KOSRAEAN REFLEXES OF PROTO-OCEANIC PHONEMES

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1. INTRODUCTION

This discussion of Kosraean (Kusaiean) (KSR) reflexes of the phonemes reconstructed for Proto-Oceanic (POC) is based on a set of approximately 100 putative cognates culled by Kee-dong Lee[1] from some 180 KSR forms possibly cognate to the POC reconstructions given in Grace 1969, Dyen 1949, and Blust 1972. The purpose of this paper is to present the major correspondences between present-day KSR segments and the phonemes reconstructed for POC, as represented in these data, and to consider how the one set might have developed from the other.

Let us begin with a brief discussion of the sound system of KSR. Lee 1975 gives the following inventory of distinctive surface vowels:[2]

	front	central	back
high	i [i]	ih [ɨ]	u [u]
higher mid	e [e]	uc [ə]	o [o]
lower mid	ac [ɛ]	uh [ʌ]	oh [ɔ]
low	ah [æ]	a [ɑ]	oa [o͡ɑ]

The KSR standard orthography adopted in 1973 clearly is not phonemic; however, it will be used in this paper in the absence of an adequate analysis of the KSR phonological system. The phonetic values given for the vowels are those in Lee 1975.

Like several other Micronesian[3] (MC) languages, KSR has three different sets of consonants: plain, velarised, and labialised (phonetically rounded). The following table of KSR consonants is adapted from Lee 1975.

		bilabial	labiodental	dental	palatal (retroflex)	velar
stops	plain	p		t		k
	velarised	pw		tw		kw
	labialised			to		ko
frica-	plain		f	s	sr	
tives	velarised		fw	sw	srw	
	labialised			so	sro	

Byron W. Bender, ed. *Studies in Micronesian Linguistics*, 403-442. *Pacific Linguistics*, C-80, 1984.

nasals	plain	m	n		ng
	velarised	mw	nw		ngw
	labialised		no		ngo
liquids[4]	plain		l	r	
	velarised		lw	rw	
	labialised		lo	ro	

As with the vowels, the symbols in this table are those of the 1973 standard orthography.

Since the sequence of consonant followed by w is relatively rare in KSR, a w following a consonant generally can be interpreted as a diacritic. A following o is used to represent distinctive rounding — non-distinctive rounding is not spelled out. With one or two exceptions, both distinctive velarisation and distinctive rounding appear to be restricted to consonants preceding a mid front vowel (e or ac). Non-distinctive velarisation of consonants before central and back vowels and non-distinctive rounding of consonants before round vowels are not indicated in the standard orthography. All three types of consonants appear to occur non-distinctively in syllable-final position.

KSR also has two glides w and y. W occurs both velarised and rounded (not distinguished orthographically), but never plain. Y has all three variants, of which only the rounded y is distinguished orthographically as yo.

KSR monosyllables generally conform to the canonical shape (C)V:(C). In citation forms, at least, all KSR monosyllables have long vowels — this appears to hold for lexical (content) words in context, but is not necessarily true of grammatical morphemes. Disyllables may have one of a number of shapes, all of which can be collapsed into the schema (C1)V1(C2)(C3)V2(C4). V1 may be either long or short, but V2 appears always to be long. One- and two-syllable words are the most common in KSR; however, words of up to five (underlying) syllables are possible — e.g., sefolosuwohs *(adj) sleeping lightly*. In normal speech many of these longer words will lose a syllable, even two, through processes of vowel reduction and loss. It should be noted, however, that consonant clusters are permitted only in medial position. Such clusters frequently, though not always, represent the juxtaposition of two morphemes. Thus, the basic morpheme (as well as (mono-)syllable) shape in KSR appears to be (C)V(C).

2. CONSONANT CORRESPONDENCES

The table below summarises the consonant correspondences represented in the data on which this paper is based. Conditioning environments are not given for the different reflexes in the table because it is not always clear what the conditioning factors might have been. In many cases different reflexes of the same proto-segment occur in the same environment, suggesting either sporadic change or possibly dual inheritance.

POC	*p	*t	*k	*ʔ
KSR	Ø,p,y	t,s,n[5]	k	Ø

POC	*mp	*nt	*ŋk
KSR	f,p	s,sr,t	k

POC		*s
KSR		s,sr,t,Ø

POC			*ns				
KSR			s,t,Ø				
POC	*m	*n		*ŋ			*ŋm
KSR	m,w	n		ŋ			w,m
POC		*l	*d[6]	*(dr)	*R[7]		
KSR		l	l	r	Ø		
POC			*nd				
KSR			sr				
POC		*y				*w	
KSR		Ø				w,Ø	

2.1. Stops

2.1.1. *p

POC *p is normally lost in KSR:

POC		KSR	
*papine		acn	*woman*
*pitu		it-	*seven*
*punti		usr	*banana*
*topu		tuh	*sugarcane*
*napo	*surf*	noa	*wave*
*pai-		a-	reciprocal pref
*paka-		ahk-	causative pref
*patu		yot	*stone*

In the last example above it appears as though *p > y. Why this should have occurred is not clear. Ordinarily one would expect to find the glide agreeing with the vowel in backness and roundness, regardless of whether one believes that the consonant was lost first and an epenthetic glide inserted, or that the glide was inserted first and then the consonant lost, or even that the glide resulted from the weakening of the consonant and is thereby a direct successor of the consonant. It is possible that *p was a palatalised segment, in this item at least, and that the y somehow preserves the palatality of the lost consonant. In that case, the glide must have arisen before the consonant was lost, but it would appear not to be a direct successor by weakening of the consonant, since [y] is not on the most natural path from [p] to Ø via [b] > [β] > [w]. The status of y in the synchronic phonology of KSR is unclear. Most of the glides which appear in the standard orthography (both w's and y's) appear to be phonemic. It is possible that there was a diachronic process of glide insertion in the development of KSR from POC. Whatever the case, a single instance of *p > y is not much basis for any kind of generalisation. It may be worth noting, however, that there is no trace of a glide in the pronunciation of any of the other KSR forms that once contained *p. Only noa *wave* sometimes sounds as though it were [nwa], but the probable explanation for this may lie elsewhere (in the synchronic nature of oa).

The other exceptions to the complete loss of *p are more blatant:

*pakiwak	pahko	*shark*
*paŋ(ou)(n)	pahngon	*(vt) to call*

What is not obvious is the factor conditioning the retention of *p in these forms. It is evidently not the presence of a following *a, since *p was lost in forms like *panua *land* (> KSR acn), as well as in the reciprocal and causative prefixes (see above) and the troublesome *patu (> yot). What it is, is not evident.

A further question occurs to us: if POC *p normally is lost in KSR and *mp normally becomes KSR f (see Section 2.2.1.), then where does KSR p come from? p is not at all rare in contemporary KSR, but its historical source at the POC level is not clear. Further investigation will be required to unravel this mystery.

2.1.2. *t

POC *t is most frequently reflected as KSR t.

*tama	tuhma-	*father*
*taŋi(s)	tuhng	*to cry*
*tolu	tol-	*three*
*tu?u	tu	*to stand*
*pitu	it-	*seven*
*natu	nahtuh-/nuhtV-[8]	*child*
*?utup	uti	*(vt) to draw water*
*muta(?)	wihte	*(vt) to vomit*
*matolu	mahtol	*thick*

However, when followed by *i or *e, *t appears to become KSR s.

*?ate	acsyac-/esyac-	*liver*
*tia(n)	(in-)siyac-	*belly*
*ŋkinit	kihnis	*(vt) to pinch*
*mpulut	fulus	*(vt) to paste*

The change of *t to KSR s in the last two examples above can be accounted for by supposing the presence of a transitivising suffix *-i on the verb (see Harrison 1978).

In one case *t is reflected by KSR s in an environment in which one would normally expect to find KSR t: *tali > sucl *rope*.

The KSR word ninac for *mother* is probably cognate to the POC form *tina, with an idiosyncratic change in the initial segment.

2.1.3. *k

The KSR reflex of *k in non-final position is k, as shown in the following examples:

*kianto		kiyacs	*outrigger boom*
*kinta		kuht	*we (1 pl)*
*tuki		tuk	*(vt) to pound*
*kuRita		koet	*octopus*
*kali		kuhlkuhl	*(vi) to dig*
*nsakaRu	*reef*	tuhka	*island*
*waka		okah	*root*

2.1.4. *ʔ

*ʔ appears to have been lost completely in KSR.

*maʔudi(p)		moul	*alive, life*
*ʔuluŋa	*pillow, to rest one's head*	ilung	*(vt) to rest, prop, support*
*ʔumu		um	*earth oven*
*tuʔu(d)		tu	*to stand*
*ʔate		acsyac-/esyac-	*liver*
*daʔa(n)		lah	*branch*
*tudu(ʔ)		tul	*drip, drop*

2.2. Prenasalised stops

The following prenasalised stops occur in the POC reconstructions used in this paper: *mp, *nt, *ŋk. The problem of the oral and nasal grades in POC is well beyond the scope of this paper; however, it is worth pointing out that the various OC languages frequently differ not merely on the question of preserving the original oral-nasal grade distinction (supposing there to have been one at all), but also on which grade is reflected in a given lexical item. Some of the confusion in the KSR reflexes of POC prenasalised segments may be due to unresolved confusions at a higher level.

2.2.1. *mp

*mp appears to become KSR f with only one exception:

*mpeŋka	fak	*bat, flying fox*
*mpo-	fo	*smell*
*mponot	fonos	*(vt) to block, stop up, plug up*
*mpou	fo	*post, pole, stick*
*mpoŋi	fong	*night*
*mpule	ful	*shell: cowry*
*mpulut	fulus	*(vt) to paste*
*mputo	fuht/fihtac-	*navel*

The exception is POC *mpaya > KSR pa *bait*. It is possible that KSR pa comes from some other source such as POC *pani, but then one would have to explain the loss of the entire second syllable of the proto-form. Final vowel deletion could account for the loss of *i (see Section 3.2.), but the loss of *n could only be regarded as idiosyncratic. It is also possible that *mp > p/___*a, although one hesitates to postulate such a rule based on only one instance. Additional data will be needed to decide whether or not this form is an exception to a general change of POC *mp to KSR f.

2.2.2. *nt

Only three instances of *nt occur in the data:

*kianto	kiyacs	*outrigger boom*
*kinta	kuht	*we*
*punti	usr	*banana*

With so little data it is difficult to arrive at any conclusions regarding the regular development of *nt. Both *outrigger boom* and *banana* have alternate reconstructions with *t. KSR s suggests *t in the word for *outrigger boom*, while KSR sr would seem to suggest something other than *t in the word for *banana*.

2.2.3. *ŋk

KSR appears to have merged *ŋk with *k, reflecting both as k. This generalisation is based on only two forms, however:

*mpeŋka	fak	*bat, flying fox*
*ŋkinit	kihnis	*(vt) to pinch*

2.3. Fricatives

2.3.1. *s

*s is sometimes preserved as KSR s, as in

*sulu	sul	*torch*
*sae(t)/*sai/*sei	se	*(vt) to tear*

In the case of *susu > titi- *breast*, *s appears to have become KSR t under conditions which would appear to favour preservation of s.

*s appears to have been lost in forms in which it preceded *i:

*?anusi		acni	*to spit*
*si(dr)i(t)		iri	*masturbation*
*sili	*to enter*	il	*to come, go, move*
*tasimi	*sharpen it*	twem	*(vt) to sharpen*

More data will be needed before anything more definitive can be said concerning developments of POC *s in KSR.

2.3.2. *ns

It appears to be the rule that *ns is lost in KSR:

*nsake		-yak/-ack	*up, upwards*
*aŋin/*nsaŋi		eng	*wind*
*nsiwa		yuh	*nine*
*tansi(k)	*sea, salt water, salt*	te[9]	*beach, seaside*

The two KSR words containing a non-zero reflex of *ns show different reflexes in what appears to be the same environment:

*nsai		suc	*who?*
*nsakaRu	*reef*	tuhka	*island*

2.4. Nasals

2.4.1. *m

POC *m is regularly reflectd as KSR m.

*mata	muhta-/mwet[10]	*eye, face*
*mapo	mah	*to heal*
*matudu(R)	mutul	*to sleep*
*tama	tuhma-	*father*
*ʔuma	imac	*garden, field*
*lima	luhm-/lime-	*five*
*tasimi	twem	*(vt) to sharpen*
*-mu	-m	2sg poss suff

In two instances, however, *m seems to have become KSR w:

*manu(k)	won	*bird*
*muta(ʔ)	wihte	*(vt) to vomit*

It is not clear what could have conditioned this change. Not the presence of a following round vowel, because mutul has a (synchronic) following round vowel and *-mu a historical one. *manu(k) has *a following *m, just as in *mata, *mapo, etc., and ih in wihte is not a round vowel. Vowel height cannot be a conditioning factor, for similar kinds of reasons. Nor does it seem likely that a change of *m to w was conditioned by any of the other consonants in either of these forms. The only explanations left to us are sporadic change or borrowing; there is no evidence in the data to show which might have occurred.

2.4.2. *n

Non-final *n is normally reflected as KSR n.

*manipi(s)	mihnini	*thin*
*niu(R)	nu	*coconut*
*ŋkinit	kihnis	*(vt) to pinch*
*manu(k)	won	*bird*
*panua	acn	*land*
*natu	nahtuh-/nuhtV-	*child*
*inu(m)	nihm	*(vt) to drink*

2.4.3. *ŋ

Non-final *ŋ normally remains ŋ (orthographic ng) in KSR.

*laŋi(t)	lucng	*sky*
*ŋapulu(ʔ)	si-nguhul	*ten*
*ʔuluŋa *pillow*	ilung	*(vt) to rest, prop, support*
*paŋ(ou)(n)	pahngon	*(vt) to call*
*doŋo	lohng	*to hear*
*mpoŋi	fong	*night*

2.4.4. *ŋm

Only two instances of the labiovelar nasal *ŋm occur in the data:

*ŋmata	wet/wat	*worm*
*Ruŋma(?)	yuwac-/iwac-	*house, shelter*
	lohm	*house*

Disregarding for the moment the form lohm, it appears as though the regular reflex of *ŋm might be w. The form lohm is peculiar in two respects. In the first place, *R is regularly lost in KSR (see Section 2.5.5.). In the second place, the remaining evidence suggests that *ŋm regularly became KSR w rather than m. However, if one were to disregard for a moment one's beliefs about regular reflexes, lohm appears quite plausible as a reflex of *Ruŋma(?). Both the phonetics and the semantics fit well enough. It is possible, though it seems unlikely in view of the meaning and frequency of the word, that lohm is a borrowing and that this is an instance of what Biggs 1965 termed 'indirect inheritance'. The fact that both the initial l and the final m appear to be irregular reflexes of the corresponding proto-segments tends to support this hypothesis. Against it is the fact that no donor language has yet been identified. This, however, may be merely a matter of conducting a systematic search for the likely donors of not only this, but possibly other as yet unidentified loanwords in KSR.

2.5. Liquids

As mentioned in Note 6 the term 'liquid' is used loosely in this paper to denote the set of proto-phonemes including *l, *d, *(dr), *nd, and *R. The first three all have KSR liquids l or r as their reflexes. *nd is included because it is the nasal-grade counterpart of *d, although it is not regularly reflected as a liquid in KSR. *R is included here only by virtue of the fact that it appears to correspond to a liquid in some other OC languages.

2.5.1. *l

The normal reflex of non-final *l is KSR l.

*sulu		sul	*torch*
*walu		oal-	*eight*
*tolu		tol-	*three*
*lima		luhm-/lime-	*five*
*laŋo		loang	*fly (insect)*
*sili	*to enter*	il	*to come, go, move*

2.5.2. *d

KSR l appears to be also the regular reflex of *d.

*da?a(n)	lah	*branch*
*doŋo	lohng	*to hear*
*dua	lo/luo-/lu-	*two*
*madama	mahlwem	*moon*

*matudu(R)	mutul	*to sleep*
*ma?udi(p)	moul	*alive, life*
*tudu(?)	tul	*drip, drop*

2.5.3. (dr)[11]

The proto-segment which has been reconstructed as *(dr) is quite a different matter, however. Judging from the scant evidence available, it seems to be regularly reflected as r in KSR:

*pi(dr)i	ir	*twist, twisted*
*si(dr)i(t)	iri	*masturbation*

r is not a particularly frequent sound in KSR. Its retroflexed quality is unusual for Micronesia, where some sort of flap or trill is the norm. Words with r often seem to be either onomatopoeic or loanwords.

Since the regular reflex of *d appears to be KSR l, one is tempted to suggest that KSR r might reflect *r rather than *d in these two forms, at least. The fact that the *(dr)'s in these forms share a common environment /*i __ *i may or may not be relevant. More evidence is needed to decide. However, given the data at hand, one is inclined to suggest that the KSR evidence points to *r rather than *d in these forms.

2.5.4. *nd

*nd is the nasal-grade counterpart of *d; however, it appears to be regularly reflected in KSR as the retroflexed fricative sr.

*ndanu(m)	sroano-	*liquid*
*ndau(n)	sra	*leaf*

A third form has been reconstructed alternately with *d and *nd:

*doŋo/*ndoŋo	lohng	*to hear*

The presence of KSR l suggests that the KSR form, at least, comes from *doŋo rather than *ndoŋo.

It may seem rather odd that the nasal grade of *d should be reflected as a fricative rather than as a liquid like the oral grade reflex. However, a relationship seems to exist between liquids and affricates (rather than fricatives) in some of the Trukic languages. In Woleaian, for instance, the geminate counterpart of r is a retroflexed affricate ch [č̣:] (< PMC *r), which suggests that an affricate may be the 'strengthened' counterpart of a liquid.[12] If pre-nasalisation can be regarded as a kind of 'strengthening', then it is perfectly possible that a fricative sr may have come to be the 'strengthened' counterpart of *d, since KSR lacks affricates. It is even possible that KSR did at one time possess an affricate reflex of *nd which later merged with or became sr. On present evidence, however, this is mere speculation.

2.5.5. *R

One might expect *R to be lost in KSR as it is in so many other OC languages. However, it is not clear that this is the case. The following is a list of all forms in the data involving *R:

*kuRita	koet	*octopus*
*waRo	ah	*rope*
*Ruŋma(ʔ)	yuwac-/iwac-	*house, shelter, place*
	lohm	*house*
*ʔatoluR	ahtro-	*egg*
*ʔaRu(s)	acsr	*current*

In the first two forms and one (pair of) reflex(es) of the third, *R has indeed been lost. In *ʔatoluR the final consonant would probably have been lost whatever it might have been. In the form *ʔaRu(s) it is not clear whether KSR sr is supposed to reflect *R or *s. Given that POC final consonants were regularly lost in KSR (see Section 2.7.), it seems unlikely that the final KSR sr would reflect a final *s whose presence was doubtful to begin with. However, there is another form containing a non-zero reflex of *R, which is lohm < *Ruŋma(ʔ). The evidence seems a bit more clear in this second case. The fact that there are 'regular' reflexes of *Ruŋma(ʔ) (see Section 2.4.4. for reflexes of * m) suggests that lohm is an irregular reflex, possibly a borrowing (although rather an unlikely one, in view of its meaning and frequency of occurrence), possibly a case of sporadic change, or possibly dialect mixing.[13]

Whatever the case, it is clear that more could be said about the development of *R in KSR if more data were available. At the very least, one might hope to clarify the status of the various reflexes Ø, l, and sr.

2.6. Glides

2.6.1. *y

There is only one instance of *y in the data, and it has been lost in the KSR reflex of that form:

*mpaya	pa	*bait*

It is not clear that *y was phonemic in POC.

2.6.2. *w

The reconstruction of a *w phoneme in POC appears to be more secure. *w generally is lost in KSR, although not always without leaving some trace of its presence on the vowels either preceding or following it.

*waka	okah	*root*
*nsiwa	yuh	*nine*
*pakiwak	pahko	*shark*
*waRo	ah	*rope*
*walu	oal-	*eight*

In *waka > okah the sequence *wa appears to have coalesced as o. Similarly, in the word for *shark* *-iwa- appears to have become o, possibly via **ewa.[14]

Why the identical sequence in *nsiwa did not become o is not clear, although it is possible that the changes which brought about the presence of the initial glide in the KSR form yuh may have had some effect.

On the other hand, *waRo did not become o, nor did *walu become ol-. There is some disagreement among KSR speakers as to the nature of the initial vocalic portion of the word for *eight*. In some people's speech it appears to be a diphthong [ᵒɑ]. An occasional speaker might give a citation form which is best transcribed [ɒ:l], in which the symbol ɒ represents a monophthongal low back round vowel rather like that in some British speakers' pronunciation of the English word hot. In many people's speech, however, the sound spelled with the digraph oa has no rounding whatsoever; it is simply [ɑ:]. Younger speakers, in particular, appear to be losing this rounding feature.

2.7. Final consonants

Like other MC languages, KSR normally does not retain POC word-final consonants. For example,

*aŋin/*nsaŋi	eng	*wind*
*ʔatoluR	ahtro-	*egg*
*daʔa(n)	lah	*branch*
*ndanu(m)	sroano-	*liquid*
*kuli(t)	kolo-/kulu-	*skin, bark*
*laŋi(t)	lucng	*sky*
*manipi(s)	mihnini	*thin*
*pakiwak	pahko	*shark*
*tuʔu(d)	tu	*to stand*

In transitive verbs, however, the last consonant was 'protected' from loss by the presence of a transitive suffix *-a or *-i (cf. Harrison 1978) which was subsequently lost through a general process of final vowel deletion. Thus one finds transitive-intransitive verb pairs such as

*ŋkinit		kihnis	*(vt) to pinch*
		kihnkihn	*(vi) to pinch*
*mpulu(t)		fulus	*(vt) to paste*
		fulful	*(vi) to adhere, etc.*
*paŋ(ou)(n)		pahngon	*(vt) to call*
		pahngpahng	*(vi) to call*
*tanom/*tanum		taun	*(vt) to bury*
		tatuh	*(vi) to bury*
		toan	*(vt) to press, bury*
		toatoa	*(vi) to press, bury*
*tasimi	*sharpen it*	twem	*(vt) to sharpen*
		twetwe	*(vi) to sharpen*
*ʔuluŋa		ilung	*(vt) to rest, prop*
		ilul	*(vi) to rest, prop*

KSR kihnis is presumably descended from a proto-form *ŋkinit-i in the same fashion that KSR twem can be traced back (despite a number of phonological changes) to POC *tasimi. KSR kihnkihn and twetwe, on the other hand, may be taken to reflect *ŋkinit and *tasim, respectively, with reduplication occurring after final consonant deletion and final vowel deletion (see Section 4 for a discussion of diachronic rule ordering).

The development of ilung/ilul from *?uluŋa may represent an analogical extension of this pattern. It is possible that the final vowel on the reconstructed POC form may have been (reanalysed as) the transitive suffix *-a, in which case it would serve the same function as the final *i of *tasimi. Why the intransitive form is ilul rather than **ilil is not clear, any more than the fact that the initial vowel of both forms is i rather than u.

As for *tanom/*tanum, one would have predicted something like KSR **tanum/**tantan rather than either of the actually occurring verb pairs. The exact relation between the two pairs of KSR verbs is not clear. They may be variant pronunciations of the same forms — that is, tatuh may be merely toatoa minus rounding, as al- is oal- *eight*, minus rounding, and taun may be a variant of toan or vice versa. Both are equally 'acceptable' as reflexes of *tanom/*tanum. In both instances KSR behaves as though the last consonant of the proto-form had been n and the last syllable of the POC form had been lost at some earlier stage. The fact that MRS has jewen *press down on* suggests that the final *o/um of the POC form might not have been present at the PMC level — unless either KSR or MRS (or both) had borrowed the form from some third language. It is also possible that these particular pairs of verbs did not exist in KSR until after final consonant deletion (and probably also final vowel deletion) had applied historically, and that they were created later by a still-productive (?) process of reduplication.

Our data contain two instances of KSR transitive verbs without the final consonants reconstructed for POC:

*si(dr)i(t)	irii	*(vt) to masturbate*
*sae(t)	se	*(vt) to tear*

In both cases the fact that the final consonant of the POC form is enclosed in parentheses indicates that it "may or may not have been part of the form" (Grace 1969:44). In neither case does the final *t appear to have been present in PMC (cf. KIR tii *to spurt*, MRS jjir *slippery, lubrication*, TRK siir *urine, to urinate* and ir *to masturbate (taboo)*, and WOL siri *to masturbate*). For *to tear* there exist alternate reconstructions without the final consonants (PEO *sai and *sei) which are included as possible Oceanic proto-forms because of the point-for-point congruence between the phonological systems reconstructed at that time for POC and PEO.

Some POC verbs ended in consonants that are normally lost in KSR:

*punu?	uni	*to hit, kill*
*?utup	uti	*(vt) to draw water*
	ut	*(vi) to draw water*

The only notable feature of these forms is the fact that the final vowel is i in KSR rather than u as one might expect from a straightforward application of the process of final vowel deletion.[15]

*punu? + i	? > Ø
**punu + i	final vowel deletion
**punu	

Evidently, something happened to the second *u. Whether it was assimilated to the following *i, which suggests that the order of the rules must be as given above with assimilation applying before final vowel deletion, or whether it was replaced by -i by analogy to the productive transitivising suffix, cannot be decided on the basis of the evidence at hand.

POC verbs which are reflected only as intransitive verbs (i.e. without transitive counterparts) show no trace of the reconstructed final consonants:

*matudu(R)	mutul	*to sleep*
*ma?udi(p)	moul	*(be) alive, life*
*tanji(s)	tuhng	*to cry*

Admittedly, these are not the best possible examples, as there is some uncertainty as to the presence of the final consonant in the POC forms (although one wonders whether it is not the historical existence of a process of final consonant deletion which created this uncertainty), and there is the possibility that all of these consonants might have been lost in KSR, anyway, even had there been a following vowel to 'protect' them. Still, one would expect that KSR intransitive verbs without transitive counterparts would not retain any reconstructed POC final consonant.

2.8. Distinctively velarised consonants in KSR

As mentioned in Section 1., velarised consonants appear to occur non-distinctively in the environment of central and back vowels in KSR. Distinctive velarisation is restricted to syllable-initial position before a front vowel, generally the mid vowels e and ac, occasionally before i, apparently never before the low front vowel ah.

Comparison with other MC languages suggests that this distribution of velarised consonants must have developed at some post-PMC stage. Marck 1977 reconstructs a distinct set of velarised labials in PMC. KSR agrees with the other MC languages in reflecting PMC *p' (> KSR f) differently from PMC *p (> KSR p). However, PMC *m and *m' are treated identically in KSR — they are merged so that it is impossible to tell whether any given instance of synchronic m or mw comes from PMC *m or *m'. It does appear, however, that distinctively velarised consonants are especially likely to occur before KSR e < *a:

*madama	mahlwem
*mata	muhta-/mwet
*tasimi	twem

Not all instances of *a > e condition velarisation, however:

*lima		luhm-/lime-	*five*
*sae(t)		se	*(vt) to tear*
*tansi(k)	*sea, salt water, salt*	te	*beach, seashore*

The problem of the history and synchronic status of velarisation in KSR requires more consideration than can be given it here.

2.9. Distinctively labialised consonants in KSR

It was pointed out in Section 1., that distinctively labialised (rounded) consonants occur only before the mid front vowels e and ac. Only one form in the data contains such a sequence — KSR koet (< POC *kuRita *octopus*) — although such forms are not extraordinarily rare in KSR. No doubt a more extensive search would discover POC antecedents for a number of these words. The difficulty in this instance is not necessarily lack of data, but is due to the

unresolved question of how to analyse such sequences in the synchronic phonology. The problem of the vowel/diphthong oa may be related to this.

On the one hand, it appears as though KSR might be analysable as having no underlying diphthongs. That is, sequences such as orthographic koe and koac would be analysed as consisting of a (distinctively) rounded consonant followed by an unrounded vowel. This is the analysis implied in Lee (1975).

There is no a priori reason why a sequence such as orthographic koa could not be analysed in a similar fashion. Lee's decision to describe oa as a low back vowel (Lee 1975:15-16) may be attributed to a desire to fill an empty slot in the vowel matrix — Lee clearly describes the diphthongal pronunciation represented by this orthographic symbol.

Not all speakers actually use this diphthongal pronunciation, however. In fact, some (younger?) speakers appear to have lost all trace of rounding in words that are spelled in the dictionary with oa and also in at least some words given as having rounded consonants.[16] It may be as much a matter of theoretical prejudices as of empirical fact whether one chooses to interpret this synchronically as loss of rounding or as loss of a labial glide between the consonant and the vocalic nucleus of the syllable.

Historically, on the other hand, one would probably prefer an analysis that would account for oa as well as oe and oac. The example cited, KSR koet < POC *kuRita, does not seem to be typical of this class of sound changes. One suspects the following examples to be more representative of this kind of rounding:

*ndanu(m)	*fresh water*	sroano-	*liquid*
*laŋo		loang	*fly (insect)*
*napo	*surf*	noa	*wave*
*tanom/*tanum		toan	*(vt) to press, bury*
		toatoa	*(vi) to press, bury*

Evidence has been given for a process of rounding assimilation in the evolution of KSR phonology (Section 3.2.3.). Excluding the operation of other processes, one would expect to find a unitary low back rounded vowel in the first syllable of these forms as a result of the application of this rule. The synchronic loss of rounding in oa suggests that this vowel is not particularly stable, perhaps because it is relatively difficult to round the lips when the mouth is open so wide. Some speakers — historically the majority? — circumvent this difficulty by diphthongising oa, pronouncing it as Lee (1975) describes. Other speakers — including many young people — find it easier to simply do away with the rounding feature. Anticipatory rounding of the preceding consonant does appear to occur when speakers pronounce oa as a round vowel or as a diphthong whose first part is rounded. When oa is unrounded, however, the preceding consonant is not rounded, either.

In the case of the mid vowels e and ac, one can imagine rounded counterparts of these vowels, probably not very stable because there would not be much support for them from the rest of the phonological system. Diphthongisation would represent a way to retain the rounding feature without adding two new vowels to the inventory.

In both cases, once diphthongisation has occurred, it would be a simple matter to transfer some features from the first part of the diphthong to the preceding consonant. There is some question as to whether the letter o in the sequences oe and oac really does represent merely a feature of the consonant

or an actual segment, a glide, occurring between the consonant and the vowel. This paper, however, is not the place to attempt to resolve the issue. What we are suggesting here is that the problem appears to exist on a diachronic as well as a synchronic level.[17]

To further complicate the issue, there are a few forms like oal (< POC *walu *eight*) in which the KSR form may or may not reflect loss of POC *w, either preceded or followed by rounding of the *a, conditioned by either the preceding *w (if rounding occurred before loss of *w) or by *u in the following syllable (presumably before final vowel deletion). Synchronically the alternation between a diphthongal pronunciation [o͡al] and an unrounded pronunciation [a:l] is associated with different dialect areas — Maclwem vs. the other villages. However, all KSR speakers consulted insisted that this is not a general phonological feature by which the dialect areas could be distinguished, merely a single idiosyncratic lexical item.

3. VOWELS

The following vowels occur in the POC reconstructions used in this paper:

i	u
e	o
a	

Their reflexes are distributed among the twelve (surface) vowels of contemporary KSR (catalogued in Section 1.) in ways which are not entirely predictable. What regularities can be found in the data are presented below.

3.1. Vowel correspondences

3.1.1. *i

Non-final *i is most often reflected as a high vowel in KSR, particularly if the following vowel in the proto-form was also high:

*ŋkinit	kihnis	*(vt) to pinch*
*lima	luhm-/li̲me-	*five*
*manipi(s)	mihnini	*thin*
*pi(dr)i	ir	*twist*
*pitu	it-	*seven*
*pitu?u	itu/itih	*star*
*si(dr)i(t)	ir	*masturbation*
*sili	il	*to enter*
*anitu	inut	*ghost, spirit*
*niu(R)	nu	*coconut*

Of these high vowel reflexes, KSR i is the most frequent. *i corresponds to KSR ih in only one form in the data, but this low frequency is most likely an artifact of the highly restricted database — a wider-ranging search would probably discover more instances of this historical development, which might make it possible to attempt to explain it, something one hesitates to do on the basis of a single instance.

*i appears to become u when the next vowel is *u in the forms *anitu and *niu(R), but not in *pitu or *pitu?u. It is remotely possible that the

preceding consonant may condition the application of this (diachronic) rule or possibly even a later change back from an intermediate **u to i, but there is not enough evidence here for any more precise statement.

The presence of a following *a in the proto-form seems to have caused lowering of *i in some forms:

*kinta	kuht	*we (1 pl)*
*kuRita	koet	*octopus*
*lima	luhm-/lime	*five*
*pakiwak	pahko	*shark*
*nsiwa	yuh	*nine*

However, there are exceptions to this generalisation, too:

*kianto	kiyacs	*outrigger boom*
*lima	luhm-/lime-	*five*
*tia(n)	(in-)siyac-	*belly*
*tina	ninac	*mother*

It is interesting to note that the KSR reflexes of *kianto and *tia(n) both contain a y glide between the i and the reflex of *a. When and how these glides originated is not at all clear; however, it would not be surprising to find a connection between their presence and the preservation of *i as KSR i in an environment in which one might otherwise expect lowering of *i.

This explanation will not apply to *tina and *lima (> KSR lime-), however. No non-ad hoc account of these forms is possible on the basis of the evidence at hand. There may be a way to account for the doublet from POC *lima when the KSR numeral system is more carefully examined.

In two instances medial *i appears to have been lost following *a, but not before having had some effect on that vowel:

*papine	acn	*woman*
*tasimi	twem	*(vt) to sharpen*

The second of these forms suggests that the loss of *i in this environment must have been preceded by the loss of *s, which is conditioned by the presence of a following *i:

There is some evidence to suggest that *i may have conditioned a more general raising and sometimes fronting of a preceding *a:

*aŋin/*nsaŋi		eng	*wind*
*api		e	*fire*
*kali		kuhlkuhl	*(vi) to dig*
*laŋi(t)		lucng	*sky*
*manipi(s)		mihnini	*thin*
*nsai		suc	*who?*
*tali		sucl	*rope*
*taŋi(s)		tuhng	*to cry*
*tansi(k)	*sea, etc.*	te	*beach, seaside*

What determines the resulting KSR vowel is not clear, possibly a combination of the consonantal environment and whether or not the vowel is stressed. If conditioned by a following *i, the raising rule must have applied before final vowel deletion removed the conditioning factor in many of the forms above.

The reciprocal prefix *pai- is the sole exception (in the data) to this raising rule, as its KSR reflex is a-.

*i evidently had no effect on preceding non-low vowels:

*mpoŋi	fong	*night*
*pu(n)ti	usr	*banana*
*sili	il	*to enter*
*tuki	tuk	*(vt) to pound*

In only one instance is non-final *i lost without any trace:

*inu(m)	nihm	*(vt) to drink*

Evidence from other MC languages suggests that this development must have occurred at some proto- or pre-MC stage (cf. KIR nina *(vt) drink, swallow*, MRS limiy *(vt) to drink*, PNP nim *(vt) drink*, ULI lema *(poss cl) drink*).

3.1.2. *e

*e is indisputably the lowest-frequency vowel in the POC reconstructions on which this paper is based. Only one form had a KSR reflex of non-final *e:

*mpeŋka	fak	*bat, flying fox*

A handful of forms suggest that *e might have had an effect on preceding *a similar to that of *i:

*?ate	acsyac-/esyac-	*liver*
*(n)sake	-yak/-ack	*up, upwards*
*sae(t)	se	*(vt) to tear*
*mpule	ful	*shell: cowry*
*papine	acn	*woman*

3.1.3. *u

Like *i, *u is most often reflected as a high vowel in KSR, most frequently u:

*kutu	kut	*louse*
*mpulu(t)	fulus	*(vt) to paste, gum*
*pu(n)ti	usr	*banana*
*sulu	sul	*torch*
*tu?u(d)	tu	*to stand*
*?umu	um	*earth oven*
*?una(p)	unac-/une-	*fish scale, etc.*

but sometimes i or ih:

*mputo	fuht/fihtac-	*navel*
*Ruŋma(?)	yuwac-/iwac-	*house, etc.*
*susu	titi-	*breast*
*?uluŋa	ilung	*(to) pillow*
*?uma	imac	*garden, etc.*
*inu(m)	nihm	*(vt) to drink*

Again like *i, *u is sometimes reflected by a lower vowel in KSR, apparently due to the presence of a low vowel in the following syllable:

*dua	lo/luo/lu-	*two*
*muta(?)	woht[18]	*(vi) to vomit*
*Ruŋma(?)	lohm	*house*

There are exceptions to this, however:

*dua	lo/luo/lu-	*two*
*?una(p)	unac-/une-	*fish scale, etc.*
*?uma	imac	*garden, etc.*
*muta(?)	wihte[19]	*(vt) to vomit*

as well as one and a half instances of unexplained lowering:

*?atolu(R)	ahtro-	*egg*
*paŋ(ou)(n)[20]	pahngon	*(vt) to call*

A somewhat better case can be made for *u having conditioned raising and/or rounding of the vowel in the preceding syllable:

*ndanu(m)	sroano-	*liquid*
*manu(k)	won	*bird*
*matudu(R)	mutul	*to sleep*
*ma?udi(p)	moul	*alive, life*
*ŋapulu(?)	(si-)nguhul	*ten*
*anitu	inut	*ghost, spirit*
*niu(R)	nu	*coconut*
*patu	yot	*stone*
*taku	tok/tohkoh/tuku-	*back (anat.)*

However, there are exceptions to this, too:

*?anusi	acni	*to spit*
*?aRu(s)	acsr	*current, stream*
*?atolu(R)	ahtro-	*egg*
*ndau(n)	sra	*leaf*
*natu	nahtuh-/nuhtV-	*child*
*panua	acn	*land*

for which no systematic explanation is currently available.

3.1.4. *o

Non-final POC *o is generally reflected as o in KSR, occasionally as oh, occasionally as a non-round mid vowel:

*matolu	mahtol	*thick*
*onom	on-/ohn-	*six*
*paŋ(ou)(n)	pahngon	*(vt) to call*
*mpo-	fo	*smell*
*mponot	fonos	*(vt) to block, etc.*
*mpoŋi	fong	*night*
*mpou	fo	*pole, etc.*
*tolu	tol-	*three*
*doŋo	lohng	*to hear*
*topu	tuh	*sugarcane*
*?ulo(s)	ulac	*maggot*

A possible explanation for the unrounding of the vowel in tuh (< *topu, which contains two round vowels) may be found in the fact that the word tohoh also exists in KSR as the name of a kind of tree. This may be an instance of avoidance of ambiguity.

The presence of a final vowel in ulac is unexpected to begin with. Ordinarily the last vowel would have been lost, whether or not the final *s was actually present, because final vowel deletion seems to have followed final consonant deletion historically (see Section 4. for further discussion of diachronic rule ordering). In a so-called 'alienable' noun like ulac (see Section 3.3.3. for further discussion of 'alienable' vs. 'inalienable' nouns), there would have been no possessive suffix to 'protect' the historical final vowel from deletion. This suggests that the final vowel in KSR ulac does not reflect the last vowel of POC *ʔulo(s), but there is no evidence to indicate where it might have come from.

The evidence concerning the effects of a following *o on a preceding non-round vowel is contradictory. In some instances it appears to have no effect:

*aŋoaŋo	*yellow*	ahng	*turmeric*
*kianto		kiyacs	*outrigger boom*
*mapo		mah	*to heal*
*tanom/*tanum		taun	*(vt) to bury*
		tatuh	*(vi) to bury*
*waRo		ah	*string, rope*

Sometimes, however, it appears to result in rounding of the vowel in the preceding syllable, in forms very much like those listed above:

*laŋo		loang	*fly (insect)*
*napo	*surf*	noa	*wave*
*tanom/*tanum		toan	*(vt) to press, bury*
		toatoa	*(vi) to press, bury*

There is always the possibility that the surrounding consonants may have an effect on the vowel, although this remains to be demonstrated. There is also the possibility that these two different sets of forms represent different historical strains in the development of KSR. As mentioned in Section 2.7., the relationship between taun/tatuh and toan/toatoa has not yet been explained satisfactorily — it may be that different dialects of KSR varied in their application of the rounding assimilation rule and that the present situation is a result of dialect mixing.

In all of the examples above the vowel which could have been influenced by *o was *a. That is not because there is any a priori reason to expect that only *a was susceptible to such influence, but because the data contain no words of the shape *CiCo or *CeCo. Obviously, words of the shape *CoCo or *CuCo would not constitute evidence either for or against a historical rule of rounding assimilation unless that rule were supposed to have operated at a Pre-POC stage which is well beyond the domain of this paper.

3.1.5. *a

*a may be reflected as any of the twelve surface vowels in KSR. Generally, it is a non-high, but not necessarily low, vowel. More often than not, it is unrounded.

low vowel reflexes

*a > ah

*aŋoaŋo	*yellow*	ahng	*turmeric*
*?atoluR		ahtro-	*egg*
*da?a(n)		lah	*branch*
*madama		mahlwem	*moon*
*mapo		mah	*to heal*
*natu		nahtuh-/nuhtV-	*child*
*paka-		ahk-	causative pref
*waka > PMC *wakaRa		okah	*root*

*a > a

*ndau(n)		sra	*leaf*
*ŋmata		wet/wat	*worm*
*pai-		a-	reciprocal pref
*mpaya		pa	*bait*
*nsakaRu	*reef*	tuhka	*island*
*(n)sake		-yak/-ack	*up, upwards*
*tama		tuhma-	*father*
*tanom/*tanum		taun	*(vt) to bury*
		tatuh	*(vi) to bury*

*a > oa

*ndanu(m)		sroano-	*liquid*
*laŋo		loang	*fly (insect)*
*napo	*surf*	noa	*wave*
*tanom/ tanum		toan	*(vt) to press, bury*
		toatoa	*(vi) to press, bury*
*walu		oal-	*eight*

Notice that in all cases where *a > oa the vowel in the following syllable is round. The converse is not true, however; that is, a round vowel in the second or subsequent syllable of a proto-form does not necessarily cause rounding of *a in the preceding syllable. No ready explanation offers itself for the choice between a and ah reflexes of *a.

low-mid vowel reflexes

*a > ac

*?anusi	acni	*to spit*
*?aRu(s)	acsr	*current, stream*
*panua	acn	*land, earth*
*papine	acn	*woman*
*tia(n)	(in-)siyac-	*belly*
*?una(p)	unac-/une-	*body hair, etc.*
*(n)sake	-yak/-ack	*up, upwards*
*kianto	kiyacs	*outrigger boom*
*Ruŋma(?)	yuwac-/iwac-	*house, shelter*
*?ate	acsyac-/esyac-	*liver*
*tina	ninac	*mother*
*?uma	imac	*garden, etc.*

*a > uh

*mata	muht̲a-/mwet	*eye, face*
*natu	nah̲tuh-/nuht̲V-	*child*
*nsakaRu	tuh̲ka	*island*
*tama	tuh̲ma-	*father*
*taŋi(s)	tuh̲ng	*to cry*

*a > oh

*taku	tok/toh̲koh-/tuku-	*back (anat.)*

Among the lower mid vowel reflexes of *a the front vowel seems to predominate. As before, the only instance in which *a is reflected as a round vowel is when the vowel in the following syllable of the proto-form is round. Contrary to the case of the low vowel reflexes of *a, there appears to be a synchronic explanation for the choice between one lower mid reflex and another. Except for tuhng, all of the words with KSR uh as a reflex of *a have that vowel in unstressed position (see Lee 1975:33-35 for a summary of KSR stress patterns). The fact that the KSR word for *to cry* is tuhng rather than tucng (see examples below) remains inexplicable at present.

high-mid vowel reflexes

*a > e

*aŋin/ nsaŋi	eng	*wind*
*api	e	*fire*
*?ate	acs̲yac-/e̲syac-	*liver*
*madama	mahlwe̲m	*moon*
*mata	muhta-/mwe̲t	*eye, face*
*ŋmata	we̲t/wat	*worm*
*sae(t)/*sai/*sei	se	*(vt) to tear*
*tasimi	twem	*(vt) to sharpen*
*tansi(k) *sea, etc.*	te	*beach, seaside*
*?una(p)	unac-/une-	*body hair, etc.*

*a > uc

*kali	kuhlkuhl [kə:lkə:l][21]	*(vi) to dig*
*laŋi(t)	lucng	*sky*
*ŋapulu(?)	singuhul [si:ŋə:u:l]	*ten*
*tali	sucl	*rope*
*nsai	suc	*who?*

*a > o

*taku	to̲k/tohkoh-/tuku-	*back (anat.)*
*manu(k)	wo̲n	*bird*
*ma?udi(p)	moul	*life, alive*
*patu	yot	*stone*
*waka	o̲kah	*root*

As before, rounded reflexes of *a occur in words with a round vowel in the following syllable, except for okah, in which the o may be taken to result from the coalescence of the sequence *wa.

In addition to this, there appears to be some evidence here for a historical process of low-vowel dissimilation:

*a > e / _____*Ca

as exemplified by the KSR forms mahlwem, mwet, and wet. The non-occurrence of forms like **melwem suggests that the rule must have applied from right to left. The lower mid front vowel (orthographic ac) never seems to be the result of low-vowel dissimilation, nor do the central or back mid vowels.[22]

Most often, KSR e, uc, and o reflexes of POC *a seem to have resulted from an assimilative process of *a-raising conditioned by the presence of a high vowel in the following syllable. If that following vowel is round, the result is usually a round vowel (although not in the case of singuhul < *ŋapulu(?)). e frequently alternates with ac as the stem vowel of the so-called 'inalienable' nouns, apparently in free variation, based on the (synchronic) evidence to date.

high vowel reflexes

*a > i			
	*anitu	inut	*ghost, spirit*
*a > ih			
	*manipi(s)	mihnini	*thin*
*a > u			
	*matudu(R)	mutul	*to sleep*
	*taku	tok/tohtoh-/tuku-	*back (anat.)*

One would not normally expect to find a proto-low vowel reflected as a high vowel in a daughter language (although the Great English Vowel Shift demonstrates that stranger things have happened). At any rate, it will not surprise most readers that KSR high vowel reflexes of POC *a are so few. What seems to be significant about these reflexes is the fact that they all occur in the unstressed (first) syllable of words whose stressed (second) syllable contains a (synchronic as well as historical) high vowel. This suggests that there might have been a second (whether synchronic or historical is not clear) assimilative vowel-raising rule which operated on short unstressed vowels (most likely mid vowels resulting from the other — presumably earlier — rule), causing them to become high vowels when followed by a stressed high vowel. Considerably more data would be needed to test this hypothesis.

3.2. Vowel assimilation rules[23]

The vowel correspondences catalogued above seem to suggest that a number of vowel assimilation rules must have applied in the development of KSR from POC. Most prominent among these are vowel height assimilation (both raising of low vowels and lowering of high vowels) and rounding assimilation. There also seems to be some evidence for a process of monophthongisation.

Other developments involving the vowels are low-vowel dissimilation (see Section 3.3.1.), glide insertion/glide formation (3.3.2.), and final vowel deletion (3.3.3.).

3.2.1. *a-raising

Evidence has already been presented in Section 3.1.5. which indicates that there might have been at least two rules having the effect of causing POC *a

to be reflected as a higher vowel in KSR. One of these rules (historically the earlier of the two?) had the effect of raising *a to a mid vowel (ac, uh, oh, e, uc, o) when the vowel in the following syllable was a high vowel. Aside from rounding assimilation, which will be discussed more fully in Section 3.2.3., it is not clear what determines which of the mid vowels would develop in any particular instance. Examples of this first raising rule are repeated here for the convenience of the reader:

*?anusi	acni	*to spit*
*papine	acn	*woman*
*taŋi(s)	tuhng	*to cry*
*taku	tok/tohkoh-/tuku-	*back (anat.)*
*aŋin/*nsaŋi	eng	*wind*
*tasimi	twem	*(vt) to sharpen*
*laŋi(t)	lucng	*sky*
*nsai	suc	*who?*
*manu(k)	won	*bird*
*patu	yot	*stone*

The second of the raising rules appears to have applied only to unstressed vowels in the first syllable of a word — which need not necessarily have been low vowels at the time that the rule applied, although they seem to have come originally from *a — followed by a stressed high vowel in the next syllable. The output of the rule was an unstressed short high vowel (examples repeated from Section 3.1.):

*anitu	inut	*ghost, spirit*
*manipi(s)	mihnini	*thin*
*taku	tok/tohkoh-/tuku-	*back (anat.)*
*matudu(R)	mutul	*to sleep*

At least the first of these rules is not without exceptions:

*ndau(n)	sra	*leaf*
*pai-	a-	reciprocal pref
*nsakaRu *reef*	tuhka	*island*
*natu	nahtuh-/nuhtV-	*child*
*ndanu(m)	sroano-	*liquid*
*walu	oal-	*eight*

However, no systematic explanation for these is immediately apparent.

3.2.2. High vowel lowering

The evidence for a rule lowering POC high vowels to KSR mid vowels when followed by *a in the next syllable is rather less satisfactory than that given above for low-vowel raising. Favouring the existence of such a rule are forms such as

*kinta	kuht	*we (incl)*
*kuRita	koet	*octopus*
*lima	luhm/lime-	*five*
*pakiwak	pahko	*shark*
*nsiwa	yuh	*nine*
*dua	lo/luo/lu-	*two*
*muta(?)	woht	*(vi) to vomit*
*Ruŋma(?)	lohm	*house*

Almost as many forms can be found that would have to be regarded as exceptions or counterexamples to this rule:

*kianto	kiyacs	*outrigger boom*
*tia(n)	(in-)siyac-	*belly*
*tina	ninac	*mother*
*lima	luhm/lime-	*five*
*dua	lo/luo/lu-	*two*
*ʔuna(p)	unac-/une-	*fish scales, etc.*
*ʔuma	imac	*garden, etc.*

Again, no systematic explanation immediately suggests itself. It is quite possible that there is some other way to account for this distribution of reflexes of the POC high vowels which might be uncovered by further investigation.

3.2.3. Rounding assimilation

On the other hand, the evidence is relatively good for a historical process of rounding assimilation whereby unrounded proto-vowels became rounded when the vowel in the following syllable was round:

*ndanu(m)	sroano-	*liquid*
*manu(k)	won	*bird*
*matudu(R)	mutul	*to sleep*
*maʔudi(p)	moul	*life, alive*
*anitu	inut	*ghost, spirit*
*niu(R)	nu	*coconut*
*patu	yot	*stone*
*taku	tok/tohkoh-/tuku-	*back (anat.)*
*laŋo	loang	*fly (insect)*
*napo *surf*	noa	*wave*
*tanom/*tanum	toan	*(vt) to press, bury*
	toatoa	*(vi) to press, bury*

But one can find just as many exceptions to this generalisation:

*ʔanusi	acni	*to spit*
*ʔaRu(s)	acsr	*current, stream*
*ʔatolu(R)	ahtro-	*egg*
*ndau(n)	sra	*leaf*
*natu	nahtuh-/nuhtV-	*child*
*panua	acn	*land, earth*
*aŋoaŋo	ahng	*turmeric*
*kianto	kiyacs	*outrigger boom*
*mapo	mah	*to heal*
*tanom/*tanum	taun	*(vt) to bury*
	tatuh	*(vi) to bury*
*waRo	ah	*string, rope*

It would be interesting to see if the exceptions to one rule also turned out to be exceptions to other rules; however, this possibility cannot be explored in this paper, owing to limitations on time and data.

3.2.4. Monophthongisation

The evidence is scanty, but a few forms in the data suggest that some kind of monophthongisation or coalescence rule may have applied in the history of KSR. The forms that most strongly suggest the existence of such a rule are

*pakiwak	pahko	*shark*
*papine	acn	*woman*
*tasimi	twem	*(vt) to sharpen*
*waka	okah	*root*

From the first three examples it appears that either the second vowel (which became juxtaposed to the first as a result of the loss of the intervening proto-consonant) in a VV sequence, or the glide in the sequence VG, first conditioned assimilation of the first vowel (for height and/or roundness) and then was lost through either deletion or coalescence — e.g. either

*papine	*p > Ø
**aine	final vowel deletion
**ain	*a-raising
**acin	V > Ø / V —
acn	monosyllabic lengthening[24]
[ɛ:n]	

or

*papine	*p > Ø
**aine	final vowel deletion
**ain	monophthongisation
acn [ɛ:n]	

For reasons of economy at least, one would probably want to opt for the second of these derivations, but it is not clear from the data that things were necessarily so.

The fourth form cited above differs from the first three primarily in that, in this case, the glide precedes the vowel and the resulting vowel may be short rather than long (although the question of vowel length in KSR has yet to be resolved on either a historical or a synchronic basis). Perhaps the rule ought to be written to accommodate both orders V-Vc and Vc-V (where the symbol Vc stands for the segment — vowel or glide — that seems to 'disappear' from the proto-form).

Again, there are exceptions, forms such as

*ŋmata	wet/wat	*worm*
*tanom/ tanum	taun	*(vt) to bury*

as well as synchronic forms like paing *to greet*, sauk *to catch, grasp*, wal *proper, suitable*, vat *eastern part of a village*, etc. which suggest that this rule of coalescence was probably rather restricted in its application and, furthermore, is no longer active.

3.3. Other historical developments involving POC vowels

3.3.1. Low vowel dissimilation

The evidence for such a rule is scanty in KSR (although it appears to form part of the history of other nuclear Micronesian languages).

*madama	mahlwem	*moon*
*mata	muhta-/mwet	*eye, face*
*ŋmata	wet/wat	*worm*

Evidence against a rule of low vowel dissimilation is provided by forms such as

*da?a(n)	lah	*branch*
*paka-	ahk-	causative pref
*mpaya	pa	*bait*
*nsakaRu *reef*	tuhka[25]	*island*

A more extensive database is clearly necessary for the resolution of this question.

3.3.2. Glide insertion/glide formation

The question of the status of glides in POC has not yet been resolved to everyone's satisfaction, nor has it been entirely resolved with respect to the synchronic phonology of KSR — all of which means that any statement about developments involving glides must necessarily be highly tentative. Nonetheless, it seems clear enough that the glides are distributed differently in present-day KSR than in the ancestral language. The reconstructed POC glides all have been lost (see Section 2.6.), while other glides have arisen in different places. Not all of the glides in present-day KSR can be accounted for on the basis of the few forms considered in this paper, but some guesses can be hazarded.

Some instances of KSR w appear to be merely irregular reflexes of POC *m or (regular reflexes of) *ŋm:

*manu(k)	won	*bird*
*ŋmata	wet/wat	*worm*
*muta(?)	wihte	*(vt) to vomit*
	woht	*(vi) to vomit*
*Ruŋma(?)	yuwac-/iwac-	*house, shelter*

Some instances of KSR y appear to be successors of lost proto-consonants:

*patu	yot	*stone*
*Ruŋma(?)	yuwac-/iwac-	*house, shelter*
*(n)sake	-yak/-ack	*up, upwards*
*nsiwa	yuh	*nine*

although the exact mechanism by which these arise remains unclear.

Still other instances of KSR y appear to be epenthetic.

Forms such as

*kianto	kiyacs	*outrigger boom*
*tia(n)	(in-)siyac-	*belly*

suggest that there may have been a rule in KSR inserting a y-glide between a high front vowel and a following (lower) mid front vowel or possibly a historical rule inserting y between a historical high front vowel and a historical low vowel. The data at hand do not even permit a statement of whether or not a similar rule applied with respect to historical sequences of high (rounded) back vowel followed by low vowel, much less any statement concerning the synchronic as opposed to diachronic status of such a rule.

Further complications arise from the as yet unresolved nature of such features of synchronic KSR phonology as the rounding on the consonant or the first part of the diphthong (if such it be) in forms like the following:[26]

koet	< *kuRita	*octopus*
sroano-	< *ndanu(m)	*liquid*
loang	< *laŋo	*fly (insect)*
noa	< *napo	*wave (< surf)*

The problem of glides clearly warrants further investigation.

3.3.3. Final vowel deletion

In addition to final consonant deletion (see Section 2.7.), there appears to have been a rule in the development of KSR deleting final vowels from POC forms. This rule evidently applied after final consonant deletion (see Section 4 for discussion of diachronic rule-ordering), resulting in many consonant-final words in KSR:

*anitu	inut	*ghost, spirit*
*aŋin/*nsaŋi	eng	*wind*
*ndau(n) > **ndau > **nda > sra[27]		*leaf*
*kinta	kuht	*we (incl)*
*kuRita > **kuita > **kueta > **kuet > koet		*octopus*
*pakiwak > **pakiwa > **pakewa > **pakew > pahko		*shark*
*patu	yot	*stone*
*doŋo	lohng	*to hear*
*matolu	mahtol	*thick*
*pi(dr)i	ir	*twist(ed)*
*sili	il	*to enter*
*kali > **kuhli > **kuhl > kuhlkuhl		*(vi) to dig*
*tasimi	twem	*(vt) to sharpen*

As indicated by the above examples, this process appears to have applied to words of all classes impartially.

However, as with final consonant deletion, there appears to be an entire class of cases in which the final vowel of the POC form has been 'protected' by the presence of a suffix. This class consists of 'inalienable' nouns, those nouns for which possession is indicated by the direct attachment of a possessive suffix (as opposed to the 'alienable' nouns, for which possession is indicated by a following 'classifier' carrying the possessive suffix). The vowel that was affected by final vowel deletion was the final vowel of the possessive suffix rather than that of the noun stem. Thus we find the final vowel of the reconstructed proto-form reflected as the stem(-final) vowel of the inalienable noun:

*tama	tuhma-	*father*
*mata	muhta-/mwet	*eye, face*
*natu	nahtuh-/nuhtV-	*child*
*mputo	fihtac-/fuht	*navel*
*taku	tok/tohkoh-/tuku-	*back (anat.)*
*ʔate	acsyac-/esyac-	*liver*

The alternation in the vowels of the contemporary KSR forms may be attributed (at least historically) to the influence of the vowel in the possessive suffix.

4. DIACHRONIC RULE-ORDERING

In preceding sections of this paper we have tentatively put forward a number of rules that might have applied during the development of the KSR phonological system. It seems quite clear that the changes represented by these rules did not all occur at one and the same time. In this section we will examine the data for evidence bearing on historical rule ordering.

Final consonant deletion may have occurred quite early in the history of KSR. It must have preceded final vowel deletion, if one can assume the final consonant to have been present in the following POC forms:

*aŋin/*nsaŋi	eng	*wind*
*laŋi(t)	lucng	*sky, heaven*
*manu(k)	won	*bird*
*matudu(R)	mutul	*to sleep*
*ma?udi(p)	moul	*alive, to live*
*taŋi(s)	tuhng	*to cry*
*tudu(?)	tu	*to stand*

This ordering is supported by the existence of forms in which a final reconstructed vowel was lost but the consonant that preceded it has been retained, e.g.:

*anitu	inut	*ghost, spirit*
*doŋo/*ndoŋo	lohng	*to hear*
*kianto	kiyacs	*outrigger boom*
*madama	mahlwem	*moon*
*mpeŋka	fak	*bat, flying fox*
*tali	sucl	*rope*

A number of forms seem to suggest that final consonant deletion, but not final vowel deletion, must have taken place before the development of the inalienable possessive marking system. For example,

*ndanu(m)	sroano-	*liquid*
*kuli(t)	kolo-/kulu-	*skin, bark*
*Ruŋma(?)	yuwac-/iwac-	*house, shelter*
*tia(n)	(in-)siyac-	*belly*
*?una(p)	unac-/une-	*fish scale, etc.*

The presence of the possessive suffix would 'protect' the final vowel of vowel-final forms from deletion:

*?ate	acsyac-/esyac-	*liver*
*mata	muhta-/mwet	*eye, face*
*natu	nahtuh-/nuhtV-	*child*
*mputo	fuht/fihtac-	*navel*
*susu	titi-	*breast*
*taku	tok/tohkoh-/tuku-	*back (anat.)*
*tama	tuhma-	*father*

These forms support the hypothesis that the development of inalienable possession marking preceded final vowel deletion.

A number of changes are conditioned by a following vowel. There is evidence that these, too, must have occurred before final vowel deletion. For instance, in forms such as

*ŋkinit	kihnis	*(vt) to pinch*
*mponot/*ponot	fonos	*(vt) to block, plug*
*mpulu(t)	fulus	*(vt) to paste*

the final -s in the KSR forms presumably reflects POC *t, which became s in the presence of a following *-i transitive suffix (see Section 2.1.2.), which was later deleted along with other final vowels.

The set of transitive verbs cited above also provides evidence that the *t > s change must have followed the change of *s > Ø / ___ *i (see Section 2.3.1.) — or else that the latter change did not occur until after final vowel deletion had taken place. To suppose that a final *i conditioned first a change of *t to s and then *s > Ø before being deleted would leave the final s in these forms unaccounted for. However, the data used for this paper do not permit us to clarify the matter. Only one item in the data is reconstructed as ending in *-si, POC *ʔanusi *to spit*. This is reflected in KSR as acni. The absence of s suggests that *s did become Ø. Since we have established that final consonant deletion preceded final vowel deletion (and if we can take the synchronic final -i to be an irregular reflex of *u rather than a reflex of the POC final vowel), the only rule that could have deleted *s presumably was the one conditioned by following *i. Thus we argue that the loss of *s / ___ *i must have antedated not only final vowel deletion but also the change of *t > s.

The loss of *s /____*i also must have occurred before monophthongisation (see Section 3.2.4.), as evidenced by KSR twem *(vt) to sew* (< POC *tasimi):

*tasimi	*s > Ø / __ *i
**taimi	final vowel deletion
**taim	monophthongisation/velarisation of the preceding consonant
twem	

Loss of *ns and *p also may have preceded monophthongisation. For example,

*tansi(k)	final consonant deletion
**tansi	*ns > Ø
**tai	monophthongisation
te[28]	

(See also the derivation given for acn *woman* < POC *papine in Section 3.2.4.). KSR e *fire* may have evolved from POC *api in a similar fashion.[29]

Among the other changes that must have antedated final vowel deletion are *a-raising, high-vowel lowering, rounding assimilation, and low-vowel dissimilation. The examples below give evidence that all of these rules may have been conditioned by a final vowel which was subsequently lost.

*a-raising

*aŋin/*nsaŋi	eng	*wind*
*laŋi(t)	lucng	*sky, heaven*
*tali	sucl	*rope*
*taŋi(s)	tuhng	*to cry*

high-vowel lowering

*kinta	kuht	*we (1 pl)*
*kuRita	koet	*octopus*
*muta(?)	woht	*(vi) to vomit*
*Ruŋma(?)	lohm[30]	*house*
*nsiwa	yuh	*nine*

rounding assimilation

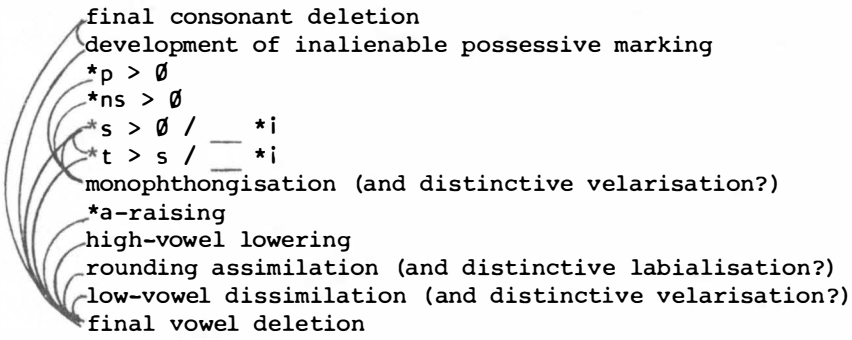
*laŋo		loang	*fly (insect)*
*manu(k)		won	*bird*
*napo	*surf*	noa	*wave*
*taku		tok/tohkoh-/tuku-	*back (anat.)*
*tanom/*tanum		toan	*(vt) to press, bury*

low-vowel dissimilation

*madama	mahlwem	*moon*
*mata	muhta-/mwet	*eye, face*
*ŋmata	wet/wat	*worm*

No evidence can be found in the data to order the various other consonantal changes with respect to any of the rules described in this paper. This includes the loss of *? and *R, and the various replacements (*d > l, *nd > sr, etc.). The development of distinctive velarisation and labialisation may be connected with low-vowel dissimilation (and monophthongisation?) and rounding assimilation, respectively. The development of glides in KSR warrants another paper in itself.

The following schema sums up what we have been able to observe about diachronic rule ordering in KSR (following the old transformational-generative convention, pairs of rules that can be ordered with respect to each other are connected by lines):



unordered with respect to the above:

other consonantal changes
(*? > Ø, *R > Ø, *d > l, *nd > sr, etc.)
development of glides

late or synchronic:[31]

reduplication
-i transitive derivation
etc.

5. UNANSWERED QUESTIONS

It is difficult to come to any conclusions in a paper of this sort. No general questions have been asked or answered, only the specifics of how the various phonemes that have been reconstructed for POC appear to be reflected in KSR. With a sample as small as that used for this paper, it is not easy (or

perhaps all too easy) to generalise from the data. Clearly more work needs to be done, both synchronic and diachronic, before we will know enough about the evolution of KSR phonology to be able to attempt a clarification of relationships between KSR and other MC languages.

Many of the unanswered — perhaps unanswerable — questions about the history of KSR concern the amount of variation in the phonology and the multiple reflexes of the various POC phonemes. We have speculated about the possibility of dialect mixing and/or borrowing from as yet unidentified sources. These are among the areas in which work needs to be done.

POSTSCRIPT

Since the time when Kee-dong Lee wrote the original version of this paper, much work has been done in both synchronic and diachronic MC and OC linguistics. I have access to the KSR dictionary and reference grammar which Lee did not complete until well after he wrote his term paper for Professor Grace's course. The one thing that still is lacking is a good description of the synchronic phonology of KSR. Many of the questions raised but not answered in this paper will not be resolved without an understanding of the underlying representations of the synchronic forms involved. The orthography used in the dictionary is adequate for most purposes, but it is not phonemic.

I have been attempting to attack the KSR problem from both sides, synchronic and diachronic. The small samples of KSR speakers with whom Lee and I have worked do not allow us to solve the problem of synchronic variation. We recognise that variation exists and suspect that it may lie behind some of the complications in the phonological system. Perhaps if it were possible to sort out the variation, it might be possible to establish a 'core' phonological system shared by all KSR speakers, from which individual speakers may deviate in idiosyncratic (?) ways. No one has ever found much evidence for local dialect variation in present-day KSR, although such variation probably existed in pre-European contact times, as in most other Micronesian speech communities. The historical records are poor. It most likely never will be known exactly what happened to the population of Kosrae as it dwindled from early estimates of 2000 - 5000 to less than 200 native Kosraeans in 1880. A recent count gives a population of 4900, but does not specify how many of these are native Kosraeans. However many native Kosraeans there may be at present, they are almost certainly not distributed according to the original precontact dialect groups. In the absence of extensive written records, the only information available is whatever might have been passed via oral tradition — including, of course, the language itself. To my knowledge no one has attempted any thorough study of the oral traditions of Kosrae. It will soon be too late — if it is not already too late — to do so. The younger people are not learning either the old ways or the old language. Both the society and its language have been changing rapidly. The lexicon is the most obvious aspect of this linguistic change, but informants note differences in pronunciation between older and younger speakers (cf. Lee 1975:391-392). No observations have been made of differences in syntax, but that is not to say that such differences may not come to light.

There is another possible explanation for some of the variation in KSR — that is, that present-day KSR may reflect a mixed linguistic heritage, not merely in terms of dialect mixing, but also mixing in elements from some other language (or languages?). This is not necessarily to say that KSR is a 'mixed language' — any more than is a language such as Rotuman (Biggs 1965).

I have begun re-examining KSR reflexes of POC phonemes using a larger sample than was available to Kee-dong Lee in 1972. The reconstructed POC lexicon is considerably larger than it was then, and by being more flexible about cognacy — at least as a first step — than Lee allowed himself to be, I am finding that KSR has multiple reflexes of many POC phonemes. Of these, there often is one that might be considered the 'regular' reflex. It seems to be the most frequent and generally agrees with the reflexes in the other MC languages. Of the minor reflexes, a few can be explained away as sporadic changes, but there are others that occur too frequently to be so lightly dismissed. A preliminary examination of these 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. The next step is to take the entire corpus of POC reconstructions available to me and examine the KSR reflexes of that set. If my preliminary findings are borne out by the larger set, KSR will join Rotuman as another definitely identified case of direct and indirect inheritance in OC. Unlike the Rotuman situation, however, the source of the indirect inheritance in KSR is not particularly evident. The suspect forms do not immediately call to mind any other MC language. Nor do they look especially Polynesian, although Nukuoro and Kapingamarangi — and Kiribati — testify to the presence of Polynesians in Micronesia. Nauruan is a possibility which needs to be examined more closely. The next most likely candidates lie in Melanesia, but not much is known about many of these languages.

In terms of the nuclear Micronesian languages as a group,[32] sorting out the different sets of KSR reflexes may help to clarify relationships within the group. Subgrouping within the putative MC group has been relatively shallow. The relatedness of the Trukic languages is apparent even to the non-specialist, as is the relation between Ponapean, Mokilese, and Pingelapese. Among Micronesianists there is a general impression that KSR is most closely related to the Ponapeic languages, but this has never been demonstrated systematically. Perhaps I will eventually manage to do so.

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December 1981

NOTES

1. The original version of this paper was written by Kee-dong Lee in May 1972 for a University of Hawaii seminar on historical-comparative Micronesian linguistics conducted by Professor George W. Grace. Since that time Lee has published a *Kusaiean-English dictionary* (Lee 1976) and a *Kusaiean reference grammar* (Lee 1975). However, he never did write the definitive phonology of Kosraean that might have resolved some of the unanswered questions in this paper.

   Judith Wang took up the study of Kosraean in 1977, after Lee was obliged to return to his native Korea, hoping to find the key to the phonology that had eluded Lee. In the interval between Lee's departure and Wang's arrival on the Micronesian linguistic scene, considerable progress had been (and continues to be) made in historical and comparative Micronesian linguistics, some reports of which appear in this volume.

   The present paper is Wang's revision of Lee's original work. Since Wang has not yet succeeded in untangling the synchronic phonology of KSR, this paper must necessarily reflect the analysis presented in Lee 1975. Moreover, owing to limitations of time, additional historical-comparative data not available to Lee in 1972 have not been systematically incorporated, although occasional reference is made to such data.

2. It should be noted, however, that there is some question as to the nature of two of these vowels. Native speakers seem to disagree about the sounds spelled uc and uh. Lee (1975:13-14) indicates that these are distinct vowels, but that uh may alternate with uc under certain conditions. Most words, however, containing one or the other clearly have the one or the other without alternation. The dictionary (Lee 1976) makes no mention of variation between the two sounds.

   However, not all KSR speakers seem to agree with the dictionary. Wang's two principal informants are quite consistent in distinguishing between the sounds spelled uc and uh. For both uc is somewhat higher and has a noticeable diphthongal quality in careful pronunciation. These two speakers generally seem to agree with each other as to which words have uc and which uh. However, their judgments do not wholly agree with those of the KSR speakers who served as consultants for the dictionary. A larger sample of speakers will have to be consulted before any resolution can be expected to this problem.

   The sequence of letters oa actually represents two possibilities in KSR. One clearly is a sequence of two vowels [o:a:] — e.g. toasr [to:a:ṣ] *heavy, sad*. No further attention will be paid to these forms. The other possibility is the troublesome — and interesting — one. For the purposes of the reference grammar Lee treated oa as a vowel among other vowels. However, Lee's own statements (Lee 1975:15-16) indicate that oa appears to be a diphthong rather than a unitary vowel. The behaviour of Wang's KSR consultants appears to be consistent with oa being a diphthong: only one speaker ever pronounced it as a unitary low back rounded vowel, and did so only as a careful (elicitation) pronunciation. Both this speaker and one of the others alternated between a careful diphthong pronunciation [oa] and a casual pronunciation in which the first part of the diphthong appears to have been lost [a:]. A third speaker consistently gave a low back unrounded vowel [a:] and only evidenced awareness that this vowel might be rounded for some other speakers when questioned directly about it. See Section 2.9. for further speculation on this question.

3. For the purposes of this paper Micronesian (MC) means nuclear Micronesian as defined by Bender (1971).

4. Lee (1975) distinguishes between a dental lateral /l/ and /r/, which is described as a palatal flap. Wang finds no evidence that KSR r is ever pronounced as a flap by native speakers. Rather, it is a voiced, retroflexed palatal continuant, more strongly retroflexed than in most varieties of American English, but not unlike the Beijing (Mandarin) r.

5. This n reflex of POC *t occurs in only one form, KSR ninac *mother* (< POC *tina), and is most plausibly explained as a sporadic change.

6. *d and *(dr) are regarded as liquids for the purposes of this paper on the basis of their reflexes in KSR. The KSR reflex of *nd is not a liquid but a fricative sr, with the same strong retroflexion as KSR r.

7. *R is not reflected as a liquid in KSR; however, it is included among the liquids because it appears to be reflected as some variety of r or other liquid in some other OC languages.

8. The alternation in the stem vowel of this and other so-called 'inalienable' nouns (i.e. those for which possession is marked by the direct suffixation of the possessive marker, rather than by a following 'classifier' marked for possession) appears to be morphologically conditioned in the synchronic grammar. It is possible that such alternations were at one time conditioned by the final vowel of the possessive suffix, but this conditioning factor was lost when a (historical) rule of final vowel deletion came into the language. There is no synchronic evidence for the retention of historical vowels, even in underlying forms. The variation one is apt to encounter within a single possessive paradigm, as well as the competition between alternative paradigms for the same noun, both testify to the present fluctuating state of KSR morphophonemics.

9. This may be the same formative as in kihfihnte *saltwater* (< kof *water* + ligature (?) + te *sea, salt water*).

10. See Sections 2.8. and 2.9. for discussion of distinctive velarisation and labialisation in KSR.

11. Grace (1969) uses the convention of writing two or more segments within parentheses to indicate that there is evidence for each of the alternative reconstructions, but that the evidence does not appear to favour one over the other(s).

12. Note also PUL ŕ, cc, STW rh, ch, CRN rh, tch < PMC *t', which also happens to be the source of KSR sr. Also CRL geminate sch → tch, and WOL geminate sh → cc (< PMC *t').

13. Ward Goodenough (personal communication) points out that the present-day (native) Kosraean population is probably mostly descended from a small group of Christian converts who managed to survive the demographic disasters of the 19th century. An 1880 census count showed approximately 200 (adult?) native Kosraeans, as compared to early European contact estimates of several thousand. The people who survived the various European diseases probably did not reflect the original (precontact) dialect distribution of Kosrae. If, as Goodenough suggests, these survivors formed a single Christian convert community, there is every likelihood that the speech of that mixed community would have undergone dialect mixing and levelling. The considerable variation in present-day KSR, as well as the lack of systematic dialect distinctions, may well be the result of such a situation.

14. Two asterisks (**) preceding a form indicate that it is not attested.

15. The order of the rules here is quite arbitrary. There is no evidence as to which order these developments occurred in historically.

16. The same one of Wang's informants who consistently unrounded oe also unrounded the stop in the word intoe *to look*. When shown the written word, this speaker did not recognise it at first and commented that he did not know that there was supposed to be an o there. No trace of lip-rounding was observed when this speaker was asked to pronounce this word, but his pronunciation of other words containing the orthographic sequence of a consonant followed by oac consistently included the phonetic sequence [wɛ] and the preceding consonant appeared to be rounded.

17. Furthermore, a similar problem may exist with respect to the distinctively velarised consonants so glibly summed up in the preceding section (2.8.). That is, it may be that these ought to be analysed synchronically as an underlying plain consonant (which becomes non-distinctively velarised) preceding a high back (central?) unrounded glide. The diachronic version of this analysis would be that the back quality of the vowel was separated from the vocalic nucleus through diphthongisation and that the glide (at least the backness represented by the glide) was subsequently assigned to the preceding consonant. The apparent association between low-vowel dissimilation and distinctive velarisation may be explainable as a transfer of the quality of backness from the vowel to the preceding consonant, with simultaneous or subsequent raising of the now-front vowel. Even the case of twem *(vt) to sew* (< POC *tasimi), while evidently not involving low-vowel dissimilation, still may be analysed as a transfer of the quality of backness from the *a to the preceding consonant.

    All this is pure speculation, of course, that would have to be fitted somehow in a coherent analysis of KSR phonology before it can be used to account for anything.

18. This KSR form probably ought to be attributed to POC *muta(?) plus the *-i transitive suffix, which may have conditioned a different set of changes before it was lost through final vowel deletion.

19. The difference between this and the form woht (also attributed to POC *muta(?)) is that wihte is transitive and properly ought to be attributed to POC *muta(?) + -i.

20. The *(ou) in the reconstruction indicates that the available reflexes of this proto-form do not point unequivocally to either of these vowels, merely that it must have been one or the other of them. KSR seems to point toward *o (see Section 3.1.4.).

21. As pointed out in Note 2, there appears to be some confusion among native speakers regarding the vowels spelled uh and uc. The uh spelling is the one given in the dictionary; the uc spelling was offered by one of Wang's KSR consultants.

22. KSR uh in words like muhta- (< POC *mata *eye, face*) and tuhma- (< POC *tama *father*) does not seem to be so much the result of historical low-vowel dissimilation as of synchronic stress patterns. Both of these words are stressed on the second syllable, suggesting that the uh in the first syllable may be the result of vowel reduction.

23. The word rules is used here solely for reasons of convenience. It is not meant to imply any particular theoretical position with regard to the nature of rules and how (or even if) they should be formalised.

24. See Section 1.3. or Lee (1975:30-32) regarding (synchronic) vowel length in KSR.

25. See Note 22.

26. See Section 2.9.

27. Obviously, these derivations are merest speculation, serving only to sketch out possible paths of development from the reconstructed POC form to the currently-attested KSR form.

28. Presumably final vowel deletion did not apply to monosyllables, or if it did, it produced short vowels that were then lengthened again by monosyllabic lengthening.

29. There is an equally plausible alternative derivation for at least the forms te (< *tansi(k)) and e (< *api), involving *a-raising, loss of *ns/*p, and final vowel deletion. That derivation will not work for acn (< *papine), however, because the *i that would condition *a-raising is not in word-final position and would require an additional rule to delete it. It was to account for forms like *papine and *tasimi (> twem) that the rule of monophthongisation was proposed.

30. If this form is not a borrowing.

31. See Lee (1974) for a description of these and other verbal derivation rules which also play a role in the evolution of the KSR forms under consideration. One would expect that there would be a corresponding set of synchronic phonological rules, but the phonology has resisted all attempts to date at systematic description.

32. This presupposes the existence of a distinct nuclear MC subgroup within Oceanic. However, the group described in Bender (1971) has never been clearly defined in terms of a set of exclusively shared innovations.

POC RECONSTRUCTIONS

Most of the reconstructions listed below are taken from Grace 1969. Those taken from Blust 1972 are prefixed with a B, those inferred from Dyen 1949 with a D.

POC	KSR	
D*anitu	inut	*ghost, spirit*
*?anusi	acni	*to spit*
B*aŋin (also *nsaŋi) *yellow*	eng	*wind*
*aŋoaŋo	ahng	*kind of plant: turmeric*
*api	e	*fire*
*?aRu(s)	acsr	*current, stream*

*ʔate		esyac-/acsyac-	*liver*
*ʔatoluR		ahtro-	*egg*
*daʔa(n)		lah	*branch*
*ndanu(m)	*fresh water, bathe, mix with liquid*	sroano-	*liquid*
*ndau(n)		sra	*leaf*
*doŋo/*ndoŋo		lohng	*to hear*
*dua		lo/luo/lu-	*two*
*inu(m)		nihm	*(vt) to drink*
*kali		kuhlkuhl	*(vi) to dig*
*kianto		kiyacs	*outrigger boom*
*ŋkinit		kihnis	*(vt) to pinch*
		kihnkihn	*(vi) to pinch*
*kinta		kuht	*we (1 pl)*
*kuli(t)		kolo-/kulu-	*skin, bark*
*kuRita		koet	*octopus*
*kutu		kut	*louse*
*laŋi(t)		lucng	*sky, heaven*
*laŋo		loang	*fly (insect)*
*lima		luhm-/lime-	*five*
D*madama		mahlwem	*moon*
*manu(k)		won	*bird*
*manipi(s)		mihnini	*thin*
*mapo		mah	*heal*
*mata		muhta-/mwet	*eye, face*
*ŋmata		wet/wat	*worm*
*matolu		mahtol	*thick*
*matudu(R)		mutul	*to sleep*
*maʔudi(p)		moul	*alive, life*
*-mu		-m	2 sg poss suff
*muta(ʔ)		wihte	*(vt) to vomit*
		woht	*(vi) to vomit*
*napo	*surf*	noa	*wave*
*natu		nahtuh-/nuhtV-	*child*
*niu(R)		nu	*coconut*
*ŋapulu(ʔ)		si-nguhul	*ten*
*onom		on-/ohn-	*six*
*pai-		a-	reciprocal pref
*paka-		ahk-	causative pref
*pakiwak		pahko	*shark*
*panua		acn	*land*
*paŋ(ou)(n)		pahngon	*(vt) to call*
		pahngpahng	*(vi) to call*
*papine		acn	*woman*
*patu		yot	*stone*
*mpaya		pa	*bait*
*mpeŋka		fak	*bat, flying fox*
*pi(dr)i		ir	*twist*
*pitu		it-	*seven*
*pituʔu/*pituʔo(n)		itu/itih	*star*
*mpo		fo	*smell*
B*mponot/*ponot		fonos	*(vt) to block, plug*
		fohnfohn	*(vi) to block, plug*
*mpoŋi		fong	*night*

*mpou	
*mpule	
*mpulu(t)	*gum, sap, pulp, glue, sticky*
*punu(ʔ)	
*puti/D*punti	
*mputo	
*Ruŋma(ʔ)	
*sae(t)/*sai/*sei	
*nsai	
*nsakaRu	*reef*
*sake/*nsake	
*nsaŋi (also *aŋin)	
*si(dr)i(t)	
*sili	*to enter*
*nsiwa	
*sulu	
*susu	
*taku	
*tali	
*tama	
*tanom/*tanum	
*taŋi(s)	
*tansi(k)	*sea, saltwater, salt*
D*tasimi	*sharpen it*
*tia(n)	
*tina	
*tolu	
*topu	
*tudu(ʔ)	
*tuki	
*tuʔu(d)	
*ʔulo(s)	
*ʔuluŋa	*pillow, head rest, to rest one's head*
*ʔuma	
*ʔumu	
*ʔuna(p)	
*ʔutup	*to flood, draw water, fill with liquid, soak*

fo	*post, pole, stick*
ful	*kind of shell: cowry*
fulus	*(vt) to paste, gum*
fulful	*(vi) sticky, gummy, adhesive, viscous, juicy, sappy*
uni	*to hit, kill*
usr	*banana*
fuht/fihtac-	*navel*
yuwac-/iwac-	*house, shelter, place*
lohm	*house*
se	*(vt) to tear*
suc	*who?*
tuhka	*island*
-yak/-ack	dir suff: *up, upward*
eng	*wind*
iri	*(n) masturbation*
irii	*(vt) to masturbate*
il	*to come, go, move*
yuh	*nine*
sul	*torch*
titi-	*breast*
tok/tohkoh-/tuku-	*back (anat)*
sucl	*string, rope*
tuhma-	*father*
taun	*(vt) to bury*
tatuh	*(vi) to bury*
toan	*(vt) to press, bury*
toatoa	*(vi) to press, bury*
tuhng	*to cry*
te	*beach, seaside*
twem	*(vt) to sharpen*
twetwe	*(vi) to sharpen*
(in-)siyac-	*belly*
ninac	*mother*
tol-	*three*
tuh	*sugarcane*
tul	*drip, drop*
tuk	*(vt) to pound*
tuktuk	*(vi) to pound*
tu	*to stand*
ulac	*maggot*
ilung	*(vt) to prop, support, rest*
ilul	*(vi) to rest, prop* *(n) pillow*
imac	*garden, field*
um	*earth oven*
unac-/une-	*fish scale, feather, fur, body hair*
uti	*(vt) to fetch water, draw water*
ut	*(vi) to fetch water, draw water*

*waka	okah	*root*
*walu	oal-	*eight*
*waRo	ah	*string, line, rope*

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