PROTO-OCEANIC REFLEXES IN WOLEAIAN

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1. GENERAL

Woleaian (WOL) is a nuclear Micronesian (MC) language spoken by some 1,400 inhabitants of the atolls of Woleai, Eauripik, Faccaulap, Elato, Lamotrek, and Ifaluk, all located in the Yap District of the Trust Territory of the Pacific Islands. The language used for comparison with Proto-Oceanic (POC) in this paper is the dialect of Woleai Atoll where Tawerilmang came from.[1] POC is the name given to the reconstructed language that comprises what have been traditionally known as the MC, Polynesian, and Melanesian groups, as over against the Indonesian or Western Austronesian. The few sets of POC reconstructions then available (which had generally not included data from MC languages) are collected with slight modifications in Grace 1969, to make a total of 698 POC lexical items.[2]

The aim of this paper is to describe the pattern of phonological evolution from POC to WOL through a comparison of the two sets of vocabulary. It is hoped that the findings presented in this paper will contribute to a larger and more significant undertaking: MC comparative linguistics. This hope is particularly strong in that WOL has been found to be a language which retains POC forms faithfully and consistently in terms of both the number of obvious cognates (see Appendix) and sound (especially vowel) reflexes.

2. METHODOLOGY

Since our main concern is the historical development of the phonological structure of WOL, it is imperative at the outset to draw the line between synchronic and diachronic aspects of WOL phonology. Needless to say, all rules are historical products in their origin, i.e. added in the course of time. However, addition of certain rules results in the restructuring of the underlying representations of lexical items, while addition of others has nothing to do with restructuring. Let us call the former type of rules diachronic and the latter, synchronic. For instance, the vowel a is obligatorily raised to e between two high vowels in WOL. Addition of this rule in the grammar of WOL has not yet been accompanied by any restructuring of relevant lexical items in underlying representations. Thus, the appearance of the alternation between

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sila- and sile- in silasE *our* (incl.) *mother* and silei *my mother* has not caused the underlying form sila *mother* to be changed. On the other hand, the change of POC *t to WOL s, as in POC *tina *mother* vs. WOL sila, has certainly resulted in restructuring of the underlying representation of relevant lexical items (e.g. *tina > sila). Therefore, POC *t > WOL s is a diachronic rule.

Suppose we directly compare POC *tina and WOL sile- *mother*, as in the form silei *my mother*, ignoring the existing synchronic alternation between a and e in WOL. We would have to describe the development as *tina > sila > sile. This description would overlook the important fact that sila and sile are automatic alternants produced by a general rule of a-raising which currently applies to all forms that meet the given environment (cf. Sohn 1972 and Bender 1973). This rule, which has no exceptions, has nothing to do with the meanings of the lexical items involved, and may be presumed to be internalised by contemporary speakers of WOL. The change *t > s, however, is neither exceptionless nor is it internalised by contemporary speakers. It may once have been a synchronic rule, but is now quite foreign to the native speaker, who does normally not even know of its existence.

Currently, there are two opposing views concerning the occurrence of restructuring. In transformational generative grammar as represented by Chomsky and Halle (1968), it seems that a rule remains synchronic as long as surface forms are derivable predictably from underlying representations even by means of powerful abstract devices. Restructuring is allowed only when no predictability is possible. In natural generative phonology, on the other hand, restructuring occurs much sooner, i.e., immediately upon the addition of a new phonological rule (e.g. Hooper 1974:121). This claim of the natural generativists is an integral part of their theoretical framework, which also includes the general abolishment of rule ordering, establishment of only one level of phonological representation, and adherence to the strong naturalness condition.[3]

Our concept of restructuring falls somewhere between these two extremes. We will not postulate any abstract devices, inasmuch as we believe that such devices are mostly far from the psychological reality of the native speaker. However, we will recognise the existence and importance of deep and surface levels of phonological representation. We will also admit a certain amount of ordering in phonological rules, not only to attain greater simplicity in the statement of the conditions associated with rules but to achieve greater generality in the statement of phonological processes. Let us take an example.

In WOL, we have a productive process called dissimilation, which, operating from right to left, raises a to e before a low vowel (Sohn 1975:31-32).[4] Thus, we have the following alternations.

(1) {[meramE] *moon*
[maremalI] *moon of*

{[temai] *my father*
[tamemamI] *our* (excl.) *father*

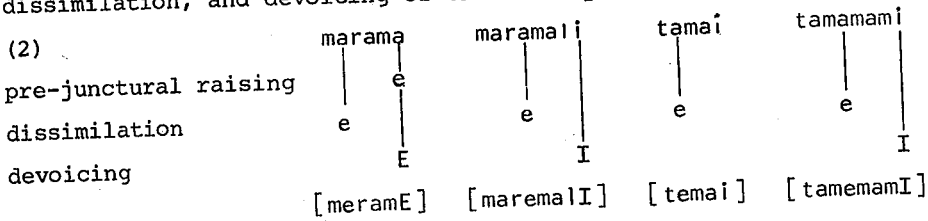
In the natural generative framework, which admits only one level of phonological representation, the underlying stem of *moon* would be either merame or marema, and that of *father* either tema or tame. However, there is no way to predict one form from the other. Both forms in each set are derivable only from a third which is never realised on the surface, i.e. marama for *moon* and tama for *father*. If, in this situation, we were to consider both surface forms in each set as lexical representations, we would miss an important phonological

generalisation (i.e. the dissimilation process) which is purely phonological and applies without exception. Moreover, to the linguistically unsophisticated native speaker of WOL, the formal difference between meramE and marema (in maremalI), for example, is not recognised, because it comes about entirely automatically, just as in allophonic alternation. We consider an allophonic variation to be a synchronic alternation. Then, there is no reason why we should not also consider purely phonological alternations such as this dissimilation process to be synchronic facts. Both phenomena are governed by the native speaker's unconscious, meaning-disregarding linguistic habits. Insofar as the native speaker of WOL recognises the two forms meramE and marema as one, it would be unreasonable to treat the dissimilation process as a historical (or diachronic) rule.

A natural corollary of considering it to be a synchronic rule is that we have to admit the existence of two levels of phonological representation. A basic premise of this paper, therefore, is that diachronic rules apply to POC forms and derive the corresponding WOL base forms, which are reconstructable from purely phonological alternations, while synchronic rules apply to WOL base forms to derive the corresponding surface forms. In other words, diachronic rules deal with the patterns of restructuring, while synchronic rules deal with the patterns of currently automatic sound alternations. Based on this premise, we draw a distinction between those processes which are partly or wholly dead and those which are completely active in purely phonological environments. If a certain phonological change were suspended prematurely or were in progress through lexical diffusion, we would consider it to be a diachronic fact, since restructuring in our sense of the term is involved in either case.

Let us go back to our examples. In order to obtain the surface forms from the reconstructed base forms marama, marama-li, tama-i, and tama-mami, we must have three general synchronic rules: prejunctural raising of a to e, dissimilation, and devoicing of the final post-consonantal simple vowel.

(2)



One significant ordering to be imposed on the above rules is that prejunctural raising must apply before dissimilation because the latter requires a surface low vowel (e.g. [a]) as its environment. On the other hand, devoicing does not have to be ordered in relation to the other two rules.

One may naturally ask, then, how we should treat WOL pairs like b (= [ɓw]) and pw, š and c, r and c, x and k, and l and n. The members of each pair are in complementary distribution in native vocabulary, in that the first occurs only as a single consonant and the second only as a geminate. Besides, when two of the first members of a given pair meet at a morpheme boundary, they are automatically replaced by the corresponding second member, as in xx → kk. For instance, notice the alternation between xaŋi *to eat it* and kkekkaŋi *to be eating it*. The only feature that differentiates x from k is [continuant]. If we take only native vocabulary into account, x and k are certainly allophonic variants. A flood of recent borrowings (especially from Japanese), however, have caused the WOL system to develop simple pw, c, k, and n which contrast with the corresponding double or fricative ones. Moreover, some neighbouring languages retain pw, c, k, and n where WOL has b, š/r, x, and l, respectively, which fact

makes the native speaker sensitive to the phonetic differences between, for example, x and k. Based on these observations, we will regard the development of b, š, r, x, and l as historical (or diachronic) facts, while the fortition of for example xx → kk is regarded as a synchronic process.

Another thorny problem concerns the treatment of semivowels. *w and *y have been reconstructed as phonemes in POC, as in *awaŋ *mouth* and *yaŋo *yellow*. In WOL, w and y are inserted before syllable-initial vowels in an entirely predictable way (see SR 1 below). In many cases, therefore, it is difficult to tell whether a given semivowel in a WOL form is inherited or has been synchronically epenthesised. However, in the case of ya:wE *mouth*, it is easy to tell that the w is an inherited one even without the evidence of POC *awaŋ, because w is never inserted between unrounded vowels. In the case of yaŋoyaŋ0 *yellow*, on the other hand, one might want to set up aŋo-aŋo as the base form, because y is inserted in the environment #___a anyway. To this word correspond two POC forms, *aŋoaŋo and *yaŋo, both meaning *yellow*, which might suggest either yaŋo-yaŋo or aŋo-aŋo as the WOL base form. Some morphophonemic alternations involving the word in question and others, however, lead us to choose yaŋo-yaŋo. Compare the pairs in (3a) and those in (3b).

(3) a.

yaŋoyaŋ0	*yellow*
xeyaŋoyaŋo	*make it yellow*
yateffasE	*beardless*
xeyateffesa	*shave him completely*
yarusa:sa	*reddish*
xeyarusa:sa:li	*make it bloody*
yaŋŋeŋŋawE	*sloppy*
xeyaŋŋeŋŋewa	*make him do things sloppily*
yaŋekuwE	*mischievous*
xeyaŋekuwa	*make him mischievous*

b.

yalI	*to fly*
xa:li	*make it fly*
yarE	*to get through*
xa:ra	*make it get through*
yaxiyexI	*to think*
xa:xiyexi	*to plan*
yafE	*to swim*
yefa:fE	*to swim vigorously*
yalI	*thin piece*
růwa:lI	*two thin pieces*

Notice that in (3a) y is retained after the causative prefix xa- (xe- before a by dissimilation), whereas in (3b) y does not show up after the same prefix. Further, notice in (3b) that y does not occur in the second member of a reduplicated form (e.g. yefa:fE) and after a numeral (e.g. ruwa:lI). What this means is that the y's in (3a) and those in (3b) differ in historicity. The former are already fossilised, either through inheritance from POC or through later development, while the latter are synchronically epenthesised in the given environments. The WOL base form of *yellow* should, therefore, be yaŋo-yaŋo, and not aŋo-aŋo.

A similar phenomenon is observed with w. For instance, w is epenthetic in wolɔ:l0 *to flip* and wo:r0 *fence*, in that the former may be derived from ola-ola (cf. wolati *flip it*) and the latter from oro-oro. The above observation leads us to distinguish base-form semivowels which are inherited or historically developed from surface ones which are epenthesised through synchronic processes.

3. SYNCHRONIC PHONOLOGICAL PROCESSES

WOL has the following phonological inventory in the native vocabulary. Notice that many sounds are limited to single or double occurrence. This is viewed as largely due to phonological diffusion through linguistic contact with neighbouring languages, and to the internal pressures to maintain structural symmetry (Sohn et al:1976).

(4) Consonants

p	t	c (doubly)	k (doubly)
		š (singly)	x (singly)
pw (doubly)	s	r (singly)	
b (singly)			
	l (singly)		
m	n (doubly)		ŋ
mw			

Vowels

i	ʉ	u
e	əə (long)	o
	a	ɔɔ (long)

Semivowels

y w

The major synchronic rules (SR's) operative in WOL are listed below, with relevant examples. Rule ordering is specified where applicable.

SR 1 (semivowel insertion)

$$\emptyset \rightarrow \begin{cases} y \;/\; \{ \#\_\_\bar{V}r,\ \bar{V}r\_\_V \} \\ w \;/\; \{ \#\_\_Vr,\ Vr\_\_V \} \end{cases}$$

(Vr = rounded vowel; $\bar{V}r$ = unrounded vowel)

Condition: A semivowel is not inserted before a high vowel (i, ʉ, or u) or between two identical simple vowels.

(The semivowel y is inserted before a word-initial unrounded vowel or between an unrounded vowel and any vowel. The semivowel w is inserted before a word-initial rounded vowel or between a rounded vowel and any vowel.)

(5) Examples

alʊ́sʊ́ → yalʊ́sʊ́ → yalʊ́sʊ̈ (by SR 7)	*ghost*
ama → yama → yame (by SR 3) → ya:mE (by SR's 7 & 8)	*office*
afi → yafi → ya:fI (by SR's 7 & 8)	*fire*
ate → yate → ya:tE (by SR's 7 & 8)	*chin*
weriai → weriyai → weriyei (by SR 5)	*see me*
ia → iya → iye (by SR 3) → i:yE (by SR's 7 & 8)	*he*
liia → liiya → li:yE (by SR's 3 & 7)	*kill him*
olo → wolo- (by SR 1)	*six*
laloa → lalowa → lalowE (by SR's 3 & 7)	*yesterday*
falʊ́a → falʊ́wa → falʊ́wE (by SR's 3 & 7)	*island*
xasʊ́ʊ́a → xasʊ́ʊ́wa → wasʊ́:wE (by SR's 3 & 7)	*build it*
uaa → uwaa → uwa (by SR 7)	*fruit*

SR 2 (a rounding)

$$a \rightarrow o \;/\; \left\{ \begin{matrix} o \\ ɔɔ \\ u \end{matrix} \right\} \; C\_\_\#$$

(The simple word-final vowel a is rounded to o after a back rounded vowel followed by a simple or double consonant).

(6) Examples

bunna → bunno → bunn0 (by SR 7)	*heart*
ssooŋa → ssooŋo → sso:ŋ0 (by SR 7)	*anger*
xotɔɔta → xotɔɔto → xotɔ:t0 (by SR 7)	*crack*

When, instead of a consonant, a semivowel occurs between a rounded vowel and a, SR 2 does not apply, as in paxowa → paxowE *shark* (by SR's 3 and 7).

SR 3 (prejunctural a raising: applies after SR's 1 and 2)

$$a \rightarrow e \;/\; \left\{ \begin{matrix} C \\ G \end{matrix} \right\} \; \_\_\# \;.$$

(The simple vowel a is raised to e between a consonant or a semivowel (G = glide) and a word boundary).

(7) Examples

ita# → ite → i:tE (by SR's 7 & 8)	*name*
afara# → yafare (by SR's 1 & 3) → yefarE (by SR's 4 & 7)	*shoulder*
mwara#mwarali# → mwaremwarali → mwaremwerali (by SR's 4 & 7)	*lei of*

SR 4 (dissimilatory a raising: applies after SR 3)

$$a \rightarrow e \;/\; \_\_\_(C) \; \left\{ \begin{matrix} a \\ ɔɔ \end{matrix} \right\}$$

Condition: This rule applies from right to left.

(The simple vowel a is raised to e before a low vowel, i.e., a or ɔɔ).

(8) Examples

matamami → matemami → matemamI (by SR 7) *our* (excl.) *eyes*
matai → metai *my eyes*
xammata → xammate (by SR 3) → xemmate → xemmatE (by SR 7) *bailer*

xatɔɔlaa → xetɔɔlaa → xetɔ:la (SR 7) *make it bloom*
xamɔɔa → maxɔɔwa (by SR 1) → xamɔɔwe (by SR 3) → xemɔɔwe → xemɔ:wE (by SR 7) *erase it*

SR 5 (assimilatory a raising)

a → e / Vh (C)___(C) Vh

Condition: This rule applies across word boundaries.

(The simple vowel a is raised to e between high vowels, whether or not a simple or double consonant intervenes.)

(9) Examples

maŋi#maŋi → maŋimeŋi → maŋimeŋI (SR 7) *to think*
itai → itei *my name*
paaů#šalů → paaůšelů → paaušelŮ (SR 7) *water provisions*

An allophonic process relevant to SR's 3-5 is that e is pronounced with the lips rounded (i.e. [ə]) before or after ů, as illustrated in (10). However, simple [ə] is not a separate phoneme in WOL.

(10) (a) before ů

surface form	pronunciation	
lexŮ	[ləxŮ]	*make it tight*
mmweů	[mmwəů]	*broken*
iteů	[itəů]	*who?*
faůfeů	[faůfəů]	*to weave*

(b) after ů

surface form	pronunciation	
yaůtE	[yaůt̪]	*current*
xů:sE	[xů:s̪]	*octopus*
pa:ůselŮ	[pa:ůsəlŮ]	*water provisions*

SR 6 (i assimilation)

$$i \rightarrow \left\{ \begin{array}{l} ů \;/\; ů\ (C)\_\_\_ \\ u \;/\; u\ (C)\_\_\_ \end{array} \right\} \#$$

(The word-final vowel i is completely assimilated to the preceding ů or u whether a consonant intervenes or not.)

(11) Examples

alůsůli → yalůsůli (by SR 1) → yalůsůlů → yalůsůlŮ (by SR 7) → *ghost of*
xattui → xattuu → xattu (by SR 7) *my finger*
maŋaaxuli → meŋaaxuli (by SR 4) → meŋaaxulu → meŋa:xulŮ (by SR 7) *clothes of*

SR 7 (vowel devoicing and shortening)

$$V_{\iota} \rightarrow \left\{ \begin{array}{ll} \text{devoiced} / & \{ \begin{smallmatrix} C \\ G \end{smallmatrix} \}\_\_\#\# \\ \emptyset \quad / & V_{\iota}\_\_\#\# \end{array} \right\}$$

(A simple vowel following a consonant or a semivowel (G = glide) is devoiced before a phrase boundary; a long (geminate) vowel is shortened before a phrase boundary.)

(12) Examples

imwa → imwe (by SR 3) → imwE → i:mwE (by SR 8)	*house*
iiaa → iiyaa (by SR 1) → i:ya	*where?*
iraa → ira	*branch*

SR 8 (vowel lengthening)

$$\emptyset \rightarrow : / \# \; (\{\begin{smallmatrix} C \\ G \end{smallmatrix}\}) \left\{ \begin{array}{l} V\_\_ \; (\{\begin{smallmatrix} C \\ G \end{smallmatrix}\}) \; \underset{\circ}{V} \\ V_{\iota}\_\_V_{j} \end{array} \right\} \#$$

($\underset{\circ}{V}$ = voiceless vowel)

Condition: This rule applies only to a noun.

(In a form which consists of only two simple vowels, with one or two simple consonants or semivowels (G = glide), the first vowel is lengthened.)

(13) Examples

faʊ́ → fa:ʊ́	*stone*
afi → yafI (by SR's 1 & 7) → ya:fI	*fire*
lamwo → lamw0 (by SR 7) → la:mw0	*lagoon*
ia → iya (by SR 1) → iyE (by SR's 3 & 7) → i:yE	*he*

SR 9 (fortition)

$$\begin{bmatrix} b \\ x \\ \{\begin{smallmatrix} r \\ \check{s} \end{smallmatrix}\} \\ l \end{bmatrix}_{\alpha} + \alpha \rightarrow \begin{bmatrix} ppw \\ kk \\ \\ cc \\ nn \end{bmatrix}$$

(When doubled, the fricative b, x, r, and š are plosivised, and the flap l is nasalised.)

(14) Examples

bbubbuutoxo → bbubbuutox0 (by SR 7) → ppwuppwu:tox0	*to be coming*
(cf. bu:tog0 *to come*)	
xxaxxatapaa → xxexxatepa (by SR's 4 & 7) → kkekkatepa	*to be touching it*
(cf. xettapE *to touch*)	
rrorro → rrorr0 (by SR 7) → ccocc0	*to decorate*
(cf. rosi *decorate it*)	
rraxo → rrax0 (by SR 7) → ccax0	*to hug*
(cf. raxomi *hug it*)	
šša̰šša̰lʊ́ʊ́a → ššḛšša̰lʊ́ʊ́wE (by SR's 1, 3, 4, & 7) → cceccalʊ́:wE	
(cf. ša̰:lʊ́ *water*)	*to fill it with water*

llʉtʉ → llʉtʊ̈ (by SR 7) → nnʉtʊ̈ *to be jumping*
(cf. lʉtʊ̈ *to jump*)

4. DIACHRONIC RULES

The POC phonemic system as reconstructable from Grace 1969 is as follows:

(15) POC Consonants:

p	t		k	?
mp	nt		ŋk	
ŋp				
	d			
	nd			
	s			
	ns			
	nj			
		R		
	l	r		
m	n		ŋ	
ŋm				

POC Vowels:

i		u
e		o
	a	

POC Semivowels:

y	w

The following diachronic rules (DR's) show the development from POC forms to WOL base forms. The WOL forms cited are, therefore, all base forms. Ordered rules are marked as such. Unlike synchronic rules, DR's have certain exceptions which may be regarded either as having undergone idiosyncratic changes or as later borrowings from neighbouring languages.

DR 1 (final-consonant apocope)

*C > Ø / ___#

All word-final POC consonants were dropped and no reflexes are found unless protected by a suffix of a certain kind (and hence non-final in the suffixed form).

(16) Examples

*p	*ma?udi(p) > maʉrʉ	*alive*
	*?atop > aso	*thatch*
*t	*laŋi(t) > laŋi	*sky*
	*masaki(t) > mataxi	*sick, pain*
	*ŋkinit > xiii-	*to pinch, pluck*

*k	*manu(k) > malʉ	*bird, animal*
*ʔ	*daRa(ʔ) > ccaa	*blood*
	*muta(ʔ) > (m)mwuta	*to vomit*
*s	*manipi(s) > malifi	*thin*
*R	*matudu(R) > masʉrʉ	*to sleep*
*m	*inu(m) > ʉlʉ	*to drink* but ʉlʉmii *drink it*
	*ndanum > šalʉ	*fresh water*
	*onom > olo	*six*
*n	*ʔatun > asʉ	*bonito*
*ŋ	*awaŋ > awa	*mouth*

Notice that ʉlʉmii *drink it* retains the final *m of *inu(m) because it is followed by an object suffix. This verb belongs to the class of so-called thematic-stem transitive verbs (Sohn 1975:125-127), in that it retains the thematic consonant -m only before a suffix (cf. ʉlʉ *to drink*).[5]

DR 2 (u centralisation)

*u > ʉ / if not preceded or followed by a POC bilabial consonant

(17) Examples

*ʔatun	> asʉ	*bonito*
*ndanu(m)	> šalʉ	*fresh water*
*dua	> rʉa-	*two*
*kku	> kkʉ	*nail, toe*
*kuRita	> xʉsa	*octopus*
*kutu	> xʉsʉ	*louse*
*mataku(t)	> mataxʉ	*afraid*
*matudu(R)	> masʉrʉ	*to sleep*
*natu	> laʉ	*child*
*panua	> falʉa	*land, island*
*pitu?u	> fʉsʉ	*star*
*Ru?a	> ʉa	*neck*
*sau(ʔ)	> taʉ-	*to pull out*
*susu	> tʉtʉ	*breast*
*ʔuna(p)	> ʉla	*fish scale, body hair*
*ʔuda(ŋ)	> ʉra	*lobster*

DR 2 does not apply when *u occurs in the neighbourhood of a POC bilabial consonant, as illustrated in (18).

(18) Examples

	*lumu	> lumwu	*seaweed, moss*
	*-mu	> -mwu	*your* (singular)
	*muta(ʔ)	> (m)mwuta	*to vomit*
	*namu(k)	> lamwu	*mosquito*
	*pua(ʔ)	> uaa	*fruit*
	*mpua	> bbua	*(betel)-nut*
D.	*puko	> uxo	*net*
	*puŋa	> uŋa	*ridge pole*
	*mputo	> buso	*navel*
	*putu	> utu	*tree sp. Barringtonia*
	*tampu	> tabu	*taboo*
	*tumpu(ʔ)	> subu	*to be born*
	*ʔumu	> umwu	*earth oven*

As we see in *putu > utu, DR 2 does not apply to *u when it follows another u which is not subject to DR 2. Similarly, the second *u remains unchanged in *ŋapulu(ʔ) > ŋaulu *ten.* *puti (D. *punti) > wisi *banana* might be construed as an exception to (18). However, wisi may be viewed as having been derived through usi > wisi where u is diphthongised due to the following i. A questionable exception is *tau *man, person* > tau *practitioner* where the meanings of the two words are only remotely related.

Due to the operation of DR 2, the WOL phonemic system has seen the split of POC *u into u and ů, thus resulting in the system of six simple vowels.

In addition to the regular shift of *u to ů as shown in DR 2, there are some high vowel alternations conditioned by neighbouring vowels. One such alternation is represented in DR 3, which applies fairly widely.

DR 3 (i centralisation: applies after DR 2)

*i > ů / ___ (C) ů

(19)

D *anitu > anitů (by DR 2) > anůtů > alůsů (by DR's 7 & 14) *ghost*
*iku > iků (by DR 2) > ůků > ůxů (by DR 9) *tail*
*inu(m) > inů (by DR's 1 & 2) > ůnů > ůlů (by DR 14) *to drink*
*liu(R) > liů (by DR's 1 & 2) > lůů *coconut*
*pitu?u > pitů?ů (by DR 2) > půtů?ů > fůsů (by DR's 4, 5, & 7)[6] *star*

One exception is *pitu > fisi *seven,* which may have been changed in order to avoid homophony with fůsů *star.* The shift *ʔuluŋa > ilůŋa *pillow* is a case of change in a direction opposite to DR 3, in that the first *u changed to i (probably by way of ů) in dissimilation from the second ů. Some other forms which show irregular high vowel reflexes include *kuli(t) > xili *skin, bark* where *u (> ů) changed to i before i, and *maʔudi(p) > maůrů *alive* and *tuki > sůxů *to pound* where *i changed to ů in assimilation to the preceding ů. Still other correspondences show mutual assimilation between a POC high vowel and a neighbouring non-high vowel, as illustrated in (20). Notice that if there is an intervening POC consonant, the assimilation occurs only when the consonant is deleted by rules to be specified later.

(20)

*au, *aou	> əə	*paʔu	> fəə	*to tie*
		*ndau(n)	> šəə	*leaf*
		*paRu	> (xili-)fəə	*hibiscus*
		*paʔoRu	> ffəə	*new*
*eu	> ɔɔ	*seu	> tɔɔ	*rake*
*ai	> e(e)	*mai	> me	*and, with*
		*saʔit	> tee-tee	*to bind*

The above changes are not entirely regular because, for instance, we have *patu > fať *stone,* *sapu > taů *to pull out,* and *ʔaRus > aůta *current,* where *au did not change to əə but followed the regular shift given in DR 2. Also, along with *seu > tɔɔ, we have *kesu > xůů *back of head* where *e was completely assimilated to the following ů. One might be able to use some kind of rule ordering in the deletion of the consonants involved (e.g. *ʔ, *t, *p, *R, *s) to provide an account of the vowel changes. In view of the lack of supporting data, however, such a proposal does not seem particularly attractive. In any case, the fusion of vowels added two new long vowel phonemes əə and ɔɔ to the WOL phonemic system. Remember that these long vowels do not have corresponding short counterparts.

DR 4 (glottal stop deletion)

*? > Ø

The POC glottal stop *? has been completely lost in all positions. Deletion of word-final *? has already been accounted for by DR 1. In (21) are given examples of deletion of initial and medial *?.

(21)

initial:	*?apaRa	>	afara	*shoulder*
	*?aro-?opa	>	arofa-	*love, like, miss*
	*?ate	>	ase	*liver*
	*?atop	>	aso	*thatch*
	*?uda(ŋ)	>	u̇ra	*lobster*
	*?umu	>	umwu	*earth oven*
medial:	*pa?u	>	fəə	*to tie*
	*da?a(n)	>	raa	*branch*
	*Ru?a	>	u̇a	*neck*
	*ma-?anu	*to be afloat*	> maalu̇	*flood*
	*ma?udi(p)	>	mau̇ru̇	*alive*
	*pitu?u	>	fu̇su̇	*star*
	*sa?it	>	tee-tee	*to bind*
	*tu?u(d)	>	su̇u̇	*to stand up*

DR 5 (p weakening: applies after DR 2)

$$*p > \begin{cases} Ø \;/\; \_\_\_ \;\; *u, *o \\ f \;/\; \text{elsewhere} \end{cases}$$

POC *p has been lost before a POC back vowel, whereas it has shifted to f in all other positions, as illustrated in (22).

(22) *p > Ø

	*mapo	>	mɔɔ	*to heal*
	*napo	>	lɔɔ	*wave, surf*
	*pua(?)	>	uaa	*fruit*
D.	*puko	>	uxo	*net*
D.	*puŋa	>	uŋa	*ridgepole*
D.	*punti	>	wiši	*banana*
	*sapu	>	tau̇-	*to pull out*
	*ŋapulu(?)	>	ŋaulu	*ten*

*p > f

*?apaRa	>	afara	*shoulder*
*api	>	afi	*fire*
*?aro-?opa	>	arofa-	*love, like, miss*
*manipi(s)	>	malifi	*thin*
*pada	>	faša	*pandanus*
*pai-	>	fa-	(reciprocal prefix)
*pale	>	fale	*house*
*panua	>	falu̇a	*island, land*
*papine	>	faifile	*woman*
*patu	>	fau̇	*stone*
*pitu	>	fisi	*seven*
*tipi	>	sifi	*girdle, skirt*

One exception to DR 5 is observed in *tupa > supa *fish poison* and *Ripa > repa *to go close*, where *p is reflected as p. In view of the abundance of reliable examples supporting DR 5, the exception may be ascribed to one of the following: (a) the POC forms may be reconstructed with *mp rather than *p; (b) they are not real correspondences; (c) the POC forms were introduced in WOL as borrowings after DR 5 was no longer active; or (d) the shift *p > f stopped prematurely before *a. If the last statement was actually the case, we would have to change DR 5 to DR 5'.

DR 5'

$$*p > \begin{cases} \emptyset & / \underline{\quad} \ *u, *o \\ p & / \underline{\quad} \ *a \text{ (only in certain words)} \\ f & / \text{elsewhere} \end{cases}$$

In *pili(?) > ffili *to select* and *kapi(t) > xaffii *seize it*, *p is reflected as ff. The transitive counterpart of ffili is filii *select it*, which explains the former correspondence. The latter, however, has no explanation at present.

In *nsipo > tiwe *downward* and *tapu > tawii *conch*, deletion of *p is followed by an irregular diphthongisation of the following vowel, i.e. *o > we and *u > wii, respectively.

DR 6 (bilabial denasalisation)

$$*mp, *ŋp > \begin{cases} b & / \underline{\quad} \ *u, *o \\ p & / \text{elsewhere} \end{cases}$$

POC *mp and *ŋp seem to have been merged, and then denasalised in WOL to b (by way of pw) before a back (or rounded) vowel, and to p elsewhere. However, a strong case cannot be made for the two POC consonants, because there is only one correspondence available in which *ŋp occurs, as shown in (23).

(23) $\left\{ \begin{matrix} *mp \\ *ŋp \end{matrix} \right\} >$ b

*mpo-	> boo	*smell*
*mpua	> bbua	*(betel)-nut*
*mpule	> bulo	*white shell, cowry*
*mputo	> buso	*navel*
*tampu	> tabu	*taboo*
*tumpu(?)	> subu	*to be born*
*ŋpoŋi	> boŋi	*night*

*mp > p

*mpampa(n)	> paapa	*board, plank*
*mpaya	> paa	*bait, worm*
D. *tampi	> tapiya	*bowl*

Notice in the shift *mpua > bbua that *mp is reflected as bb for reasons not statable at the moment.

DR 7 (t weakening)

$$*t > \begin{cases} t & / \underline{\quad} \ *a \\ \emptyset & / \underline{\quad} \ *u \text{ (only in certain words)} \\ s & / \text{elsewhere} \end{cases}$$

POC *t is retained unchanged before the POC low vowel *a. Otherwise it has shifted to s or Ø, although predominantly s. The dropping is observed only before POC *u, and that only in a very limited number of words. One can only speculate that the words with the Ø reflex have been either influenced by or borrowed from other Trukic (TK) languages, which are regarded as having undergone a second shift of *t, i.e. t > s and s > Ø (Sohn et al 1976). This speculation is partly supported by the reflexes of POC *patu *stone*, which are fasʉ (old form) and faʉ (new form). Examples of DR 7 follow:

(24) *t > t

	*taŋi(s)	> taŋi	*to cry*
	*tansi(k)	> tati	*sea*
	*tali	> tali	*rope*
	*taliŋa	> taliŋa	*ear*
	*tama	> tama	*father*
	*tano(?)	> talo	*earth*
	*taku	> taxʉ	*back*
	*mata	> mata	*eye*
	*mataku(t)	> mataxʉ	*to be afraid*
	*muta(?)	> (m)mwuta	*to vomit*

*t > s

	*tuki	> sʉxʉ	*to pound*
	*tumpu(?)	> subu	*to be born*
	*tu?u(d)	> sʉʉ	*to stand up*
D.	*anitu	> alʉsʉ	*ghost*
	*?atun	> asʉ	*bonito*
	*kutu	> xʉsʉ	*louse*
	*matudu(R)	> masʉrʉ	*to sleep*
	*pitu	> fisi	*seven*
	*pitu?u	> fʉsʉ	*star*
	*?ate	> ase	*liver*
	*?atop	> aso	*thatch*
	*mate	> mase	*to die*
	*mputo(s)	> buso	*navel*
	*tika	> sixa	*bad, angry*
	*tina	> sila	*mother*
	*tipi	> sifi	*girdle, skirt*
	*toko(n)	> soxo	*pole, staff*

*t > Ø

	*motu	> mmweʉ	*to break off*
	*natu	> laʉ	*child*
	*patu	> faʉ	*stone* (old form: fasʉ)
	*patu	> faʉ-faʉ	*to weave*

Exceptions to *t > t are *ta?aki *to draw water* > saaxii *extract it* and *kuRita > xʉsa *octopus*. Exceptions to *t > s are *putu > utu tree sp.: *Barringtonia* and *kato > xato *basket*.

DR 8 (dental denasalisation)

*nt, *nd > š

The two POC prenasalised dental stops *nt and *nd have merged into the palatal retroflexed fricative š in WOL, as shown in (25).

(25) *nt > š

	*-nta	> -ša	*our* (incl.)
	*kinta	> -xiša	*we* (incl.)
D.	*punti	> wiši	*banana*

*nd > š

	*ndanu(m)	> šalʊ́	*water*
	*ndau(n)	> šəə	*leaf*

The reconstruction of POC *puti for *banana* is not adequate as far as the WOL (and TK) data are concerned, because *puti would have to be subject to DR 7 and would result in a wrong reflex. Therefore, *punti must be the correct reconstruction.

DR 9 (velar spirantisation)

simple *k, *ŋk > x

Simple POC *k is regularly reflected as x in WOL, while POC *kk remains unchanged. As mentioned earlier, when two x's meet at a morpheme boundary, they become kk by a synchronic process. We have only one example of *ŋk shifting to x.

(26) *k > x

	*-ʔaki	> -axi	*cause or instrument suffix*
	*(dl)iki	> šixi	*small*
	*ika(n)	> ixa	*fish*
	*iku	> ʊ́xʊ́	*tail*
	*kau	> xəə	*fish hook*
	*kiekie	> xiexie	*pandanus*
	*kinta	> xiša	*we* (incl.)
	*ko(e)	> xo	*you*
	*kutu	> xʊ́sʊ́	*louse*
	*lako	> laxo	*to go*
	*masaki(t)	> mataxi	*sick, pain*
	*mataku(t)	> mataxʊ́	*to be afraid*
	*puko	> uxo	*net*
	*toko(n)	> soxo	*staff, pole*

*kk > kk

	*kku	> kkʊ́	*nail, claw*

*ŋk > x

	*ŋkinit	> xili-	*to pinch, pluck, nip*

One aberrant correspondence is *kali > kkeli *to dig*. The WOL form may have been derived through kakali > xaxali > xexali (dissimilatory a-raising) > xxeli > kkeli.

There are a couple of examples in which *k and *ŋk correspond to Ø. These are *suku > tʊ́tʊ́tʊ́ *to bathe* and *waŋka(ŋ) > waa *canoe*. If these are true cognates, DR 9 has to allow for the Ø reflex. At the moment, however, we have no strong evidence to consider them true cognates.

DR 10 (d rhotacism)

*d, *r > r

POC *d and *r have been merged to r in WOL, as illustrated in (27). Notice that there are not many examples of *r > r. In Grace (1969), *(dr) indicates that some authors reconstructed *d and others *r for the same set of correspondences.

(27) *d > r

*-da	>	-:ra	*their*
*daŋa(n)	>	raa	*branch*
*deŋa	>	raŋa	*turmeric, yellow*
*doŋo	>	roŋo-roŋo	*to hear*
*dua	>	rʉa	*two*
*madama	>	marama	*moon*
*matudu(R)	>	masʉrʉ	*to sleep*
*ma?udi(p)	>	maʉrʉ	*alive*
*sida	>	ira	*they*
*?uda(ŋ)	>	ʉra	*lobster*

*r > r

*kari(s)	>	xeri	*to scratch, tear*
*raku	>	raxʉ	*to take a handful, eat clumsily*
*turu	>	sʉrʉ	*post*

*(dr) > r

*(dr)ani	>	rale	*day*
*(dr)odo	>	rošo	*night, darkness*
*si(dr)i(t)	>	siri	*semen, masturbation*

There are exceptions to DR 10, i.e. certain occurrences of *d (not of *r) are reflected as š in WOL, as in (28).

(28)

*(dr)odo	>	rošo	*night, darkness*
*pada	>	faša	*pandanus*
*dudu	>	ʉšʉ-ʉšʉ	*to shake, collect fruit*
*(dl)iki	>	šixi	*small*

The regular source of š is *nd or *nt, as we saw in DR 8. From the WOL examples given in (28), we are tempted to modify the reconstructions in such a way that *d and *(dl) are rewritten as *nd.

DR 11 (pharyngeal weakening)

$$*R > \begin{cases} r \\ \emptyset \end{cases}$$

Without statable reasons, the POC pharyngeal *R has either merged with *d and *r to r (cf. DR 10), or been lost as shown in (29). Notice that more examples favour loss.

(29) *R > r

D. *Ratu	>	-rasi	*1,000*
*Ripa	>	(xa)repa	*to go close*
*?apaRa	>	afara	*shoulder*
*tiRi *to urinate*	>	siri	*to masturbate*

*R > Ø

*kuRita	>	xʉsa	*octopus*
*ʔaRus	>	aʉta	*current*
*ma(R)a	>	maa	*ashamed*
*Ruŋmaʔ	>	imwa	*house*
*waRo	>	yɔɔ	*string, line*
*pəwoRu	>	ffəə	*new*
*RuʔaRu	>	ʉa	*neck*

Here belongs the correspondence *daRa(ʔ) > ccaa *blood*. The form ccaa is assumed to have resulted from *daRa(ʔ) > daRa > rara > rraa > ccaa (by SR 9).

DR 12 (non-high vowel fusion: applies after DR 5 & DR 11)

*ao > ɔɔ

When *a and *o met as a result of dropping of the intervening consonant, they fused with each other, resulting in the long vowel ɔɔ. Three examples are found, as in (30).

(30)	*mapo	>	mɔɔ	*to heal*
	*napo	>	lɔɔ	*surf, wave*
	*waRo	>	yɔɔ	*string, rope*

An example parallel to (30) is *mawap > mɔɔ *to yawn*, where *awa is reflected as ɔɔ.

DR 13 (dental plosivisation)

*ns, *s > t

POC *ns and *s are both reflected as t in WOL. The two proto phonemes may have been reconstructed erroneously, as Milke has pointed out (Grace 1969). According to him, the two phonemes should be one and the same in POC.

(31) *ns > t

*nsake	>	taxe	*upwards*
*nsama	>	tama	*outrigger*
*nsila(k)	>	tʉla	*to shine*
*nsiwa	>	tiwa	*nine*
*nsai	>	i-taʉ	*who?*
*ansa(n)	>	ita	*name*
*anse	>	ate	*chin, jaw*
*mansu(rR)	>	matʉ	*full (of food)*
*pinsa	>	fita-	*how many*
*pinsiko	>	fitixo	*flesh*
*tansi(k)	>	tati	*sea*

*s > t

*sili	>	tili	*to enter*
*sola	>	tola	*coconut blossom*
*susu	>	tʉtʉ	*breast*
*susu	>	titi	*to sew*
*saʔit	>	tee-tee	*to bind*
*sapu	>	taʉ	*to pull out*
*seu	>	tɔɔ	*rake*
*ʔasu *smoke*	>	atʉ	*appearance of smoke*
*ma-masa	>	mmata	*dry, low tide*
*masaki(t)	>	mataxi	*sick, pain*
*masawa	>	matawa	*strand, sea*

There are some exceptions to DR 13, as shown in (32), where *ns and *s are reflected as s or Ø. It might be the case that the WOL words either have undergone irregular shifts due to the influence of TK languages, or are recent borrowings from them.

(32) *s > s

*ŋase	>	ŋase	*weak*
*si(dr)i(t)	>	siri	*semen, masturbation* (cf. *tiRi *to spurt, urinate*)

*ns, *s > Ø

*nsaŋa	>	aŋa-aŋa	*a measure*
*nsaŋi	>	aŋi	*wind*
*sala(n)	>	ala	*road, path*
*sida	>	ira	*they*
*kesu	>	xůů	*back of head*
*tasimi	>	taimi-	*sharpen (it)*

POC *nj, which is supposed to be Milke's nasal grade of *s, is reflected in only one convincing example. This reflex is Ø, as in *njala(n) > ala *road* (cf. *sala(n)).

DR 14 (l/n neutralisation)

simple *l, *n > l

POC *n and *l are merged as *l in WOL. The only case in which *n is retained unchanged is when it is geminate (cf. Sohn et al 1976). On the other hand, when two l's meet at a morpheme boundary, they automatically become nn (SR 9).

(33) *n > l

*-na	>	-la	*his, her, its*
*namo	>	lamwo	*lagoon*
*namu(k)	>	lamwu	*mosquito*
*nana(ʔ)	>	lala	*pus*
*niu(R)	>	lůů	*coconut*
*anitu	>	alůsů	*ghost*
*ndanu(m)	>	šalů	*fresh water*
*inu(m)	>	ůlů	*to drink*
*ŋkinit	>	xili	*to pinch, pluck*
*ma-ʔanu *float*	>	maalů	*flood*
*manawa	>	malawa	*to live, breathe*
*manipi(s)	>	malifi	*thin*
*manu(k)	>	malů	*bird*
*panua	>	falůa	*land*
*tano(ʔ)	>	talo	*earth*

*l > l

*lako	>	laxo	*go, walk*
*laŋi(t)	>	laŋi	*sky*
*laŋo	>	laŋo	*a fly*
*limu (*lumut)	>	lumwu	*sea-weed, moss*
*njala(n)	>	ala	*road*
*sola	>	tola	*coconut blossom*
*tali	>	tali	*rope*
*ŋapulu(ʔ)	>	ŋaulu	*ten*

*taliŋa	>	taliŋa	*ear*
*pale	>	fale	*house*
*ʔuluŋa	>	ilůŋa	*pillow*

DR 15 (velarisation)

$$*m > \begin{cases} mw & / \quad \_\_\_ \quad *u, *o \\ m & / \text{ elsewhere} \end{cases}$$

POC *m has been split into velarised mw and plain m. Velarised mw, which occurs only before a POC round vowel, has merged with the POC *ŋm, a labiovelar.

(34) *m > mw

*-mu	>	-mwu	*your*
*muʔa	>	mmwa-	*front*
*mudi	>	mwiri-	*behind*
*muta(ʔ)	>	(m)mwuta	*to vomit*
*ʔumu	>	umwu	*earth oven*
*komu	>	xumwu	*mouthful, gargle*
*namo	>	lamwo	*sea, lake, lagoon*
*limu (*lumut)	>	lumwu	*seaweed, moss*
*namu(k)	>	lamwu	*mosquito*

*m > m

*maa	>	maa	*to be ashamed*
*ma-ʔanu	>	maalů	*flood*
*mai	>	me	*and, with*
*-mami	>	-mami	*our* (excl.)
*manipi(s)	>	malifi	*thin*
*manu(k)	>	malů	*bird, animal*
*masaki(t)	>	mataxi	*sick, pain*
*masawa	>	matawa	*strand, sea*
*lima	>	lima	*five, hand*
*tama	>	tama	*father*

As mentioned above, POC *ŋm appears as mw in WOL. Examples follow:

(35) *ŋmalo	>	mwalo	*to submerge*
*ŋmata	>	mwata	*worm*
*Ruŋma(ʔ)	>	imwa	*house*
*ndaŋma	>	šimwe	*head*
*ŋmane	>	mwaŋea-	*sibling (different sex)*

POC *ŋ is regularly retained unchanged, as shown in (36).

(36) *yaŋo	>	yaŋo-yaŋo	*yellow*
*deŋa	>	raŋa	*turmeric, yellow*
*laŋi(t)	>	laŋi	*sky*
*paŋu	>	faŋů	*to be awaken*
*ŋpoŋi	>	boŋi	*night*
*taliŋa	>	taliŋa	*ear*
*taŋi(s)	>	taŋi	*to cry*
*ʔuluŋa	>	ilůŋa	*pillow*

The POC semivowels are retained unchanged, as in (37). Note that there is only one example of *y > y.

(37) *y > y

	*yaŋo	> yaŋo-yaŋo	*yellow*
*w > w			
	*madawa	> maarawa	*green, raw*
	*masawa	> matawa	*sea, ocean*
	*walu	> wali	*eight*
	*awaŋ	> awa	*mouth*

One exception to (37) is *waRo > yɔɔ *string, rope* where *w has shifted to y. Another exception is *mpaya > paa *bait* where *y has been dropped between a's.

Aside from the changes effected by DR's 2, 3, and 12, the POC vowels are consistently retained unchanged, as illustrated in (38).

(38) *a > a

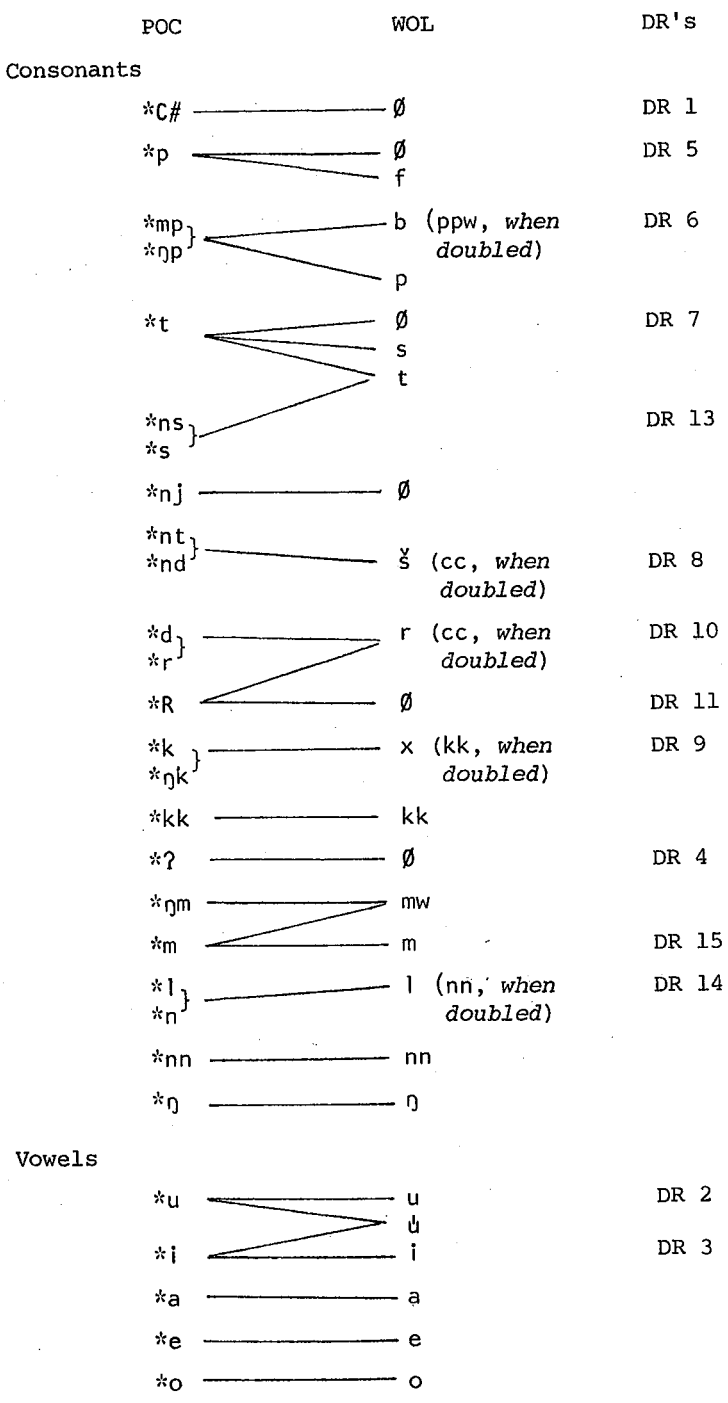
	*api	> afi	*fire*
	*ia	> ia	*he, she, it*
	*panua	> falůa	*islands*
*o > o			
	*kato	> xato	*basket*
	*onom	> olo	*six*
	*ŋpoŋi	> boŋi	*night*
*i > i			
	*ika(n)	> ixa	*fish*
	*tipi	> sifi	*girdle, skirt*
	*taŋi(s)	> taŋi	*to cry*
	*kinta	> xiša	*we* (incl.)
*e > e			
	*anse	> ate	*chin, jaw*
	*kiekie	> xiexie	*pandanus*
	*pale	> fale	*house*
	*mate	> mase	*to die*

5. CONCLUSION

We have tried to describe the phonological development of WOL from POC by explicitly distinguishing synchronic from diachronic aspects. Nine synchronic and fifteen diachronic rules have been presented, together with examples of lexical correspondences and some putative exceptions. As may be noted in the Appendix, there are quite a few idiosyncratic sound changes that have not been discussed. Some could be accounted for in light of the phonological environments involved, while others must await further investigation. For instance, there are a few examples of (putative) correspondences in which *n is reflected as ŋ: *nuns(io) > ŋito *squid*, *kani > xaŋi(i) *food, eat*, *ŋmane > mwaŋea- *sibling of different sex*, *nipon > ŋii *tooth*, and *ponu > oŋi *turtle*. The regular shift is *n > l in all positions, and we have no way to state a quasi-productive rule *n > ŋ, at least for the moment. We have also included a number of questionable cognates (marked with ?) in the Appendix in the hope that they might provide some important clues for future study, which should be conducted in a broader perspective, i.e. within the framework of comparative Micronesian phonology.

Let us conclude by summarising the regular sound correspondences between POC and WOL, as in (39). For the sound environments, see the fuller statements of the rules in Section 4.

(39)



*ao, etc. ———— ɔɔ DR 12

*au, etc. ———— əə

Semivowels

*y ———— y

*w ———— w

APPENDIX. POC-WOL

	POC	WOL surface form	WOL base form	Gloss
1.	*-ʔaki	-yaxi- or -axi-	-axi	causative or instrument (affixed to verb)
2.	D.*anitu	yalʊ́sʊ̋	alʊ́sʊ́	*spirit*
3.	*aŋoaŋo	yaŋoyaŋ0	yaŋo-yaŋo	*yellow*
4.	*ʔapaRa	yefarE	afara	*shoulder*
5.	*api	ya:fI	afi	*fire*
6.	*ʔaro-ʔopa	yarofa-	arofa-	*love, like, seek, miss*
7.	*ʔaRus	yaʊ́tE	aʊ́ta	*current*
8.	*ansa(n)	i:tE	ita	*name*
9.	*anse	ya:tE	ate	*chin, jaw*
10.	D.*ʔasu	ya:tʊ̋ *(appearance of smoke)*	atʊ́	*smoke*
11.	*ʔate	ya:sE	ase	*liver*
12.	*ʔatop (D. *ʔato)	ya:s0	aso	*thatch*
13.	*ʔatun	ya:sʊ̋	asʊ́	*bonito*
14.	*awa	ya:wE	awa	*open space, mouth*
15.	*-da	-:rE	-:ra	*their*
16.	*daʔa(n)	ra	raa	*branch, twig*
17.	*ndaŋma	ši:mwE *(head)*	šimwe	*head, forehead*
18.	*(dr)an(i)	ra:lE	rale	*day*
19.	*ndanu(m)	ša:lʊ̋	šalʊ́	*fresh water*
20.	*daRa(ʔ)	cca	ccaa	*blood*
21.	*ndau(n)	šə	šəə	*leaf*
22.	*deŋa	ra:ŋE	raŋa	*turmeric, yellow*
23.	*(dl)iki	šixI	šixi	*small*
24.	*(dr)odo	ro:š0	rošo	*night, darkness, shadow*
25.	*doŋo, ndoŋo	roŋoroŋ0	roŋo-roŋo	*to hear*
26.	D.*doŋo	ro:ŋ0	roŋo	*rite, inheritance*
27.	*dua	rʊ́wa-	rʊ́a-	*two*
28.	*dudu	ʊ́šʊ́:šʊ̋	ʊ́šʊ́-ʊ́šʊ́	*to shake, collect fruit*
29.	*eno	wol0	olo	*to lie down*
30.	*ia	i:yE	ia	*he, she, it*

	POC	WOL surface form	WOL base form	Gloss
31.	*ika(n)	i:xE	ixa	*fish*
32.	*iku	u̇:xʊ̈	u̇xu̇	*tail*
33.	*inu(m)	u̇lu̇(m)	u̇lu̇(m)	*to drink*
34.	*ka(dr)u	xerixerI	xeri-xeri	*to scratch*
35.	*kai	xa:xa (Ulithi: xai)	xaa-xaa	*tree, wood*
36.	*kali	kkelI	kkeli	*to dig*
37.	*kami	xa:mamI	xaamami	1st pl. excl. pronoun *(we)*
38.	*kamu	xa:mi	xaamii	*ye* (2nd pl. pronoun)
39.	*kani	xaŋi *(eat it)* xalE *(food)*	xaŋii, xala	*eat, food*
40.	*kapi(t)	xaffi *(seize it)*	xaffii	*seize, squeeze*
41.	*kari(s)	xeri *(scratch it)*	xerii	*to scratch, tear*
42.	*kasup	kkutU	kkutu	*to spit*
43.	*katea	xeta	xetaa	*side of canoe opposite outrigger*
44.	*kato	xa:tO	xato	*basket*
45.	*kau	xə	xəə	*fish hook*
46.	*kau	xa:xa	xaa-xaa	*tree, stalk*
47.	*kawakawa	xawexawE	xawaxawa	*fish sp. (yellow finned groper)*
48.	*kawe	xə:xə	xəə-xəə	*to fasten on with straps*
49.	*ke	i-xa	ixaa	*here*
50.	*kesu	(xapili)xu̇	(xapili) xu̇u̇	*back of head*
51.	*kianto	xiyɔ	xiɔɔ	*outrigger boom*
52.	*kiekie	xiyexiyE	xiexie	*pandanus*
53.	*(ki)ki(t)	xu̇:xu̇	xu̇u̇-xu̇u̇	*to bite at, squeeze*
54.	*kilala	xu̇la *(know it)*	xu̇laa	*to know*
55.	*ŋkinit	xilI	xili	*to pinch, pluck, nip*
56.	*kinta (D. *kinta)	xi:šE	xiša	1st incl. pronoun *(we)*
57.	*ko	xo *(you!)*	xo	specifying particle, vocative particle
58.	*ko(e)	xo	xo	*you, thou*
59.	*komu	xumwʊ̈	xumwu	*mouthful, gargle*
60.	*kku	kkʊ̈	kku̇	*claw, nail, toe*
61.	*kuli(t)	xi:lI	xili	*skin, bark*
62.	*kuRita	xu̇:sE	xu̇su̇	*octopus* (cf. *uRita)
63.	*kutu	xu̇:sʊ̈	xu̇su̇	*louse*
64.	*lako	laxO	laxo	*to go, walk*
65.	*laman	la:mwO	lamwo	*sea, lake*
66.	*laŋi(t)	la:ŋI	laŋi	*sky*
67.	*laŋi	?ya:ŋI	aŋi	*wind*
68.	*laŋo	la:ŋO	laŋo	*house-fly*
69.	*laso	?to:lO	tola	*genitals*
70.	*lawas	lela:i	lalaai	*long*
71.	*lima	li:mE	lima	*five, hand*
72.	*limu	lu:mwU	lumwu	*seaweed, moss*
73.	*lo	lalo, la-	lalo, la-	*in*
74.	*loku	lexu̇ *(make it tight)*	lexu̇	*bend, fold*

POC	WOL surface form	WOL base form	Gloss
75. *lumut	lu:mwU	lumwu	*seaweed, moss*
76. *ma	me	me	*and, with*
77. *maa	ma	maa	*to be ashamed*
78. *ma-ʔanu	ma:lʊ̈ *(flood)*	maalʊ́	*to be afloat*
79. mada	mmašE	mmaša	*fermented, soft, ripe*
	ma:rE *(preserved breadfruit)*	mara	
80.D.*madama	meramE	marama	*moon*
81. *madawa	ma:rawE	maarawa	*green, raw*
82. *mai	me	me	*and, with* (cf. *ma)
83. *mala	(ni)malE *(open space)*	(ni)mala	*place*
84. *malaʔe	malemalE	mala-mala	*village, open space in village*
85. *manaŋ	ke-malE	ka-mala	*spiritual power*
86. *ŋmalo	mwalO	mwalo	*to submerge*
87. *malu	mannʊ̈	mallʊ́	*soft*
88. *-mami	-mamI	-mami	*our* (excl.)
89. *manawa	melawE	malawa	*to breathe*
90. *ŋmane	mwaŋeya-	mwaŋea-	*woman's brother*
91. *manipi(s)	malifI	malifi	*thin* (cf. *mapini)
92. *manu(k)	ma:lʊ̈	malʊ́	*bird, animal*
93. *mapini	malifI	malifi	*thin* (cf. *mapini(s))
94. *mapo	mɔ	mɔɔ	*to heal (of a wound, sore)*
95. *maRa	ma	maa	*to be ashamed* (cf. *maa)
96. *ma-masa	mmatE	mmata	*dry, low tide*
97. *masaki(t)	metaxI	mataxi	*sick, pain*
98. *masawa	metawE	matawa	*strand, shore, sea* (cf. *sawa)
99. *mansu(rR)	ma:tʊ̈	matʊ́	*full (of food), plenty of food*
100. *mata	ma:tE	mata	*eye*
101. *ŋmata	mwa:tE	mwata	*worm*
102. *mata(ʔ)	yematE	e-mata	*raw, new*
103. *mataku(t)	metaxʊ̈	mataxʊ́	*afraid*
104. *mate	ma:sE	mase	*to die, death*
105. *matudu(R)	masʊ́rʊ̈	masʊ́rʊ́	*to sleep*
106. maʔudi(p)	maʊ́rʊ̈	maʊ́rʊ́	*alive (of plants)*
107. *mawap	mɔ:(-li xatelʊ̈)	mɔɔ(-li xatelʊ́)	*to yawn*
108. *moso	mottO	motta	*cooked*
109. *motu	mmweʊ́	mmweʊ́	*to break off, broken*
110. *-mu	-mwU	-mwu	*your* (sing.)
111. *muʔa	mmwa-	mmwa-	*front*
112. *mudi	mwiri-	mwiri-	*behind, after*
113. *muta(ʔ)	(m)mwutO	(m)mwuta	*to spit, vomit*
114. *muntu	mwošomwo:šO	mwošo-mwoošo	*severed, cut short* (cf. *motu)
115. *-na	-lE	-la	*his, her, its*
116. *na	lE (immed. fut.)	le	*sign of future tense*
117. *namo	la:mwO	lamwo	*lagoon*
118. *namu(k)	la:mwU	lamwu	*mosquito*

	POC	WOL surface form	WOL base form	Gloss
119.	*nana(?)	la:lE	lala	*pus*
120.	*napo	lɔ	lɔɔ	*surf, wave*
121.	*natu	la:ʊ	laʊ	*child, offspring*
122.	*nipi(s)	malifilifI	malifilifi	*thin* (cf. *manipi(s))
123.	*nipon	ŋi	ŋii	*tooth*
124.	*niu(R)	lʊ	lʊʊ	*coconut*
125.	*noRa	lalowE	laloa	*yesterday*
126.	*nua	la-, le-	la-, le-	*inside*
127.	*nuns(io)	ŋi:t0	ŋito	*squid*
128.	*ŋapulu(?)	ŋaulU	ŋaulu	*ten*
129.	*ŋase	?ŋasE	ŋase	*weak, exhausted, lame*
130.	*onom (D. ono)	wo:l0	olo	*six*
131.	*pada	fa:šE	faša	*pandanus*
132.	*pai-	fa-(fe-)	fa-	reciprocal prefix
133.	*paka-	xa-	xa-	causative prefix
134.	*pakiwak	paxowE	paxowa	*shark*
135.	*pale	falE	fiale	*house*
136.	*palisi	fatilI	fatili	*grass*
137.	*panua	falʊwE	falʊa	*land, earth, village*
138.	*paŋ(ou)(n), (D. *paŋu)	faŋʊ	faŋʊ	*awaken, arouse*
139.	*pa?oRu	ffə	ffəə	*new*
140.	*papa	fa:-	faa-	*under, downwards*
141.	*mpampa(n)	pa:pE	paapa	*board, plank, flat*
142.	*papine	faifilE (archaic)	faifile	*woman*
143.	*paRa	yefarE	afara	*shoulder* (cf. *?apaRa)
144.	*paRi	faiyE	faia	*stingray*
145.	*paRu	xili-fə	xili-fəə	*hibiscus*
146.	*pat	fa:-	faa-	*four*
147.	*patu	fa:ʊ	faʊ	*stone*
148.	*patu	faʊfeʊ	faʊ-faʊ	*to weave*
149.	*pa?u	fə:-	fəə-	*to tie, bind*
150.	*mpaya	pa	paa	*bait, worm*
151.	*pe-	fa *(which, where)*	faa	*where?*
152.	*pi(dr)i	ffišI*(snap)*	ffiši	*to fold, twist, sprain*
153.	*pili(?)	ffilI	ffili	*to select, choose, pick up*
154.	pine	faifilE (archaic)	faifile	*woman*
155.	*pinsa	fita-	fita-	*how many*
156.	*pinsiko	fitix0	fitixo	*flesh*
157.	*pitu	fi:sI	fisi	*seven*
158.	*pitu?u (D. *pitu?o)	fʊ:sU	fʊsʊ	*star*
159.	D.*mpo-	bo	boo	*smell*
160.	*ponu	wo:ŋI	oŋi	*turtle*
161.	*ŋpoŋi	bo:ŋI	boŋi	*night*
162.	*ponse	?fatʊlE	fatʊla	*paddle*
163.	*pua(?)	uwa	uaa	*fruit*
164.	*mpua	bbuwE	bbua	*(betel) nut*
165.	*puki	wexI *(turn)*	wexi	*return*
166.	D.*puko	u:x0,	uxo	*net*
167.	*mpule	bul0, ubilI	bulo, ubili	*white shell, cowry*

	POC	WOL surface form	WOL base form	Gloss
168.	*mpulu(t)	bilisE	bilisa	*gum, sap, glue*
169.	D.*puŋa	u:ŋ0	uŋa	*ridgepole*
170.	*mpu(dr)i(t)	bu̇ru̇wE	bu̇ru̇a	*buttocks, excrement*
171.	*mpuso(s)	bu:s0	buso	*navel* (cf. *mputo)
172.	*puti (D. *punti)	wi:šI	wiši	*banana*
173.	*mputo	bu:s0	buso	*navel, anus* (cf. *mpuso(s))
174.	*putu	u:tU	utu	*tree sp.: Barringtonia*
175.	*raku	raxu̇	raxu̇	*take a handful, eat clumsily*
176.	*Ratu	(saŋe)rasI	(saŋe)rasi	*one thousand*
177.	*Ripa	repE	repa	*to go close*
178.	*Ru?a	u̇:wE	u̇a	*neck*
179.	Ruŋma(?)	i:mwE	imwa	*house*
180.	*nsanda	?texašE	taxaša	*to rise (sun, moon), to ascend*
181.	*nsai	iteu̇	i-tau̇	*who?*
182.	*sa?it	te:te	tee-tee	*to bind, restrain*
183.	*nsake	taxE	taxe	*upwards, to climb*
184.	*sala(n)	ya:lE	ala	*road, path*
185.	*njala(n)	ya:lE	ala	*road, path*
186.	*nsama	ta:mE	tama	*outrigger*
187.	*nsaŋa	?yeŋa:ŋE	aŋa-aŋa	*a measure, a span*
188.	*nsaŋi	?ya:ŋI	aŋi	*wind*
189.	*sapu	tau̇-	tau̇-	*to pull out, take to pieces*
190.	*sau(?)	tta:wE	ttaawa	*outside, far off*
191.	*-sawa	ta:wE *(channel)*	tawa	*strand, shore, sea* (cf. *masawa)
192.	*seu	tɔ	tɔɔ	*to rake, sweep, scratch*
193.	*sida	i:rE	ira	*they*
194.	*si(dr)i(t)	?si:rI	siri	*semen, masturbation*
195.	*sikita	si:xE	sixa	*enmity, hostility*
196.	*siku(n)	u̇:xU	u̇xu̇	*tail, tail of fish*
197.	*nsila(k)	ttu̇lE	ttu̇la	*lightning, to shine*
198.	*sili	tilI	tili	*to enter*
199.	*sina(R)	ttu̇lE	ttu̇la	*to shine*
200.	*nsipo	tiwE	tiwe	*downwards*
201.	*nsiwa	ti:wE	tiwa	*nine*
202.	*so(dr)i	sorou (old form) torou (new form)	sorou, torou	*humility toward a chief*
203.	*nsoka	tokatok0	toka-toka	*to stab*
204.	*sola	to:l0	tola	*coconut blossom*
205.	*suku	?tu̇:tu̇	tu̇u̇-tu̇u̇	*to bathe, dive, wash*
206.	*sulu	ttu̇lE	ttu̇la	*torch, glow*
207.	*susu	tu̇:tU	tu̇tu̇	*breast, suck*
208.	*susu(dr)	ti:tI	titi	*to sew*
209.	*-nta	-šE	-ša	*our* (incl.)
210.	*ta?aki	sa:xi	saaxii *(extract it)*	*to draw water, dig up*
211.	*ta-dawa	xa:rawerawE	xaa-rawarawa	*green*
212.	*tali	ta:lI	tali	*cord, rope*

	POC	WOL surface form	WOL base form	Gloss
213.	*taliŋa	taliŋE	taliŋa	*ear, earwax*
214.	*ntalo	ʔccelI	cceli	*shore tree; Calophyllum inophyllum*
215.	*tama	ta:mE	tama	*father*
216.	*tamole	mwa:lE tamwelʊ̈ *(chief)*	mwale, tamwelʊ̈	*man*
217.	*tano(ʔ)	ta:lO	talo	*earth, soil*
218.	*taŋi(s)	taŋI	taŋi	*to cry, weep*
219. D.	*tampi	ʔtapiyE	tapiya	*bowl*
220.	*tampu	ta:bU	tabu	*a ban, taboo*
221.	*tapu-	tawi	tawii	*conch*
222.	*tansi(k)	ta:tI	tati	*sea, salt water*
223. D.	*tasimi	taimi	taimii	*sharpen it*
224.	*tau-	ʔtau- *(practitioner)*	tau-	*man, person*
225.	*tia(n)	siyalE	siala	*belly*
226.	*tido	surO	suro	*to look at*
227.	*tika	sixE *(angry)*	sixa	*bad*
228.	*tina	si:lE	sila	*mother*
229.	*tipi	si:fI	sifi	*man's girdle, woman's skirt*
230.	*tiRi	si:rI *(masturbate)*	siri	*to spurt, urine*
231.	*tiRo(m)	ʔsa:rʊ̈	sarʊ́	*oyster*
232.	*toka	toxO	toxo	*to arrive, land*
233.	*toko(n)	so:xO	soxo	*staff, pole*
234.	*tolu	seli-	seli-	*three*
235.	*tom(i)	ʔsorom(i)	sorom(ii)	*to drink, sip*
236.	*topu	ʔwo:u	ou	*sugar cane*
237.	*tuʔa	so:wE	soa	*back, beyond, outside, edge*
238.	*tu(dr)(i)	šʊ́	šʊ́ʊ́	*bone, body*
239.	*tuki	sʊ́xʊ́ *(hit it)*	sʊ́xʊ́ʊ́	*to hammer, pound*
240.	*tupa	su:pO	supa	*fish poison*
241.	*tumpu(ʔ)	su:bU	subu	*to be born*
242.	*turu	sʊ́:rʊ̈	sʊ́rʊ́	*post, kneel, knee*
243.	*tusu(k)	ʔti, xati:ti	tii, xa-tii-tii	*to point, index finger*
244.	*tuʔu(d)	sʊ́	sʊ́ʊ́	*to stand up*
245.	*ʔuda(ŋ)	ʊ́:rE	ʊ́ra	*lobster*
246.	*ʔuluŋa	ilʊ́ŋE	ilʊ́ŋa	*pillow*
247.	*ʔumu	u:mwU	umwu	*earth oven, to roast*
248.	*ʔuna(p) (D.*ʔuna)	ʊ́:lE	ʊ́la	*fish-scale, body hair*
249.	*upe	ʊ́:fE	ʊ́fa	*seedling, seeds*
250.	*uRita	xʊ́:sE	xʊ́sa	*octopus* (cf. *kuRita)
251.	*ʔutup	itiitI	iti-iti	*to flood, draw water*
252.	*waka	wexarE	waxara	*root*
253.	*waŋka(ŋ)	wa	waa	*canoe*
254.	*walu	wa:lI	wali	*eight*
255.	*waRo	yɔ	yɔɔ	*string, rope*
256.	*wasa	ʔta:wE	tawa	*open sea*
257.	*yaŋo	yaŋoyaŋO	yaŋo-yaŋo	*yellow* (cf. *aŋoaŋo)

NOTES

1. In the writing of this paper, the labour was divided in such a way that Tawerilmang provided the Woleaian (WOL) linguistic data, while Sohn was responsible for the analysis. This paper benefited from a comparative Micronesian seminar conducted by Dr. George Grace in 1972-73.

For a synchronic description of the phonology and syntax of WOL, see Sohn 1975.

2. Other POC reconstructions from Grace n.d. a and n.d. b are occasionally cited. These are prefixed with a D. (referring to Grace's source, Dyen 1949).

3. Lee (1976) makes a strong case for certain kinds of rule ordering in natural phonology.

4. Judging from the description of Marshallese stress in Bender (1975), dissimilatory a-raising may be related to alternating stresses in Woleaian. We must defer the study of WOL stress for the future, however.

5. Base forms of some more thematic-stem transitive verbs are given below:

baisii	*untie it*	(cf.	bai-bai	*to untie*)
bbooiii	*pound it*	(cf.	bboo	*to pound*)
beli ii	*snap it*	(cf.	beli-beli	*to snap off*)
fatoxii	*plant it*	(cf.	fato-fato	*to plant*)
filetii	*stir it*	(cf.	file-file	*to stir*)
narii	*taste it*	(cf.	na-na	*to taste*)
raxomii	*hug it*	(cf.	rraxo	*to hug*)
tɔɔfii	*rub it*	(cf.	tɔɔ-tɔɔ	*to rub*)

6. This appears to be a case of idiosyncratic final-vowel shortening, i.e. u̇u̇ > u̇. This exception may be explained away by reconstructing *pitu? for some pre-WOL (or Proto-TK) stage.

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