hundred'	*-garatu[g]	--	--	--	-ngaa(?)[g]	--
*maRa	'light in weight'	*mara	marahra	marahra	merah	--	muhlahlah
*wakaR	'root'	*wakara	wakar	--	wekar	wakaa	okah
*takuRu	'back'	*takuru	--	jarki-	jaqir	akuu	tok
*taŋiRi	'k. of fish'	*tagiri	--	--	-jagir	tangii	--
*saRe	'rip, tear'	*daari-g	--	--	--	rae	se(?)[d]
*puRi	'wash'	*uru	--	--	we'r-	--	--

[a]MRS t is irregular here

[b]regular development from *nanoa

[c]KSR f is irregular

[d]questionable cognate

[e]3 sg form

[f]gloss is 'to carry on shoulder'

[g]counting classifier for thousands

similar loss of the final syllable occurred in the KSR reflex of the type *wakara 'root', and that KSR okah 'root' in fact reflects a possessed form *waka-na. KSR se 'rip, rend' may not reflect POC *saRe, but a type *njei which appears to be reconstructible for PEO on the basis of Rotuman jei 'rip, tear' (and cf. Rotuman sesei 'rip downwards, tear to bits', which is cognate with Nggela sali 'tear downwards'). If these accounts of the three forms in KSR are correct, then the absence of a reflex of *R is not irregular.

The KSR form lohm 'house, shelter' has a doublet yuwac which is phonologically regular in every respect (see next subsection). It seems likely that one of the doublet forms is not directly inherited, and because of the regularity of yuwac, it is more likely that lohm is the intrusive form. There is no apparent source, however, as all neighboring languages lose *R in this form.

Tryon (1976) bases major subgrouping decisions in Vanuatu on the loss of POC *R in a single lexical form, *paRi 'ray fish'. (But see Geraghty 1978 for criticism.) The MC data show consistency across some 26 comparisons with *R.[7]

POC *nt and *nd are merged in all MC languages. KIR r is an alveolar flap, MRS d is a dental retroflex trill, MOK s is an alveolar fricative, and PON t and PTK *c represent slightly retroflex stops with some affrication. It seems likely, thus, that PMC *t' was a postalveolar stop of some sort--perhaps retroflex. POC *s, *ns, and *j, together with PEO *nj, are merged in these four branches of MC. The phonetic quality of KIR r and possible phonetic qualities of PTK *d have been described already. MRS t and PON, MOK d are phonetically identical voiceless alveolar stops.

It should be noted that there are four etyma where putative POC *ns or *s is unexpectedly lost in some or all MC languages. We have already discussed the loss of *ns from POC *nsana in PTK *aga 'counting cls. for finger spans', where the form is not attested in any other MC language (see section 2.2.2.5). Other instances where POC *ns was unexpectedly lost are PMC *taim- 'sharpen' (KIR taima, MRS jemey, MOK jaim, PON saim, PTK *taim-, KSR twem) < POC *tansim 'sharp', and MRS yiyal', MOK al, PON ahl, PTK *ala 'path, road' (where KIR and KSR do not reflect the etymon) < POC *nsala. In addition, the problematic POC reconstruction for 'outrigger boom' (variously *kiato, *kiaso, and *kayaso in Grace et al. (1979)) is reflected as PTK *kiau, PON kiai, MOK kia, and MRS kiye'y, all showing loss of the medial consonant. KIR kiaro, however, suggests earlier *kia(n)so, which is also reasonably compatible with KSR kiyacs. Jackson (in press a) observes that cognates of the last three etyma have been reconstructed by Ross (1977) for Proto-Siassi on the north coast of New Guinea with a distinctive *nj. Ross (1977:54) writes that the Siassi distinction between *ns and *nj "is a feature found nowhere else in Oceania," but it is possible that the MC languages reflect the same distinction. If so, the distinction must be a very early one in Oceanic, for it is almost certain that there is no direct genetic relationship between Siassi and MC.

The evidence for PMC *T has been presented and discussed already. Reflexes of PMC *t are reasonably straightforward, although, as noted earlier, KIR is intolerant of morphemes where *t and *k co-occur. It should be observed that KIR t is phonetically [s] before the high front vowel in the Southern Gilberts, and before both high vowels in the Northern Gilberts (Harrison p.c.). MRS j is a palatalized dental stop, usually with affrication, while MOK j is a palatal stop with fricative allophones. In both PP languages, however, *t is normally lost before the historical high vowels and before *e, as in the CTK subgroup of TK (see section 3.3.2.4).[11] As explained earlier, PTK *t had an s allophone before high vowels, and had probably already been lost in a few forms. Under these circumstances, with all daughter languages except MRS showing lenition of *t before at least *i, and MRS also showing evidence of palatalization and sibilant release, it is very likely that the ancestral language of these four branches also had some palatalization and lenition of *t, at least before the high front vowel.

Little will be said in this work about the development of the vowel systems of the contemporary MC languages, but a few points should be made which bear directly on the proto-language. One point is that only KIR and the TK languages of WOL and PUA regularly attest historical short vowels word-finally before pause. All other MC languages, including KSR, lose short vowels in that environment. We have argued in section 3.3.3 that word-final short vowels in PTK were probably devoiced, and it is worth exploring the extent to which that might have been true in PMC.

In KIR, short *i and *u are systematically lost word-finally after a nasal consonant and, to my ear at least, are devoiced after phonetic [s] (/t/ < *t). In addition, although I have not measured them acoustically, it appears that historically long final vowels in KIR are noticeably shorter than word-internal long vowels, a development that is also true of all other MC languages. Marck (1977) has suggested that KIR might once have had a "more general final vowel devoicing rule," and that the proposed redevelopment of voiced final vowels could have been due to Polynesian influence from Tuvalu to the south. This possibility may be worth considering--although I have no idea how to go about trying to confirm or disconfirm it--but even without it there is a likelihood that some loss of final vowel information occurred in PMC. At the least, we can probably assume some phonetic shortening of word-final long vowels, and it seems very probable that final *i (if not all high vowels) was devoiced as well.

A second point is that all MC languages show evidence of extensive patterns of regressive vowel assimilation. Even in KIR, which has only five phonemic vowels and thus looks rather well-behaved, the low vowel regularly fronts in diphthongs before a front vowel, and backs before a back vowel. Ken Rehg has also observed assimilation among the nonlow vowels (Rehg p.c.). It is probable that these KIR allophones have not become phonemic precisely because the conditioning environments are still present in the form of the historical final vowels. (See Twaddell 1938 for a similar argument regarding umlaut in German.) Recall that in TK it is precisely those languages that retain final devoiced vowels which have the smallest phonemic vowel inventories. It is very probable, then, that vowel assimilation was also characteristic of PMC.

Marck suggests that some vowel allophony in PMC was conditioned by the preceding consonant. He suggests, for example, that PMC *u was centralized to u after *t, *d, *l, *n, and *ñ, which he terms "non-back sounds," and that it remained backed and round after *p', *m', *t', *z, *k, *r, *g, and *w. His evidence comes largely from KIR, where his proposed PMC *ü regularly becomes i, and from the westernmost TK languages. Whatever the extent of the effect of consonants on vowels in PMC, however, it has greatly expanded and become a central part of the phonologies of MRS (Bender 1971:450-451), PP (Rehg 1981; in press b), and probably KSR (Wang p.c.; also see Lee and Wang in press).

The final point regarding vowels that needs to be made is with respect to the so-called "compensatory lengthening" rule that is found in many MC languages (see Rehg (in press a) for an extended and insightful discussion of the motivations for the rule). In contemporary MC languages, this rule is attested in KIR, TK, and PP,[12] but apparently not in MRS. Thus, whether it can be reconstructed for PMC will depend on KSR and on the subgrouping hypothesis that can be made from other data.

In sum, there is very strong phonological evidence that these four branches of MC group together. This evidence consists of the following shared phonological developments:

(1) split of POC *mp into *p and *p', with great consistency among all four branches in their reflexes;
(2) split of POC *m into *m and *m', with great consistency among all four branches in their reflexes;

(3) loss of POC *p before round vowels;

(4) merger of POC *nt and *nd, probably as a postalveolar stop;

(5) merger of POC *s, *ns, and *j with PEO *nj;

(6) split of POC *R into ∅ and *r, with perfect consistency in their reflexes;

(7) loss of POC *q;

(8) loss of POC *y;

(9) reasonably consistent reflexes of POC *n as PMC *g in the environment /a__i in the same five specific lexical items;

(10) spirantization of POC *t before *i;

(11) loss of final vowel information;

(12) regular regressive assimilation among vowels.

These shared developments--especially the first six--are more than ample grounds for claiming that KIR, MRS, PP, and TK descend from the same ancestral language, which we have called Proto-Micronesian. Lexical and grammatical evidence to further substantiate this claim will also be presented, but first we shall examine whether there is phonological evidence that KSR descended from the same ancestral language.

4.2.2 Phonological developments in KSR

According to Lee and Wang (in press), the present population of Kosrae (5,522 according to the preliminary figures of the 1980 Trust Territory Census, but not all of them Kosraean) are the descendants of approximately 200 Kosraeans who managed to survive contact with the West during the nineteenth century. In contrast, when contact was first made with Kosrae in the early part of that century, the population was estimated at from three to five thousand (B. G. Snow 1857, as quoted in Hezel and Berg 1979:199). Lee and Wang (in press) suggest that the "considerable variation in present-day KSR, as well as the lack of systematic dialect distinctions, may well be the result" of this rapid decrease in population and a resulting merger of speakers of several communities into a single one.

Lee and Wang also suggest that some of the variation in KSR may be due to borrowing from other languages or another language. In particular, they claim that when multiple reflexes of POC phonemes occur in KSR, one appears to be "the most frequent, and generally agrees with the reflexes in the other MC languages." They go on to say that "a preliminary examination of the minority reflexes suggests that there may be a tendency for them to co-occur with each other in given lexical items and not with the majority set." Lee and Wang rightly state that this kind of patterning is indicative of borrowing—cf. Biggs' (1965) study of Rotuman--but are unable to identify the donor language.

The research reported on in this subsection provides support for Lee and Wang's hypothesis of borrowing in KSR, and has also turned up likely sources for some of the KSR loans from among other MC languages.

Table 23 indicates the probable "directly-inherited" KSR reflexes of POC consonants, with the putative PMC interstage also shown. Each proposed reflex is discussed following the table.

Table 23

KSR Reflexes of POC Consonants

POC	*p		*mp	*ŋp	*k	*ŋk	*q	*m	*ŋm
PMC	∅	*f	*p	*p'	*k	*x	∅	*m	*m'
KSR	∅	∅	p	f	k	k,∅	∅	m	w,m

POC	*n	*ñ	*ŋ	*w	*y	*l	*d	*R
PMC	*n	*ñ	*g	*w	∅	*l	*r	∅
KSR	n	∅	ng	∅	∅	l	l	∅

POC	*nt	*nd	*t	*s	PEO *nj	*ns	*j	
PMC	*t'		*t	*d		*z		(*T)
KSR	sr		t,s			∅		s(?)

There is no instance where POC *p is reconstructed as lost in PMC where it is not also lost in KSR. Comparisons supporting the proposed regular KSR reflexes of PMC *f, *p, and *p' are presented below. Exceptions will be discussed afterwards.

<u>PMC *f > KSR ∅</u>

*afi	'fire'	e	
*fa-	'reciprocal prefix'	a-	
*fanua	'land, island'	acn	
*fazu	'eyebrow'	in-yac	
*fatu	'weave'	otwe	'weave it'
*fatu	'stone'	yot	

*fau	'tie, bind'	awi	'tie it'
*fitu	'seven'	it	
*manifinifi	'thin'	mihnini	
*tafa	'cut, split'	twe	
*afi	'carry under arm, on hip'	aci	'hold it or carry it on hip'
*faa-	'four'	ah-	
*fafine	'woman'	acn	
*fagi	'four, in serial counting'	ahng	
*pur,t'afa	'steal'	pihsre	
*faa-	'under'	ye	
*fali	'sacred, taboo'	oal	
*fauu	'cold'	ohu	
*fiago	'story, legend'	angwe	'say, tell'
*fizi	'accompany, follow'	wi	
*-faa	'where, how'	yac	'where'
*faka-afi	'evening'	ekuh	
*fituu	'star'	itih	
*afafi	'coconut crab'	aci	'k. of crab'

PMC *p > KSR p

*paa	'bait'	pa	
*papa	'board'	pahp	'sides of canoe'
*pada	'low area, hole'	pat	'hole'
*lapa	'big, older'	luh-lap	
*capi	'stem, base'	srohpoh	'trunk, stem'
*pau	'arm, wing'	paho	

*pati	'float'	puhs
*pika	'sand'	puhk
*pini	'braided, twisted'	pihn
*pur,t'afa	'steal'	pihsre
*tapa-g	'help'	taptap
*tapakau	'k. of mat'	sahpkuh
*pakewa	'shark'	pahko
*paku	'cut, hack, chop'	pak-puhk
*pata	'drift'	paht
*patiku	'long-winded, able to hold breath under water'	pahtok
*parara	'thunder'	puhlahl
*peata	'ashes'	apact
*paiki	'side, slope'	pacik
*peti	'rubbish, waste'	puhs
*piki-r	'slap'	pihkihl 'dust off, brush off'
*pina	'patch, mend'	puhn

<u>PMC *p' > KSR f</u>

*lip'a	'hole'	luhf
*p'ota	'swelling'	fihti 'swell, swelling'
*p'ono	'blocked, obstructed'	fohnfohn
*p'ogi	'night'	fong
*p'ou	'smell'	fo
*p'uli	'sap, gum'	ful
*p'up'u	'triggerfish'	fihf 'k. of fish'
*p'auzu	'nose'	fwac

*p'ula	'flame, burn'	fulok
*p'uta	'navel'	fihtac
*tap'o	'end'	sahf 'come to an end, finish, conclude'
*p'oca	'turtle shell'	fihsrac
*p'uko	'knot'	fokoi 'tie or fasten in a knot'
*-p'ukua	'counting cls for hundred'	foko
*p'au	'fish pole, pole'	fo
*p'et'e	'coral lime'	fasr
*p'et'i	'hot, warm'	fuhsr-fuhsr
*p'ugu	'handle'	fung
*up'a	'belly, chest'	in-yuwac
*p'a	'future aspect'	fah
*p'uli	'cowrie shell'	ful
*p'exa	'twin'	fak
*p'eka	'bat'	fak

The following exceptions to the reflex of PMC *f have been identified: PMC *f > KSR p in KSR panga-la 'to give away without motive' (PMC *faga 'give'), KSR pahngosr 'disease of nose' (PMC *fagu 'blow nose'), KSR epang 'south' (PMC *(e-)fagi 'north'), KSR pihrak 'braid, plait' (PMC *fira-k), KSR tahpuhl 'turn' (PMC *tafaali 'return'), and KSR pahlpahl 'carry a canoe on the shoulder' (PMC *afara 'shoulder'); PMC *f > KSR f in KSR fihlweli 'guess, conjecture, choose randomly' (PMC *fili 'choose, select'), KSR falfal 'split, saw lengthwise' (PMC *fala 'cut, carve with adze'), KSR fac- 'top, surface (PMC *fao 'on, above'), and KSR siifac 'ray' (PMC *fai).

If we recall that _p_ is the regular PP reflex of PMC *f, and that *f is the regular TK reflex, possible sources for these KSR exceptions are suggested. A check of the Ponapean dictionary shows that that language has _panga-la_ 'to betray; to give away, without motivation or compensation', _pangid_ 'to blow one's nose', _palie-peng_ 'north (side)', _pir_ 'to turn, to spin, to twist', but _pirek_ 'crooked, off-target, inaccurate'. MOK has _piroaki_ 'to braid (v.t.)' and _japahl_ 'to return'. Although not all of these possible source forms are identical formally and semantically with the KSR words, they are certainly indicative of potential sources.

TK languages reflect PTK *fili 'choose, select', and the final two syllables of the KSR form may reflect the type *ziwali 'choose', reflected in ULI and PUA. PTK *falafala refers primarily to cutting done with an adze rather than with a saw, as in KSR, but is formally a likely source for the KSR form _falfal_. Similarly, PTK *fai 'ray fish' is a likely source for KSR -_fac_ in _siifac_, although it does not provide an explanation for the initial increment in the KSR form. PTK *ao 'on, above' has been reconstructed, showing irregular loss of the initial consonant in POC *papo, but it is possible that the loss of this consonant postdates PTK. Ponapeic languages regularly reflect the initial consonant of PMC *fao in this meaning as _p_ (PON _powe_ (3ps), MOK _poh_-), and, as we have mentioned, there is reason to believe that PP may derive from within TK. Thus, it is possible that the correct PTK reconstruction is *fao, and that the *f has been lost in individual TK languages comparatively recently. If so, KSR _fac_- might well have been borrowed from TK.

The only irregular KSR reflex of PMC *p that has been identified is KSR fohk 'excrement, feces' (cf. PMC *pe,aka, PTK *paka < POC *peka(s)). No likely source for this form can be found in a MC language, but PPN *fekafeka 'excrement' may suggest a possible external source. Another possibility, however, is that KSR independently developed a round vowel after the initial consonant, causing that consonant to become phonetically velarized. The regular KSR reflex of PMC *p' is f, so if the KSR *p in the hypothesized early KSR form *poka 'excrement' became velarized before the application of the *p' > f rule, it would have undergone the rule as well.

Only one irregular reflex of PMC *p' has been identified in KSR. PTK-PP *p'uro 'foam, froth, bubbles' (< PMP *bureq 'foam, bubbles' (Blust 1982)) is reflected in KSR as pulohl 'blister, bubble'. This is almost certainly a loan from MOK pwuroar 'bubble, bubbly'. Interestingly, it appears that the KSR form has itself been borrowed into PON as pwolol 'bubble, foam, suds'.

KSR regularly reflects PMC *k as k, and regularly shows loss of POC *q. PMC *x is most frequently reflected as KSR k, but there are two forms where it appears to have been lost before a high back round vowel. All the KSR forms which appear to reflect PMC *x are: KSR fak 'twin' < PMC *p'exa; KSR oak 'canoe' < PMC *waxa; KSR oaki 'set up, erect, establish, found (vt)' < PMC *waxa 'frame'; KSR -k '1 sg possessive pronoun' < PMC *-xu; KSR ahok 'yes' < PMC *auxu; KSR ah 'take by force, snatch' < PMC *zaxu 'snatch' (< PEO *s,zaŋkum 'snatch'); and KSR yihyih 'bathe, take a shower, shower' < PMC *zuxuzuxu.[13]

With two apparent exceptions, KSR reflects PMC *m as m. The exceptions are KSR won 'bird, poultry' < PMC *manu 'bird, creature', and KSR atuck 'pain, ache' < PMC *madaki 'ache, pain' (< POC *masaki 'sick, feverish').[14] These exceptions will be discussed following an examination of KSR reflexes of PMC *m', which are listed below:

PMC *m' > KSR w

*m'aau	'good'	wo	'good'
*m'aane	'male'	waen	'male, boy'
*um'a	'house, shelter'	yuwac	
*m'uta	'vomit'	woht	
*m'ulo-z	'crumple, crinkle'	oloi	'wrinkle, crumple, crease'
*m'are	'lei, garland'	ola	'cls used with neck decoration'
*m'ata	'worm'	wat(koekoe)	'k. of worm'
*tum'u	'bunch, cluster'	tu-n	'bunch, string of'
*m'ucu	'firewood'	wohsr	'firebrand'
*t'am'a	'forehead, gable'	(moton)sro	'forehead'
*kom'alau[15]	'phase of moon'	kohwohla-tyok	'17th phase of moon'

PMC *m' > KSR m

*lum'u	'seaweed, moss'	lum	
*-m'u	'2 sg poss pron'	-m	
*nam'o	'lagoon'	nwem	'deep area in lagoon'
*kam'u	'2 pl pronoun'	kom	'2 sg pronoun'
*um'u	'earth oven'	um	
*ñam'u	'taste'	em	

*ñam'u	'mosquito'	em-syac	
*m'egau	'eat, food'	mongo	
*m'ee	'sleep'	mwemwe	'dream'
*m'etu	'broken, separated'	mwet (?)	'die, fall out (of hair'
*t'am'a-ni-fani[16]	'26th phase of moon'	srohmpal	'23rd phase of moon'

If we temporarily disregard the last four items of the above comparison sets, then a plausible pattern emerges. Note that in all the comparisons where PMC *m' is reflected as KSR w (or Ø) the *m' is either in initial position, medial position, or, in the case of *um'a, *tum'u, and *t'am'a, occurs in the final syllable of an inalienably possessed noun. In contrast, PMC *m' is reflected as KSR m in word-final position. If we assume that the KSR developments of *m' have occurred after the loss of final vowels in the language, then we can conclude that *m' merged with *m in final position as m, while it became w before vowels.[17] Under this analysis, *m' would not have merged with *m in, for example, *um'a 'house', because the final vowel in that form would normally be protected by a suffix, while the alienably possessed *nam'o 'lagoon', for example, would rarely take a suffix. As a result the final vowel in that form would be lost, and PMC *m' would be retained as m.

If this analysis is correct, the final four comparisons are irregular, and thus possible loans. The most likely source for KSR mongo 'eat, food' is TK, where PTK *m'egau is reflected as mwongo in MRT, STW, CRL, and WOL. KSR mwemwe 'dream' could also have come from TK, where PTK *m'ee 'sleep well, be at peace' has been reconstructed, but it could also be a borrowing of a reflex of PPN *mohe 'sleep'. KSR mwet 'die, fall out (of hair)' could also have been borrowed from a Polynesian language, as PPN *motu is reconstructed with the meaning 'cut, sever'.

Returning now to the two irregular reflexes of PMC *m in KSR won 'bird' and atuck 'pain, ache', it appears that PMC *manu and *madaki must have developed labiovelar initial consonants in early KSR, as the KSR reflexes are more compatible with *m'.

KSR reflexes of PMC *n and *g are also quite regular, although there are three cases where *n merges with *g in KSR (and other MC languages) in the environment /a__i, as noted in the previous subsection. PMC *ñ appears to be lost in KSR in all environments, although there are only five certain reflexes. Those reflexes are as follows:

(1) PMC *-ña, 3 sg poss pron' > KSR ∅.[18]

(2) PMC *ñam'u 'mosquito' > KSR em-syac (cf. MOK amw-je, PON amwi-se).

(3) PMC *(ña-)ñoa 'yesterday' (< POC *noRa) > KSR ekuh-yoh 'evening before last evening' (where ekuh reflects PMC *faka-afi 'evening'). It is possible that KSR ekweyah 'yesterday' also reflects PMC *(ña-)ñoa, but if so the correspondences are not transparent.

(4) PMC *ñam'u 'taste' > KSR em.

(5) PMC *ñau 'delicious, sweet' > KSR yuh 'delicious'.

Lee and Wang (in press) state that POC *w and *y are regularly lost in KSR, although they note that *w appears to have had a backing and/or rounding effect on neighboring vowels in KSR. The KSR reflex of PMC *l is also very consistently l, although there is one comparison where a reflex of PTK *lodoa 'west' appears to have been borrowed into KSR with an r: rohtoh 'west'.[19]

We have already seen that KSR is in agreement with other MC languages regarding whether POC *R is merged with POC *d as PMC *r or lost. The pattern of apparent reflexes in KSR of PMC *r is quite complex, however, as both l and r occur. The following list shows the comparison sets attesting these reflexes.

PMC *r > KSR l

*ira	'3 pl focus pron'	el	'3 sg focus pron'
*-(i)ra	'3 pl poss pron'	-l	'3 sg poss pron'
*maturu	'sleep'	mutul	
*raa	'branch'	lwe	
*raani	'day'	lwen	
*ragi	'warm'	langluhng	'warm up, heat, dry up'
*rogo	'hear'	lohng	
*rua	'two'	luo[20]	
*ura	'lobster, shrimp'	ohl-pahp	'k. of lobster'
*mauru	'alive, life'	moul	'live, alive'
*tari	'child'	tuhlihk	
*uru	'pull, drag'	ul	'pull, drag, stretch'
*karuki	'sand crab, ghost crab'	kuluk	

*marau	'thirsty'	maluh	'thirsty, breathless'
*m'are	'lei, garland'	ola	
*oro	'fish gills'	ohloh	
*parara	'thunder'	puhlal	
*piki-r	'slap, hit, clap'	pihkihl	'brush off'
*rato	'whale'	loaht	
*(ma-)ripi	'broken, shattered'	mihlihp	
*marama	'moon, moonlight'	mahlwem	
*are(gu)	'coconut cream'	el	'coconut oil for poi'
*rot'o	'dark'	lohsr	
*rutu	'started, surprised'	lut	
*tarawa	'barracuda'	tuhla	
*toro-m	'suck'	tohlloh	
*luru	'shade'	lul	
*ura[21]	'15th phase of moon'	el	
*mara(ara)	'light in weight'	muhlahlah	

PMC *r > KSR r

*rere	'shake, tremble'	rarrar	
*ragaraga	'yellow'	rangrang	
*auru	'south'	acir	'north'
*fauru	'do, make'	oruh	'do, make, perform'
*fira-k	'braid, plait'	pihrak	
*tiri	'masturbate'	iri	
*aro-[22]	'around'	yohroh	'vicinity'
*mara	'preserved breadfruit'	mahr	'core of preserbed b.f.'
*gara	'nit'	si-ngar	

*garugaru	'crunch'	nguhrnguhr
*goro	'snore'	ngohr
(?)*tere	'fate, luck'	sire 'lucky, fortunate'
*tirog-	'look at, observe'	karongo, irong
*kara	'near'	apkuhran 'close to, about to, near'
*arofitu[23]	'27th phase of moon'	arpih
*arop'ukua[24]	'phase of moon'	arfuga[25]

KSR r is described by Lee and Wang (in press) as a voiced retroflex palatal continuant, quite different from the alveolar trills that are attested in most MC languages. Wang (p.c.) has questioned whether, in fact, it is a native Kosraean phoneme, observing that the large majority of KSR items with r appear to be either onomatopoetic or loans, especially from English or Japanese.[26] Several of the forms in the above table that appear to have r reflexes of PMC *r also have irregular reflexes of other proto-phonemes that are likely to be diagnostic of loans, including pihrak 'braid, plait', which has an irregular p reflex of PMC *f, iri 'masturbate' and irong 'glance, peek', which show irregular loss of earlier *t, and arpih 'phase of moon', which also has both an irregular p reflex of earlier *f and irregular loss of *t. In addition, KSR karongo 'watch, notice, observe' appears to reflect the causative prefix *ka-, which is not otherwise attested in KSR (cf. KSR ahk- 'causative prefix' < POC *paka-). Since all other MC languages reflect a causative *ka-, karongo is also very likely to reflect a loan.

It is rather strongly suggested, thus, that l is the regular KSR reflex of PMC *r, and that the r reflexes are diagnostic of loans. Sources for those loans are, for the most part, not difficult to find, and the following are only suggestions: KSR rarrar 'shake, tremble' = PON rerrer or MOK roar, KSR rangrang 'yellow' = MOK roangroang, KSR acir 'north' = PON -eir, KSR oruh 'do, make' = TK *fauru (a very early loan, with the *f subsequently lost in KSR), or perhaps from the root *ara that is apparently attested in MOK kahrehda 'to cause', KSR pihrak 'braid, plait' = MOK piroaki, KSR iri 'masturbate' = CTK *iri, KSR yohroh 'vicinity' = NTK *aro 'near, around' or, perhaps, a Polynesian reflex of PPN *qaro 'front', KSR mahr 'core of preserved breadfruit' = the type maar in any TK or PP language, KSR si-ngar 'nit' = MRS li-ggar (although the initial morphemes do not correspond), KSR nguhrnguhr 'crunch, crackle' = MRS ggir"gir", KSR ngohr 'snore' = MRS g'er- or MOK ngorngor, KSR sire 'lucky, fortunate' = MRS jerah- 'luck',[27] KSR irong 'glance, peek' = ETK *irong- 'look at, observe' or PON irong 'look or peer in the distance, see one's reflection', KSR apkuhran 'close to, near, about to' = MOK koaroa-n with an unidentified initial accretion, and both forms for phases of the moon are almost certainly from CTK.

The KSR retroflex fricative sr regularly reflects PMC *t' (< POC *nt and *nd). KSR reflexes of POC and PMC *t are, again, somewhat complex, with both t and s occurring. The following list shows the forms attested in the data.

PMC *t > KSR t

PMC		KSR	
*anitu	'ghost'	inut	
*ata	'up, east, high'	yat	'eastern half of village'
*fatu	'weave, plait'	otwe	
*fatu	'rock, stone'	yot	
*fitu	'seven'	it	
*(a-)mata	'raw, uncooked'	tahl-mwet	
*katafa	'frigate bird'	katkat (?)	'sandpiper'
*kit,t'a	'1 pl incl foc pron'	kuht	
*kuita	'octopus'	koet	
*kutu	'louse'	kut	
*mata	'eye, face'	muhta	
*mataku	'fear, be afraid'	motok	
*matolu	'thick'	mahtol	
*matoa	'strong, mature, ripe'	mahtuh	'old'
*maturu	'sleep'	mutul	
*(m'u)m'uta	'vomit'	woht	
*natu	'child, offspring'	nahtuh	
*(t)a	'perfective aspect'	tuh	
*tafa	'split, cut'	twe	
*takuru	'back'	tohkoh	
*tama	'father'	tuhma	
*tani	'skin disease'	tuhn	
*tagi	'cry, weep'	tuhng	
*tazi	'sea, seawater'	kihfihn-te	'salt water'

PMC		KSR	
*toro-m	'suck'	tohlloh	
*tou	'sugarcane'	tuh	
*tuu	'stand'	tu	
*tuku	'pound, beat'	tuk	
*(ara)mata	'person, people'	mwet	
*fituu	'star'	itih/itu	
*p'uta	'navel'	fihtac	
*talae,i	'adze'	tuhla	'axe'
*tapa-g	'help, support'	taptap	
*tautu	'porcupine fish'	taut	'needlefish'
*ta,oo-n	'soak'	twen	'soak, wash'
*(w)otu	'out to sea, outwards'	-wot	'hence'
*aluta	'beard'	altac, aluht	
*ito	'pile up, assemble'	etoa	
*kinata	'wound, sore'	kihnet	
*latuu	'tomorrow'	lutu	
*m'ata	'worm'	wet	
*patiki	'hold breath for long time, have great endurance'	pahtok	
*peata	'ashes'	a-pact	
*rato	'whale'	loat	
*rutu	'surprised, startled'	lut	
*tai-m	'sharpen'	twem	
*tapa	'cheek, gill'	tuhpah	'cheek'
*tarawa	'barracuda'	tuhla	
*tari	'child'	tuhlihk	

PMC		KSR	
*tum'u	'bunch, cluster'	tu-n	'bunch of'
*pata	'drift'	paht	

PMC *t > KSR s

PMC		KSR	
*tia	'belly'	in-siyac	
*pa,eti	'float'	puhs	
*tiku	'white-tailed bird'	sihk	
*(ka-)tiza-k	'ask, inquire'	siyuck	
*kini-t	'pinch, pluck'	kihnis	
*peti	'trash, rubbish'	puhs	
*t,Tigi	'fart, pass wind'	sucng	
*ate	'liver'	acs, esyac	
*mate	'die, dead'	misac mas	'die, death' 'sick, ill'
*te-	'one (in cls counting)'	se-	
*tali	'rope'	sucl	
*tapakau	'k. of mat'	sahpkuh	
*tau	'who?'	suc	
*tap'o	'end, half'	sahf	'finish'
*tau	'kin, clan member, family'	sucu	'family'
*tau-k	'catch'	sauk	
*kata	'speak, language'	kahs	
*ka(u)tuu	'canoe mast'	koesu	
*patu	'empty'	pihsac	

Lee and Wang (in press) propose that POC *t is reflected as KSR s before *i and *e, and as t elsewhere. The above data provide substantial support for their proposal, but also include seven forms where PMC *t appears to be reflected as KSR s before *a, and two forms where it appears to be reflected as s before *u. Since there are 28 forms where PMC *t > KSR t/__a, and 15 forms where PMC *t > KSR t/__u, it is justifiable to claim that those are the regular KSR reflexes, and that the final 9 forms in the list are aberrant and probably indicative of loans. Sources for the 7 forms with s correspondences before *a may be easily found among PP and CTK languages, but those with s before *u are more difficult to locate. While MRS (Ratak) kajiw or WOL gaúsúú may be the source of KSR koesu 'canoe mast', no reasonable source for KSR pihsac 'empty' is apparent in the data. (All forms in TK show loss of the *t from PMC *patu, which is reconstructed primarily on the basis of PSS *bwatu 'empty' in Levy n.d.) It should be noted that KSR also has forms with t correspondences for PMC *t that are almost certainly loans. We have already discussed tahpuhl 'turn' (PMC *tafaali) and mwet 'die, fall out (of hair)' (PMC *m'etu 'broken, separated'); another form is KSR fakuhtae- 'turn a canoe to port' (cf. PMC *katae,a 'lee side of canoe'), where the initial syllable almost certainly represents the Polynesian causative prefix *faka (and cf. KSR fakyeme- 'turn a canoe to starboard', from Polynesian *faka-hama, where *hama reflects POC *nsama 'outrigger float' (PMC *zama)).

The pattern in KSR of reflexes of the POC palatal consonants is difficult to discover, in large part due to the fact that KSR is unique among MC languages in having different reflexes for the palatal proto-phonemes. As is well-known, Oceanic languages are by no means consistent in reflecting oral or nasal grade consonants, and the reconstruction of POC *s and *ns is especially problematic (see Blust 1978 for discussion). As a result, it is difficult to locate secure reconstructions to use as a baseline to determine the pattern of reflexes in KSR.

Marck (1977) states that KSR appears to lose POC *ns and retain POC *s as t, but Bender and Wang (1983:35) disagree, stating that "the correlation [between KSR loss and POC *ns] is not as straightforward as Marck had thought." They do not offer an alternative solution, however. On the basis of 13 comparisons, Lee and Wang (in press) observe that both POC *s and *ns may apparently be reflected as s, t, or ∅ in KSR.

To attempt to find a baseline that is closer chronologically to KSR than POC, I decided to investigate whether Geraghty's (1979:127-148) reconstructions for putative Proto-Eastern Oceanic (PEO) might help to sort out the KSR reflexes of the palatal consonants. Geraghty reconstructs PEO *s and *z, with the latter corresponding to POC *ns. He also reconstructs PEO *j on the basis of Fijian s, Rotuman j, PSS *d, and PPN *t. With Geraghty's permission, we shall use the symbol *nj for his *j, so that we may use *j for Blust's (1978) POC *j, which Geraghty now believes is also attested in PEO (Geraghty p.c., and also see Geraghty 1979:146-148). The table below gives KSR reflexes of PEO forms that have been very securely reconstructed with one of the four PEO palatal obstruents. Following an examination of these forms, we shall also examine KSR reflexes of some forms that are less securely reconstructed.

KSR Reflexes of PEO *z

PEO		KSR	
*tazi	'sea, seawater'	te	
*zaa	'what?'	me-ac	
*-zake	'up, upwards'	-ack	
*-zivo	'down, downwards'	-i	
*ziwa	'nine'	yuc	
*vaqu-z	'tie up, bind'	awi	'tie, bind (vt)'
*mazu	'full, sated'	muht	'full, swelling, plenty'
*zake	'go up, climb'	takwack	'rise'

KSR Reflexes of POC *j

POC		KSR	
*ŋaqija	'when?'	ngac	
*aja	'name'	e	
*taŋi-j	'cry, weep'	tuhngi	'be sorry for (vt)'
*taji	'younger same-sex sibling'	tahmtahe-l	'sisters, female siblings'

KSR Reflexes of PEO *s

PEO		KSR	
*su(q)a	'spear, dagger'	tah	'wooden knife'
*masaki	'sickness'	atuck	'pain, ache'
*saqi	'sew, bind'	tuh	
*sala	'spread out'	tuhla, taltal	'untie, spread out'

PEO		KSR	
*suqi	'pour water on'	twetwe	'wash' (?)
*k,qanusi	'spit'	acni	

KSR Reflexes of PEO *nj

PEO		KSR	
*Runja	'load, cargo'	us, utuhk	'carry'
*munji,u	'cut off'	wot	'cut'
*njonjon(a)	'plug, stop up'	isong	'push in, stick in, cram'
*(ŋ)i,unju	'mouth'	wihs	'tooth'
*kanja	'kava stem'	kwac	'stalk, stem'

According to Geraghty (1979 and p.c.), all of the above PEO reconstructions have unequivocal reflexes among Fijian, Polynesian, and Southeast Solomons languages with respect to the palatal consonant that is reconstructed. Reconstructions with POC *j are from Blust (1978). KSR reflexes of the four palatal reconstructions are either t, s, or Ø, and are distributed as follows:

KSR Reflexes of PEO *s, *nj, and *z, and POC *j

	KSR		
	t	s	Ø
PEO *s	5	Ø	1
PEO *nj	2	3	1
PEO *z	2	Ø	6
POC *j	Ø	Ø	4

Although the only umambiguous KSR reflex is for POC *j, if we set the ∅ reflexes against the t and s reflexes, we can see that PEO *s and *nj are much more frequently reflected as t or s, while PEO *z and POC *j have much more common ∅ reflexes. This pattern is even more marked if the following comparisons are also considered, where each PEO reconstruction has one reflex--usually in Polynesian--which disagrees with the palatal that is reconstructed (Geraghty p.c.). In the PEO reconstructions, the palatal that is most widely attested is written first, so that, for example, PEO *z,saŋa 'crotch, thigh' has reflexes of *z in Fijian and Nggela, but a reflex of *s in PPN.

PEO		KSR	
*z,saŋa	'crotch, thigh'	engah	'area between two legs'
*viz,siko	'flesh'	iko	
*i,uz,su	'nose'	fwac	(cf. PMC *p'a-uzu)
*z,sama	'outrigger float'	em	
*z,siz,si	'peel off, scoop'	yuhyuh	'scoop'
*vaz,so-k	'to plant'	yok	
*z,sa	'one'	e	
*vaz,su	'eyebrow'	in-yac, inn-uwac	
*maz,sawa	'space, open space'	meoha	'ocean'
*mulo-z,s	'twist, wring'	oloi 'wrinkle, crumple, crease'	
*z,solo	'highlands'	ohl	'mountain'
*z,suŋku	'bathe'	yihyih	
*waz,se	'divide'	oacoac	'count, enumerate'
*z,siz,si	'run'	yuh	'run, pass'
*z,sakule	'pick lice'	aki	

PEO		KSR	
*z,saŋkum	'snatch'	ah	
*z,sakaRu	'reef'	tuhka	'island, atoll'
*kaz,si,e	'call'	okas	'call, make noise to awaken'
*qoz,so	'provisions, food'	oht	'k. of taro'
*z,suz,su	'breast'	titi	
*z,sulu	'torch'	sul	
*z,sili	'insert in weaving'	tihli	'form, pattern, copy out (in weaving)'
*nj,sei	'rip, tear'	se	
*lanj,se	'coral'	lahs	'k. of coral'
		lahslahs	'full of coral'
*kunj,s,zi	'rub'	kohtoht	'scrub, rub off, scour'
		kote	'break, scrub'
*s,zala	'wrong'	twelac	'mistake'
*s,zoko	'arrive'	tuhkuh	

If we assume the KSR forms in the above 26 comparisons to reflect the most widely attested reconstructions, and add these KSR reflexes to the chart presented earlier, the results are as follows:

	KSR		
	t	s	∅
PEO *s	7	∅	1
PEO *nj	3	5	1
PEO *z	6	2	22
POC *j	∅	∅	4

Paul Geraghty believes, contrary to what is implied by the traditional orthography for POC and PEO, that the phoneme represented by *z (POC *ns) was the oral grade counterpart of nasal grade *s. His reasoning is based on the premise that nasal grade consonants are not reflected in Oceanic languages as thematic consonants on transitive verbs. He observes that Fijian c, which is the reflex of PEO *z, often occurs as a thematic consonant in that language, while Fijian s (< PEO *s) never so occurs, and concludes that *z must have been oral grade (Geraghty p.c.). If Geraghty is correct, then the above chart indicates that KSR most commonly lost the oral grade palatal consonants and retained nasal grade *s and *nj.

Under this analysis, the single KSR Ø reflexes of both *s and *nj and the six t reflexes and two s reflexes of *z are irregular. As such, they might represent confusion in oral and nasal grade in KSR, of the type that is witnessed in all Oceanic languages. Or they might represent loans. Of the 51 palatal comparison sets that we have examined for KSR, nine, or slightly less than 20% are irregular. Approximately the same proportion of KSR reflexes of PMC *f, *m', and *r are irregular, perhaps indicating that about 20% of the Kosraean vocabulary is indirectly inherited.

Henceforth, reconstructed palatal consonants that are lost in KSR are reconstructed for PMC as *z; palatals that are retained in KSR as t or s are reconstructed as PMC *d. Recall that both PMC *d and *z are reflected elsewhere in MC as KIR r, MRS ṭ, PON and MOK d, and PTK *d.

As Table 24 demonstrates, KSR _t_ and _s_ reflexes of PMC *d are mostly conditioned by the following vowel, with _s_ occurring where that vowel is *i or *e, and _t_ occurring elsewhere. There are, however, two apparent exceptions to this generalization: KSR _sul_ 'torch' < PEO *z,sulu, PMC *dulu; and KSR _tihli_ 'form, pattern, copy out (in weaving)' < PEO *z,sili 'insert in weaving', PMC *dili 'pierce, penetrate, weave in and out'. The first of these exceptions has KSR _s_ where _t_ might be expected, while the latter, if cognate, has _t_ where _s_ is expected. Despite these exceptions, however, the general pattern is clear. An identical pattern has been identified for KSR reflexes of PMC *t, which strongly suggests that PMC *t and *d were merged in early KSR.

The history of KSR vowels is extremely complex and cannot be dealt with in this dissertation. (See Lee and Wang in press for some discussion, and Wang in preparation for a more thorough analysis.) It is clear, however, that patterns of vowel assimilation that are similar in some respects to those in the other MC languages have occurred in KSR as well, and KSR also shares with MRS and PP the loss of historical final short vowels. It should also be noted that there are apparently predictable long vowels in KSR that may be related to the vowel lengthening rule attested in KIR, PON, and TK, although the KSR system, if it is related, is far more extensive. According to Lee (1975:30-32), all monosyllabic forms in KSR have long vowels, and all syllables except the first in polysyllabic forms are also obligatorily long. Lee also notes (16-17) that all three low vowels in KSR (_ah_, _a_,

Table 24

KSR Reflexes of PMC *d

PMC	Gloss	KSR	Gloss	PEO	Gloss
*madu	'full, abundant'	muht	'plenty, abundant'	*mazu	'full, sated'
*dake	'rise, climb'	takwack	'rise'	*zake	'go up, climb'
*madaki	'pain, ache'	atuck	'pain, ache'	*masaki	'sickness'
*dai	'sew'	tuh	'sew'	*saqi	'sew, bind'
*dala	'spread out'	taltal	'untie, spread out'	*sala	'spread out'
*uda	'load, cargo, carry'	utuhk	'carry'	*Runja	'load, cargo'
*m'udu	'cut off'	wot	'cut'	*munji,u	'cut off'
*dakau	'reef, island'	tuhka	'island, atoll'	*z,sakaRu	'reef'
*odo	'k. of taro'	oht	'k. of taro'	*qoz,so	'food, provisions'
*dudu	'breast'	titi	'breast'	*z,suz,su	'breast'
*dala	'mistake'	twelac	'mistake'	*s,zala	'wrong'
*doko	'arrive'	tuhkuh	'arrive, come'	*s,zoko	'arrive'
*pada	'low, damp area'	pat	'hole'	FIJ: pasa	'dig hole for taro'
*ida-g	'rub, press'	itucng	'press, run over, smear'	--	
*mado	'sit, be seated'	muhta	'sitting posture'	GED: mado	'to remain'
*duku	'hit, strike'	tok	'hit'	--	
*kida	'lie, deceive, fool'	kuhta-srihki	'fool, cheat, deceive'	--	
*p'uada	'slingshot'	fuht	'slingshot'	--	
*dapidapi	'chest, trunk'	tuhptuhp	'trunk, chest, coffin'	--	
*gidi	'laugh, giggle'	ngihs	'laugh, giggle'	--	
*dipa	'chip, slice, piece'	sihpsihp	'cut, slice, chop'	--	
*udi	'mouth, teeth'	wihs	'tooth'	*(ŋ)i,unji,u	'mouth'
*lade	'coral'	lahs	'k. of coral'	*lanj,se	'coral'
*dei	'rip, tear'	se	'rip, tear, rend'	*nj,sei	'rip, tear'

and <u>oa</u>) are always long, although the other nine KSR vowels may be short or long.

The KSR evidence presented in this subsection strongly suggests the inclusion of KSR with KIR, MRS, PP, and TK in the Micronesian subgroup of Oceanic. In the previous subsection, twelve phonological innovations were presented that are shared by KIR, MRS, PP, and TK, and this subsection has demonstrated that KSR is in agreement with eleven of them. In addition, the KSR data suggest two other innovations. Thus, the thirteen phonological innovations that are diagnostic of membership in the Micronesian subgroup of Oceanic are the following:

(1) Split of POC *mp into PMC *p and *p', with great consistency among all MC languages in their reflexes;

(2) Split of POC *m into PMC *m and *m', with great consistency among all MC languages in their reflexes;

(3) Loss of POC *p before round vowels;

(4) Merger of POC *nt and *nd as PMC *t', which was most probably a retroflex obstruent;

(5) Merger of PEO *z and POC *j as PMC *z;

(6) Merger of PEO *s and *nj as PMC *d;

(7) Split of POC *R into PMC ∅ and *r;

(8) Loss of POC *q;

(9) Loss of POC *y;

(10) Reasonably consistent reflexes of POC *n as PMC *g in the environment /a__i in the same five lexical items;

(11) Spirantization of POC *t before *i;

(12) Loss of final vowel information;

(13) Regressive assimilation patterns among vowels.

Nathan (1973) presents a discussion of possible Nauruan reflexes of POC, and although the data for NAU are quite limited, it seems likely that the language fails to attest at least one of the above PMC innovations, the merger of POC *nt and *nd. Nathan indicates that the NAU reflex of *nt is t (while POC *t is lost in NAU) and the reflex of *nd is r. In addition, forms that regularly reflect PMC *f in nuclear Micronesian languages are reflected in NAU as both p and Ø: PMC *fatu 'stone', NAU e-pee; PMC *fa(i)fine 'woman', NAU e-een; PMC *fili 'choose, select', NAU ji. Thus, it is probable that if NAU does have a close genetic relationship with the MC languages that we have been discussing, it must have separated prior to the establishment of the PMC community in which some of the above thirteen phonological innovations occurred.[28]

4.2.3 Phonological developments within Micronesian

Table 25 repeats the consonant correspondences of the five linguistic branches within the Micronesian subgroup. At least three potential internal Micronesian groupings are suggested by these correspondences:

(1) KIR, MRS, and TK appear to agree in reflecting loss of PMC *x and merger of PMC *ñ with PMC *n as n;

(2) KSR, KIR, and MRS agree in showing loss of PMC *f;

(3) KIR, MRS, PP, and TK agree in merging PMC *z and *d, with MRS,

Table 25

Consonant Correspondences among MC Languages

PMC	*f	*p	*p'	*k	*x	*w
KSR	∅	p	f	k	k,∅	∅
KIR	∅	b	b'	k,∅	∅	w
MRS	∅	p	b	k,k',q	∅	w
PON	p,∅	p	pw	ĸ	r,∅	w
MOK	p,∅	p	pw	k	r,∅	w
PTK	*f	*p	*p'	*k	∅	*w

PMC	*m	*m'	*n	*ñ	*g	*l
KSR	m	w,m	n	∅	ng	l
KIR	m	m'	n	n	ng	n
MRS	m	m'	n,n'	n,n'	g,g"	l,l'
PON	m	mw	n	∅	ng	l
MOK	m	mw	n	∅,n	ng	l
PTK	*m	*m'	*n	*n	*g	*l

PMC	*r	*t'	*z	*d	*t	(*T)
KSR	l	sr	∅	t,s	t,s	s
KIR	∅	r	r	r	t,∅	t
MRS	r	d	t	t	j	j
PON	r	t	d	d	∅,s	s
MOK	r	s	d	d	∅,j	j
PTK	*r	*c	*d	*d	*t,∅	*T

PP, and all TK languages except ULI showing an alveolar stop reflex, and KIR showing an alveolar flap.

In addition, KSR, MRS, and PP agree in reflecting loss of historical final short vowels, but since there is evidence to suggest that word-final short vowels were voiceless in PTK and that word-final short high vowels were voiceless in PMC, this evidence would appear to have little weight for subgrouping purposes.

Of the three possible internal subgroups that are suggested by the consonant correspondences, I believe that (1) and (2) must be rejected in favor of (3). Subgrouping (1), which groups KIR, MRS, and TK apart from PP and KSR, is rejected because there is substantial morphosyntactic and lexical evidence which demonstrates that the TK languages are most closely related to PP (see section 4.6). In addition, the merger of *n with *n is a development that is extremely common among Oceanic languages (indeed, a partial merger of *n with *n occurs in the Ponapeic language of Mokilese) and is, thus, relatively weak grounds for subgrouping. Loss of POC *nk (PMC *x) is stronger grounds, but the KSR and PP reflexes of that phoneme suggest that some loss might well have occurred as early as PMC. (Note especially KSR ah 'take by force, snatch' < PEO *z,sankum 'snatch' and KSR yihyih 'bathe' < PEO *zunku 'bathe'.) Moreover, PP has lost *x before nonlow vowels in forms where it is retained as k in KSR. If some loss had already occurred in PMC, it is not surprising that further loss occurred among some of the daughter languages.

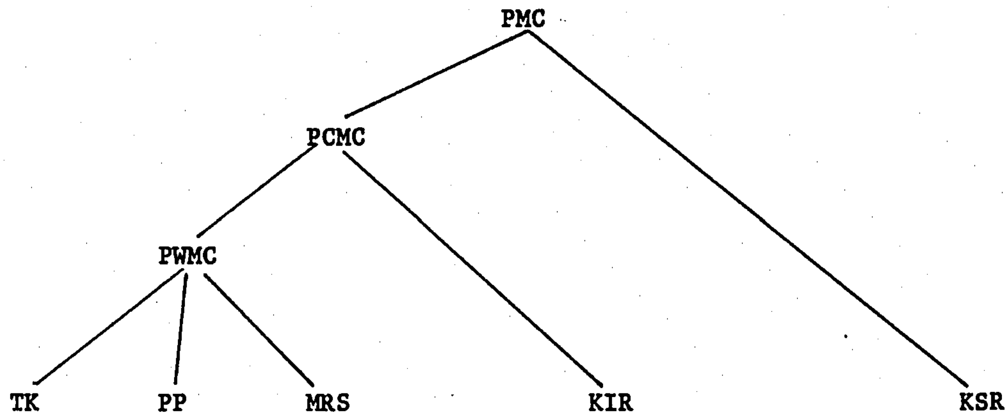
A similar argument leads to the rejection of a KSR-KIR-MRS group within Micronesian that is based on loss of PMC *f. We have already seen that POC *p was lost in PMC before round vowels, and that it has also subsequently been lost before *i in several forms in PP. Again, once loss had begun, it is not surprising that it should have continued among different daughter languages.

The case for KSR having been the first language to separate from the PMC community, moreover, is a strong one. As noted above, KSR has merged *x with *k in forms where *x is lost in all other MC languages (e.g., *-xu '1 sg possessive pronoun'). Also, KSR shows several developments that are not attested in any of the other languages: reflex of PMC *p' as f, merger of PMC *l and *r, merger of PMC *d and *t, loss of PMC *w, loss of PMC *z, and split of PMC *m' into KSR w and m. These developments must have taken place over an extended period of individual development. In addition, if some other MC language had been the first to separate from PMC, it would have entailed at least two separate mergers of PMC *z and *d, and at least one of those mergers would have had to occur after the subsequent separation of KSR, which has distinct reflexes of the two proto-phonemes. Clearly, on the basis of the phonological data, the best analysis is that KSR was the first language to separate from the proto-community.[29]

If KSR was the first to break off, it appears likely that KIR was the second. KIR has innovated two developments--loss of PMC *r and merger of PMC *t', *z, and *d as r--that are not attested in any other MC language, or any other Oceanic language that I am aware of. In addition, KIR also attests a merger of PMC *n, *ñ, and *l that is elsewhere in MC only attested among some TK languages. Of course, these developments do not demonstrate the integrity of the putative MRS-PP-TK group, but some support for this hypothesis comes from the fact that MRS, PP, and all TK languages except ULI reflect the merger of PMC *z and *d as an alveolar stop. If, as is quite possible, PTK *d was a stop (see section 3.7), then the importance of this observation is somewhat strengthened.

There is no strong phonological evidence for the proposed TK-PP group unless we look within the TK group. That evidence will not be examined here but in section 4.6, following a discussion of the morphosyntactic and lexical evidence for the nuclear Micronesian group and the two internal subgroups that have been proposed in this section.

Let us use the term Micronesian (MC) for the subgroup of Oceanic that consists of KSR-KIR-MRS-PP-TK. For the putative subgroup that consists of those languages less KSR, let us use the term Central Micronesian (CMC). The CMC proto-phoneme that reflects the merger of PMC *z and *d will be written as PCMC *d. Finally, let us term the putative subgroup that consists of MRS-PP-TK Western Micronesian (WMC). The following genetic tree shows the relationships of the MC languages as proposed in this subsection on the basis of phonological evidence.



In the following two sections, grammatical and lexical evidence which supports these subgroupings will be presented.

4.3 Grammatical evidence for the Micronesian group and for proposed internal subgroups

Wherever possible in this section, grammatical evidence will be presented in the context of the system in which it occurs. Only those grammatical forms or structures that appear to be innovative will be discussed in detail, however.

4.3.1 Personal pronouns

Rehg and Sugita (1975) reconstruct a PMC personal pronoun system on the basis of the data available at that time. Additional information about several languages has since become available which suggests some relatively minor alterations in their reconstructions. These alterations are included in Table 26, which also includes data from Nauruan (Nathan n.d.) for additional reference.

Forms in the table that are believed not to be cognate are given in parentheses. Some such forms, however, have cognates elsewhere in

Table 26

Micronesian Personal Pronouns (with Nauruan)

	PMC	PTK	PON	MOK	MRS	KIR	KSR	NAU
FOCUS PRONOUNS								
1 sg	*gau	*gagu	ngehi	ngoahi	gah	ngngai	nga	angnga
2 sg	*koe	(*ke(e)na)	kowe	koawoa	qey	ngkoe	(kom)	awe
3 sg	*ia	*ia	ih	ih	yey	ngaia	(el)	(amea)
1 pl inc	*kit,t'a	*kica	kit-	kihs	kej	ngaira(?)	kuht	ata
1 pl exc	*kamami	*kaamami	(kiht)	--	kemmem(W)	--	(kitacl)	amma(?)
	*kami	*kami	--	kam-#	kem(E)	--	--	--
2 pl	*kamii	*kamii	--	--	kemiy(E)	ngkamii	--	amie
	*kam'u	--	kumw-	kamw-#	qem'(W)	--	kom-tacl	--
3 pl	*ira	*ira	ihr	ihr	yer	ngaiia	el-tahl	ura
SUBJECT PRONOUNS								
1 sg	*ú	*ú	i	--@	yi-	i	--@	(a)
2 sg	*ko	*ko	ke	--@	qe-	ko	--@	wo
3 sg	*e	*e	e	--@	ye	e	--@	--
1 pl inc	*ti,e	*ti	--@	--@	je-	ti	--@	(an)
1 pl exc	*ka(m)i(?)	*kaú,i	(se)	--@	--@	(ti)	--@	(mma)
2 pl	*ka(m')u(?)	*kau	--@	--@	--@	kam'	--@	(mwa)
3 pl	*ra	*re	re	--@	re-	a-	--@	ro

Table 26. (Continued) Micronesian Personal Pronouns (with Nauruan)

	PMC	PTK	PON	MOK	MRS	KIR	KSR	NAU
OBJECT PRONOUNS								
1 sg	*(y)ai	*ai	-ye	--[@]	-yeh	-ai	-yuc	-o(?)
2 sg	*ko	*ko	-yuk	--[@]	-yeq	-ko	--[@]	-uw
3 sg	*a	*a	-∅	--[@]	--[@]	-a	--[@]	-∅
1 pl inc	*kit,t'a	*kica	--[@]	--[@]	-kej	-(i)ra(?)	--[@]	-kota
1 pl exc	*kamami	*kamami	--[@]	--[@]	-kemmem(W)	(-(i)ra)	--[@]	-komma(?)
	*kami	*kami	--[@]	--[@]	-kem(E)	--	--[@]	--
2 pl	*kamii	*kamii	--[@]	--[@]	-kemiy(E)	--[@]	--[@]	-komie
	*kam'u	--	--[@]	--[@]	-qem'(W)	--	--[@]	--
3 pl	*ira	*ira	--[@]	--[@]	-yer	-ia	--[@]	-ura
POSSESSIVE PRONOUNS								
1 sg	*-xu	*-i	-i	-i	-i	-u	-k	-o(?)
2 sg	*-m'u	*-m'u	-mw	-mw	-m'	-m'	-m	-mw
3 sg	*-ña	*-na	-∅	-∅,-n	-n	-na	-∅	-n
1 pl inc	*-t'a	*-ca	-t-	-s-	-d	-ra	-sr	-ta
1 pl exc	*-mi	*-mi	(-t)	-m	-m	(-ra)	(-k-tacl)	--
	*-mami	*-mami	--	--	--	--	--	-mma(?)
2 pl	*-mii	*-mii	(-mw-)	(-mw-)	-mi	-mii	(-m-tacl)	-mie
3 pl	*-(i)ra	*-ira	-Vr-	-Vr-	-er	-ia	-l-tacl	-ira

[@]The focus (or independent) pronoun is used for this function.
[#]These MOK forms are the roots in the dual and trial series of independent pronouns. The true plural MOK independent pronouns are kimi '1 pl exclusive' and kimwi '2 pl'.

the table. For example, KSR <u>kom</u> '2 sg focus pronoun' is almost certainly a reflex of PMC *kam'u '2 pl pronoun', KSR <u>el</u> '3 sg focus pronoun' is similarly a reflex of PMC *ira '3 pl focus pronoun', PON <u>kiht</u> '1 dual/plural exclusive independent pronoun', <u>se</u> '1 dual/plural exclusive subject pronoun', and -<u>t</u> '1 dual/plural exclusive possessive pronoun' are reflexes of the respective PMC first person plural <u>inclusive</u> forms, and the PON and MOK second person plural possessive pronouns -<u>mw</u>- are almost certainly reflexes of the PMC second person singular possessive pronoun.

There is some difficulty in reconstructing the '1 pl' and '2 pl' subject and object pronouns for PMC. Harrison (1978) presents a persuasive argument that, in fact, there were no distinct plural object pronouns in PMC, but that the plural focus (or independent) pronouns functioned as objects that were not suffixed to the verb. In addition to pointing out the formal identity between the plural focus and object pronouns, Harrison also presents several strong morphosyntactic arguments, which will not be discussed here.

The problematic data that lead to difficulties in reconstructing the '1 pl exclusive' and '2 pl' subject pronouns for PMC may suggest yet further support for Harrison's proposal. Note that doublets are reconstructed in these meanings for both the focus and object pronouns sets, while the reconstruction of the respective subject pronouns is very difficult. Is it not possible that the doublets in the focus and object pronoun sets in fact reflect pre-Micronesian focus and subject pronouns, i.e., that the pre-Micronesian focus pronouns were *kamami '1 pl exclusive' and *kamii '2 pl', and that the respective subject pronouns were *kami and *kam'u? KIR <u>kam'</u> '2 pl subject pronoun' is a regular reflex of *kam'u, while PTK *kaú,i '1 pl exclusive subject pronoun' and *kau '2 pl subject pronoun' might reflect *kami and *kam'u, respectively, but with irregular loss of the medial nasals.[30]

Pawley (1972:64,66) reconstructs for PEO the forms *k,mami '1 pl exclusive subject pronoun' and *m(i)u '2 pl subject pronoun'. Among the forms listed by Pawley with the latter gloss, however, are Rotuman <u>'au</u> (< earlier *kau), Lakon <u>gamu</u>, Maewo <u>kamu</u>, Tasiriki <u>komi</u>, Kwara'ae <u>kamu</u>, Lau <u>kamu</u>, and Oroha <u>'amu</u>, suggesting that PEO *ka(m)u can also be reconstructed in this meaning. Moreover, all languages cited by Pawley that attest either *kami '1 pl exclusive subject pronoun' or the proposed *kamu have identical forms cited as focal pronouns. Thus, the problems in reconstructing subject pronouns for PMC in these meanings also occur at a much earlier stage of Oceanic.

In any case, the presence of the identical doublets in the focus and object pronoun sets for PMC would appear to add further support to Harrison's already strong argument that the plural focus and object pronouns were, in fact, the same items in PMC.

Most of the Micronesian pronouns reflect POC or PEO reconstructions. A few, however, are less widely attested. These are:

(1) PMC *gau '1 sg focus pronoun' (cf. PTK *gagu). This form is not a PMC innovation, however, as it also appears to be reflected in NAU <u>angnga</u> and Rotuman <u>ngou</u>. The form should be noted, nonetheless, as the geographical proximity of these languages

makes it possible that they are members of a larger subgrouping.[31]

(2) PMC *ti,e '1 pl inc subject pronoun'. This form is attested in all MC branches except KSR, which has lost all subject pronouns. It may also be cognate, however, with Wayan _ti_ (although Geraghty (p.c.) states that that form is bimorphemic), Aulua _til_, Nguna and Sesake _tu_, Tasiko _te_, and Bugotu _ati_ (Pawley 1972:65).

(3) PMC *ira '3 pl object pronoun'. So far as I am aware, this form is only attested outside MC by NAU -_ura_ and Bauan Fijian _ira_. If Harrison (1978) is correct in proposing that the current MC plural object pronouns are reflexes of the PMC focus pronouns, however, the PMC form is regular.

(4) PWMC *re '3 pl subject pronoun'. KIR clearly reflects PEO *da (Pawley 1972:67), while PTK, PON, and MRS equally clearly reflect earlier *re. The only possible cognate forms with a mid vowel that I am aware of are Sa'a _kire_ and NAU _ro_. Since KIR reflects the PEO reconstruction, however, it appears more likely that *re was a PWMC innovation.

(5) PTK, MRS, KIR *ira '3 pl possessive pronoun'. Pawley (1972:67) reconstructs PEO *nda in this meaning, and lists no form that is cognate with the type *ira. Unfortunately, *ira cannot be reconstructed with certainty for PMC, as PP and KSR may reflect the PEO reconstruction, although with oral grade. NAU apparently reflects *ira, however, and since it is possible that NAU forms a higher order subgroup with MC, it is likely that the form existed in PMC.

Thus, there appear to be no clear PMC innovations among the personal pronouns. One possible WMC innovation has been identified, however.

4.3.2 Inalienably possessed nouns and possessive classifiers

It was observed in section 2.2.2.2 that a set of inalienably possessed locational nouns may be reconstructed for PTK, but that most of the forms reflect POC etyma. Two of those forms may reflect Micronesian innovations, however:

(1) PMC *faa- 'under, below': KSR ye-, KIR aa-, PON paa-, MOK paa-, PTK *faa-, MRS yawm'i- (?). All the forms except, perhaps, the MRS are reflexes of the securely reconstructed POC *papa. PTK and PP show irregular loss of the medial *p, and although the KSR and KIR forms are regular for a hypothetical PMC *fafa-, the innovation reflected in the TK and PP forms could be reflected in those languages as well. Rotuman fa-ni 'under, below' might appear to reflect the same innovation, but Rotuman f derives only from earlier *t or from a loan (Biggs 1965).

(2) TK-PP *ree- 'at, of': PTK *ree-, PON reh-. MRS raha- 'on top' may be cognate, but has a low vowel and attests a different gloss from the other languages. Bender (p.c.) suggests that the MRS form may be a reflex of PMC *raa 'branch' (< POC *daqan). KIR i-rou- is almost identical functionally and semantically with the TK-PP reconstruction (Harrison p.c.), but is not formally cognate.

Seven possessive classifiers were also reconstructed for PTK in section 2.2.2.2, and most of them appear to be attested as classifiers outside TK as well: PTK *im'a- 'shelter', PON imwa- 'building', MOK imwa-, MRS yem' 'house, building'; PTK *nima- 'drinkable object', PON nima-, MOK nima-, MRS n̦lime-, KSR nihmac, NAU nime-n; PTK *waa- 'canoe, vehicle', PON wara-, MOK wara-, MRS waha-, KSR okoac; PTK *na(t)u- 'offspring, pet', PON nah, MOK nah, MRS naji-, KSR nahtuh; PTK *aa- 'general objects', PON a-, ah-, MOK a-, MRS ha-, haha- (and cf. KSR la); and PTK *kana- 'prepared food', PON kana-, MOK kana-. Many of these forms would appear to be reconstructible as possessive classifiers for PMC, but Shelly Harrison (1981) argues very persuasively that PMC probably did not have the lexical category "possessive classifier." Harrison observes that KIR has no possessive classifiers, but also notes that appositional structures like nima-na te ran 'his drink--the water' are extremely frequent in KIR. He further observes that KIR has a form a- which takes possessive suffixes and occurs prenominally and which is cognate with PTK *aa-, but he argues on syntactic grounds that KIR a- is not, in fact, a possessive classifier. First, Harrison demonstrates, unlike the possessive classifiers in all other MC languages and the KIR nouns and nominalized verbs that are cognate with those classifiers and which may occur in appositional structures, KIR a- may not take the attributive suffix *-ni. This fact suggests that it is not nominal. Second, and crucially, KIR a- may not co-occur in front of the same noun with the KIR article te.

These observations lead Harrison to argue that KIR a- is not a possessive classifier but a possessive article, that it is probably cognate in that function with PPN *(q)a 'dominant possessive marker' (and also, presumably, Oroha and Kwaio a-, which are glossed as 'general classifiers' (Ivens 1926-1928:596; Keesing 1975)), and that therefore the development of a category "possessive classifier" has probably occurred in MC languages since the break-up of the PMC community. Harrison notes that all MC classifiers except the type *a(a)- reflect nouns or transitive verbs that either exist in the language or can be reconstructed outside MC, and argues that the appositional structure that exists in KIR together with the putative possessive article *a- were present in PMC and formed a structural basis for the later development of the possessive classifiers in other MC languages. Thus, assuming the correctness of our subgrouping proposals, all KSR classifiers (Lee 1975:110-118) would have developed individually within that language, and other classifiers would have developed in WMC, in TK-PP, and, perhaps, in individual languages within WMC. It is reasonable to ask how likely such a scenario might be.

The answer is, strangely enough, that it is not that improbable. Shown below are the seven meanings that PTK forms can be reconstructed for, together with the comparable classifiers in the other MC languages (the PPP reconstructions are my own):

Gloss	PTK	PPP	MRS	KSR
'general objects'	*aa-	*a(a)-	ha-,haha-	(la-)
'offspring, pet'	*na(t)u-	*nai-	naji-	nahtuh
'canoe, vehicle'	*waa-	*wara-	waha-	okoac
'shelter, house'	*im'a-	*imwa-	yem'	(se)
'food'	*kana-	*kana-	(kije-)	(na)
'raw food'	*kocaa-	--	--	(osrwac)
'drinkable object'	*nima- (PNTK)*únuma	*nima-	n,lime-	nihmac

Classifiers in other languages that are not cognate with PTK are shown in parentheses.

Strikingly, only three of the seven meanings have cognate forms in all four branches, and in each of those cases a cognate noun or transitive verb can be reconstructed securely for PMC: PMC *natu 'child, offspring', PMC *waxa 'canoe', and PMC *nima 'to drink'. Although KSR has possessive classifiers to express all the other meanings reconstructed for PTK, the forms are clearly not cognate. On the other hand, five of the seven meanings have cognate forms among all the putative WTK branches, and one of the remaining two has cognate forms in PTK and PPP. On the basis of this evidence, let us propose at least the following form as an innovation of the putative PWMC:

(3) PWMC *a(a)- 'possessive classifier for general objects'. This form is clearly cognate with KIR a-, but if Harrison is correct its use as a classifier is innovative. Also innovative is the long vowel in TK which is also attested in MRS and PON (but not

in MOK (Harrison p.c.)), although together with a short vowel doublet. The long vowel form in PON appears to be in free variation with the short vowel form except for when the classifier and suffix function as a separate NP, when only the long vowel form may be used (Rehg 1981:187).[32] I have no information regarding the syntax of the MRS variants.[33]

The use of PWMC *natu, *waxa, *im'a, and *nima as possessive classifiers may also be innovative of that group, but because of the independent development of three of these items as classifiers in KSR, it appears safer not to claim them as support for the WMC group. It should, however, be noted that the form *kana- 'possessive classifier for prepared food' provides strong support for a TK-PP group (cf. PTK -PP *kagi 'to eat (vt)', which may also be reconstructed for PMC).[34]

4.3.3 Demonstrative morphemes

As noted in section 2.2.2.3, Oda-Tanaka (1978) reconstructs a set of demonstrative morphemes for PMC. Her reconstructions are as follows: *e '1st person exclusive demonstrative root'; *e-ni '1st person inclusive demonstrative root'; *na '2nd person demonstrative root'; *na-ni '3rd person demonstrative root: away from both speaker and hearer'; *o '3rd person demonstrative root: away from both speaker and hearer'; *we 'demonstrative root: out of sight of speaker and hearer'; *ka 'demonstrative plural marker'; *ika 'locative prefix'; *i- 'prefix to demonstratives'; and *mene- 'prefix to demonstratives' (Oda-Tanaka 1978:18-20).

In many ways, Oda-Tanaka's analysis is quite insightful. However, she was hampered in her reconstructions by the lack of a subgrouping hypothesis, leading her to reconstruct for PMC forms that are less widely distrbuted, and she apparently did not have access to full data on MOK and KIR. As a result, she appears to have been perhaps overly influenced by forms in the TK languages that appear to represent more recent developments (see sections 2.2.2.3 and 3.4.2). For example, the use of the type *na(a)-na (Oda-Tanaka: *na-ni) with a meaning 'away from both speaker and hearer' seems clearly to be restricted to the TK languages.

I am not sure that it is possible at this time to reconstruct the complete PMC demonstrative system. (At any rate, I am unable to reconstruct it.) However, it appears that several demonstrative forms--some of them identical with Oda-Tanaka's--with their probable meanings can be reconstructed. An attempt at this task appears in Table 27.

The forms reconstructed in the table for PMC appear to be continuations of earlier etyma. Pawley (1972:76) reconstructs PEO *e,ina 'away from speaker', under which several na forms are listed and PPN *ena has the gloss 'near hearer', which is almost certainly cognate with the PMC demonstrative root *na. Similarly, Pawley's *(q)i 'position in place or time, "at, in on"' (1972:85) is probably cognate with proposed PMC *i- 'demonstrative prefix' (although Pawley's supporting data include no reference to demonstratives). PMC *e 'near speaker' also appears to have a cognate in Lau Fijian iei 'here (near speaker)' (Geraghty p.c.), and PMC *oe 'away from speaker'

Table 27

Micronesian Demonstrative Morphemes

Gloss	PMC	PTK	PON	MOK	MRS	KIR	KSR
'demonstrative root: near speaker'	*e	e(e)	-e	-e,[a] -i[b]	yey	-e	-ac,-e
'demonstrative root: near hearer'	*na	*na(a)	-en	-en,[a] -n[b]	n'ey,[c] yen'[d]	-ne,[e] -na[f]	-acn
'demonstrative root: away from speaker and hearer'	*oe	*we(e)	-o,[a] -u[b]	-o,[a] -u,[b] -wa[g]	yew[h]	-oo[i]	-oh
'prefix to demonstratives'	*i-(?)	*i-	i-	--	yi-	--	in-(?)
'temporal prefix to demonstratives'	(PCMC)*ika-(?)	*ika-	--	--	ki-(?)	ik(a)-	--
'(emphatic?) suffix to demonstratives'	(PCMC)*-na(?)	*-na	-n	--	-n(?)	?	--
'suffix to demonstratives'	(PCMC)*-i(?)	*-i	--	--	--	-i	--
'plural formative on demonstrative roots'	(PCMC)*ka	*(k)ka	ka-	ka-	ka-[j]	ka-	--

[a] After consonant-final nouns
[b] After vowel-final nouns
[c] Near hearer
[d] Away from speaker and hearer
[e] Most frequently used form
[f] Used only in the ligative set of demonstratives (Harrison, p.c.)
[g] Singular definite determiner
[h] Remote, often out of sight
[i] Known referent
[j] Only used with non-humans; the plural human formative is <u>ra-</u>.

is almost certainly cognate with NAU -oo in the same meaning (Nathan n.d.). So far as I am aware, however, this latter form is unattested elsewhere. It might, therefore, provide more evidence for a grouping of NAU with MC.

To the extent that they are valid reconstructions, the four forms reconstructed for the putative PCMC all appear to be innovations. Of these, the strongest is clearly PCMC *ka 'plural formative on demonstrative roots', which is reflected in all four branches and apparently not attested elsewhere. The other three forms are far more problematical.

A comment should be made about MOK -wa 'singular definite determiner'. As described in Harrison (1976:76-87) this form appears to have many of the functions that are typical of TK *we(e) (and apparently of MRS yew), in that it is quite comparable in discourse to the English definite article the. It is, therefore, possible that there were two 'away from speaker and hearer' demonstrative roots in PWMC (if not higher): one a reflex of PMC *oe and the other the source of MOK -wa, with the meaning 'object referred to, definite referent'. If so, these forms might have merged in TK, MRS, and PON, with the latter meaning becoming dominant in TK and MRS, and both meanings remaining in the single PON form. MOK, of course, retains the proposed distinction.

4.3.4 Numbers and countable bases

Harrison and Jackson (in press) reconstruct for PMC number roots from 'two' through 'nine' that reflect the corresponding POC reconstructions.[35] Two forms for 'one' are also reconstructed, with a reflex of POC *(n)sa 'one' (Pawley n.d.) occurring in the serial counting series, and a form that must be reconstructed as PMC *te- 'one' which is prefixed to countable bases, or classifiers. It is possible that this latter form, which is also apparently attested in NAU (Nathan n.d.), is innovative, for although Pawley (n.d.) reconstructs a form *ta(n)sa 'one' for POC, and several languages in scattered areas of the Southeast Solomons and Vanuatu attest the types _ta_, _tai_ 'one', the mid vowel in the PMC (and NAU) form does not appear to be attested elsewhere.

All MC languages and NAU show evidence of countable bases which are affixed to the number roots. KIR has in excess of one hundred such bases (Harrison p.c.), as does TRK (Sugita n.d.) (although the number that can be securely reconstructed for PTK is only slightly more than twenty: see Table 5 in section 2.2.2.5). For PON, Rehg (1981:124-140) lists some 41 numeral classifiers, but Harrison (1976:95-100) lists only 14 for MOK. KSR has a binary classification system, but appears to reflect five morphemes that must originally have served as countable bases (Lee 1975:119-125), while MRS, which has apparently eliminated number classification from the modern grammar, nonetheless appears to reflect at least eight countable bases as fossils. Nathan (n.d.) provides five examples of classifiers in NAU, but implies that there are more.[36]

The types of countable bases that are found in MC languages can profitably be classified as either "qualitative" or "quantitative" (Harrison and Jackson in press). Qualitative countable bases are "selected in terms of a classification of objects in the world on the basis of salient features of the inherent semantics of the objects being counted." For example, animate objects typically take a different countable base from inanimate objects. Other common distinctions are between long objects, broad ones, flat ones, etc. In contrast, quantitative countable bases refer to units of measurement (days, nights, rows, layers, pieces, cups, fathoms, cubits, pairs, bunches, piles, etc.) and to fixed numerical values, based on a ten-power system.

It appears now that two, and perhaps three, qualitative countable bases may be reconstructed for PMC. All three, however, are also attested in NAU and thus are not innovations of the MC group.

(1) PMC *-ua 'countable base for general (i.e., unspecified) objects': PTK *-ua, PON -u, MOK -w, KIR -ua, MRS -w (in numbers from 1-3), KSR -o, -u (in numbers from 2-3), and NAU -o, -u (in the serial counting set).

(2) PMC *-manu 'countable base for animates': PTK *-manu, PON -men, MOK -men, KIR -man, MSR -man (in the form for 'four'), and NAU -men 'people'.

(3) PMC *-t'au(?) 'countable base for leaves, pages, and other flat objects': PTK *-cau, PON -te, and NAU -ra.

Similarly, two quantitative countable bases may be reconstructed for PMC. While one of these forms reflects a POC etymon, the second appears to be a PMC innovation.

(4) PMC *-gaulu 'countable base for units of tens': PTK *-gaulu, PON -ngoul, KIR -ngaun, MRS -gewil, KSR -nguhul (< POC *ŋapulu 'ten').

(5) PMC *-p'ukua 'countable base for units of hundreds': PTK *-p'ukua, PON -pwiki, MOK -pwki, KIR -bubua, MRS -biqiy, KSR -foko. The KIR form is irregular in the medial consonant, but is functionally identical with the other forms. KIR attests other instances of progressive consonant assimilation of an historical *k (e.g., KIR kiika 'octopus' < POC *kuRita), and it is very likely that a similar development occurred here.[37] POC *Ratus is reconstructed in the meaning 'hundred'.

The fact that so few countable bases can be reconstructed for PMC while three of the five branches attest so many, suggests two possible sequences of development: either there were several more such bases in the proto-language which have since been lost in some daughter languages and thus cannot easily be reconstructed, or else once the system of countable bases was firmly established in the proto-language, a precedent was set which the daughter languages could use for the development of more countable bases. Although the first possibility cannot be rejected out of hand (for example, more data on NAU may require us to reconstruct additional countable bases for PMC), it is my belief that the second possibility is more likely to be correct. Partly supporting this belief is the fact that the two KSR countable morphemes that have not been accounted for by the above reconstructions, -koe and -kohsr,[38] are not cognate with a base in any other MC language, which suggests that they, at least, are independent developments of KSR.

If our internal subgrouping hypotheses are correct, however, it would appear that at least some countable bases developed in PCMC that were subsequently lost in MRS. The countable bases that are at least potentially reconstructible for PCMC are the following:

(6) PCMC *-kudi 'countable base for high power of ten': PTK *(k)kidi 'countable base for ten thousands', PON and MOK -kid 'countable base for thousands', KIR -kuri 'countable base for hundred thousands', MRS -qit 'hundred pairs of fish or copra'.

(7) PCMC *-gafa 'countable base for fathoms': PTK *-gafa, KIR -ngaa.

(8) PCMC *-p'ogi 'countable base for nights': PTK *-p'ogi, PON -pwong, KIR -bong.

(9) PCMC *-depu 'countable base for high power of ten': PON -dep, MOK -dep 'countable base for millions', KIR -rebu 'countable base for ten thousands'.

(10) PCMC *-garatu 'countable base for thousands': PTK *-garatú, KIR -ngaa, where the KIR form, if cognate, shows very irregular loss of the final syllable (cf. POC *Ratu(s) 'hundred').

Numbers (7) and (8), of course, reflect widely attested POC etyma, and both *-gafa and *-p'ogi are reflected in other MC languages, albeit not as countable bases. The other forms appear to be innovative.

Still other countable bases are reconstructible for PTK-PP. All of these appear to be innovations:

(11) PTK-PP *-faco 'countable base for long objects': PTK *-faco, PON -pwoat,[39] MOK -pas.

(12) PTK-PP *-kúta 'countable base for very small amounts': PTK *-kúta, PON -kis, MOK -kij.

(13) PTK-PP *-(t)um'u 'countable base for bunches, clusters': PTK *-(t)um'u, PON -umw.

(14) PTK-PP *-dipa 'countable base for chips, slices': PTK *-dipa, PON -dip.

(15) PTK-PP *-ka 'countable base for tens': PTK *-(i)ka, PON -k.[40]

(16) PTK-PP *-nena 'countable base for ten thousands': CRL -l, WOL -nnA, PON,MOK nen.

(17) PTK-PP *-lop'a 'countable base for hundred thousands': WOL -lobA, PON,MOK lopw.

4.3.5 Directional enclitics

At least six, and probably seven postverbal directional enclitics are reconstructible for PMC, all of which reflect earlier forms. Those reconstructions are shown with supporting data below:

	PMC	PTK	PON	MOK	MRS	KIR	KSR
'thither, toward hearer'	*watu	*-wa(t)u	-wei	-we	-waj	-wati	--
'outwards, out to sea'	*otu	*-wo(t)u	-iei	--	--	--	-wot
'downwards, downwind, west'	*zio	*-di(w)o	-di	-di	-téw	-rio	-i
'upwards, upwind, east'	*zake	*-dake	-da	-da	-tak	-rake	-yak
'hither, toward speaker'	*mai	--	--	--	--	-mai	-ma
'away; completive aspect'	*lako	*-lako	-la	-la	-l'aq	-nako	-lac

	PMC	PTK	PON	MOK	MRS	KIR	KSR
'inwards, inland, ashore'	*logo	*-logo	-long	--	-l'eg"	--	--

TK, PP, and MRS have replaced PMC *mai 'hither' with a reflex of PEO *(n)soko 'arrive'. This innovation, which may be reconstructed as PWMC *-doko 'hither, toward speaker', is not attested in any other Oceanic language so far as I am aware. PWMC *logo 'inwards, inland' has an innovative final vowel, as can be seen from comparisons with Fijian loga 'inside', Bugotu i-longa 'landwards', Vaturanga longa 'ashore, inland, south', Kove longa 'inside', and Rotuman -loga 'toward the interior (of an island)'. As KIR and KSR do not reflect the form, however, it is not possible to determine whether the innovation is limited to WMC or was also present in PMC.

The failure of the PP languages to reflect the medial *k in their reflexes of PMC *lako and *zake (and PWMC *doko) is somewhat problematic. A possible solution will be presented in section 4.6.

4.3.6 Other grammatical innovations

As Harrison (1982) has suggested, it is possible that the development of PMC *-aki as an agentless passive suffix on verbs may be innovative. A reflex of the type *-aki which Pawley (1972) reconstructed as an instrumental transitive suffix in PEO (but see Harrison 1982 for a quite different analysis), PMC *-aki had a function that appears to be unique in Oceania. It is reflected as PTK *-aki (where it is productive only in modern PUA, but attested in fossilized forms in all TK languages), PON -ek, MOK -ek, MRS -ak, -ek, KIR -aki, and KSR -yuhk.

No other grammatical innovations appear to be reconstructible for PMC at this time, but the following can be reconstructed for PCMC:

(1) PCMC *ka- 'causative prefix': PTK *ka-, PON ka-, MOK ka-, MRS ka-, KIR ka-. POC *pa(ka), which is reflected in KSR ahk-, is securely reconstructed in this meaning. I know of no other language in Oceania which reflects the type *ka- in this meaning.

(2) PCMC *p'ae 'because, so that': PTK *p'ae, PON pwe, MOK pwa, MRS be, KIR b'a . Oba be 'thereupon, so that' may be cognate, but more needs to be known about it to decide. If it is not cognate, then it is almost certain that the CMC form is innovative.

(3) PCMC *p'a(e) 'complementizer following verbs of saying and thinking': PTK *p'a(e), MOK pwa, KIR b'a. This form reflects an earlier *(n)pa 'to say, speak', which is reflected in Loniu p^way 'say, speak', Tongan pe 'say, speak', Mota βaβa 'say, speak', and, in MC, in KSR fahk, MRS bah, PON pwa (archaic), all meaning 'to say'. It is possible that the complementizer use has developed independently in TK, MOK, and KIR, but it is also possible that it reflects a period of joint development.

(4) PCMC *tai 'negative marker': PTK *tai, PON sai-, MOK joah, KIR tai 'negative imperative'. Both *taqe and *teqe are reconstructed for earlier stages in Oceanic, but I am aware of no form *tai. (See section 2.2.2.6 for further discussion.)

It is also appropriate at this time to observe again that PON has a form deh 'negative used in commands' that is cognate with PTK *de. To my knowledge, this form is attested nowhere else, and despite the absence of a cognate MOK form, it is strong evidence for a TK-PP group.

4.4 Lexical evidence for the Micronesian group and for proposed internal subgroups

The first subsection presents lexical evidence which appears to support the integrity of the NMC group. Following subsections, in turn, present evidence for the putative CMC and WMC groupings. Although all of the forms to be presented appear to be innovative, the inherent dangers of trying to use lexical evidence for subgrouping in Oceanic, which were pointed out in section 2.2.3, should be kept in mind. It is hoped, however, that the quantity and quality of the evidence is persuasive.

4.4.1 Lexical evidence for PMC

4.4.1.1 Formal innovations of PMC

(1) PMC *Tigi 'fart': KSR sucng, KIR ting, MRS jing, MOK jing, PON sing, PTK *Tigi. Geraghty (1979) reconstructs PEO *ziki 'fart' on the basis of Nggela higi, Kwaio si'i, and Fijian ciki. The MC form shows unexpected reflexes of both consonants.[41]

(2) PMC *tai-m 'to sharpen': KSR twem, KIR taima, MRS jemey, MOK jaim, PON saim, PTK *taim-. This form reflects irregular loss of the medial consonant from POC *tansim 'sharp' (but see discussion in section 4.2).

(3) PMC *luru 'shade, shadow, shady': KSR lul, KIR nuu, MRS llér", MOK rir, PTK *núru. This form appears to reflect POC *maluR, but with loss of the initial syllable and the addition of a copy

vowel. PPN *ruru 'shelter, calm' should also be mentioned, together with Mota rurunga 'shelter from rain, calm (of wind)' and Fijian ruru 'calm (of wind)', but although the MOK form might be cognate with the PEO etymon reflected by these items, the other MC forms do not appear to be.

(4) PMC *ñau 'delicious, sweet: KSR yuh, MRS nnaw, PON iou, PTK *nnau. This form appears to reflect unexpected loss of the medial consonant from POC *ñamu 'taste, flavor'.

(5) PMC *karuki 'beach or sand crab': KSR kuluk, KIR kauki, MRS kariq, PTK *kariki. Nuclear Polynesian *kaviki and Rotuman 'awi'i 'ghost crab' suggest a Proto-Central Pacific *kawiki. The MC form has an innovative medial consonant.

(6) PMC *up'a 'chest, upper belly': KSR in-yuwac 'chest, bosom', KIR ub'a 'chest', MRS wéb 'chest', PTK *up'a. PEO *topwa 'belly' has been reconstructed by Geraghty (1979); the MC languages, however, show innovative loss of the initial consonant and a raised initial vowel. Oroha and Marau Sound opa 'belly', although formally similar to the PMC form, nonetheless are regular reflexes of *topwa.

(7) PMC *p'uko 'knot, tie a knot': KSR fokoi, PON pwukopwuk, PTK *p'uko. PEO *(m)puku 'knot, wood, protuberance', with which Fijian buku 'to knot' is cognate, is securely reconstructed. The MC form has an innovative final vowel.

(8) PMC *ulu-ulu 'pillow': KSR ilul, MOK,PON uluhl, PTK *uluulu. Clearly a reflex of POC *quluŋa 'pillow', which is also reflected

as PMC *uluga, this item nonetheless shows a reduplicated form that does not appear to be attested elsewhere.

(9) PMC *faka-afi 'evening': KSR ekuh, PTK *faka-afi. POC *Rapi is reconstructed in this meaning, and Blust (p.c.) has reconstructed PAdm *paRapi, but neither of these forms attests the second syllable of the PMC form. Fijian yakavi 'evening' shows a medial -ka-, but Fijian y does not correspond to PMC *f.

(10) PMC *afafi 'coconut crab': KSR aci 'k. of crab', KIR aai, PON emp, PTK *affi. POC *kape 'crab taxon' is reconstructed. This PMC form appears to show very irregular loss of the initial *k, if it reflects the POC etymon.

4.4.1.2 Semantic innovations of PMC

(11) PMC *madaki 'ache, pain': KSR atuck, KIR maraki, MRS metak, MOK moadoak, PON medek, PTK *madaki. POC *masaki is reflected in other OC languages with a consistent meaning of 'sick, feverish'. No MC language attests that meaning, and all attest the meaning given in the reconstruction.

(12) PMC *lewe 'tongue': KSR lo-, KIR newe, MRS lewe-, MOK loawoa (3ps), PON lewe (3sg), PTK *lewe. POC *leqo is securely reconstructed with the meaning 'speech, voice'. PPN *qalelo has the same meaning as the PMC reconstruction, but is not formally compatible.

(13) PMC *laú 'pool, pond, puddle': KSR in-luhluh, KIR nei, MRS l"éy, MOK le, PON leh, PTK *laú. POC *lau is reconstructed with the meaning 'open sea, seashore'. The PMC form for the former of these meanings is *mazawa.

(14) PMC *kona 'catch (of fish, birds, etc.)': KSR koano-, MRS qen'a-, KIR kona, MOK koanoah (3sg), PTK *kona. PEO *kona 'secure (as by tying)' is reconstructed, but according to Paul Geraghty (p.c.) no reflexes have the same semantic as the MC one. Problematic, however, is whether YAP k'oon 'catch of fish' is a borrowing from TK or a retention of an earlier form.

(15) PMC *m'ata 'worm': KSR wat koekoe 'k. of worm', KIR m'ata 'worm', MRS m'aj 'intestinal worm, eel, hemmorhoids, tumor', MOK mwaj, PON mwahs, PTK *m'ata. POC *ŋmata 'snake' is securely reconstructed. As there are no snakes in the areas of Micronesia inhabited by MC speakers, the semantic change is a likely one, but it does not appear to be attested elsewhere in Oceanic.

(16) PMC *tapa 'cheek'; KSR lihkihn-tuhpah, KIR taba, MRS jepay, MOK joap, PON sepe (3sg), PTK *tapa 'cheek, fish gill'. Cf. POC *tapa 'side, shoulder'.

(17) PMC *wazewaze 'count': KSR oacoac, KIR wareware, MRS watwat, PON wadawad, PTK *wadewade. POC *wanse is securely reconstructed with the meaning 'divide, separate out'. No other reflexes appear to have the PMC meaning.

(18) PMC *kapi 'buttocks, bottom, keel': KSR kapih- 'bottom', KIR kabi 'keel, bottom', MRS kapi-n 'bottom of', MOK kapi- 'buttocks, end, bottom', PON kapi (3sg) 'bottom', PTK *kapi 'bottom, buttocks, hip, keel'. POC *kapu 'buttocks, loin' is reconstructed, but other languages reflect the PMC semantic extension or the final front vowel.

(19) PMC *lúku 'believe, have faith, trust': KSR luhkuhk 'easy to convince, credulous, gullible', MRS lékéy, MOK liki, PON likih, PTK *lúku. Fijian luku 'grasp, handful, gather' and Nggela lugu 'hold, clasp tight' suggest PEO *luku 'hold, grasp'. If so, the PMC form appears to be an innovation.

(20) PMC *maagu 'pandanus leaf': KSR mweng, MRS mahag, MOK moang 'pandanus key', Pingilapese saeraeki-n mahng 'sail made from green pandanus', PTK *maagu. Cf. PEO *maŋu 'withered (of leaves)'. Buli maang 'dry' suggests that the reconstruction can also be made at the POC level.

(21) PMC *mat'a 'pimple': KSR mwesr, MOK mas, PON maat, TRK mmach. This form appears to reflect a semantic innovation of PEO *ma(n)da 'ripe, fermented, soft', which is also reflected in MC with the expected meaning.

(22) PMC *pit'i 'bow and arrow, spear with string attached': KSR pihsr, MOK koa-pis, PTK *(ka-)ppici. Almost certainly cognate with PEO *vinti 'to snap, spring up', which may also be related to Motu pidi 'flick, fillip', the PMC form appears to reflect a semantic innovation.

(23) PMC(?) *kata 'speak, boast, talk, language': KSR kahs 'word, speech, language', MRS kaj 'idiom, motto, pun, saying', PON kahs 'speak in anger, boast', PTK *kata 'speak loudly, talk, word'. This form apparently reflects POC *kata 'laugh', but with a semantic change. The KSR form may be a loan, however, as KSR normally reflects earlier *t as t before a low vowel. In that

case, the innovation might more appropriately be assigned to the WMC level.

4.4.1.3 Replacement innovations of PMC

(24) PMC *ida 'press, rub': KSR itucng 'press, run over, smear', KIR ire 'rub, polish', MRS yit 'make fire by rubbing sticks', MOK idaid 'press', PON idang 'to mash', PTK *ida 'rub, press'. Several forms are reconstructed in this meaning for POC, but only *asa 'grate, rub' is a possible cognate. That form, however, is reflected in PON adahd 'sharpen, put an edge on something'.

(25) PMC *kinata 'wound, sore': KSR kihnet, KIR kina 'scratch, mark, stain' (with unexpected loss of the final syllable), MRS kinéj, PON kens 'yaws', PTK *kinata. It is possible that this form reflects PAN *kata 'bite' with the *-in- infix, in which case it is not an innovation but a rare retention. POC *lake is reconstructed in this meaning.

(26) PMC *mago 'forehead, fontanelle': KSR mahngo 'head, forehead', KIR mango 'fontanelle (of people)', MRS mag" 'pate of head, soft spot on baby's head', MOK moang 'head', PON moahng 'head', PTK *mago 'forehead, top of head'. The POC reconstruction is *(n)daqe. Blust (1982) proposes that the following Malaita forms are cognate with the PMC: 'Are-'Are mano-mano 'breathe', mano-na 'breast, chest; breath, respiration'; Arosi ma-mango-na 'pit of chest, stomach, where breath heaves'; Kwaio mango 'breathe, pause for breath', mango-na 'breath, life'; Lau mango-na 'pulse, beat of heart; fontanel; lungs, life, soul, spirit; wind, breath'; Sa'a ma-mango 'breath; (metaphorical) heart'; Ulawa mango-mango

'breathe'. As Blust notes, however, only Lau attests a meaning related to 'head'. It is not necessary to dispute Blust's proposed comparison, moreover, to note that the restriction of the form's meaning in MC to the head appears innovative.[42]

(27) PMC *m'akum'aku 'arrowroot, starch': KSR mokmok, KIR m'akem'ake, MRS m'akm'ék, MOK mwoakmwoak, PON mwekimwek, PTK *m'aku(m'aku). Proto-Central Pacific *(m)pia seems to be reconstructible in this meaning on the basis of PPN *pia 'arrowroot, starch' and Fijian via 'generic for Alocasia and Cyrtosperma'. It is possible, however, that the KSR form is a loan, as *m' is normally reflected as KSR w in initial position. If so, this may be a CMC innovation.

(28) PMC *oro 'fish gills': KSR ohloh, KIR oo, MRS wer, MOK woal, PTK *oro. Cf. POC *i,asaŋ.

(29) PMC *p'exa 'twin': KSR fak, KIR bwebwe MOK umpwoar, PON mpwer, PTK *li-p'p'ea. Cf. POC *pasaŋ.

(30) PMC *auxu 'yes': KSR ahok, MRS yigg-ay, PON ei, PTK *au. POC *io appears firmly reconstructed in this meaning. Lau (Fijian) aue 'yes' may appear cognate, but would not be expected to lose earlier *ŋk (> PMC *x).

(31) PMC *p'et'i 'hot': KSR fuhsrfuhsr, MOK pwesi-n, PTK *p'eci. Several forms are reconstructed in this meaning for POC, but none seems a likely source.

(32) PMC *p'at'e 'coral lime': KSR fasr, MOK pwoahs, PON pweht, PTK *p'ece. Cf. POC *a(m)puR.

(33) PMC *genu 'shadow, ghost, spirit, reflection': KSR nguhn, MOK ngeni-, PON ngeni-, PTK *genu. POC *n,ñun,ñu is reconstructed in this meaning (Blust 1978). It is possible that the PMC form represents a formal innovation of the POC, rather than a replacement.

(34) PMC *fauu 'cold, cool': KSR ohu, MRS pi-yaw, MOK pou, PON pou, PTK *faúu. POC *maka(n)di(n)di is reconstructed in this meaning as a continuation of a PAN etymon. POC *malaso is also reconstructed in this meaning on the basis of OC languages in and near New Guinea.

(35) PMC *maaunu 'battle, war': KSR mweun, MRS mawin 'magic to make soldiers brave', MOK mahwin, PON mahwin, PTK *maaunu. This form may be a reflex of POC *punu 'kill, strike, extinguish', but with an unidentified initial *maa-. In this form, however, it appears innovative. YAP mael, in the same meaning as the PMC reconstruction, is almost certainly a loan from ULI maaul.

4.4.1.4 Other lexical evidence for PMC

The following lexical items do not appear to be attested elsewhere in Oceanic, and thus may be innovations of PMC.

(36) PMC *rato 'whale': KSR loat, KIR ato-ni marawa (lit.: 'whale of the sea'), MRS raj, MOK roaj, PON roahs, PTK *rato.

(37) PMC *p'ot'a 'turtle shell': KSR fihsrac, KIR bora, MRS bed, MOK pwoas, PON pweht, PTK *p'oca.

(38) PMC *pika 'sand, beach, sandbank': KSR puhk 'sand', KIR bike 'beach sand', MRS pike-n 'flat land surface', MOK pik 'beach,

sand', PON pihk 'beach, sand', PTK *pika 'sand, sandbank' (and cf. PTK *ppia 'sand, beach'). Possibly related are POC *pa(m)pi 'sand, sandbank' and POC *pia 'earth, ground', although the latter is a more likely source for PTK *ppia and MRS ppéy 'sandbank'.

(39) PMC *peata 'ashes from fireplace': KSR apact, MRS wipahaj, MOK poahj, PON pehs, PTK *peata.

(40) PMC *m'are 'lei, garland': KSR ola 'possessive classifier for neck decorations', KIR m'ae, MRS m'are-, MOK mwarmwar, PON mwaramwar, PTK *m'are. Paul Geraghty (p.c.) notes PPN *pale 'head garland', but also observes that the initial consonant does not correspond with PMC *m'.

(41) PMC *malu(a)-k 'forget': KSR muhlkihn, KIR manuoki-na, MRS mel'aql'aqey, MOK moalukluk, PTK *malu(a)ki. If the PMC form began with a labiovelar, it would be possible that PPN *ŋalo 'forget' were cognate. All MC languages agree that the initial consonant was *m, however.

(42) PMC *waani 'pumice': KSR yot-wen 'basalt', KIR waan, MRS til-ahan, MOK wehn, PON wahn-pei, PTK *waani.

(43) PMC *liki-z 'leave behind, deposit': KSR liki 'leave, put down', KIR nikira 'remainder, rest, leftover', MRS likit 'put, place, deposit', MOK likid 'leave behind, throw away', PON likid 'to spit (honorific)', PTK *liki-d 'leave alone, leave, save'.

(44) PMC *patiki 'to be long-winded, able to hold one's breath under water for a long time': KSR pahtok, MRS ppakij (with metathesis), MOK poaik PON peik PTK *patiki.

(45) PMC *ripi 'broken, shattered': KSR mih-lihp 'smash, shatter', KIR ma-ibi, MRS r"ip, PTK *ripi-g.

(46) PMC *t'ao 'person, companion, member': KSR elak-srao-nak 'family, lineage', KIR rao 'friend, companion, colleague', MRS dewe-n 'subjects of, followers of', MOK soo- 'member', PON too- 'member', PTK *cao 'person, people, member of a group'. It is possible that this form represents a nasal grade reflex of POC *tau 'people', although PMC *tau 'people, clan member, family member' is the more normal reflex of that reconstruction. YAP choo-n 'member of' is probably a loan from ULI.

(47) PMC *latuu 'tomorrow': KSR lutu, MRS yi-ljiw, PTK *latuu.

(48) PMC *kunu 'go out, be extinguished': KSR kun 'extinguished, blind', MRS qqin, MOK kun, PON kun, PTK *kunu.

(49) PMC *kat'au 'heaven, paradise; traditional source of original settlers': KSR kuhsrao, KIR karawa 'sky, mythical heaven', PON katau 'Kosrae; traditional source of original settlers'; PTK *kacau 'heaven, paradise; clan name; traditional homeland of original settlers'.

(50) PMC *fizi 'accompany, follow': KSR wi, KIR iri, PTK *fidi.

(51) PMC *ut'u-k 'to shake s.t.': KSR usruk, KIR ruuru (where the initial vowel has been irregularly lost), MRS yidikiy, MOKisik, PON utuki, PTK *ucu-k. It is possible that Fijian vutuki 'pound' is cognate, although it reflects an oral grade medial consonant.

(52) PMC *lama 'think, feel, perceive': KSR luhma, MRS l'emn'ak, MOK lamlam, PON lamalam, PTK *lama.

(53) PMC *fiago 'idea, fable, tale': KSR angwe 'say, tell', KIR iango

'thought, idea, fable, fairytale', MRS(?) yinag" 'legend, story, myth', PTK *fiago 'story, legend, history'. Rotuman fiaga 'speak, talk' appears to be a loan from MC, as the normal Rotuman correspondence with PMC *f is h. Biggs (1965) shows that the only nonborrowed source of Rotuman f is earlier *t.

4.4.2 Lexical evidence for PCMC

To provide support for the putative Central Micronesian subgroup, a form must be attested in KIR and in at least one of the putative WMC branches. It must not occur in KSR or elsewhere in Oceanic. It is, of course, quite possible that KSR might have lost a PMC etymon that is retained in the other MC languages, thus giving the impression that the form is only Central Micronesian. For this reason, the best evidence is where KSR continues an earlier form which is changed or replaced in CMC. Such forms have proved difficult to find, but six have been located:

(1) PCMC *gii 'tooth': KIR ngii (archaic), MRS giyi-, MOK ngih-, PON ngih, PTK *gii. KSR wihs 'tooth' appears to reflect PEO *(ŋ)i,unju 'mouth', but Seimat nisu- 'tooth' (Blust p.c.) probably reflects the same etymon and with the same meaning as the KSR form. Cf. also POC *n,ñipon 'tooth'.

(2) PCMC *kalo 'sennit, make sennit': KIR kanoa 'to engage in twisting strands', MRS qqal', MOK koalkoal, PON ngkoal, PTK *kalo. KSR kokoali 'twist sennit into rope' is clearly cognate, but suggests that the final high vowel that is attested in Fijian qali 'braid sennit' and Tongan pakali 'tighten by twisting' was

also inherited into PMC. In that case, the final mid vowel in PCMC *kalo is innovative.

(3) PCMC *telu 'three': KIR teni-, MRS jiliw, MOK jili-, PON sili-, PTK *telu. KSR tol 'three (serial counting)' and tolu 'three (cardinal number)' clearly reflect POC *tolu. The *o has equally clearly been fronted in the CMC languages.

(4) PCMC *ogi-d 'wring, squeeze, express': KIR ongira, MRS wig"tahakey, PON wengid, MOK ungud, PTK *(w)ogi-d. KSR fulohfohl probably reflects POC *poRo 'wring, squeeze, express', albeit with a nasal grade reflex (PMC *p'). The POC etymon does not appear to be reflected elsewhere in MC.

(5) PCMC *p'aki 'carry, take, bring, lift': KIR(?) b'ab'ako 'carry in arms, on breast, cuddle', MRS bek 'carry, bring, receive, get, capture', MOK pwoak 'life', PON pwek 'lift, adopt', PTK *p'eki. KSR us, utuhk 'carry, bring, take' almost certainly reflects POC *Ruja 'load, cargo'. However, since CMC languages also attest that form as *uda 'load, cargo', it is possible that it is KSR which is innovative.

(6) PCMC *mena 'thing, object': KIR mena, MRS men, MOK min, PON mehn, PTK *mena. KSR ma 'one, thing' probably is cognate with PPN *meqa 'thing'. It may also be cognate with the PCMC form, but even if so, the latter group appears to have innovated the second syllable.

The following forms appear to be attested only among the CMC languages. Because the KSR form does not appear to continue an earlier etymon, however, it is impossible to determine at present whether these forms are, in fact, PCMC innovations.

(7) PCMC *mai 'breadfruit': KIR mai, MRS may, MOK moai, PON mahi, PTK *mai. PPN *mei 'breadfruit' suggests that something like *mai may need to be reconstructed for some earlier stage in Eastern Oceanic, yet POC *(ŋ)kulu 'breadfruit' is also attested there (including wide attestation in Polynesian). It is also possible that the PPN and PCMC forms are not related: KSR mos 'breadfruit' may point to a PMC *mati or *madi, with irregular loss of the medial consonant in PCMC. Some potential support for this possibility is found in the reconstruction of a star, probably Altair, for PCMC: *mati-lapa (see below). The second disyllable of this form is clearly a reflex of POC *la(m)pa 'large, senior', and it may be that the first element in the reconstruction of this important star reflects a type *mati 'breadfruit'. With no other evidence, however, this is pure speculation.

(8) PCMC *talia 'condiment or relish which accompanies staple foods': KIR tanna, MRS jaléylév, PON sali, PTK *talia.

(9) PCMC *re,i- 'people, person (of a place): KIR i- 'person of or from', MRS ri- 'person from, person who', PTK *re(e)- 'people, person (esp. of a place)'. It is possible but not likely that KIR i- reflects earlier *qi- 'locative'. Paul Geraghty (p.c.) points out that Lau (Fijian) has a prefix ni- that apparently functions identically with PCMC *re-. It is not phonologically compatible, however.

(10) PCMC *me,iña 'stay, live, dwell, be': KIR mena, PON mie, MOK mine, PTK *mina. KSR muhta 'stay, dwell' reflects PMC *moda 'sit, squat' (cf. Gedaged mado 'to remain') but that may be a KSR innovation. The POC reconstruction in this meaning is *nopo, which is reflected in some TK languages as a postverbal suffix in negative constructions.

(11) PCMC *p'ap'u 'k. of shark': KIR b'abu 'shark w. flat snout', MRS bab 'toothless sp. of shark: Hemigaleops Fosteri', MOK pwoahpw 'white sp. of shark', PTK *p'ap'u 'sp. of shark'.

(12) PCMC *p'ugu 'descend, go down, fall; break (of waves)': KIR bung 'go down, sink, descend', MRS big" 'fall, break (of waves)', MOK pwung 'to break (of waves)', PON pwungi-dek 'break (of waves), splash', PTK *pugu 'fall, drop; break (of waves)'.

(13) PCMC *maata(ata) 'cleared space, garden': KIR maataata, MRS mahaj, MOKmahjahj, PON mahsahs 'cleared of vegetation', PTK *maata.

(14) PCMC *kap'u 'dull, blunt': KIR kabubu, MRS kkéb, PTK *kkap'u. It is possible that this form may reflect consonant metathesis in the type *paku, which is reflected in Tongan, Tuvalu, and Anutan.

(15) PCMC *fara 'core of breadfruit or pandanus': KIR aa, MRS yar 'pandanus core', PTK *fara. This form may be an oral grade reflex of POC *pa(n)da 'pandanus'. A nasal grade reflex *fat'a 'pandanus' is attested throughout MC.

(16) PCMC *paa 'large, broad leaf, as of taro': KIR baa 'leaf', PON pah, PTK *paa. It is likely that this form is cognate with Fijian ba 'stalk of taro leaves; branch'. If so, either the PCMC form or the Fijian reflects an innovation.

(17) PCMC *(e-)fagi 'north': KIR me-aang 'north wind' (Ward Goodenough p.c.), MRS yagi-, PON epeng, PTK *(e-)fagi. As argued previously, KSR epang 'south' is probably a loan from PP.

(18) PCMC *uwaa 'fruit': KIR uaa, MRS wiwah 'bear much fruit', MOK uhwa 'in fruit', PON wah, PTK *uwaa. No KSR form for 'fruit' is provided in Lee (1976), so it is impossible at present to determine whether the innovative lengthening of the final vowel of POC *pua 'fruit' is limited to PCMC or is PMC.

(19) PCMC *maugu 'left hand, left side': KIR maing, MRS han-miyig, MOK meing, PON pali-meing, TRK -mmééng, PUL hayi-méé́yúng. This form appears to be a very irregular development of POC *mauRi 'left side'. KSR lacsac 'left' is not cognate, however, so it is again impossible to determine whether or not the innovation was PMC.

(20) PCMC *fadula 'paddle': KIR arina, MOK padil, PON padil, PTK *fadula. Clearly a metathesis of the consonants in POC *palusa 'paddle' occurred in the history of this form. Whether it occurred in PCMC or earlier is problematic, as KSR kal itself appears to be innovative.

(21) PCMC *u(t)a 'canoe sail': KIR ie, MRS wéj-lay, PTK *ua. The second morpheme of the MRS form may reflect POC *laya 'sail', although more expected would be **-lah. Also problematic is the

fact that PCMC *t, attested in MRS, appears to be lost in both KIR and TK. Cf. KSR _nes_ 'canoe sail', which again appears to be a KSR innovation.

(22) PCMC *towe(mea) 'goatfish': KIR _tewe_, MRS _jewmey_, MOK _joome_, PON _iomo_, PTK *(t)oomea. No form is given for KSR 'goatfish'. Paul Geraghty (p.c.) suggests the possibility that the PCMC form may indicate a metathesis of the type *wete 'goatfish, surmullet', which is reconstructible for PPN. The parenthesized element in the PCMC reconstruction may also be cognate with PPN *mea 'red'.

(23) PCMC *wilatu 'butterfly pea': KIR _inoto_, MRS _wiléj_, MOK _ilau_, PON _ilau_, PTK *ulatu. Again, no KSR form is given, so this reconstruction may be PMC.

(24) PCMC *ot'a 'reef': KIR _ora_ 'reef, shoal', MRS _wed_, MOK _wos_, PON _oht_ (archaic), PTK *oca,o. This form replaces POC *(n)sa(ŋ)kaRu 'reef', which is reflected in PMC *dakau 'atoll, low island, uninhabited island'. It is quite possible that the replacement occurred in PMC rather than PCMC, however, as no form for 'reef' is given for KSR in Lee (1976). The KSR form _in-sroac_ 'passage in reef' is given, where the _in_- prefix is a locative, but it is not certain that _sroac_ reflects earlier *ot'a. Paul Geraghty (p.c.) suggests that Fijian _voda_ 'detachable rock on tidal flat; rock at sea' may suggest a possible source for PCMC *ot'a.

The following forms are reflected only in TK and KIR, but show regular phonological correspondences, and appear to be innovative. As there is a great deal of other evidence linking TK with MRS and PP, it is very likely that these forms reflect PCMC items. It is also possible that they are PMC.

(25) PCMC *adi 'coconut spathe': KIR ari, PTK *adi.

(26) PCMC *fako-l 'care for, take care of, treat well': KIR ako-na, PTK *fakola.

(27) PCMC *fao 'canoe pole': KIR aoao 'to pole a canoe', PTK *fao. Cf. PMC *p'ou 'pole, fishing pole'.

(28) PCMC *fatuku 'head': KIR atuu, PUA dadúkú, SNS fadúgú 'head of animals'. This form is presumably cognate with POC *ŋpatu 'head', but attests an oral grade initial and an unexpected extra syllable. The type *fatu 'head' is attested elsewhere in TK.

(29) PCMC *fia 'squeeze, grind, grate': KIR ia 'grind, grate, pulverize', PTK *fia 'squeeze'.

(30) PCMC *fit'a 'blade, strip of leaf (esp. pandanus) for weaving': KIR ira, PTK *fica. Cf. PMC *fira 'to braid, plait', which appears to be related to this form.

(31) PCMC *p'aga 'hole, cave': KIR b'anga, PTK *p'aga. Both KSR and PP apparently show reflexes of an earlier *p'ara, although KSR fahr 'cavity, hole, pit' has an r reflex that is symptomatic of an early loan. If so, then the type *p'ara was probably a PP innovation. (For a possible source, cf. PNTK *p'ara 'pubic area, pubic triangle'.)

(32) PCMC *p'aro 'bent, curved': KIR b'ao, PTK *p'aro. Cf. PEO *pwelu 'bend, curve, fold' (Geraghty 1979).

The next forms have somewhat more problematic correspondences:

(33) PCMC(?) *dukafai 'old (of people)': KIR ikawai 'old, adult, mature', PTK *dukofai. KIR does not normally lose earlier *d; more expected is KIR **rikawai.

(34) PCMC(?) *kat'iV 'coconut toddy': KIR karewe, PTK *kacii. Despite the correct correspondences in the first three segments, it is possible that the putative PTK form is in fact a loan from YAP qachif (where YAP q is glottal stop). If so, it must have been a very early loan (cf. TRK áchi, MRT yashi, PUL yáři, CRN árhi, CRL aschi, WOL gashii, PUA kasi, SNS gasi, ULI gaci, all with regular correspondences for a PTK *kacii). Interestingly, KIR karewe appears to have been borrowed by several MC and Polynesian languages, but with a reflex of the KIR article te as well: MRS jekarēw, KSR suhkaruh, MOK jikalue, PON sikaliwi, Tuvalu sekaleve, Nukuoru segaleve, Kapingamarangi dagaluu (Bender 1981).

In addition, the following stars and/or constellations appear to be reconstructible for PCMC:

(35) PCMC *dum'uru 'Antares': KIR rim'ii-mata, MRS tim'ir" 'stars in Scorpio: Tau, Alpha, Sigma; Antares', MOK dumwur 'name of constellation', PON dimwir, PTK *dum'uru. KSR tumur, which was apparently recorded with the meaning 'Venus', has an irregular m reflex of medial *m' and an r reflex of *r. Both of these developments are diagnostic of loans. Nukuoru tumuru '1st month' (Goodenough 1953) is also a probable loan.

(36) PCMC *mati-lapa 'name of star or constellation': KIR matinaba 'three stars in a line of Capricorn'; MRS majlep 'Alpha, Beta, Gamma Aquilae', PON mahilap 'constellation'; PTK *mati-lapa 'the star Altair in Aquila; name of month'. Again, Nukuoru appears to have borrowed this form as mailapa (Goodenough 1953). The missing reflex of *t suggests that it was borrowed from PON or a NTK language.

(37) PCMC *mati-t'iki 'constellation and month': KIR matiriki 'constellation of three stars in Aquilae', MRS l'é-méjdikdik 'constellation: stars in Scorpio', PON mahitik 'Hercules', PTK *mati-ciki 'constellation and month'. In this case, Nukuoru matariki is probably not a loan.

(38) PCMC *kua 'constellation of stars, probably in Andromeda and Cassiopeia': KIR kua 'constellation: stars of Andromeda, Perseus, and Cassiopeia', PTK *kua 'constellation and month'.

(39) PCMC *unu 'name of star: perhaps Aldebaran': KIR un 'name of star', PTK *unu 'Aldebaran, name of month'. (cf. also PMC *kua 'porpoise'.)

(40) PCMC *manu 'star of constellation: probably Procyon, Sirius, or Canopus': KIR -man 'name of constellation and month', PTK *manu 'month of late summer; star: probably Procyon, Sirius, or Canopus'. Nukuoru manu is recorded by Goodenough (1953) as the name of the ninth month. Because of its agreement in meaning and form with TK, it too may be a loan.

Although almost all of the above forms are securely reconstructed for PCMC, it is by no means certain whether most of them are innovations of that proto-language. More research is needed to determine that. However, forms (1)-(6) do appear to provide some lexical substantiation for the group.

4.4.3 Lexical evidence for PWMC

Again, the best kind of lexical evidence for the putative Western Micronesian subgroup is innovative forms which can be reconstructed for PWMC on the basis of all three branches, where KIR and KSR continue an earlier etyma in the same meanings. The following six reconstructions appear to meet those criteria:

(1) PWMC *kiau 'outrigger boom': MRS kiyéy, MOK kia, PON kiai, PTK *kiau. KIR kiaro and KSR kiyacs probably reflect a PMC *kiado < POC *kia(n)so 'outrigger boom'. The loss of the medial consonant in WMC is very irregular.

(2) PWMC *lia 'woman, female': MRS lie- 'woman', MOK li 'woman', PON lih 'adult female', PTK *lia 'woman, female, lady'. KIR nei 'feminine article, nominal root on feminine demonstrative series' appears to be cognate with Fijian lei 'vocative form for mother' and Melefila lei- 'prefix to names of females', and thus suggests the reconstruction of PMC *lei 'woman'. KSR ni- 'formative in many woman's names' is problematic in that PMC *l is not reflected as n in KSR; it is most likely, thus, that the KSR form is not cognate with PWMC *lia.

(3) PWMC *i-doko 'come': MRS yi-teq, MOK indoa, PTK *i-ddoko. POC *(n)soko 'arrive' is also reflected by KIR roko 'come, arrive', KSR tuhkuh 'come', and PWMC *doko 'arrive' (as well as by the

PWMC innovative directional enclitic *-doko 'hither, toward speaker'), but no other languages reflect the initial *i-. It should also be noted that both MOK and PTK attest gemination of *d.

(4) PWMC *m'egau 'food, eat (vi)': MRS m'egay, MOK mwinge, PON mwenge, PTK *m'egau. This is the most common word for 'food' in these languages. KIR m'angaungau 'to eat voraciously; glutton, gluttony' is probably cognate with PPN *ŋau 'gnaw, chew', and suggests that the original source for the PWMC form was a stative verb of the type *maŋmau 'chew on', which developed a labiovelar initial early in MC. The meaning of the form was then generalized to 'food, eat' in PWMC. KSR mongo 'food' may appear to be cognate, but it was pointed out in section 4.2.2 that the KSR form is irregular in appearing to reflect PMC *m' as m in initial position. It was suggested at that time that KSR mongo is probably a loan from CTK.

(5) PWMC *dake 'ride (a vessel, vehicle, animal)': MRS takey, MOK doakoa, PON dake, PTK *dake. This form is clearly a reflex of POC *(n)sake 'climb, rise', which is also reflected throughout MC as PMC *dake 'rise, go up', and PMC *zake 'directional enclitic: upwards, eastwards'. The meaning 'to ride' does not appear to be reflected elsewhere in MC or Oceanic, however.

(6) PWMC *fafa 'swim': MRS haheh, MOK poap, PON pap, PTK *afa. PTK shows unexpected loss of the initial consonant in this form, but still appears to be cognate. KIR uaua 'swim' appears to be cognate with Fijian ova 'swim', suggesting PMC *ufa. The KSR

form for 'swim' is unrelated kof (cf. KSR kof 'water, urine'). The language of Bong in the Shepherd Islands of Vanuatu has a form ?aβ 'to swim' (Tryon 1976), but its correspondences are irregular for *fafa.

The following PWMC forms also appear to be innovative, but it is not completely clear at which level the innovation should be reconstructed:

(7) PWMC *ala 'path, road, trail: MRS yiyal', MOK al, PON ahl, PTK *ala. This form, which clearly reflects very irregular loss of the initial consonant in POC *nsala, may be a PMC innovation rather than PWMC. Neither KIR nor KSR reflects a cognate form.

(8) PWMC *tili 'sprout, shoot, sucker (from banana, taro, yam)': MRS jil", MOK il, PON ili (3ps), PTK *tili. POC *suli is securely reconstructed in this meaning, but the regular PWMC reflex of that form would be **dili. KSR solo 'young shoot, sprout' may reflect a PMC *tulu or *dulu, although with a somewhat irregular reflex of the initial consonant. (Recall that KSR normally retains both PMC *d and *t as t before back vowels.) It could also be from a different source. Thus, the level at which this innovation is to be reconstructed is unclear.

(9) PWMC *taraki 'to sail': MRS jerak, MOK joaroak, PON serek, PTK *taraki. This form appears to be an innovation of POC *tede 'touch, sail, float, graze, go fast, wash, cleanse', but with an innovative final syllable and unexpected lowering of the vowels.

YAP tarëg 'to sail' is probably a loan from ULI. It is possible that this innovation occurred in PMC, however.

(10) PWMC *raki 'harvest season, season of plenty': MRS rak 'south, summer', MOK roak 'breadfruit season', PON rahk 'season of plenty, breadfruit season', PON rek 'abundant, plentiful', PTK *raki 'breadfruit harvest season'. Apparent cognates of this form are attested in Fijian draki 'weather', Gitua rak 'Rai wind', Melefila laki 'time', Nuclear Polynesian *laki 'west, north, southwest wind' (where Takuu laki 'season of westerly winds, bringing abundance of drift material and migratory birds' (Howard p.c.), and the fact that only Maori has the meaning 'north wind' may suggest the idea of a warming or beneficial wind). As other MC languages do not appear to attest the form, however, it is not possible to determine whether the PWMC semantic is limited to that group.

(11) PWMC *p'alu 'taro patch, taro swamp': MRS bél, MOK pwehl, PON pwehl 'dirt, soil, earth, ground', PTK *p'alu. Cf. PEO *bwela 'mud, swamp'.

(12) PWMC *p'alu 'cover, lid': MRS bal 'covered over', MOK kompwel 'cover an earth oven', PON kompwoal 'cover an oven with leaves', PTK *p'alu. Lee (1976) lists kafa for KSR, which is almost certainly an English loan.

(13) PWMC *liga 'beautiful (of inanimate objects), pretty, shiny; new moon': MRS hallég 'moon', MOK ling 'pretty', PON linga-n 'beautiful, shiny', PTK *(l)liga 'beautiful (of inanimate objects), pretty; new moon'. Paul Geraghty (p.c.) suggests that

this form may be cognate with Fijian lagilagi 'glorious, admired'.

(14) PWMC *egi 'dorsal fin of fish': MRS yegi-n 'dorsal fin of smaller fish, fin', MOK ingihng 'dorsal or anal fin', PON ingi 'pectoral fin (3sg)', PTK *igi 'dorsal fin of fish'. This form appears to replace POC *tiko 'dorsal fin'. Questionable is whether KSR acngac-n 'fin of' is cognate. Even if it is not, KSR inging 'steep, hilly, sloping' may suggest that a form very like *egi 'dorsal fin' was present in PMC.

(15) PWMC *tura 'housepost, pole, pillar': MRS jir̈e- 'post, pole, handle', MOK wur 'foundation post', PON wur 'post', PTK *tura 'housepost, post'. POC *tudu is reconstructed in this meaning. However, Paul Geraghty (p.c.) has pointed out that Fijian tula 'branch', Lau Fijian ituratura 'chief's leg', and Mota tura 'leg, prop' may suggest an earlier *tura with a meaning similar to that of the PWMC form.

(16) PWMC *p'up'u 'the Southern Cross': MRS bib, MOK loopwu, PON lohpwu, PTK *(p')up'u. This form is related to PMC *p'up'u 'triggerfish' (and cf. Arosi bubu 'fish: Ballistes' for an external cognate). The reconstruction of PTK *(p')up'u 'Southern Cross' reflects the fact that in all TK languages the form is reflected as the type pwuupw as an unaffixed noun, and as -upw in compounds. PP languages show loss of the second *p'. No forms are given for this meaning for KIR or KSR.

(17) PWMC *wii 'fat, grease': MRS wiwi, PON wih, CRL wii. POC *mon̆ak is reconstructed in this meaning. Most MC languages attest loans

from English grease or Spanish manteca, but KIR nenea and the above form appear to be native.

(18) PWMC *p'ulaka 'unicornfish': MRS bilak', MOK pwilak, PON pwulak, PTK *p'ulaka. It is possible (but unlikely) that Fijian balagi is cognate. If so, either the PWMC or the Fijian form would appear to evidence major formal changes.

The following forms are attested only in MRS and TK. As there is considerable evidence linking TK most closely with PP, it appears that reconstructions may be made for putative PWMC on the basis of only MRS and TK witnesses.

(19) PWMC *fadale 'walk, stroll; here and there': MRS yetal 'to go', PTK *fadale. POC *tale 'go around, return' would appear cognate, but WMC *d and POC *t do not correspond. Both Sa'a and Ulawa, where *t is normally lost (Pawley 1972:27), attest tale 'circumscribe, go around, journey', however, suggesting a doublet with earlier *s. If that is the case, the only innovation of the PWMC form is, perhaps, the initial syllable.

(20) PWMC *kura-t 'pull back foreskin, circumcise': MRS qiraj, PTK *kura. POC *kula 'circumcise' is reconstructed, and the PWMC form apparently shows a change of POC *l to PWMC *r.

(21) PWMC *m'am'ane 'able, capable, good': MRS m'am'an 'good', PTK *m'm'ane 'able, possible, capable'.

(22) PWMC *m'una 'caterpillar': MRS m'inam'en, PTK *m'una. Cf. Proto-Central Pacific *(qa)nuve 'caterpillar' (Geraghty p.c.).

(23) PWMC *gani 'to, toward': MRS gan, PTK *gani. PP forms in this meaning are probably reflexes of PEO *vaŋa-n 'give (vt)' (PPP *aga). It is not clear, however, that the MRS and TK forms reflect that etymon. Conceivably PWMC innovated the type *gani, which was later replaced in PP.

(24) PWMC *gata 'fragrant': MRS gaj, PTK *gata.

(25) PWMC *rii 'spouse, marry': MRS riyi-, PTK *rii. If KIR iein 'marry, marriage' is cognate, this form is reconstructible for PCMC. A possible external cognate is Fijian ri 'house, building', but it is not known which meaning is the original one.

(26) PWMC *ddana 'dream': MRS ttének 'dream, fantasy, daydream', PTK *ddana.

(27) PWMC *dawura 'channel through reef': MRS tawar, PTK *dawura. (and cf. PMC *dawa 'channel'.)

(28) PWMC *(t)aap'a 'no': MRS jahab, yahab 'no', PTK *(t)aap'a. PTK *taap'a is reflected in MRT, STW, and CRL; PTK *aap'a is reflected elsewhere. In TK, this form is used to reject a plan of events. Other forms are used to reject a proposition.

(30) PWMC *telutelu 'stars in Orion': MRS jeljel 'delta, epsilon, zeta, sigma Orionis', PTK *(t)elu(t)elu.

4.4.4 Summary

A reasonably substantial amount of lexical evidence has been presented in support of the putative MC subgroup. Rather less evidence has been identified to support the putative Central Micronesian and Western Micronesian subgroups within MC, but a few of the putative innovations are quite persuasive.

The arguments for these subgroups will be summarized in section 4.7, following a brief examination of an apparently MC language that has become extinct, and a more thorough look at the relationships between the Trukic and Ponapeic languages. Also in section 4.7 will be found a tentative and highly impressionistic discussion of the population movements implied by the proposed subgroups.

4.5 The position of Old Mapian

At the end of the last century, Kubary (1889) recorded data from inhabitants of the island of Mapia, which is located about 100 miles north of West Irian, and well to the south of islands of Tobi, Merir, Sonsorol, and Pulo Anna, which are inhabited by TK-speaking peoples. The language recorded by Kubary is apparently no longer spoken on Mapia, which is now inhabited by people who speak a language closely related to Indonesian.

Bender (1975) has examined the data recorded by Kubary and has suggested that Old Mapian may well have been a nuclear Micronesian language. Since then, Goodenough and Sugita (1980) have claimed, presumably also on the basis of Kubary's data, that Old Mapian is a TK language that is most closely related to the languages in the ETK group. They provide no support for their claim, however.

In the preceding sections of the present work, we have begun to establish some characteristics of TK and MC languages and of the putative subgroups therein. With this background, it is interesting to look again at the data which Kubary (1889:79-114) recorded. Those data are provided in Table 28. The Mapian reflexes of the PMC consonant phonemes appear to be as follows:

PMC	*f	*p	*p'	*k	*x	*m	*m'	*g
MAP	f,v	p	b,Ø	g,k	Ø	m	ṅ,m	ṅ

PMC	*n	*ṇ̃	*l	*r	*w	*t'	*t	*d	*z
MAP	n	Ø?	l	r	v?	č,t	t,t^y,j,h,Ø	t	t

Some of these reflexes will be discussed following an examination of the data.

Kubary (1889:112-113) also gives the following paradigms for MAP:

ṅṅoy	'to eat'	in	'to drink'
ṅiúṅṅoy	'I eat'	niéin	'I drink'
kúṅṅoy	'you (sg) eat'	kuéin	'you (sg) drink'
yuṅṅoy	'he eats'	yéin	'he drinks'
hauṅṅoy	'we (inc) eat'	haéin, háien	'we (inc) drink'
kemineṅṅoy	'we (exc) eat'	kaméin, kamiin	'we (exc) drink'
kamuṅṅoy	'you (pl) eat'	koméin, komirin	'you (pl) drink'
ṅauṅṅoy	'they eat'	ṅéin	'they drink'

On the basis of thse paradigms, it appears that the subject pronouns for MAP are as follows: _ṅi(V)_ '1 sg', _ku_ '2 sg', _ye_ '3 sg', _ha(V)_ '1 pl inc', _kami_ '1 pl exc', _kamu_ '2 pl', and _ṅa_ '3 pl'.

One example of the MAP possessive paradigm is also given: _náha_ 'child', _nahei_ 'my child', _naheum_ 'your (sg) child', _naha_ 'his child', _naheč_ 'our (inc) child', _nahamim_ 'our (exc) child', _nahemu_ 'your (pl) child', _naheir_ 'their child'. Apparently the stem for 'child' in MAP

Table 28

Old Mapian Forms (after Kubary 1889)

Mapian	Gloss	PMC	PTK
hoy	'one (gen.)'	*te-ua	*te-ua
ruoú	'two (gen.)'	*rua-ua	*rua-ua
hólu	'three (gen.)'	*tolu-ua	*telu-ua
vau	'four (gen.)'	*faa-ua	*faa-ua
limou	'five (gen.)'	*lima-ua	*lima-ua
onou	'six (gen.)'	*ono-ua	*ono-ua
fû	'seven (gen.)'	*fitu-ua	*fitu-ua
vóllú	'eight (gen.)'	*walu-ua	*walu-ua
tuou	'nine (gen.)'	*ziwa-ua	*diwa-ua
hēk	'ten'	--	*te-(i)ka
riēk	'twenty'	--	*rua-(i)ka
helik	'thirty'	--	*telu-(i)ka
fek	'forty'	--	*fa-(i)ka
limék	'fifty'	--	*lima-(i)ka
onék	'sixty'	--	*ono-(i)ka
fihík	'seventy'	--	*fitu-(i)ka
vallík	'eighty'	--	*walu-(i)ka
tiek	'ninety'	--	*diwa-(i)ka
ébugi	'one hundred'	*te-p'ukua	*te-p'ukua
hóṅra	'one thousand'	--	*te-garatu
han	'ten thousand'	--	*te-nna
yármat	'person'	*aramata	*aramata
máram	'moon'	*marama	*marama
ṅúan	'man, male'	*m'aane	*m'aane
féfin	'woman'	*faifine	*faifine
jeri-	'child'	*tari	*taru
móṅiaṅ	'cross-sibling'	--	*m'egea
jamjam	'father'	*tama	*tama
henehéin	'mother'	*tina	*tina
jáṅol	'chief'	--	*tam'oolu
ṅógoṅog	'arrowroot'	*m'akum'aku	*m'akum'aku
bulák	'k. of taro'	*p'ulaka	*p'ulaka
yōt	'k. of taro'	*odo	*odo
may	'breadfruit'	(PCMC)*mai	*mai
ni	'coconut palm'	*niu	*núú
ran	'branch'	*raa	*raa
pik	'sandbank'	*pika	*pika
méčar	'mud'	--	*macaro
tyet	'seawater'	*tazi	*tadi
mtō, lemtō	'ocean'	*mazawa	*(la-i)madawa
eyaṅ	'wind'	*agi	*agi
laṅ	'sky, heaven'	*lagi	*lagi
ran	'day'	*raani	*raani

Table 28. (Continued) Old Mapian Forms

Mapian	Gloss	PMC	PTK
uōṅ	'night'	*p'ogi	*p'ogi
fekāf	'evening'	*fakaafi	*fakaafi
kóčou	'rain'	*kat'awu 'cloud'	*kocou
déremi	'cloud'	*kat'awu	ULI: darami
yaf	'fire'	*afi	*afi
uāt	'smoke'	*ad, zu	*p'a-adu
yal	'road, way'	*ala	*ala
vä	'stone'	*fatu	*fatu
naúṅ	'lagoon'	*nam'o	*nam'o
tau	'passage (through reef)'	*d,zau	*daau
yun	'house'	*um'a	*im'a
val	'community house'	*fale	*fale
man	'war, battle'	*mauunu	*mauunu
méher	'sleep'	*maturu	*maturu
ṅńoy	'eat'	(PCMC)*m'agau	*m'egau
mā	'die'	*mate	*mate
píraf	'steal'	--	*purafa
mal	'laugh'	*mali	*mali
rońroṅ	'hear'	*rogorogo	*rogorogo
mim	'urinate'	*mimi	(*Tiri)
ddan	'dream'	(PWMC)*ddana	*ddana
ii	'canoe sail'	(PCMC)*u(t)a	*ua
kapi-n	'keel of (canoe)'	*kapi	*kapi
bul	'hull of canoe'	--	*p'ulla
tam	'outrigger float'	*zama	*dama
kio	'outrigger boom'	*kiado	*kiao
yam	'outrigger struts'	--	(PNTK)*am'a
kája	'lee side of canoe'	*katae	*katae
evéṅ	'north'	(PCMC)*(e-)fagi	*efagi
yor	'south'	(PCMC)*auru	*auru
loto	'west'	--	*lodowa
tyáta	'name of month'	(PWMC)*taudaa	*taudaa
gi	'name of month'	(PCMC)*kua	*kua
uun	'name of month'	(PCMC)*unu	*unu
holhol	'name of month'	(PWMC)*talutalu	*alualu
mán-tak	'name of month'	(PCMC)*manu	*manu
jerual	'name of month'	--	(PTK-PP)*tarep'alu
yarmo	'name of month'	--	*aromauti
túṅur	'name of month'	(PCMC)*dum'uru	*dum'uru
métik	'name of month'	(PCMC)*mati-t'iki	*mati-ciki
méhelap	'name of month'	(PCMC)*mati-lapa	*mati-lapa

Table 28. (Continued) Old Mapian Forms

Mapian	Gloss	PMC	PTK
ṅaṅ	'1 sg focus pronoun'	*gau	*gagu
goy	'2 sg focus pronoun'	*koe	*ke(e)na
llaṅ	'3 sg focus pronoun'	*ia	*ia
kit, kič, gič	'1 pl inc focus pronoun'	*kit,t'a	*kica
kamim	'1 pl exc focus pronoun'	*kam(am)i	*kam(am)i
kāmu	'2 pl focus pronoun'	*kamii, *kam'u	*kamii
ir	'3 pl focus pronoun'	*ira	*ira

is naha- (< POC *natu), and the possessive suffixes are -i '1 sg', -m '2 sg', -Ø '3 sg', -č '1 pl inc', -mim '1 pl exc', -mu '2 pl', and -ir '3 pl'.

Despite some problematic forms, which will be discussed shortly, it appears highly probable that Old Mapian was a TK language, as suggested by Goodenough and Sugita (1980). The evidence that suggests this conclusion consists of the following forms:

(1) MAP clearly reflects PTK-PP *-(i)ka 'countable base: tens', which appears to be an innovation of that group;
(2) MAP reflects PTK *-garatú 'countable base: thousands', which is probably also an innovation;
(3) MAP reflects PTK-PP *-nena 'countable base: ten thousands', which is an innovation of that group;
(4) MAP reflects PTK *m'egea 'cross-sibling', which is an innovation (note, moreover, that MAP móñiañ has the same form as PUL mwengeyang);
(5) MAP reflects PTK *tam'oolu 'chief', which is an innovation;
(6) MAP reflects the innovative PTK *macaro 'mud';
(7) MAP reflects PTK-PP *kocou 'rain' (where other MC languages reflect the meaning 'cloud');
(8) MAP reflects PTK-PP *purafa 'steal', which is innovative;
(9) MAP reflects PTK *p'ulla 'canoe hull', which is also innovative;
(10) MAP reflects PWMC *kiau 'outrigger boom', which shows unexpected loss of PMC *d;
(11) MAP reflects PTK *lodoa 'west', which is innovative;

(12) MAP reflects most of the PTK forms for months, including *aromauti, which is attested nowhere else;

(13) MAP <u>ṅaṅ</u> '1 sg focus pronoun' clearly reflects the PTK *gagu.

In addition, the following MAP reflexes of earlier *t display a pattern that is very comparable to that of the NTK languages, and perhaps most especially WOL. For the purpose of comparison, WOL and PUL forms are shown beside those of MAP.

Gloss	MAP	WOL	PUL	PTK
'people, person'	yármat	yarematA	yerèmah	*aramata
'seawater'	tyet	taatI,saatI	háát	*tadi
'name of month'	tyāta	séétaa	hééta	taudaa
'child'	jeri-	səarÚ	haar	*tarú
'father'	jamjam	taamA	haam	*tama
'chief'	jaṅol	tamwéélÚ	hamwol	*tam'oolu
'lee side of canoe'	kája	-getaa	yáhá	*katae
'name of month'	jerual	sarebelÚ	hárepwél	*tarep'alu
'name of month'	holhol	yelúyelÚ	yeliyel	*(t)elu(t)elu
'ten'	hēk	seigA	heeyik	*te-(i)ka
'one hundred'	ébugi	sebúgúwA	yepwúkúw	*te-p'ukua
'three'	holu	seluuwA	yeluuw	*telu-ua
'thirty'	helik	seliigA	yeliik	*telu-(i)ka
'die'	mā	masE	má	*mate
'one thousand'	hoṅra	sangerasI	yengeray	*te-garatu
'seven'	fû	fisuuwA	féhuuw	*fitu-ua
'seventy'	fihik	fisiigA	fiik	*fitu-(i)ka

Gloss	MAP	WOL	PUL	PTK
'stone'	fä	faaÚ	fawú	*fatu
'sleep'	méher	masúrÚ	mawúr	*maturu
'offspring'	naha-	laú-	nawú-	*ña(t)u
'mother'	henehéin	sila-	yiin	*tina
'name of month'	yarmo	yaremooI	yóromooy	*aromauti
'name of month'	métik	maaishigI	---	*maticiki
'name of month'	méhelap	maailapA	mááylap	*matilapa

It appears that *t is reflected as MAP h or ∅ before nonlow vowels, and as t, ty or j before *a. In addition, it appears that t and ∅ occur before a word-final vowel that is lost, while j and h occur before vowels that are retained. Although this latter development does not occur in any other TK language, the former one--as the forms above show--is very similar to what is attested in WOL. Moreover, the fact that MAP appears regularly to retain PTK (and PMC) *k as either k or g (under conditions that are not clear), and does not lose it, also suggests that MAP split off from NTK before the development of the CMC group. MAP attestation of the NTK innovation *am'a 'outrigger struts' provides further evidence that MAP is NTK.

As mentioned above, however, there are problems with this analysis. Specifically, there are four such problems: (a) MAP appears to have a ∅ reflex of PMC *-ña in the form naha 'his child', suggesting that *n and *ñ were not merged in pre-Mapian. All other TK languages show evidence of the merger of both proto-phonemes as *n; (b) MAP goy '2 sg focus pronoun' is almost certainly a reflex of PMC *koe; it certainly does not reflect the putatively PTK innovation *ke(e)na; (c) MAP kami '1 pl exc subject pronoun' is not a reflex of the putative PTK *kaú,i which is attested in that meaning in all other TK languages, but may reflect a PMC *kami; and (d) MAP kamu '2 pl subject pronoun' similarly does not reflect putative PTK *kau, although it, too, may attest a PMC form (see section 4.3.1).

There appear to be three possible explanations for these forms, assuming that Kubary recorded them correctly: (1) MAP is not a TK language; (2) MAP is TK, but was the first language to separate from the TK community. After the separation of MAP, *ñ and *n were merged and the pronouns were innovated; (3) MAP is a NTK language, as other evidence suggests, and it separated at about the same time as WOL. The merger of *ñ and *n and the innovation of the pronouns occurred after the separation of MAP, and then spread to other TK communities.

The first explanation is very unlikely to be correct. For such a small corpus of data we have identified too many innovative forms that MAP shares with other TK languages for it to be coincidence. The second possible explanation is somewhat more promising, although the general agreement of MAP reflexes of *t with those for WOL would have to be explained if it should prove to be correct. Geographically, however, it is difficult to imagine the first group to separate from the proto-community travelling as far away as Mapia when there were so many more hospitable environments nearby. Moreover, if PTK *d was a spirant, then the fact that MAP reflects it as t is further evidence that MAP could not have separated before ULI.

When everything is considered, it appears rather more likely that the third explanation is the correct one. If so, however, the implications are that *n and *ñ must now be reconstructed for PTK, and that *koe was the PTK '2 sg focus pronoun',[43] and *kami and *kamu were subject pronouns in PTK. The wide distribution of the types *ke(e)na, *kaú,i, and *kai, and the merger of *n and *ñ must be attributed to innovations that occurred--perhaps in NMC--and then spread through contact to ULI and PUA. Although this sequence of events may appear unlikely, the following section examines additional data that suggest that it may have been the case.

4.6 The relationship between the Trukic and Ponapeic languages

That there is a close relationship between the Trukic and Ponapeic languages has been believed for some time. Dyen (1965b:33-34) states on the basis of lexicostatistical computations that these two groups of languages appear closely related. Marck (1977) explicitly assumes such a relationship, and Goodenough and Sugita (1980:xii) propose a "Central Micronesic" subgroup within their Micronesic, which consists only of the Trukic and Ponapeic languages.[44]

In the first part of this section, we shall propose a body of grammatical and lexical evidence in support of a Trukic-Ponapeic subgroup (TK-PP), which will prove to be well-founded. In the second part, we shall examine phonological and lexical evidence which seems to require a hypothesis that, rather than being a coordinate branch with Trukic of a TK-PP subgroup, the Ponapeic languages are, in a real sense, members of the Trukic subgroup. Problems with this hypothesis will also be discussed.

4.6.1 Evidence for a TK-PP group

In section 4.3, several apparent grammatical innovations of the TK-PP group were pointed out in passing. Those innovations are:

(1) The development of a locational noun *ree- 'at, for, of';

(2) The development of a possessive classifier *kana 'food';

(3) The development of a negative imperative form *de;

(4) The development of the following countable bases (counting classifiers): PTK-PP *-faco 'long objects'; PTK -PP *kúta 'small amounts'; PTK-PP *-(t)um'u 'bunches, clusters'; PTK-PP *-dipa 'chips, slices'; PTK-PP *-(i)ka 'units of tens'; PTK-PP *-nena 'units of ten thousands'; PTK-PP *-lop'a 'units of hundred thousands'.

Another PTK-PP grammatical innovation that was not mentioned in that section is the development of an *i- accretion onto the PMC form for 'who?', PMC *tau. Although there are a few non-Micronesian languages that appear to attest the type *itai 'who?' (see section 2.1.2.4), it would still appear notable that only the TK-PP languages within MC reflect PTK-PP *itau: MOK <u>inje</u>, PON <u>ihs</u>, PTK *itau (cf. KIR <u>antai</u>, KSR <u>suc</u>; the MRS form is not cognate).

Lexical evidence for PTK-PP is given below. The first fourteen reconstructions constitute the strongest evidence, as they represent either replacement innovations or other changes that appear to have occurred only within TK-PP. A further list of other possible innovations follows, where it is not clear whether the putative innovation is restricted to TK-PP.

(1) PTK-PP *tup'u-(diwo) 'to be born': MOK, PON ipw-di, PTK *tup'u-(diwo). This form is an innovation of POC *tu(m)pu 'grandparent, grow', which is attested in MC as KIR tibu 'grandparent, grandchild', MRS jibi- 'grandparent, grandchild, pet'. The meaning of the PTK-PP form is innovative.

(2) PTK-PP *dou 'dig up': MOK deidei, PON deidei, PTK *dou. KIR rua 'pit, ditch, trench' and MRS téw-tak 'dig up' both appear to reflect POC *sua(l) 'dig up'.

(3) PTK-PP *dau 'climb': MOK doau, PON daur, PTK *dau(-k) 'climb, crawl on all fours'. KSR fan 'climb' is a possible reflex of POC *panai 'climb', as may be MRS wan- 'go, walk towards, climb' (although reflecting a different consonant grade). If they do reflect the POC form, then it is almost certain that *dau is a PTK-PP innovation.

(4) PTK-PP *cuu 'meet, encounter': MOK su, PON tu, PTK *cuu-g). KSR toeni 'gather, meet together' is an almost certain cognate of POC *sua 'meet, come across'. The TK-PP form is not reflected elsewhere.

(5) PTK-PP *kaulu 'sing, song': MOK koaul, PON koul, PTK *kaulu. KIR una and KSR on in this meaning reflect a PMC *una.

(6) PTK-PP *paka 'excrement, feces': MOK poak, PON paka-d 'to defecate on', PTK *paka. Other languages in MC appear to reflect the mid vowel reconstructed in POC *(m)pekas 'excrement, entrails'. (However, MRS has a form pak 'taro residue used for seedling after removal of edible part.' If this form is a reflex of POC *(m)pekas, the innovative vowel is not limited to TK-PP.)

(7) PTK-PP *aga 'reach for': MOK eng 'reach by stretching', PON eng 'reach for', PTK *aga. KSR sral 'reach out for' is probably a reflex of POC *taRu 'reach, extend to', but shows a nasal grade reflex of the initial consonant. Thus, PTK-PP *aga is innovative.

(8) PTK-PP *kaila 'strong, powerful, healthy': PON kehl 'strength', kehlail 'strong, powerful, healthy', PTK *kkaila 'strong, healthy'. KSR kuh and MRS kéykéy reflect the type *kai 'stiff, steady, strong', also attested in Fijian kaikai 'strong', Rotuman 'ai 'stiff, rigid', Nggela kakai 'crisp, stiff, tough'. The final syllable on the PTK-PP form does not appear to be attested elsewhere.

(9) PTK-PP *walu 'forest, woods, bush': MOK woal, PON wahl, PTK *walú. POC *waRo 'creeper, vine' and POC *wao 'forest' are securely reconstructed. It is possible that the PTK-PP form reflects one of these etyma, but if so, the medial consonant is innovative. This form may be PMC, as other MC languages have forms that are not cognate either with POC or the PTK-PP reconstruction.

(10) PTK-PP *luTu 'jump': MOK luj, PON lus, PTK *luTu. KSR pal and MRS pal- appear to reflect PMC *palV in this meaning. The source of the PTK-PP form may be suggested by Fijian lulutu 'heavy noise of a fall' and Samoan sa'alutu 'jolt', although both the PP and TK forms are irregular for earlier *t.

(11) PTK-PP *palia 'side, edge, part': PON pali, PTK *palia. Lau in Malaita has a form babali 'cheek', which may be cognate with

Kwaio baba 'side' and Roviana papara 'side of face'. Paul Geraghty (p.c.) has suggested that these forms might also be related to his Proto-Central Pacific *bari 'cliff'. Even if all of these forms are cognate with PTK-PP *palia, however, the latter form appears to be innovative formally in its final disyllable.

(12) PTK-PP *palua 'navigator, navigational skill': PON pali, PTK *palua. KIR borau 'sailing' appears to be a loan from a Polynesian language which attests the widely spread POC *padau 'vessel, fleet'. Nukuoru also has balia 'expert navigator', but it is almost certain that form is a loan. (Goodenough 1953 points out that Nukuoru appears to have borrowed significantly from TK navigational terminology.) The PTK-PP form, thus, appears innovative.

(13) PTK-PP *weci 'strike, beat': MOK wes, PON wetih, PTK *weci. KIR oro in this meaning appears cognate but reflects a final mid vowel. It is possible that both it and the PTK-PP reflect a nasal grade doublet of a type reflected as oral grade wete 'spoil, damage' in Fijian. In any case, the final high vowel of the PTK-PP form appears innovative.

(14) PTK-PP *taai 'voyage, trip (by canoe) outside the lagoon': PON sahi, PNTK *taai. KSR ai 'come, arrive, sail in' almost certainly reflects the type *waia 'sailing trip, voyage', which is reconstructible for PMC (see section 3.5.2).

(15) PTK-PP *p'ara 'pubic area': MOK poh-n-pwoar 'pubic area', PON pwere 'lower abdomen (3sg)', PNTK *p'ara 'pubic triangle'. POC

*pude is securely reconstructed in this meaning. It should be noted, however, that the Banks Island language of Wetamut has the form pwar 'penis' (Tryon 1976), so it is possible that the PTK-PP reconstruction reflects a retention rather than an innovation.

(16) PTK-PP *dakulaara 'swordfish': MOK daklar, PON dekilahr, PTK *dakul,raara. POC *sakulaya 'k. of fish' is reconstructed, with one of its reflexes PPN *sakulaa 'swordfish'. POC *saku 'swordfish' is also reconstructed, and is reflected in KIR raku 'swordfish'. If the final disyllable of POC *sakulaya reflects the PAN etymon *layaR 'sail', then a possible source of the PTK-PP form is suggested: it may reflect a final copy vowel after the *R. Even if so, however, this development does not appear to have occurred elsewhere.

(17) PTK-PP *kuTu-f 'spit, blow out from mouth': Pingilapese kusukus 'spit', PTK *kuTu-f. As argued above (section 3.3.2.5), this form appears to show an innovation of the medial consonant in POC *kusup 'spit'. (Cf. following form.)

(18) PTK-PP *kuTu 'ejaculate': MOK kuj, PON kus, PTK *kuTu. This form also appears to reflect POC *kusup, and with the same innovation of the medial consonant.

(19) PTK-PP *ka-ddu-f 'spit out, as particles from the mouth': MOK andip, PON kendip, PTK *(ka-)ddu-f. This reflex of POC *kasup 'spit' reflects a geminate *dd in all attesting languages.

(20) PTK-PP *malúmalú 'typhoon, windstorm': MOK melmel, PON melimel, PTK *malúmalú. POC *yapa is reconstructed in this meaning, but other MC languages have noncognate forms. A possible source for

the PTK-PP is perhaps suggested by Fijian and Rotuman malumalu 'cloudy, overcast'.

(21) PTK-PP *aregu 'coconut cream': PON ering 'ripe coconut', PTK *aregu. POC *lolo is reconstructed in this meaning. MRS yal' 'coconut milk' and KSR el 'coconut cream' may reflect a PMC *ala, but it is also possible that the KSR form reflects earlier *r. The final *-gu of the PTK-PP form does not appear to be attested elsewhere, however.

(22) PTK-PP *kuaili 'k. of lizard': MOK kieil, PON kieil 'any large lizard, aligator, crocodile; sp. of large brown lizard', PTK *kuaili 'k. of lizard'. KSR kihnuhul 'lizard' and KIR tikunei 'small grey lizard' may be cognate, albeit somewhat opaquely, which perhaps increases the chances of PTK-PP *kuaili being innovative.

(23) PTK-PP *karagaapa 'k. of tuna': PON karagaap 'yellowfin tuna', PTK *karagaapa 'bonito tuna'.

(24) PTK-PP *lap'udo 'saltwater eel': MOK lapwed, PON lapwed, PTK *lap'udo. It is possible that KIR rabono 'eel' may be cognate, but with either the KIR or TK-PP form showing metathesis of the *l and *d. Paul Geraghty (p.c.) has brought his reconstruction of Proto-Central Pacific *pusi 'k. of saltwater eel' to my attention, and suggests that except for the final vowel it is formally compatible with the final disyllable of the TK-PP form.

(25) PTK-PP *kum'ucu 'wrist, hand and wrist': MOK kumwus 'wrist', PON kumwute-n peh 'wrist', PTK *kum'ucu.

(26) PTK-PP *daari 'skim, sail close to shore, quick': MOK dahr

'fast', MOK <u>ka-dahri-ek</u> 'sail across the wind', PON <u>dahr</u> 'quick, in motion, to roll', PTK *daari 'sail close to shore, skim'.

(27) PTK-PP *(ka-)tawaa 'hatch, crack': PON <u>kasawa</u>, PTK *(ka-)tawaa.

(28) PTK-PP *m'oco 'short in size': MOK <u>mwosmwos</u>, PON <u>mwotomwot</u>, PTK *m'oco. KIR <u>moro</u> 'measure, size, dimension' may be cognate, but shows a quite different meaning.

(29) PTK-PP *olo 'man, fellow, guy': MOK <u>woal</u> 'man', PON <u>ohl</u> 'man', PNTK *olo.

(30) PTK-PP *p'ariku 'k. of dance': PON <u>pwerik</u>, PTK *p'ariku. Geraghty (p.c.) suggests that Tongan <u>liku</u> 'to dance nude' may be related.

(31) PTK-PP *rakum'u 'k. of shore crab': PON <u>rokumw</u> 'small land crab', PTK *rakum'u. Geraghty (p.c.) has reconstructed Proto-Central Pacific *ŋkumuŋkumu 'Kalapa crab', which may be cognate, although TK-PP reflects oral grade *k. There does not appear to be a source for the initial syllable of the PTK-PP form, however.

(32) PTK-PP *pau 'flower, blossom': MOK <u>poau-</u>, PNTK *pau.

(33) PTK-PP *magaru 'flying fish': MOK <u>moangoar</u>, PTK *magaru. KIR <u>mangaa</u> 'flying fish' reflects earlier *magara.

(34) PTK-PP *ka-paca 'join, glue': MOK <u>kapas</u>, PON <u>kapat</u>, PTK *ka-paca. KSR <u>kuhpasr</u> 'join, tie together, connect, link' is a probable loan, as it appears to attest a reflex of the PCMC *ka- 'causative prefix', which is not otherwise found in KSR.

(35) PTK-PP *auniara 'tornado, whirlwind': PON <u>einiar</u>, PTK *auniara.

(36) PTK-PP *awa 'mouth': MOK <u>oawoa</u> (3sg), PON <u>awa-</u>, PTK *awa. This form may be cognate with POC *(ns)awaŋ 'passage, channel' (cf.

Fijian yawa 'passage through reef', PPN *awa 'channel'). Gedaged aua 'mouth' should be noted, however. More research will be needed to determine whether the PTK-PP and Gedaged forms reflect a common retention or separate innovations.

(37) PTK-PP *fagi 'four (in serial counting)': MOK oa-poang, PON e-peng, PTK *fagi. KIR aanga and KSR ahng appear to reflect earlier *faga, but Motu hani and Kove paŋe 'four' may suggest that the high vowel in TK-PP is directly inherited.

(38) PTK-PP *tarep'alu 'star: Corvus': PON seripwel, PTK *tarep'alu.

There are several other forms that appear to be attested only in TK and PP, but those above, together with the apparent grammatical innovations, appear to be sufficient to establish the group.

4.6.2 Evidence for Ponapeic as a member of TK

A large amount of grammatical and, especially, lexical evidence was presented in chapter 2 for the integrity of the Trukic languages as a subgroup. In this subsection, however, a case will be presented that the Ponapeic languages are, in fact, members of that subgroup, despite the extensive evidence to the contrary. This case rests on two facts: the PP reflexes of earlier *t and *T correspond extremely closely with those of the CTK languages--so closely, in fact, that it does not appear possible that it is the result of separate developments; and the PP languages show similar loss of *k to the CTK languages in the set of directional enclitics. A third, more problematic type of evidence is that the PP and TK languages (excepting ULI) have identical alveolar stop reflexes of PCMC *d.

This reflex, however, is shared with MRS, and as it is very possible that PWMC *d was already a stop (see discussion in section 3.7), this fact has little weight.

Clearly, the most weighty evidence for this hypothesis is that pertaining to reflexes of *t and *T. That evidence is discussed here.

Section 3.3.2.4 demonstrated that spirantization and loss of PTK *t have been gradually spreading through the TK lexicon, so that *t is most commonly reflected in PUA and ULI as <u>t</u> before low vowels and as <u>s</u> (PUA <u>d</u>) before nonlow vowels, and in CTK as <u>s</u> (PUL <u>h</u>) before low vowels and ∅ before nonlow vowels. WOL is more obviously in a state of transition, with greater agreement with ULI and PUA, but some indication that this agreement is partly a result of convergence with ULI. In any case, there are "irregular" reflexes of *t in all TK languages, as a result of the rules of spirantization or loss having diffused at a faster or slower pace through the lexicons. In section 4.2.1, it was observed that PMC *t is normally lost in PP languages before high vowels and *e, but retained elsewhere as MOK <u>j</u> and PON <u>s</u>. (The MOK phoneme is a palatal stop.) However, these rules are not completely regular in PP, either, and, strikingly, many of the PP exceptions appear to correspond to the TK ones.

Table 29 shows the TK and PP reflexes of earlier *t. TK and PUL represent the developments of the ETK group, CRL and WOL add evidence from CTK and NTK, respectively, and ULI represents developments prior to the establishment of NTK. Where there is no ULI form attested, a PUA form is substituted whenever possible. Again, full cognate sets appear in Bender et al. (1979).

Table 29

TK and PP Reflexes of Earlier *t

Reconstruction	Gloss	TRK	PUL	CRL	WOL	ULI	PON	MOK
I. Before *a								
*ta-m'aau	'sick'	--	h	s	t	t	--	j
*tawii	'conch'	s	h	s	t	t	s	j
*tauu	'placenta'	--	--	s	s	--	s	j
*tau	'sun, season, year'	s	--	--	t	--	s	j
*tadi	'seawater'	s	h	s	t,s	t	s	j
*tapa	'cut, trim'	s	h	s	t	PUA:t	s	j
*tagi	'cry'	--	h	s	t	t	s	j
*tano	'land, earth'	s	h	--	t,s	t	--	j
*tani	'skin disease'	s	--	s	--	--	s	--
*tama	'father'	s	h	s	t	t	s	j
*taliga	'ear'	s	h	s	t	t	s	--
*tali	'rope'	s	h	s	t	t	s	j
*takuru	'back'	s	h	s	t	t	--	j
*rata	'cleared land'	--	--	s	t	--	s	--
*[illegible]a'uta	'vomit'	s	h	s	t	t	s	j
*mataku	'fear'	s	h	s	t	t	s	j
*mata	'eye, face'	s	h	s	t	t	s	j
*kúúta	'octopus'	s	h	s	s	t	s	j
*katafa	'frigate bird'	s	h	s	--	--	s	j
*katae	'lee side'	s	h	--	t	--	s	--
*tap'o	'end, part, half'	s	h	s	t	t	s	--
*talae	'adze'	s	h	s	t	t	s	--
*tai	'negative aspect'	s	h	s	t	t	s	j
*tau	'catch'	s	--	s	--	--	s	j
*tautu	'porcupine fish'	s	--	s	t	t	s	j
*tari	'child'	s	h	--	s	t	s	j
*tapa	'cheek'	s	h	s	t	t	s	j
*talia	'relish, sauce'	s	h	s	t	PUA:t	s	--
*tai-m	'sharpen'	s	h	s	t	t	s	j
*tafaali	'return, do again'	s	h	s	t	t	s	j
*peata	'shes'	--	h	s	s	--	s	--
*kinata	'wound'	s	h	s	t	--	s	--
*kata	'speak, word, language'	s	h	s	s	s	s	--
*aramata	'person, people'	s	h	s	t	t	s	j
*(a)mata	'raw, uncooked'	s	h	s	t	t	s	--
*aluta	'beard'	s	h	s	--	--	s	j
*tau-	'expert; prefix to clans'	s	h	s	t,s	t	s	j
*tarawa	'barracuda'	s	h	s	s	PUA:t	s	j
*taraki	'to sail'	s	h	s	t	t	s	j
*taraa	'squirrel fish'	s	--	s	s	--	s	--

Table 29. (Continued) TK and PP Reflexes of Earlier *t

Reconstruction	Gloss	TRK	PUL	CRL	WOL	ULI	PON	MOK
*tapia	'bowl, dish'	s	h	s	t	t	—	j
*tagi	'from; source'	s	h	s	t	t	s	j
*taai	'voyage, trip'	s	h	s	s	—	s	—
*ta-	'negative prefix'	s	h	s	t	t	s	j
*katawaa	'hatch, crack'	s	—	ss	t	t	s	—
*katama	'doorway'	s	h	s	t	t	—	j
*fata	'nest'	s	h	s	t	PUA:t	s	j
*tap'o	'village, plaçe'	s	h	s	t,s	—	s	—
*taru	'skall knife'	s	h	s	s	s	s	—
*-kita	'small amount'	s	s	s	t	—	s	j
*tarep'alu	'Corvus'	s	h	s	s	s	s	—
*tafaga	'k. of plant'	—	—	s	s	—	s	—
*lifauta	'mammea odorata'	—	—	s	—	s	s	—
*i-tau	'who?'	∅	∅	∅	t	t	s	j
II. Before *i								
*tili	'sprout'	∅	∅	∅	∅	—	∅	∅
*tia	'guts, belly'	—	—	—	s	s	∅	—
*tidi	'point, stick out'	∅	∅	∅	s	—	∅	—
*tina	'mother'	∅	∅	∅	s	s	∅	∅
*peti	'float'	∅	∅	∅	s	s	∅	∅
*patiki	'hold breath long time'	∅	∅	∅	—	—	∅	—
*tiro-g	'watch, observe'	—	∅	—	—	—	∅	—
*ka-peti	'driftwood'	∅	—	∅	—	PUA:∅	∅	∅
*mati-lapa	'name of star'	∅	∅	∅	∅	∅	∅	—
*ti,e	'1 pl inc sub pron'	s	h	s	s	s	s	—
III. Before *u								
*tuu	'stand'	∅	∅	∅	s	s	∅	∅
*watu	'toward addressee'	∅	∅	—	∅	∅	∅	∅
*natu	'child, offspring'	∅	∅	∅	∅	∅	∅	∅
*m'etu	'broken off, separated'	∅	∅	∅	∅	PUA:d	∅	∅
*maturu	'sleep'	∅	∅	∅	s	s	∅	∅
*fatu	'stone'	∅	∅	∅	∅	s	∅	—
*anutu	'ghost, spirit'	∅	∅	∅	s	s	∅	∅
*(w)otu	'outwards, out to sea'	∅	∅	∅	—	—	∅	—
*fatu	'weave, plait'	∅	∅	∅	∅	s	∅	∅
*tautu	'porcupine fish'	∅	—	∅	s	s	∅	∅
*tura	'housepost, post'	∅	∅	∅	s	ss	∅	∅
*tup'u	'to be born'	∅	∅	∅	s	s	∅	∅
*tup'a	'fish poison'	∅	∅	∅	s	s	∅	—

Table 29. (Continued) TK and PP Reflexes of Earlier *t

Reconstruction	Gloss	TRK	PUL	CRL	WOL	ULI	PON	MOK
*m'etu	'adopt child, grant, permit'	∅	∅	∅	—	PUA:d	∅	∅
*katuu	'mast'	∅	∅	∅	s	s	∅	∅
*ulatu	'butterfly pea'	—	∅	∅	—	—	∅	—
*tuku	'pound, beat, mash'	s,∅	—	s,∅	s	—	s	j
*fitu	'seven'	s,∅	s,∅	s	s	s	s	j
*utu	'pull, extract'	∅	∅	∅	∅	s	s	j
*fitu(u)	'star'	∅	∅	∅	s	s	s	j
IV. Before *e								
*mate	'die'	∅	∅	∅	s	s	∅	∅
*te-	'one'	∅	∅	∅	s	s	∅	∅
*ate	'liver'	∅	∅	s	s	s	∅	j
*telu	'three'	∅	∅	∅	∅,s	∅,s	s	∅,j
*matelu	'thick'	∅	∅	∅	∅,s	s	s	j
V. Before *o								
*ato	'thatch'	s	h	s	s	s	s	j
*toka	'alight, land'	s	h	s	—	—	s	j
*too(n)	'soak, immerse'	s	h	s	—	—	s	—
*matoa	'ripe, strong, mature'	∅	∅	∅	∅,s	s	—	∅
*toomea	'goatfish'	∅	—	∅	∅	—	∅	j
*rato	'whale'	∅	∅	∅,s	s	s	s	j
*toko(n)	'cane, stick'	∅	∅	—	s	s	s	j

There are 98 comparisons in Table 29, and the agreement between PP and the CTK languages is striking. This agreement is especially close with CRL, which represents CTK prior to the developments in ETK. There are only 6 comparisons of the 90 where CRL attests a cognate form where PP fails to match with CRL: *itau 'who?', *utu 'pull, extract', *fitu(u) 'star', *telu 'three', *matelu 'thick', and *toomea 'goatfish'. In all other forms, CRL is in agreement with PP. Moreover, in each of the six forms where agreement fails to occur, CRL shows loss while PP shows retention. If PP broke off from TK after the separation of WOL, it would not be surprising if the loss of *t had not yet occurred in a few forms.

There are, moreover, four comparisons where both CRL and PP show irregular retentions of *t: *tuku 'pound, beat, mash', *fitu 'seven', *ate 'liver', and *ti,e '1 pl inclusive subject pronoun'. In addition, CRL agrees with PP in five of the six attested comparisons where *t is reconstructed before *o. As noted in chapter 3, TK reflexes of *t before *o are extremely complex, with retention and loss occurring in CTK in approximately equal propostions.

Additional evidence for the hypothesis that PP derives from within TK comes from comparisons where *T has been reconstructed for PTK. These comparisons are:

(1) PTK *luTu 'jump': MOK <u>luj</u>, PON <u>lus</u>, TRK <u>nus</u>, PUL <u>lúh</u>, STW <u>nnus</u>, CRL <u>llus</u>, WOL <u>lútÚ</u>, PUA <u>nútÚ</u>, ULI <u>lut</u>;

(2) PTK *kuTu 'ejaculate': MOK <u>kuj</u>, PON <u>kus</u>, TRK <u>kkus</u>, MRT <u>kus</u>, STW <u>kus</u>, CRL <u>kkus</u>, WOL <u>kkusU</u>;

(3) PTK *kuTu-f 'spit, blow out from mouth': Pingilapese kusukus, TRK kusufi, MRT kusufe, PUL kuhufiy, STW kusufi, CRL ghusufi, WOL gutufii/gusufii, PUA kutude, ULI gutéfi;

(4) PTK *Tup'el,ri 'catch, capture': MOK jipoar, TRK supwuri, MRT supwule, PUL hipweliy, CRL subwuri; and

(5) PTK *Tigi 'fart': MOK jing, PON sing, TRK sing, PUL hing, STW sing, CRL sing, WOL singI, PUA dingI, ULI sing.

(6) PTK *t,Túku 'bird w. white tail': MOK jik, PON sihk, TRK wúúk, PUL wúúk, STW súúk, CRL súúgh, WOL súúgú.

Note that in each of the above comparisons, PP languages agree with the CTK languages against ULI and PUA, where there are different reflexes.

We have reconstructed PTK as having spirantization of *t before high vowels, but as retaining *t as t elsewhere. If PP and TK were coordinate branches of the TK-PP subgroup, then presumably PPP would have had similar allophones of *t. And yet, as we have seen, PP languages attest diffusion of spirantization and loss of *t that is almost identical, down to the lexical items that are involved, with what is attested in CRL, a CTK language whose ancestors split off from PCTK prior to the development of the ETK group. It would appear to be very difficult to account for such similarity by proposing two independent developments. Far more likely to be correct is the hypothesis that the CTK languages and PP shared a period of common development.

If that was the case, however, there should be additional evidence for it. Unfortunately, a systematic search for lexical and grammatical support for the hypothesis has not been carried out, but the forms *p'ara 'pubic triangle', *taai 'canoe voyage, trip' and *katawaa 'hatch, crack' have tentatively been identified as restricted to PP and NTK (STK in the case of *katawaa). More impressive is the fact that CTK and PP lose *k in their reflexes of three directional enclitics: PMC *zake 'up, upwards, east' (MOK -da, PON -da; TRK -tá, MRT -tá, PUL -tá, STW -tá, CRL -tá < PTK *-dake); PWMC *-doko 'hither, towards speaker' (MOK -do, PON -do; MRT, TRK, PUL, STW, CRL -to < PTK *-doko); and PMC *-lako 'away; completive aspect' (MOK -la, PON -la; TRK -nó, MRT -la, PUL -ló, STW -ló, CRL -ló, < PTK *-lako).[45] This development is regular in CTK, of course, but PP normally retains *k. Under the hypothesis that PP separated from CTK, we must assume that the separation occurred before the extensive loss of *k in that group to account for the retention of *k in PP. However, section 3.3.2.2 demonstrates that the loss of *k in CTK was not instantaneous, but has been diffusing through the lexicons of the CTK languages, so that it has not yet affected all lexical items that meet the environment of the rule. We have seen, in fact, that there is some evidence that loss of *k might have occurred in a very few forms before CTK. Under these circumstances, it would appear also possible that *k might have been lost in the phrase-final directional enclitics early enough in PCTK to have affected the PP languages prior to their separation. Otherwise, the only "explanation" for the loss of *k in the PP directionals is accidental and irregular loss.

There are obviously a great many problems associated with this hypothesis. In chapter 2, seven grammatical innovations and a great number of apparent lexical innovations were proposed for PTK on the grounds that they are attested in the TK languages and apparently nowhere else. Under the current hypothesis, their absence in PP would have to be explained. In addition, we have seen that PP languages retained the distinction between PMC *n and *ñ and reflect PMC *x as r before low vowels. The traditionally TK languages, in contrast, merge *n and *ñ as putative PTK *n, and lose PMC *x in all environments. Yet this problem may be less serious for our hypothesis than the former one. The data from Old Mapian that were presented in the previous section appear to require the reconstruction of a distinct reflex of PMC *ñ for PTK, which could have been retained until CTK, which would, in turn, account for the distinction in PP. Merger of *n and *ñ would have occurred independently in the TK languages that separated prior to CTK.

If we recall that both MRS and KIR have independently lost PMC *x, and that PP languages lose it before nonlow vowels, it is possible to propose a solution to the second phonological quandary as well, although only a speculative one. Perhaps the phonetic quality of PMC *x, which apparently occurred in only a very few lexical items, was such that it was easy to lose. Marck's symbol *x suggests that it may have been a velar fricative. If it was so easy to lose, it may have been lost independently in TK languages after the separation of PP.

Similar speculation is necessary to explain the apparent grammatical and lexical innovations that were proposed for PTK in chapter 2, if this hypothesis is to be tenable. We have already seen, however, that the MAP data make it likely that the types *ke(e)na '2 sg focus pronoun', *kaú,i '1 pl inc subject pronoun', and *kau '2 pl subject pronoun', all of which are attested in all TK languages except MAP, were innovated after the separation of MAP and spread to the other TK languages. Other putatively PTK innovations may have spread in the same way. Still others, of course, may in fact have been present in PTK, and have been lost in PP, for if this hypothesis is correct, the separation of PP must have occurred a very long time ago.

Ken Rehg (p.c.) and Shelly Harrison (p.c.) have told me that there are a number of important innovations that are diagnostic of membership in the PP subgroup, yet Harrison (p.c.) has also pointed that there are many differences--especially in the grammatical systems--between PON and MOK, more, in fact, than between almost any two TK languages. For these innovations to develop during a period of shared development, and then for the separate grammatical distinctions to arise, would obviously require an extended period of time. During this same period, the traditionally TK languages were almost certainly in almost constant contact. In such a situation, the sharing of innovative forms, and maintenance of older ones,[46] would be easily accomplished. The loans that have spread throughout the TK communities (see section 2.2.3) are ample evidence of that.

Grace (1983:13) writes: ". . . there seem to be several cases in Melanesia where some speakers of one language in a chain of closely related languages have migrated elsewhere and, as a result of subsequent changes their language has become more differentiated from its stay-at-home sister languages than the latter are from their geographical neighbors." Grace cites Rotuman and Polynesian as examples of this, where Pawley (1979b) has shown that Rotuman probably derives from the western part of the Fijian dialect chain and Geraghty (1979a) has shown that Polynesian probably derives from the eastern, both separations coming after the development of distinct Fijian dialects. He then continues (1983:13): "It is not clear, however, whether the migrating language has undergone more rapid than normal change or whether those which remained at home have undergone change at a slower than normal rate or even whether the latter have changed at the same rate but shared some of their changes. In any case, if we recognize a grouping consisting of the stay-at-home sister plus its neighbors . . . that grouping would be a paraphyletic one." The phonological developments that are shared between CTK languages and PP suggest that modern Trukic languages may constitute a paraphyletic grouping. The evidence regarding this hypothesis, as we have seen, is not unequivocal, however. It may be the case that the PPP and PTK languages were, in fact, coordinate members of the PP-TK subgroup, much as Goodenough and Sugita (1980) have suggested. If that were the case, however, a reasonable explanation of the reflexes of *t must be found. The terms "areal phenomena" and "drift" do not appear to be able to account for such a highly detailed similarity.

4.7 Summary and speculations about population movements

In this chapter, evidence in support of a nuclear Micronesian subgroup, consisting of KIR, MRS, KSR, PP, and TK, has been presented. Further evidence has been presented in support of smaller groupings within nuclear Micronesian. In this section, evidence for those proposed groupings will be summarized. The section will conclude with brief speculations about the possible population movements implied by these proposed groupings. A genetic tree that summarizes the proposals is drawn below. (Dotted lines indicate alternative analyses.)

4.7.1 Summary of evidence for a Micronesian group

The following thirteen phonological innovations are proposed for PMC. All MC languages either attest these innovations at present, or can be shown to have passed through them in their historical developments:

(1) Split of POC *mp into PMC *p and *p';

(2) Split of POC *m into PMC *m and *m';

(3) Loss of POC *p before round vowels;

(4) Merger of POC *nt and *nd as PMC *t', which was most probably a retroflex obstruent;

(5) Merger of PEO *z and POC *j as PMC *z;

(6) Merger of PEO *s and *nj as PMC *d;

(7) Split of POC *R into PMC ∅ and *r;

(8) Loss of POC *q;

(9) Loss of POC *y;

(10) Reasonably consistent reflexes of POC *n as PMC *g in the environment /a__i;

(11) Spirantization of POC *t before *i;

(12) Loss of final vowel information;

(13) Regressive assimilation patterns among vowels.

Note: Dotted lines are used if the historical relationships are not reasonably clear.

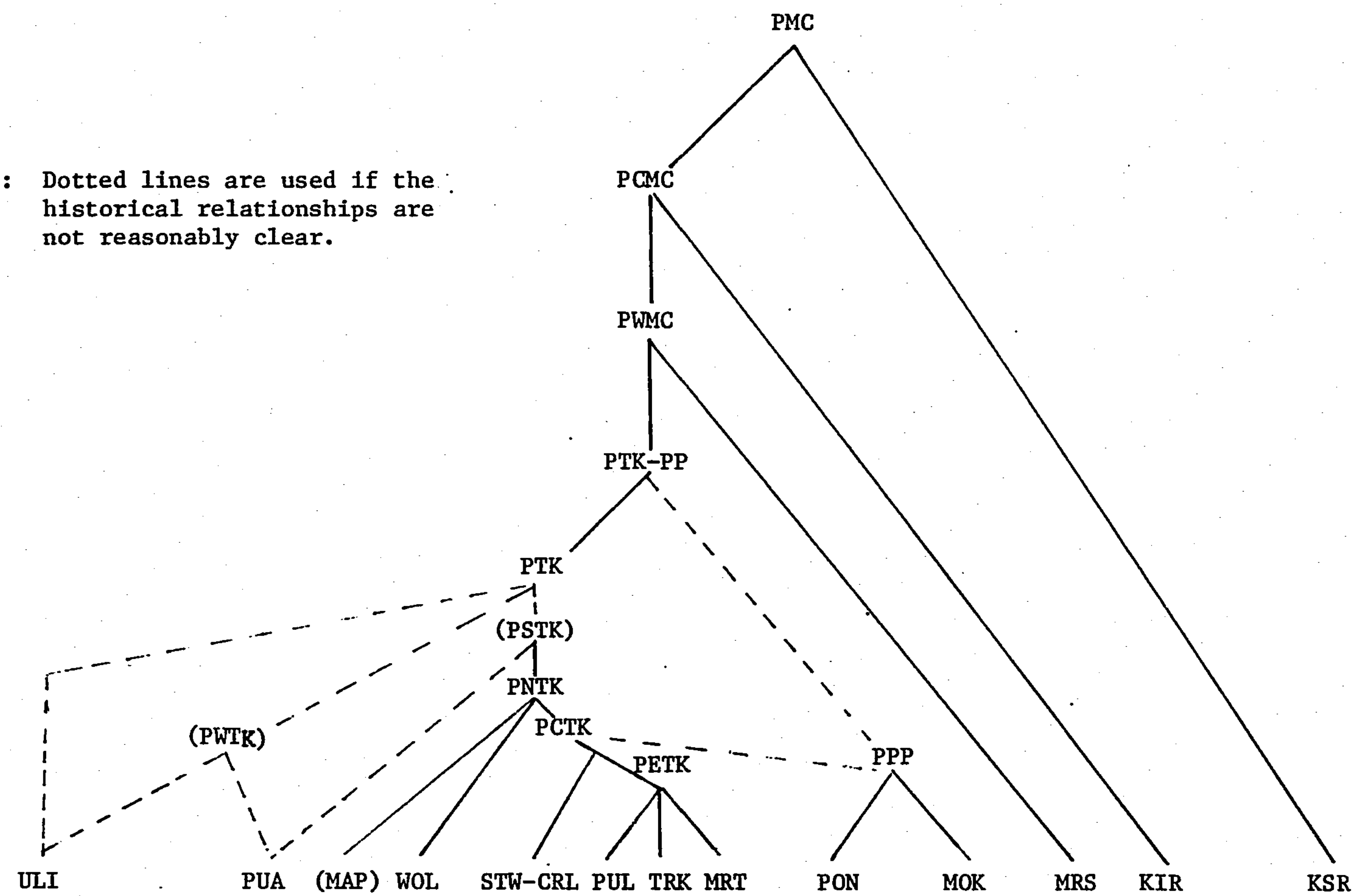


Figure 6. Historical relationships within the Micronesian subgroup of Oceanic

The following three innovations in the grammatical system of PMC are also proposed:

(14) The development of an agentless passive suffix *-aki on verbs;

(15) The development of a countable base morpheme for units of hundreds *-p'ukua; and

(16) Unexpected loss of the medial consonant in the PMC locational noun *faa- 'under, below' (< POC *papa).

In addition, more than fifty possible lexical innovations of PMC are proposed (see section 4.4.1).

It would appear that the nuclear Micronesian subgroup is well-established.

4.7.2 Summary of evidence for Central Micronesian

One Central Micronesian phonological innovation is proposed: the merger of PMC *z and *d as PCMC *d. The following grammatical forms appear to be restricted to the group, as well:

(1) The causative prefix *ka-;

(2) The plural formative *ka- on demonstratives;

(3) The PCMC conjunction *p'a,e 'because';

(4) The negative aspect marker PCMC *tai, perhaps as an irregular development of POC *taqe;

(5) The PCMC complementizer with verbs of saying or thinking *p'a(e);

(6) The locative formative on demonstratives *ika- (restricted, however, to KIR and TK);

(7) The following countable bases which are attached to number roots and may provide evidence of an extensive counting classifier system:

(7a) PCMC *-kudi 'dountable base for high power of ten';

(7b) PCMC *-gafa 'countable base for fathoms';

(7c) PCMC *-p'ogi 'countable base for nights';

(7d) PCMC *-depu 'countable base for high power of ten';

(7e) PCMC(?) *-garatu 'countable base for thousands'.

In addition, more than forty possible lexical innovations of PCMC have been identified, of which six are especially persuasive (see section 4.4.2).

4.7.3 Summary of evidence for Western Micronesian

No strong phonological evidence has been identified for this putative group, although it is possible that the development of an apical stop from PCMC *d occurred in PWMC. There are also relatively few grammatical innovations which can be assigned to this group, but one, at least, is very persuasive:

(1) Development of a PWMC directional enclitic *-doko 'hither, towards speaker' as a replacement of PMC *mai;
(2) Development of PWMC *re '3 pl subject pronoun';
(3) Development of a long vowel in PWMC *aa- 'possessive classifier for general objects' out of putative PMC *a- 'possessive article' (where, however, a short vowel alternate is also attested in MRS and PON , and MOK only attests the short vowel form); and, perhaps,

(4) Development of a final round vowel in PWMC *-logo 'in, inland, inside', from PEO *-loŋa in the same meaning.[47]

Six strong candidates for PWMC lexical innovations are also proposed for PWMC, and about 25 other possible lexical innovations are presented (section 4.4.3). Of all the groups proposed, however, this is perhaps the most weakly supported.

4.7.4 Summary of evidence for a Trukic-Ponapeic group

Phonological evidence for TK-PP consists of the very close agreement of reflexes of earlier *t between PP and the CTK language CRL, as well as the identical reflexes of putative *T in CTK and PP. This evidence, however, supports the hypothesis that PP subgroups with CTK, rather than a TK-PP subgroup, per se. Grammatical evidence for TK-PP consists of the following:

(1) Development of a locational noun *ree- 'at, of, for';

(2) Development of a negative imperative aspect marker *de;

(3) Development of a possessive classifier for foods PTK-PP *kana-;

(4) Development of the following countable bases:

(4a) PTK-PP *faco 'countable base for long objects';

(4b) PTK-PP *-kúta 'countable base for very small amounts';

(4c) PTK-PP *-(t)um'u 'countable base for bunches, clusters';

(4d) PTK-PP *-dipa 'countable base for chips, slices';

(4e) PTK-PP *-(i)ka 'countable base for units of tens';

(4f) PTK-PP *-nena 'countable base for units of ten thousands';

(4g) PTK-PP *-lop'a 'countable base for units of hundred thousands'; and, perhaps,

(5) Development of an *i- increment on PTK-PP *i-tau 'who?'.

In addition, almost forty putative lexical innovations of PTK-PP are presented in support of the proposed group (see section 4.6.1). Although the group appears quite firmly established, it is not clear whether PP languages subgroup <u>with</u> TK languages, or as a part of the TK group (see section 4.6.2).

4.7.5 Possible population movements

Serious archaeological work has only recently begun to be conducted on the islands that are inhabited by speakers of nuclear Micronesian languages (Cordy 1981; Craib 1983). Dates of the sites excavated thus far cluster at around 2000 years B.P., with the Iras site in Truk Lagoon having the earliest date of 400-100 B.C. (Cordy 1981; Craib (1983:924), however, estimates the date of the Truk Lagoon site at about 1500 B.P.). Other site dates include ULI 1700 B.P. (Craib:924), KSR 1850 B.P. (Craib:924), PON 1600 B.P. (Cordy:16), and MRS 2000 B.P. (Cordy 16). So far as I am aware, no archaeological work has been conducted in Kiribati. Cordy (1981:16) states that he anticipates earlier sites in Ponape, Kosrae, and the Marshalls, but they have not been found as yet.

The archaeological evidence does not appear to conflict with the subgrouping proposals that we have made on the basis of linguistic evidence. In the case of the early date for ULI, in fact, it provides some potentially useful support, as our analysis is that ULI was the first language to break off from the TK community.

Entrance to Micronesia of the nuclear Micronesian speakers has often been assigned to the eastern area (see Bender 1971; Marck 1975; and Blust 1982), largely because there is greater linguistic diversity there. Our proposed subgroupings would appear to suggest this as well, given that KSR was probably the first language to break off from the PMC community and KIR the second. If NAU proves to be genetically related to Micronesian, that fact would provide additional support for an eastern entry, as Nauru is geographically quite close to both Kosrae and Kiribati.

Because KSR is the most divergent of the nuclear Micronesian languages, let us speculate that the entry was on Kosrae. Let us further speculate that, after a period of separate development, a sizeable group of people who would become the ancestors of the Central Micronesians removed themselves from Kosrae to another island. The identity of that island is difficult even to guess: it may have been somewhere in Kiribati, but it also may have been either Ponape or Truk Lagoon. If Truk Lagoon continues to attest earlier archaeological sites than Ponape, and if it can be shown that there has been continuous habitation of Truk from those early sites, that would suggest that Truk was perhaps a more likely home of the Central Micronesians.

After another period of separate development, the ancestors of the present Gilbertese removed themselves (if the home was on Truk or Ponape) or were left behind (if the home was in Kiribati) by the people who would become the Western Micronesians. After another period, the ancestors of the Marshallese also left to settle the Marshalls.

The ancestors of the Trukic-Ponapeans, let us speculate, were now in place on either Ponape or Truk. If the home was Ponape, then the next development was probably the removal of the ancestors of the Trukic peoples to Truk, followed by the dispersal of those peoples. That scenario would fit in with the proposition that TK and PP are coordinate branches of PTK-PP. Let us assume, however, for the sake of argument, that the TK-PP homeland was on Truk. In that case, a possible next development might have been the separation of the ancestors of the Ulithians, who might have travelled through the atolls until they encountered Yap, which was already populated. (Craib (1983:923) gives an early date of 2310 ± 10 for Pemrang on Yap.) They then selected the largest atoll in the area for habitation: Ulithi. Later, the ancestors of the modern Woleaians also left Truk to settle the atolls between Truk and Ulithi, and at about the same time, let us imagine, the ancestors of the Ponapeic speakers also left Truk to settle Ponape. Unlike the "other" Trukic peoples, who were settled on low and relatively inhospitable atolls, these Ponapeic speakers had no need to remain in contact with the people they had left behind. The high and beautiful island of Ponape had all that they needed.[48]

The final development in this perhaps imaginary scenario would have been the removal of the ancestors of the present Puluwatese and

Mortlockese from Truk, following the development of the Eastern Trukic innovations.

Although the pattern of dispersal described above is purely speculative, it may not be completely in error. A great deal more linguistic and archaeological work will be needed, however, to determine what actually happened in the settlement of Micronesia.

NOTES TO CHAPTER IV

[1]Dyen (1949) makes much the same claim.

[2]There is at least one other form, however, where MOK loses earlier *k. The MOK reflexe of POC *kasup 'to spit' is andip (cf. PON kendip).

[3]Cordy (1981:16) has indicated archaeological site dates in Truk Lagoon for as early as 400-100 B.C. Craib (1983:924) gives a somewhat more recent date of 1500 B.P.

[4]This development is quite rare in Eastern Oceanic, where POC *p (PEO *v: Geraghty 1979) is almost always reflected as a fricative.

[5]Kiribati is geographically very close to Kosrae, and there apparently is some evidence of relations between the two communities (Wang p.c.).

[6]MRS mag means 'to know better, to learn not to (do something, based on past experience)'. It may not be cognate with PEO *mani 'think, remember', but formally and semantically it is close enough to merit citation.

[7]Several languages in Vanuatu reflect a similar pattern of loss of *R and its merger with POC *d, but I was able to find no language in Tryon (1976) that exhibits the same lexical pattern of loss or merger as is found in the MC languages.

[8]The reconstruction of POC *nduRi 'bone' is made on the basis of Blust's (1978) similar reconstruction for Proto-Admiralties and the MC forms.

[9]Blust (n.d.) reconstructs Proto-Malaita-Micronesia *pwaRusu 'nose', and suggests that it is an innovation of that putative

subgroup. The reconstruction given in Table 22, thus, is not for POC but PMMC.

[10]POC *ŋaRa is reconstructed on the basis of Roviana ngara, Fijian gaa 'wild duck', and MRS nahnah 'red-footed booby, sula-sula', PNTK *gaagaa 'duck, booby'.

[11]In fact, the agreement between CTK and PP languages in their reflexes of *t in different lexical items is such that it is strongly suggestive of a close linguistic relationship. See section 4.6.2 for discussion.

[12]Interestingly, while PON attests the rule in the modern languages, MOK does not, except for in a few fossilized forms. Harrison (n.d.) proposes an explanation of how this might have come about.

[13]KSR sroksrok 'wet, damp, moistened' has been tentatively suggested as a reflex of PEO *zuŋku, but it is far more likely to be cognate with the type *coko 'wet, damp', which is attested in TK.

[14]KSR mas 'sick, ill' is probably a reflex of POC *mate 'die'. KSR also has misac 'die, death', but the presence of the final vowel suggests that this form is either a loan or a reflex of the possessed noun *mate-ña 'his death'. (See note 18 for a brief discussion of KSR possessives.)

[15]This is a PTK reconstruction. It may be valid for PMC as well, though.

[16]This is a PTK reconstruction.

[17]Lee (1975:392) states that there is evidence that KSR has changed very recently from a labiovelar nasal reflex of PMC *m' (mw)

to the presently attested glide. He observes that several forms in the Kosraean Bible are written with mw that are now pronounced as w, and he also reports heavy nasalization on the vowels of some older speakers after w that is inherited from *m'. In addition, Wang (p.c.) reports that all word-final m's in KSR appear to be velarized, perhaps suggesting a merger that might account for the retention in KSR of final *m'.

[18]Lee (1975:62-73) distinguishes suffixed forms of inalienably possessed nouns from free forms, where final vowels are lost, and also from what he terms "impersonal forms." Impersonal forms appear to retain final historical vowels, and are glossed by Lee as 'its ___' (e.g., fihtac 'its navel', niyac 'its leg'). It is almost certain that these impersonal forms are, in fact, reflexes of the third person singular possessive suffix *-ña suffixed to the respective noun (e.g., PMC *p'uta-ña 'his navel'). The present third person singular possessive suffix in KSR is -l, but this is equally certainly a reflex of PMC *-(i)ra '3 pl possessive pronoun'. KSR has apparently substituted plural forms for singular meanings in several places in its pronoun system: KSR el '3 sg independent pronoun' < PMC *ira '3 pl focus pronoun'; KSR kom '2 sg independent pronoun' < PMC *kam'u '2 pl focus pronoun'. The present KSR plural pronouns are reflexes of earlier trial forms (e.g., KSR el-tahl '3 pl independent pronoun' < earlier *ira-tolu).

[19]All KSR compass directions appear to be borrowed.

[20]KSR luo 'two' is a reflex of the number two plus the PMC general counting classifier *-ua: PMC *rua-ua. See section 4.3 for further discussion of PMC counting classifiers.

[21]This is a PTK reconstruction.

[22]This form is only attested, other than in KSR, in some languages in TK. It may not even be a PTK form. The PPN reconstruction *qaro 'front', however, suggests that it may be a retention.

[23]This is a PTK reconstruction.

[24]This is a PTK reconstruction.

[25]This KSR form was apparently elicited by Lutke in the last century (Bender et al. 1983). It is not cited in Lee (1976).

[26]Among the many examples where KSR r is found in loans are: kuhret 'grate', rahf 'raft', rapa 'rubber', raun 'round', raito 'rightfield' (from English through Japanese), rensu 'practice, drill' (from Japanese). KSR dictionary entries under "R" consist almost entirely of such forms.

[27]Kee-dong Lee states in the Kosraean dictionary that KSR sire 'lucky, fortunate' is a loan from Japanese.

[28]Nathan (1973) tentatively suggests the following NAU reflexes of POC consonant phonemes:

POC	*p	*mp	*ŋp	*k	*ŋk	*m	*ŋm	*n	*ŋ
NAU	p,b,∅	p	bw	w,∅	w?	m,mw	mw	n	ng
POC	*t	*nt	*nd	*d	*R	*l	*s	*ns	*w
NAU	∅,j	t	ɍ	r	r,ɍ	∅,r,ɍ	t	d	∅

[29]This does not necessarily mean that the ancestors of the modern Kosraeans left the PMC community to settle on Kosrae. It is equally possible that the Kosraeans were left on Kosrae by the ancestors of the modern Kiribati, Marshallese, Ponapeic, and Trukic speaking peoples. A discussion of possible dispersal patterns in Micronesia is provided at the end of this chapter.

[30]Evidence from Old Mapian provides further support for this possibility. See section 4.5.

[31]Jackson (in preparation) presents some other evidence of a possible connection between Rotuman and MC. Stronger evidence appears to link Rotuman with Western Fiji, however (Pawley 1979b).

[32]Harrison (p.c.) has suggested that the long vowel variant in PON may be the result of the so-called "compensatory lengthening" rule in some MC languages (see Rehg in press a). If that is the case, it might provide support that the same rule was found in the history of MRS, thus permitting it to be reconstructed at least as high as PCMC.

[33]Nathan (n.d.) includes the NAU phrase <u>an</u> <u>Joe</u> <u>tii</u> 'Joe's frigate bird', which may involve use of the form *a- with a construct suffix. If that is the case, it would appear to cause problems for Harrison's analysis, as it would imply that *a- might already be used as a full possessive classifier in PMC. Clearly, more needs to be learned about NAU.

[34]Both KIR and MRS have reflexes of the type *kana 'eat, food', providing a source for the PTK-PP possessive classifier. The KIR deverbal noun <u>kana</u>- can also be used in the type of appositional structures discussed by Harrison.

[35]As noted in chapter 2, PMC *fa- 'four' is irregular for POC *pati, but identical reflexes are attested elsewhere in PEO.

[36]Nathan states: "For numbers five and above there is a separate invariable classifier followed by the numeral . . . followed by the noun being counted." It is not clear what he means, however.

[37]Shelly Harrison (p.c.) points out, however, that all other attested cases of consonant assimilation in KIR have involved *k assimilating to *t, or the reverse.

[38]It is not clear from Lee (1976:118ff) what the meanings of these KSR classifiers might be. Forms with -koe are used with animates, plants, means of transportation, and long pointed objects, while forms with -kohsr are apparently used elsewhere.

[39]The PP correspondences of the initial segment are somewhat irregular, both with TK and between themselves. There is little doubt that the forms are cognate, however.

[40]The *i of proposed PTK-PP *-(i)ka 'countable base for units of ten' is attested in all TK languages except ETK. Its presence in PP is somewhat problematical, however. See Harrison and Jackson (in press) for discussion.

[41]The expected form would be PMC *ziki.

[42]Blust also notes KIR mangongo 'passage between the nose and throat', which was also glossed by Bingham (1908) as 'the breath, or rather its odor from the nose'. This enhances the likelihood of a connection with the Malaita forms, but does not eliminate the importance of the meaning 'head', attested throughout MC.

[43]This probability has consequences for the analysis of the relationship of TK to PP. See following section.

[44]In Goodenough and Sugita's proposal, Central Micronesic is a coordinate branch of "Micronesic," together with MRS, KSR, KIR, and NAU. No support for this proposal is given.

[45]Byron Bender (p.c.) points out that the western dialect of MRS loses *k in its reflex of PMC *zake 'up, upwards, eastward' whenever that form is directly followed by a reflex of PMC *lako 'away; completive aspect' or *watu 'toward addressee', or by a reflex of PWMC *doko 'hither, toward speaker'. It would appear unlikely that this internal-to-MRS development is related to the loss of *k in the PP reflexes of directional enclitics, however, as the eastern dialect of MRS apparently fails to show evidence of it, and no MRS dialect loses *k in reflexes of PMC *lako or PWMC *doko.

[46]TK languages appear to retain a very high percentage of the Proto-Malayo-Polynesian etyma reconstructed by Blust (n.d.) to serve as the base line for his lexicostatistic 200-word list. In a draft of his study of retention rates among Austronesian languages, Blust (n.d.:44) writes: "It is doubtful that any OC languages will outscore Fijian or Motu . . . ." Blust's computations of retention rates for those two languages are both 37%. Since that time, however, Blust has recognized that TK languages have even higher retention rates. The retention rates that Blust (p.c.) now accepts for MC languages are as follows: TRK 38.3, PUA 37.9, PON 30.2, MRS 29.9, KIR 32.0, and KSR 28.6. (My own figures for MC retention rates which were computed using Blust's list are somewhat higher: TRK 42, PUL 42, CRL 41, WOL

42, PUA 41, ULI 40, PON 32, MRS 32, KIR 33, KSR 31.) It is probable that the frequent contact among the TK communities has been an important factor in the retention of such a comparatively high proportion of earlier etyma, for the need to communicate may serve to inhibit innovation that would get in the way of communication, and thus help to maintain older forms.

[47]As neither KIR nor KSR reflects the form at all, it is possible that the innovative vowel occurred earlier.

[48]Ken Rehg (p.c.) states that traditional Ponapean histories trace the origins of the Ponapean people from two sources: Katau Peidak, which is identifi d as Kosrae, and Katau Peidi, which is identified as Yap. Rehg says that the geographical designations are not certain, and that the names actually mean something like 'Home-East' and 'Home-West'. It would appear noteworthy that the Ponapeans trace at least part of their origins from the west, where lie the Trukic islands.

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