

Chapter V

Sound Correspondences and Sound Changes

In Kui, Bruu and So

There may be agreements and disagreements in languages having similar word and syllable structures and register, consonant, and vowel systems in terms of contrasts and number of phonological units. However, one question that can perhaps decide how closely the languages are genetically related is whether, for these units, there are systematic correspondences. That is, for a particular unit do the languages systematically agree in having $X : X : X$, or is the correspondence $X : Y : X$ or $X : Y : Z$?, in which one language or all the languages disagree.

For languages thought to be genetically related, phonological comparison - the comparison of units within systems rather than in isolation - requires the use of lexical items called cognates, words which the languages are assumed to have inherited from a common source, i.e. a proto or "mother" language that existed some time in the past before the "daughter" languages under consideration separated. It is only through the comparison of cognates that one can discover any systematic phonological agreements or disagreements among languages. Then, one may be able to posit explanations for these agreements and disagreements - these sound correspondences - by proposing reconstructed forms and describing sound changes that have taken place in the daughter languages.

Thus, as a further and perhaps more precise procedure in comparing the phonological systems of Kui, Bruu and So in order to de-

termine how closely they are genetically related to each other, I will present sound correspondences, which I think will better help reveal their relationships, for consonants and vowels in presyllables, and for initial consonants and consonant clusters, final consonants and consonant clusters, vowels and registers in main syllables. The sound correspondences will be illustrated by cognate sets as the available data allows.

The format of the presentation will comprise the following:

- a. a statement of the sound correspondence in formula form, e.g. t- : t- : th- , where the first sound is Kui, the second Bruu and the third So.
- b. cognate sets, in the same order as a., to illustrate the sound correspondence, each followed by a gloss.
- c. where pertinent, explanation and discussion of the sound correspondence(s), proposed proto forms and sound changes, conditioning factors, etc.

5.1 Consonants and Vowels in Presyllables

Since there are so many possible consonant and vowel combinations for the cv(c)- presyllables, a thorough treatment of sound correspondences among them and presentation of cognate sets would be unduly lengthy. Moreover, for comparing many possible cv(c)- presyllables it is nearly impossible to find cognates since they seem to have developed independently, for example, from morphological processes, or have come about through borrowing.

For those possible cv(c)- and N- presyllables shared by the three languages, cognate sets are not too difficult to find. It is also not too difficult to find correspondences for these possible presyllables. However, for countless other cognates, it is a monumental task to distinguish but a few definite patterns; marginal patterns

task to distinguish but a few definite patterns; marginal patterns are so numerous that it is difficult to set up sound correspondences.

Thus, as a practical compromise, for the possible cv- and N-presyllables shared by the three languages, namely pa- pha- ka- kha- ta- ca- sa- ma- ra- la- 'a- and $\underset{|}{m}$ $\underset{|}{n}$ $\underset{|}{\eta}$ $\underset{|}{\eta}$, I will present cognate sets to illustrate only the most definite correspondences, when they exist. Cognate sets that illustrate various other marginal presyllable correspondences can be found in the Appendix.

5.1.1 cv- Presyllables

	pa- : pa- : pa-		
pa'ooh	pa'uujh	pa'ujh	'rancid'
	ba- : pa- : pa-		
badh	padh	padh	'to explode'
badaaw	padaw	padaw	'yeast'
	pha- : pa- : pa-		
phasaj	pasaj	pasaj	'sated'
phahaam	pahaam	pahaam	'heart'
	ma- : phar- : pa-		
manaaj	pharnaaj	panaaj	'language'
manaa	pharna	pana	'tomorrow'
	ma- : ma- : ma-		
man ^à aŋ	(m ^à t)manaŋ	manaŋ	'sun'
man ^à h	man ^à ah	man ^à h	'demon'

Among the above correspondence sets, the three languages all agree in 2 cases, only Bruu and So agree in 2 cases, and none of them agree in 1 case.

	(ka-) : ka- : ka-		
ka?uut	ka?uut	ka?uut	'nauseated'
(ka)dia	kadaa	kadaa	'thin'
dah	kadah	kadah	'to crack with teeth'
	(ka-) : ku- : ku-		
(ka)mooc	kumùuj	kumùuc	'ghost'
(ka)tεε?	kutεε?	kutεεk	'earth'
(ka)saj	kusan	kusej	'snake'
	(ka-) : ka- : ?a-		
(ka)sεε?	kasii?	?asiik	'to string'
(ka)jεεt	kajiiit	?ajiiit	'to close eyes'
saac	kasaaj?	?asaac	'to splash water on'
	(ka-) : ka- : ci-		
(ka)neεj	kanεεj	cinεεj	'tooth'
ka tùmup	katùmup	citùmup	'to stomp'
	kha- : kha- : kha-		
khanaat	khanaat	khanaat	'as big as ...'
khanaaj	khanaaj	khanaaj	'possessive (of buffalo)'

Among the preceding sets, the three languages agree in 2 cases, Kui and Bruu agree in 2 cases and Bruu and So in 1 case.

	(ta-) : ta- : ta-		
tapoon	tapùun	tapùun	'to follow'
(ta)kaaj	takaaj	takaaj	'horn'
peh	tapajh	tapɛh	'to flick off'
	(ta-) : sa- : ci-		
tapih	sapih	cipih	'to break'
so?	saso?	cisok	'hair'
tapàn	sapàn	cipàn	'brass'
	(sa-) : sa- : sa-		
sadumrt	sadɣrt	sadɣrt	'convulsions'
sambooc ~	samuuj?	samuuc	'ant'
mhooc			
deet	sadɛet	sadɛet	'pinch'

For 2 sets, the three languages agree; for 1 none of them agree.

	(ra-) : ra- : ra-		
ratəŋ	ratəŋ	ratəŋ	'wall'
mùh	ramùh	ramùh	'name'

	(ka-) : ra- : ra-		
(ka)maat	rapoot	rapoot	'handful'
(ka)naa	ranaa	ranaa	'road'

	la- : la- : la-		
la?ɔɔc	laŋuat	laŋuac	*'fine'

Again, for 2 sets the three languages agree; for 1 Bruu and So agree.

* These words may not be cognate but this is the only cognate set for this correspondence available.

(?a-) : ?a- : ?a-

(?a)baŋ	?abaŋ	?abaŋ	'bamboo shoot'
riaw	?ariaw	?ariaw	'to wash'

This final set, in which all three languages agree, simply illustrates again what is quite obvious from almost all of the preceding cv- sets: the instability of the presyllable in Kui. The following set illustrates how the loss of presyllables in Kui takes another form:

N- : cv- : cv-

nthen	kathin	kathin	'religious festival'
ɲcàh	tajah	tajah	'to walk'
mpùur	tabuur	?abuur	'to wrap in leaf'
(ŋ)ŋèet	laŋèet	laŋèet	'asleep'

5.1.2 N- Presyllables

m- : m- : m-

mpɔ̀l	mpil	mpɔ̀l	'tamarind'
mprèèʔ	mprèeʔ	mprèek	'to carry on shoulder pole'

∅- : m- : m-

blɛɛŋ	mblɛɛŋ	mplɛɛŋ	'arm'
pɔɔj	mpɔ̀vɲj	mpɔ̀vɲj	'to bathe'

n- : n- : n-

ntaŋ	ntaŋ	ntaŋ	'heavy'
ntrùuŋ	ntrùun	ntrùuŋ	'termite'

	$\underset{ }{n^-} : \underset{ }{n^-} : ci-$		
nrèh	nrèh	cih	'(finger) nail'
nrèel	nrèel	cièer ~ l	'egg'
	$\underset{ }{n^-} : \underset{ }{n^-} : \underset{ }{n^-}$		
ncèè	ncAj	ncii	'head louse'
	$\underset{ }{n^-} : \underset{ }{n^-} : \underset{ }{n^-}$		
nchèèr	nsiiŋ	nchèèr	'grease'
nchaac	nsaaj?	nchaac ~ nsaac	'to itch'
	$\underset{ }{n^-} : \underset{ }{n^-} : \underset{ }{n^-}$		
ŋkeh	ŋkeh	ŋkeh	'short'
ŋkèèr	ŋkiiŋ	ŋkiiŋ	'waist'
	$\underset{ }{n^-} : \underset{ }{n^-} : \underset{ }{n^-}$		
ŋhaal	nhaal	ŋkhèel	'lightweight'
ŋhaaŋ	nhaaŋ	ŋkhaaŋ	'bone'
	$\underset{ }{n^-} : (?a-) : (?a-)$		
ŋhaam	?ahaam	?ahaam	'blood'
ŋhaar	haar	haar	'to drag'

Among the N- presyllable correspondence sets, the three languages agree with each other in 4 cases. Kui and So agree in 2 cases, Bruu and So in 2 cases, and Kui and Bruu in 1 case.

The $\underset{|}{n^-} : \underset{|}{n^-} : \underset{|}{n^-}$ set definitely seems to be conditioned by the initial consonant of the main syllable. The fact that Bruu does not have ch- and in So ch- occurs only in nch- leads us to suggest a sound change of *ns- > nch- in Kui*, in the process of

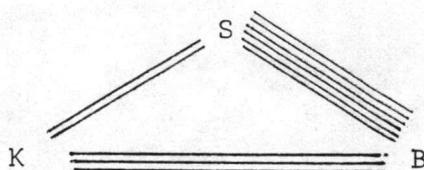
* Proto forms will be identified by * preceding the phonetic symbol representing the proto form, as *ns-; this differs from * used for footnotes.

taking place in So, as indicated by the second cognate set (and several others not listed here) where *ɲch-* varies to *ns-*.

From the above presyllable correspondence sets we find the following number of shared and non-shared sound correspondences:*

Kui-Bruu-So shared correspondences	:	12
Kui-Bruu shared correspondences	:	3
Kui-So shared correspondences	:	2
Bruu-So shared correspondences	:	6
Kui non-shared correspondences	:	8
Bruu non-shared correspondences	:	4
So non-shared correspondences	:	5

Excluding the Kui-Bruu-So shared correspondences and the non-shared ones, these numbers can be represented by lines in the following diagram:



Again, the evidence strongly supports the conclusion that Bruu and So are more closely related to each other than either is to Kui.

* "Shared sound correspondence" refers to a sound correspondence in which one language agrees with one or both of the other languages; "non-shared sound correspondence" refers to a sound correspondence in which one language does not agree with either of the two other languages.

5.2 Initial Consonants and Consonant Clusters in Main Syllables

Sound correspondences and illustrative cognates for initial consonants and consonant clusters will be presented in the following sets and in the following order:

p- t- c- k- ʔ-
 ph- th- ch- kh-
 b- d-
 m- n- ɲ- ŋ-
 s- h-
 r- l- w- j-
 pr- pl- tr- kr- kl-
 br- bl-
 thr-

Since there is virtually complete agreement among the three languages in the sound correspondences for initial consonants and initial consonant clusters, most of the sound correspondences and cognate sets will be presented without comment until the end of this section.

5.2.1 Voiceless Unaspirated Stops

p- : p- : p-			
paj	paj	paj	'three'
pɔɔn	poon	puun	'four'
pʉmrt	pʉmrt	pʉut	'big'
pʉh	pʉh	pʉh	'poison'
t- : t- : t-			
tɛʔ	tɛɛʔ	tɛʔ	'to copulate'
tɔɔm	toom	tuum	'stream'

tia	tia	tia	'duck'
tòoŋ	tòoŋ	tòoŋ	'male(fowl)'
c- : c- : c-			
caa	caa	cia	'to eat'
cuu	cuə	cuə	'Buddhist novice'
cùut	cùat	cùut	'to wipe'
cìh	cìh	cìh	'to ride'
k- : k- : k-			
kat	kat	kat	'to cut hair'
(?a)kaaj	kooj	kooj	'lizard'
kèen	kèen	kèen	'mouth organ'
kùaŋ	kùaŋ	kùaŋ	'gong'
ʔ- : ʔ- : ʔ-			
ʔuuh	ʔuujh	ʔujh	'fire'
ʔaan	ʔōon	ʔoon	'to give'
ʔem	ʔēm	ʔem	'delicious'

5.2.2 Voiceless Aspirated Stops

Most of the following cognate sets with initial voiceless aspirated stops appear to be loans from Lao and/or Thai but, if they are, they are probably very old, borrowed at a time before these Katuic languages separated because they show regular sound correspondences in the three languages. (In comparison, see the next footnote.)

ph- : ph- : ph-			
phoŋ	phoŋ	phoŋ	'dust'
phak	phak	phrak	'vegetable'

phaa	phaa	phaa	'to walk through' *
th- : th- : th-			
thee	thee	thee	'to shave'
thaan	thaan	thaan	'to give change'
thoŋ	thoŋ	thoŋ	'flag'
kh- : kh- : kh-			
kheet	khiit	khiit	'to scratch'
kheet	kheet	kheet	'boundary'
khot	khot	khot	'to coil'
ch- : s- : ch-			

In the only cognates showing this sound correspondence, ch- occurs only in the environment pch- . (See cognate sets under 5.1.2 p̄- : n̄- : p̄-.)

5.2.3 Voiced Stops

b- : b- : b-			
bat	bat	bat	'grass'
bia	baar	baar	'two'
bun̄un̄	bv̄vn̄	bun̄un̄	'to obtain'

* This item is an illustration of Thai/Lao loans with initial f- (Proto Tai *f-) usually pronounced with initial ph- in these languages, as f is not in the regular inventory of consonants. A few others are

ʔaphiin	phin	p̄in	'opium'
fraŋ, paraŋ	phalaŋ	phalaŋ	'Westerner'
p̄iaw	p̄iaw	p̄iaw	'to hurry'

In the last example the Lao f- is from Proto Tai *v- .

d- : d- : d-

dij	daŋ	daŋ	'to know'
diaʔ	dΔΔʔ	dΔʔ	'water'
dool	dool	dool	'to carry on back'

5.2.4 Nasals

Perhaps significantly there are virtually no monosyllabic 1st Register cognates in the data except for probable Lao or Thai loans. Disyllabic cognates with 1st Register main syllables are sometimes available, however.

m- : m- : m-

meɛŋ	m ^h iəŋ	miəŋ	'spicy salad'
kamaat	lamaat	lamaat	'wood borer'
mm ^h ia	m ^h ia	m ^h ia	'rain'
m ^h uh	m ^h uh	m ^h uh	'nose'

n- : n- : n-

kanaj	kunaj	kunaj	'rat'
tanool	tanool	tanuul	'post'
nàw	n ^h àw	n ^h àw	'he, she'
(ʔa)n ^h ua	ʔan ^h ua	cinoo	'while ago'

ŋ- : ŋ- : ŋ-

ŋaam	ŋaam	ŋaam	'emboldened'
ŋàʔ	ŋŋàʔ	(ŋ)ŋàʔ	'sour'
ŋàt	ŋàt	ŋèt	'to stuff'
ŋ ^h uəŋ	ŋ ^h òəŋ	ŋ ^h uəŋ	'before'

ŋ- : ŋ- : ŋ-

ŋɔʔ	ŋɔk-ŋɔɔ	ŋɔʔ	'bent'
(ca)ŋɛɛt	saŋɛɛt	saŋɛɛt	'cold(weather)'

(ŋ)ŋiam	ŋiam	ŋiam	'sweet'
ŋàŋ	ŋàŋ	ŋàŋ	'erect(penis)'

s- : s- : s-

saaj	saaj	saaj	'tail'
sel	siil	siil	'to peel'
sεεm-saaj	sεεm-saaj	sεεm-saaj	'relatives'

h- : h- : h-

haaj	hãaj	haaj	'to flow,leak'
(m)haj	(m)haj	haj	'I,we'
rahεε?	rahεε?	raha?	'torn'

5.2.6 Approximants

The observation made above in 5.2.4 on the lack of monosyllabic 1st Register cognate sets holds true for all of the approximants also.

r- : r- : r-

rèh	rèeh	rèh	'root'
rùaq	rùaq	rùaq	'(small) stream'
saroh	rùh	?arùh	'to take off clothes'

l- : l- : l-

lop	lop	lop	'to return'
lùnun	lùnun	lùnun	'to swallow'
lùu	nlùu	lùu	'thigh'

w- : w- : w-

wàaw	wàaw	(ra)wòo	'to speak'
sawih	sawih	sawih	'chipped'
wiaj	wiaj	wiaj	'to weed'

j- : j- : j-			
jòon	j`uan	jùen	'Vietnamese'
jùh	j`uh	jùh	'to vanish'
jv̄v	j`v̄v	jv̄v	'imperative particle'

J- : j- : j-			
Jih	jih	jih	'to sew'
Jεεη	jεεη	jεεη	'gold'
Juur	joor	juur	'damp'
Jumηη	?ajv̄vηη	jumηη	'foot'
Jial	jεεl	jεεl	'to lick'

In this first case of disagreement, J- : j- : j- , it appears that the occurrence of the Kui initial J- may be conditioned by close and front vowels. However, in Kui this initial also occurs with both non-close and non-front vowels, though there are no cognates to illustrate this.* Thus, the internal evidence of Kui indicates that vowels are not conditioning factors.

Given the lack of any decisive evidence, we must consider two possible sound changes: *J- > j- in Bruu and So; *j- > J- in Kui. For now the question must be left unanswered.

5.2.7 Voiceless Unaspirated Stops + r and l

pr- : pr- : pr-			
praa?	praa?	praak	'squirrel'
proη	prùη	prùη	'pit, hole'

* Except Jɔ? jò? jɔ? 'to suck' which of course is a different sound correspondence.

	pl- : pl- : pl-		
plaa	plAA	plAA	'head'
pluu?	plua?	pluək	'grey(hair)'
	tr- : tr- : tr-		
trii	tria?	triə?	'mushroom'
truuh	truah	truəh	'to pound'
	kr- : kr- : kr-		
kraaj	kraj	kraj	'correct'
kroh	kròh	kròh	'to bark'
	kl- : kl- : kl-		
klaj	klaj	klaj	'penis'
klaa	klaa	klaa	'mollusc'

5.2.8 Voiced Stops + r and l

	br- : br- : br-		
brih	brih	brih	'dust'
bruu	bruu	bruu	'mountain; Bruu tribe'
	bl- : bl- : bl-		
blaŋ	blaŋ	blaŋ	'whisky'
blumr	blAAw	blumr	'to flame up'

5.2.9 Voiceless Aspirated Stop + r

	s- : thr- : thr-		
saj	thraj	thraj	'upland field'
saa	thraa	thraa	'paddy'
səet	threət	threət	'to recede (of water)'

For this sound correspondence, I propose the changes

*sr- > s- in Kui and *sr- > thr- in Bruu and So.

Finally, there are several cases of words with clusters in Kui corresponding to disyllabic words in Bruu and So.

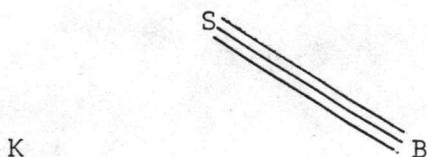
For example:

CC-	cvC-	cvC-	
praŋ	puraŋ	paraŋ	'dry(weather)'
mplùu	manlùe	palùu	'betel leaf'
trii?	taria?	ciriək	'buffalo'
klaaŋ ~ kalaaŋ	kalaŋ	kalaŋ	'hawk'

I can offer no explanation for these correspondences except to say that they could either represent in Bruu and So the instability of some initial consonant clusters (or those in particular words) or in Kui a tendency towards monosyllabic form.

In summary, as stated initially, the virtually complete agreement in sound correspondences for initial consonants and initial consonant clusters provides little to comment on.

However, the two correspondences that show disagreement (J- : j- : j- and s- : thr- : thr-) are both cases of Kui having the non-shared correspondences, and Bruu and So the shared ones. In addition, Bruu and So agree in the correspondence set CC- : cvC- : cvC- . Again, we can represent these shared correspondences thus:



so that the evidence from shared sound correspondences for initial consonants and initial consonant clusters leads us to conclude once more that Bruu and So are genetically more closely related to each other than either is to Kui.

5.3 Final Consonants and Consonant Clusters in Main Syllables

Sound correspondences and illustrative cognates for final consonants and consonant clusters will be presented in the following sets and order:

-p -t -c -k -ʔ -∅
 -m -n -ŋ -ŋ
 -w -j -r -l
 -h -jh
 -wʔ -wh

5.3.1 Stops and -∅

	-p	: -p	: -p	
kap		kap	kap	'to bite'
tɔp		tɔp	tɔp	'to bury'
talɛɛp		nɛɛp	ʔalɛɛp	'sister-in-law'
	-t	: -t	: -t	
mùut		mùut	mùut	'to enter'
bat		bat	bat	'grass'
phɔt		phɔt	phɔt	'to release'
	-c	: -jʔ	: -c	
hooc		huujʔ	huuc	'to sip;
taac		tɔɔjʔ	tɔɔc	'to pick up'
bac		bajʔ	bɛc	'to bud'
ɲàc		ɲàjʔ	ɲɛc	'to squeeze'
(ŋ)ɲàc		ɲàajʔ	ɲàc	'to drink'
bic		bɔjʔ	bic	'to lie down'

It will be noted that the -c : -jʔ : -c sound correspondence is found in various environments: with close and open vowels, with short and long vowels, and with vowels of 1st and 2nd Register.

Here, I propose that the sound shift $*-c > -j?$ has taken place in Bruu, whereas Kui and So have preserved $*-c$.

However, with the short close front vowel $*i$ Bruu seems to have undergone a further shift as indicated by the single cognate set I have found with this vowel:

pec	pi?	pic	'to dig'
-----	-----	-----	----------

although a partial cognate set provides supporting evidence:

-	ti?	tic	'to hurt'
---	-----	-----	-----------

the proposed shift being $*-ic (> -ij?) > -i? . *$

Thus, the proposed change $*-c > -j?$ seems to provide an explanation for the occurrence of the $-j?$ final consonant cluster in Bruu. However, it does not account for all of the words in Bruu with final $-j?$ for there are at least two words in Bruu that have $-j?$ not corresponding to $-c$ in So but to $-j?$, namely:

-	buj?	buj?	'to smile'
-	kuj?-kunj?	kii-kunj?	'very small'

so that in part the presence of $-j?$ in Bruu (and So) appears not to be related to the proposed change $*-c > -j?$. Given the absence of cognates in Kui no further explanations can be offered.

In the following set we can see the developments related to $*-k$ in these three languages.

$-? : -? : -k$

nchaa?	nsaa?	saak	'rice straw'
ty?	taw?	tyk	'to lead'

* The Bruu vowel in the cognate set for 'to lie down' and the So vowel in the cognate sets for 'to bud' and 'to squeeze' will be considered under 5.4.6.4 and 5.4.6.1, respectively.

(?a)lii?	?alii?	?aliik	'pig'
ca?	ca?	ɲcak	'body'

Thus it seems that *-k after both short and long vowels has been preserved only in So, whereas in Kui and Bruu it has undergone the shift *-k > -? . *

-? : -? : -?

bii?	bii?	bi?	'a little'
ɲà?	ɲɲà?	(ɲ)ɲà?	'sour'
wii?	wiə?	wiə?	'work'
(?a)ràa?	ra?	dra?	'to leak (of roof)'

Although there are some discrepancies in vowel length that I can not explain (possible due to secondary lengthening or shortening ?), all three languages agree in retaining *-? .

In contrast, there is another set of cognates that show a different correspondence:

-∅ : -? : -?

tii	tia?	tiə?	'old(things)
trii	tria?	triə?	'mushroom'
taluu	talua?	talue?	'lizard'

where it seems Kui has undergone the change *-? > -∅ after long vowels and has also undergone a shift in register. The significant point is that Bruu and So agree in retaining *-? .

* There is a sound correspondence -k : -k : -k with both short and long vowels but all of the cognate sets appear to be loans from Thai or Lao.

Finally is another sound correspondence in which all three languages are usually in agreement:

-∅ : -∅ : -∅

nrèè	nrèe	nrìi	'pestle'
klaa	klaa	klaa	'testicles'
tamaa	kumaa	kumaa	'year'
lùu	nlùu	lùu	'thigh'

To summarize, Kui, Bruu and So agree in having shared sound correspondences for 4 final consonants: -p, -t, -ʔ, -∅. Bruu has 1 independent development: *-c > -jʔ, which sets it apart from Kui and So, and Bruu and Kui share 1 development which So does not share: *-k > -ʔ. Finally, Kui has 1 independent development: *-ʔ > -∅ (see correspondence set -∅ : -ʔ : -ʔ) which sets it apart from Bruu and So.

Thus, each language has an equal number of shared and independent developments so that the sound correspondences for final stops and -∅ do not enable us to draw any definite conclusions about the relationships among the languages. On the other hand, So is set off by itself in not having undergone the *-c and *-k shifts. On the other hand, Kui shows an affinity to So in not having undergone the *-c shift but an affinity to Bruu in sharing with it the *-k shift.

5.3.2 Nasals

-m : -m : -m

(ŋ)ŋiam	ŋiam	ŋiam	'sweet'
naam	naam	naam	'emboldened'
ʔεm	ʔε̃εm	ʔεεm	'delicious'

-n : -n : -n

cɛɛn	cɛɛn	cɛɛn	'cooked,ripe'
jòon	jùan	jùən	'Vietnamese'
nthen	kathin	kathin	'religious festival'

-ɲ : -n : -ɲ

paɲ	pan	pɛɲ	'to shoot'
duuɲ	duun	duuɲ	'long time'
ntriɲ	ntrin	ntriɲ	'body louse'

Here we have evidence for another final palatal shift in Bruu, $*-ɲ > -n$, no doubt related to the shift in the final stop, $*-c > -j?$, changes which explain the absence of final palatal consonants in Bruu. However, the shift in this case is not to another palatal consonant but to an alveolar one. It also occurs in the environment of both long and short, and 1st and 2nd Register, vowels.

-ŋ : -ŋ : -ŋ

kruuŋ	krùan	krùəŋ	'forest,wild'
pùŋ	pàŋ	p'vŋ	'to depend on'
niàn	niàn	niàn	'chrysalis'

-ɲ : -ŋ : -ŋ

liiɲ	?aliin	liin	'to pour'
teɲ	teŋ	teŋ	'to lay on top of'
sɛɛɲ	sɛɛŋ	sɛɛŋ	'to descend'

For the final velar nasal in the environment of short or long non-front vowels, Kui, Bruu and So show agreement. But after short or long front vowels Kui appears to have undergone a shift to the palatal nasal, $*-ŋ > -ɲ$.

5.3.3 Approximants

-w : -w : -w			
liaw	liaw	liaw	'Lao'
badaaw	padaw	padaw	'yeast'
cɛɛw	cɛɛw	cɛɛw	'spicy sauce'
-j : -j : -j			
(ka)maaj	tamaaj	tamaaj	'stranger'
ntrùuj	ntrùəj	ntrùəj	'chicken'
proj	parùmj	parùj	'caterpillar'
-r : -r : -r			
(ka)moor	kumoor	kumuur	'young girl'
(ka)sɛər	kasiir	?asiir	'to blow nose'
Juur	joor	juur	'damp, wet'
(ka)waar	kuwar	kuwar	'to stir'
-l : -l : -l			
tanool	tanool	tanuul	'post'
sel	siil	siil	'to peel'
tapal	tapal	tapal	'rice mortar'

There is complete agreement among the three languages regarding sound correspondences for final approximants. However, for -r and -l following high (or close) vowels and front vowels there are many cases of disagreement. For example,

tùr	tùur	tùul	'cobra'
kajùur	manjùəl	majùər	'pangolin'
sawiil	sawiir	sawiir	'dizzy'

which show different patterns of agreement.

There are also cases of Kui -? corresponding to Bruu and So -r, e.g.

ʔvʔ	saʔΛʔr	saʔvʔr	'delighted'
saaʔ	saar	saar	'knife sheath'

and the reverse situation:

diaʔ wiir	dΛʔ wiaʔ	dΛʔ wiəʔ	'saliva'
juaʔ	juaʔ	(juaʔ)	'because of'

Finally, there are cases of Kui -∅ corresponding to Bruu and So -r , e.g.

bia	baar	baar	'two'
juu	juer	juer	'to get up'

Although no explanation can be offered for these correspondences, the clear fact is that in the latter 3 sets above Bruu and So invariably agree with each other.

5.3.4 Fricatives

-h : -h : -h

ʔatiih	ntiah	ntiəh	'bland'
ʔah	ʔāh	ʔah	'to ladle'
ntrùh	santrùh	ntrùh	'to fall'
tàah	tàah	tàh	'to slap'

-h : -jh : -jh

(ka)paah	kupaajh	ʔapajh	'cotton'
(ta)loh	talùujh	(tùŋ)lùjh	'navel'
caŋ-ŋkah	sukΛΛjh	cikΛΛjh	'porcupine'
pooh	poojh	pojh	'barking deer'

For the first correspondence set, in which all three languages agree, there are no restrictions on vowel environment, whereas in the second only non-front vowels are in evidence.* Thus, we can

* There are no examples of front vowels occurring with -jh in Bruu and So.

propose that in this environment Kui has undergone the shift $*-jh > -h$, not shared by Bruu and So, explaining the absence of the final consonant cluster $-jh$ in Kui.

5.3.5 Other Final Consonant Clusters

Since the developments concerning the final consonant clusters $-jʔ$ and $-jh$, found in Bruu and So but not in Kui, have been dealt with in 5.3.1 and 5.3.4, respectively, we have remaining two other final consonant clusters: $-wʔ$ and $-wh$, the former found in both Bruu and So, the latter only in Bruu.

For $-wʔ$ items in So, no cognates have been found in the other two languages, but for most of the $-wʔ$ items in Bruu, cognates were found in Kui and So (save 2 gaps), with the following correspondences:

	$-ʔ : -wʔ : -k$		
bʉʔ	bʌwʔ	bʉk ~ bʉk	'wound, cut'
tʉʔ	tʌwʔ	tʉk	'to lead'
hʉʔ	hʌwʔ	-	'sunken'
	$-w : -wʔ : -w$		
haaw	haawʔ	haaw	'high-spirited (of animals)'
-	niwʔ	niw	'kidney stone'

The first set seems to indicate, in Bruu, a $*-k > -ʔ$ shift and diphthongization of short back close and half-close vowels to ʌw [ʌu] in the environment of $-ʔ$. The first shift is shared by Kui (see 5.3.1 above), but the second change is unique to Bruu and partly explains the presence of $-wʔ$ in this language. (The $-wʔ$ in So remains unexplained.)

The second set, along with the word $ʔawʔ$ 'sultry' in

Bruu, can be explained as loans from Lao [haau ɬ[?]], [niu ɬ[?]] and [ʔau ɬ[?]], respectively, in which, interestingly, Bruu has kept the glottalization which accompanies the Lao tones.

For -wh items in Bruu, the sound correspondence is

-h : -wh : -h

buh	bawh	buh	'to roast'
toh	tawh	tùh *	'to pluck'
saroh	sarawh	sarwh	'to come loose'
laʔoh	laʔəwh	laʔɔh	'soft, decayed'

Here we find a vowel shift, again unique to Bruu, which is almost identical to that posited for the -ʔ : -wʔ : -k correspondence set above, in this case taking place in the environment of -h .

Finally, it should be noted that the vowel shifts posited for Bruu in the above two correspondence sets occur in only 1st Register syllables.

To summarize, out of the total number of sound correspondences for final consonants, Kui, Bruu and So agree in 12 out of 15 correspondences. The correspondences that are in agreement comprise -∅ and 3 out of 5 final stops, 3 out of 4 final nasals, all 4 of the final approximants, 1 out of 2 final fricatives. None of the final consonant clusters are shared by all three of the languages.

For final stops, there are 2 developments: *-c > -jʔ and *-k > -ʔ . The former change has taken place in Bruu alone, whereas the latter is shared by Kui and Bruu.

For final nasals, there is 1 development: *-ɲ > -n , again found only in Bruu.

* 2nd Register in the So item is unexplained.

For final fricatives, there is 1 development: $*-jh > -h$, found only in Kui.

For final consonant clusters, Bruu and So share $-jh$ but the developments of the $-w^?$ and $-wh$ final consonant clusters are unique to Bruu.

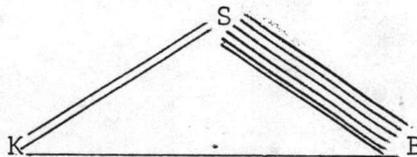
There are several other differences of agreement regarding $-^?$ and $-\emptyset$, $-^?$ and $-r$, and $-\emptyset$ and $-r$. Bruu and So agree with each other in all four cases.

Finally, Bruu and So also agree in having $-\eta$ after front vowels, whereas in Kui $*-\eta$ has shifted to $-n$ in this environment.

Disregarding Kui-Bruu-So shared correspondences, for those shared by two languages, we have

Kui-Bruu shared correspondences	: 1
Kui-So shared correspondences	: 2
Bruu-So shared correspondences	: 6

and represented by diagram:



The evidence from shared correspondences again leads us to conclude that Bruu and So are more closely related than either is to Kui.

5.4 Vowels

As pointed out earlier (in 4.4.2), the possible number of vowel nuclei that could occur in Kui, Bruu and So is very large. Thus, an exhaustive treatment of the vowel correspondences would necessarily be long, detailed and complicated. The presentation of data to follow may not represent an exhaustive treatment but it does represent one possible explanation of the vowel correspondences among the three languages

by focusing on the non-shared correspondences and independent developments of one of the languages in particular, namely, Kui.

At first, the order in which the vowels are considered does not follow the traditional one of *ii*, *ee*, *εε*, etc., but was chosen so as to postulate and explain a series of vowel changes, especially obvious in Kui. Many are restricted to this language, but others are not. Using the supportive evidence in the sound correspondences, some reconstructed vowels are proposed and postulations are made concerning vowel changes that are linked together like a chain so that one change in the system leads to another, and that to another, and so on. As appropriate, observations are also made concerning changes in register, though explanations for these may not be possible.*

It should be pointed out that the order in which the proposed changes are presented and considered does not necessarily imply the actual chronological order in which they took place in history. In other words, the fact that the proposed shift **aa* is presented first does not necessarily mean that it took place first in time, since certainly other changes were occurring in the vowel system at the same time or had perhaps begun earlier, e.g. the lowering of higher vowels in certain environments. Thus, I make no claims concerning the actual chronology of the changes, only the connections and parallels among them. The format of the presentation is more or less the same as that used in 5.1 - 5.3.

* The proposed reconstructed forms are based strictly on the evidence in the correspondence sets for only the languages Kui, Bruu and So; no data from other languages has been considered. In contrast, Diffloth (1982) used data from 7 Katuic languages to establish his reconstructions. Thus the results of my study may differ from his.

5.4.1 a and aa

a : a : a			
paj	paj	paj	'three'
ca?	ca?	ɲcaɲ	'body'
bat	bat	bat	'grass'
à : à : à			
tapàn ~ capàn	sapàn	cipàn	'brass'
làŋ	nlàŋ	?alàŋ	'clear(water)'
ŋàh	kàh	ŋkàh	'side, direction'
aa : aa : aa			
taa?	taa?	taak	'iron'
(ka)naa	ranaa	ranaa	'road'
ɲaam	ɲaam	ɲaam	'emboldened'

For these very common vowels the three languages are in agreement and the following developments can be proposed: *a > a , *à > à , *aa > aa in all three languages.

However, the following correspondence set shows Kui in disagreement:

ia : aa : aa			
(ka)dia	kadaa	kadaa	'thin'
bliaj	blaaj	blaaj	'white'
Jiaŋ	jaaŋ	jaaŋ	'to step across'

so that I propose that in Kui *aa following voiced stops diphthongized to ia .

Other cognate sets indicate that Kui has developed secondary lengthening, *a > aa and *à > àa , in different environments, sometimes shared by Bruu.

aa : a(a) : a

paar	par	par	'to fly'
(ka)paah	kupaajh	?apajh	'cotton'
kraaj	kraj	kraj	'correct'
sadaaw	sadaw	sadaw	'night'

àa : à(a) : à

tapàat	tapàt	tapàt	'six'
tàah	tàah	tàh	'to slap'
(?a)ràaw	?aràw	?aràw	'taro'
nàap	nàp	nàp	'to count'

This secondary lengthening of a and à in Kui is quite common. Is it conditioned by the nature of the finals as it is in Bruu (before fricatives)? It seems not. Is there possibly another explanation?

The fact is that àa in Kui is almost entirely the result of this secondary lengthening, which has also given rise to some àa in Bruu. In addition, both languages have àa in loans from Lao and Thai. But in So there is no àa at all! So that the correspondence set àa : àa : àa does not exist.

How do we account for this absence? Was there no *àa in the predecessor of these three languages? It seems unlikely since aa is by far the most common vowel; certainly it must have occurred with 2nd Register. I propose that *àa did exist and that what happened to it is suggested by the *aa > ia shift proposed above, namely *àa > ìa in all three languages, represented by the following correspondence set:

ìa : ìa : ìa

mmìa	mìa	mìa	'rain'
riaw	?ariaw	?ariaw	'to wash'

n̄iam	n̄iam	n̄iam	'to weep'
n̄iaj	n̄iaj	n̄iaj	'master.'

Furthermore, the secondary lengthening in Kui of *a > aa and *à > àa occurred at least in part to compensate for the "losses" of *aa and *àa, i.e. to fill the gaps in the system left by the *aa > ia and *àa > ìa changes.

5.4.2 ia and iə

I further postulate that in Kui because the ia and ìa resulting from the *aa and *àa shifts merged with pre-existing *ia and *ìa, this ia/ìa diphthong set became overcrowded, leading to an imbalance in this part of the vowel system.

Consequently, in Kui there were subsequent shifts of the pre-existing diphthongs to long monophthongs, namely *ia > ii, *ìa > ii (change in register), and presumably by analogy *iə > ìi. This series of inter-connected changes in Kui may be diagrammed as follows:

$$\begin{array}{l} *aa > ia \longrightarrow *ia > ii \\ *àa > ìa \longrightarrow *ìa > ii \\ \qquad \qquad \qquad *iə > ìi \end{array}$$

*a > aa

*à > àa

The correspondence sets to follow and the illustrative cognate sets reveal not only the proposed latter shifts in Kui but also the developments of *ia, *ìa and *iə in Bruu and So. In Bruu, these diphthongs have been preserved, i.e.

*ia > ia

*ìa > ìa

*iə > iə

In So, the developments have been

*ia > ie

*ia > iə

*ie > iə

ii : ia : ie*

siin	sian	siən	'to rear'
kliit	kliat	kliət	'unlucky'
(?a)ciip	?aciaŋ	?aciəŋ	'elephant'

ii : ia : ie*

(?a)kriim	tariam	tariəm	'millet'
(?a)tiih	ntiah	ntiəh	'bland'
priit	priat	priət	'banana'

ii : ie : iə

m̄iit	m̄iət	m̄iət	'vulture'
w̄ii?	w̄iə?	w̄iə?	'work'
(?a)j̄i(i)l	?aj̄iəl	?aj̄iəl	'small bat'

The immediate question that arises is what about *ie and by analogy with the third correspondence set, the expected ii : ie : iə ? It does exist but the cognate sets show only Thai and Lao loanwords, e.g.

biin	biən	biən	'to lurk'
phiin	piən	piən	'to change'
siip	siəŋ	kiəŋ	'sound'

Another set, ee : ie : iə suggests a different or further development in Kui but I have found only one set of cognates:

ceet	ciət	ciət	'to slice off'
------	------	------	----------------

* Plus another set of only two items in which either the Bruu or the So register is aberrant:

piir	piar	piər	'flower'
trii?	taria?	ciriək	'buffalo'



plus another with So having unexplained 2nd Register:

(?a)teer	tier	t ^h ier	'cicada'
----------	------	--------------------	----------

so that the data is conflicting or too meagre to postulate *iə and its development in the three languages.

5.4.3 a and aa

a : a : a

blaŋ	blaŋ	blaŋ	'whisky'
ɲàʔ	ɲaʔ	(ɲ)ɲaʔ	'sour'
(ŋ)kah	kah	kah	'to chop'
à(a) : à : à			
ŋàŋ	ŋàŋ	ŋàŋ	'erect(penis)'
làh	làh	làh	'to exit'
?aràaʔ	raʔ	draʔ	'to leak(roof)'

Even though a and à are very uncommon in all three languages, restricted to occurrence with final glottal and velar consonants, Kui, Bruu and So are in agreement, and the developments *a > a, *à > à can be postulated. The Kui secondary lengthening, *à > àa, in set 2 seems to be restricted to before ? and h. (The register differences in 'sour' and 'to leak' are unexplained.)

aa : aa : aa

haaʔ	haaʔ	haak	'spear'
(ta)kaaʃ	takaaj	takaaj	'horn'
saa	thraa	thraa	'paddy'

This long vowel is similar to aa in being very common and the development *aa > aa is proposed for all three languages. There is also in Kui an *aa shift to a diphthong similar to that proposed for *aa, namely *aa > ua, and in the same restricted environment, following voiced stops.

ua : aa : aa

buan	baan	baan	'place'
du?	daa?	?ada?	'to put away'

To top off the similarities with aa , the 2nd Register counterpart, àa , is extremely rare in Kui and Bruu and does not occur in So at all, so there is no aa : aa : aa correspondence set.

As in the case of *àa , and for similar reasons, I propose that *aa did exist but in all three languages shifted to the diphthong ùa , paralleling the Kui *aa > ua change proposed above.

The following set represents the result of the *aa > ùa shift.

ùa : ùa : ùa

(ŋ)ùàc	ùàaj?	ùàc	'to drink'
(?a.)rùaj	rùaj	?arùaj	'a fly'
lùam	lùam	lùam	'liver'
plùà?	phalùà?	malùak	'elephant tusk'

In contrast to *à > àa lengthening, however, there has been very little compensatory lengthening of *à to àa to fill the gap left by the *aa > ùa change, and none for *a . But a and à are both rare in the three languages, as mentioned above. However, the following 2 sets hint of other shifts taking place in Kui to compensate for the *aa > ua change: *ɔɔ > aa and *ʌʌ > aa .

aa ɔɔ ɔɔ

ntaar	mantɔɔr	matɔɔr	'star'
?aan	?ɔɔn	?ɔɔn	'to give'
taac	tɔɔj?	tɔɔc	'to pick up'

aa : AA : AA

mana	pharna	pan	'tomorrow'
paan	paan	paan	'above, up- stream'
phahaam	phahaam	phahaam	'heart'

But in one environment, following *d*, the *aa* that developed from **AA* were further diphthongized to *ua*, i.e. **AA > aa > ua*, in a secondary change (of **aa*) discussed above, e.g.

kaduac	kadaaj?	radaac	'to tickle'
	~ radaaj?		
kaduap	kadaap	daap	'below, downstream'

There is a strong possibility that **ɔ̃* was involved in this shift to *ua* also since there is no *ɔ̃* in So and it is very rare in Bruu. Though less rare, some *ɔ̃* in Kui may be due to vowel lowering and/or lengthening, e.g. **ɔ̃ > ɔ̃ > ɔ̃*, especially preceding **-jh*. Thus there is no *ɔ̃ : ɔ̃ : ɔ̃* correspondence set.

5.4.4 ua and uə *

Paralleling the inter-connected changes postulated in 5.4.2, the *ua* and *ua* in Kui arising from the **aa* and **aa* shifts, respectively, caused an imbalance in the vowel system by merging with and overloading the original diphthong set of **ua/*ua*, so that in Kui the latter in turn shifted to monophthongs, **ue* undergoing the same change by analogy, and the reflex of **ua* changing from 2nd to 1st Register. The proposed changes in Kui, Bruu and So

* *ue* has been excluded since all cognate sets seem to be Lao or Thai loans and sound correspondences are irregular, except that Kui always has *uu* or *uu*.

are represented in the following diagrams and correspondence sets.

In Kui:

*aa > ua	*ua > uu
*àa > ùa	*ùa > uu
	*ùə > ùu

*à > àa

*ɔɔ > aa

*ΛΛ > aa

In Bruu, the diphthongs have been preserved:

*ua > ua

*ùa > ùa

*ùə > ùə

And in So the developments have been

*ua > uə

*ùa > ùə

*ùə > ùə

uu : ua : uə

kuuj	kuaj	kuəj	person'
truut	kuat	kuət	'to inspect'
puu?	phua?	phuək	'sunshine'

uu : ùa : ùə

kruuŋ	krùaŋ	krùəŋ	'forest, wild'
truuj	cùaj	cùəj	'cone, funnel'
(?a)kuut	?akùat	kùət	'frog'

ùu : ùə : ùə

jùu	jùər	jùər	'to get up'
ntrùuj	ntrùəj	ntrùəj	'chicken'
tùu?	tùə?	tùək	'boat'

As for the "missing" *uə there is a problem similar to that concerning *iə: conflicting and scanty evidence. Similarly, there is an uu : uə: uə set:

cuu	cuə	cuə	'novice'
kaa suum	?asuəm	?asuəm	'shrimp'

and an oo : uə : uə one:

poo	puə	puə	'to treat, cure'
door	paduər	paduər	'welt'
phoom	mahuəm	phuəm	'fragrant'
sool	suel	-	'loud; to speak'

Given this evidence, we could propose that *uə has been preserved in Bruu and So whereas in Kui there seem to be two developments: *uə > uu and *uə (> uu ?) > oo, the conditioning factors of which remained undetermined.

5.4.5 Long Front (ii ee εε) and Back Vowels (uu oo ɔɔ and uuu ʏʏ ΔΔ)

The sound correspondences to be presented in this section clearly indicate a general lowering of close and half-close long front and back vowels in Kui, which Bruu (except for 3 cases) and So have not shared.

I have no definite explanation for this lowering - perhaps it was conditioned by one or both of the registers or a combination of registers and finals. It may or may not be related to the shifts in Kui of diphthongs to monophthongs: *ia, *i̇a, *i̇ə to ii, ii, i̇i respectively and *ua, *u̇a, *u̇ə to uu, uu, u̇u respectively.

Such a connection is quite possible. On the one hand, one might posit that the lowering of, for example ii to εε, i̇i

to $\epsilon\epsilon$ in Kui, created a lack of high close vowels for which the Kui diphthong shifts to ii and i compensated, thus re-balancing the vowel system. On the other hand, one might argue that the Kui diphthong shift "forced" the lowering of $*ii$ to $\epsilon\epsilon$, $*ii$ to $\epsilon\epsilon$, etc. when the ii vowel position became overloaded. Whatever explanation one chooses, it should be repeated that these and all the previously proposed sound changes may have been taking place simultaneously so that it is difficult to establish a clear cause-effect relationship.

In a few correspondence sets all the languages agree (e.g. i : i : i and u : u : u); in others it is clear that Kui has the lower or lowest vowel and that Bruu and So most often agree with each other. The following sets are presented mainly to demonstrate these obvious patterns. No attempts will be made to propose proto forms for these vowels or to explain changes.

5.4.5.1 Long Front Vowels *

ii : ii : ii

sawiil	sawiir	sawiir	'dizzy'
?ii	?a?ii ~ ?a?Aj	?a?ii	'to ache'
i : i : i			
(?a)lii?	?alii?	?aliiik	'pig'
liiŋ	?aliiŋ	liiŋ	'to pour'

* Other cognate sets for the ii : ii : ii and ee : ii : ii sound correspondences, and the sound correspondences ee : ee : ee and $\epsilon\epsilon$: $\epsilon\epsilon$: $\epsilon\epsilon$, along with their illustrative cognate sets, have been omitted since they all seem to be Thai and/or Lao loans; many also show irregularities.

	ee : ii : ii		
kheet	khiit	khiit	'to mark'
teep	tiip	tiip	'half-closed (eyes)'
	εε : ii : ii		
ηκεεη	ηkiiη	ηkiiη	'waist'
(kha)hεεp	kahiip	rahiip	'centipede'
(ka)sεεr	kasiir	?asiir	'to blow nose'
	èε : ii : ii		
krèε	krii	krii	'to growl'
	εε : ee : ii		
cεεn	ceen	ciin	'ripe'
tεεn	teen	tiin	'to step on'
(ka)cεεt	kaceet	kaciit	'to kill'
	èε : èε : ii		
ntrèε	ntrèε	ntriï	'pestle'
	εε : ee : ee		
(?a)preεt	pheet	preet	'demon'
	èε : èε : èε		
(η)ηèεt	laηèet	laηèet	'asleep'
mprèε?	mprèε?	mprèek	'to carry on shoulder pole'
	εε : εε : εε		
(ka)tεε?	kutεε?	kutεεk	'earth'
Jεεη	jεεη	jεεη	'gold'
kansεn	ransεn	ransεn	'child'

5.4.5.2 Long Back Vowels

uu : uu : uu			
buul	buul	buul	'drunk'
duup	duun	duup	'long time'
ka?uut	ka?uut	ka?uut	'nauseated'
ùu : ùu : ùu			
mùut	mùut	mùut	'to enter'
lùu	nlùu	lùu	'thigh'
ntrùup	ntrùun	ntrùup	'termite'
oo : uu : uu			
sooc	suuj?	suuc	'to sting'
toop	tuup	tuup	'drooping(ears)'
ŋ?oor	ta?uur	ta?uur	'wasp'
òo : ùu : ùu			
(ta)pòol	tapùul	tapùul	'seven'
oo : ùu : ùu			
(ka)mooc	kumùuj?	kumùuc	'ghost'
tapoon	tapùun	tapùun	'to follow'
ɔɔ : uu : uu			
lɔɔc	nlùuj?	luuc	'piece(firewood)'
ŋkɔɔc	kuuj?	ŋkuuc	'charred'
ɔɔ : ùu : ùu			
samɔɔl	mùul	mùul	'shadow'
ɔɔ : oo : uu			
soot	soot	suut	'blind'
(ka)toor	kutoor	katuur	'ear'
poon	poon	puun	'four'

	òò : òò : òò		
kòòʔ	kòòk	kòòk	'upland area'
ròòm	ròòm	ròòm	'to assemble'
tòòŋ	tòòŋ	tòòŋ	'male(chicken)'
	̀̀̀ : ̀̀̀ : ̀̀̀		
l̀̀̀j	l̀̀̀j	l̀̀̀j ^v l̀̀̀j	'to swim'
	ɔɔ : ɔɔ : ɔɔ *		
salɔɔj	?alɔɔj	?alɔɔj	'to float'
talɔɔn	talɔɔn	talɔɔn	'buttocks'
dɔɔl	dɔɔl	dɔɔl	'to carry on back'
	ùùù : ùùù : ùùù		
lùùù	lùùù	lùùù	'to swallow'
jùùù	?ajùùù	?ajùùù	'to raise'
	ʏʏ : ùùù : ùùù		
jʏʏr	tanjùùùr	tajùùùr	'flying lemur'
tamʏʏ	tanùùù	tamùùù	'to fell(tree)'
mumʏʏŋ	kurùùùŋ	tamprùùùŋ	'galangal'
	ʌʌ : ʏʏ : umu **		
sʌʌŋ	sʏʏŋ	sumuŋ	'five'

* See also the aa : ɔɔ : ɔɔ set under 5.4.3.

** See also the aa : ʌʌ : ʌʌ set under 5.4.3.

5.4.6 Short Vowels5.4.6.1 *a > ε and *-jh > -h Shifts in So

The well-substantiated sound correspondences and proposed developments regarding *a, *à and *a, *à were dealt with under 5.4.1 and 5.4.3, respectively. However, besides the more common correspondences a : a : a and à : à : à, other cognate sets show that So has undergone shifts of *a > ε and *à > è before final palatals, *-c and *-ɲ :

bac	bajʔ	bεc	'to bud'
pac	pàjʔ	pèc	'to slash'
ɲàc	ɲàjʔ	ɲèc	'to squeeze'
ntaɲ	tàn	tèɲ	'to beat, poke'
(ka)saɲ	kusan	kaɛɲ	'snake'
sakaɲ	sakan	cikaɲ	'catfish'

and also *-jh:

prah	pràjh	prèh	'to beat, strike'
ʔah	ʔãjh	ʔeh	'a boil'
ɲkah	luɲkajh	lakeh	'brittle'
(ka)tεh	katajh	ʔatεh	'to fling, shake'
bεh	rabajh	rabeɲ	'fishhook'
(ka)lεh	làjh	lèh	'to spring'

so that *-jh evidently conditioned the *a > ε and *à > è shifts just as *-c and *-ɲ did. This is convincing proof that *-jh historically represents a palatal fricative.

But in the latter case, So underwent a second change of *-jh > -h, conditioned by the vowels ε and è, since -jh can not occur after front vowels. The Kui forms indicate that the expected *-jh > -h change occurred in every case and that an

unexpected *a > ε shift occurred in some cases, which at present are unexplained since environmental conditioning does not seem to be a factor. The shift from 2nd to 1st Register in several of the items above is a common pattern for short vowels in Kui (see 5.4.6.3 below).

Obtaining sound correspondences for other short vowels is made quite difficult by the fact that many short vowels, if they occur at all in Kui, Bruu and So, occur only with final glottal and velar consonants (usually only ŋ). The half-close and half-open vowels e o ʏ and ε ɔ ʌ, respectively, of either one or both registers are particularly rare. Not only may cognates not exist but even when they do, they may be sufficient for determining only a few definite patterns

5.4.6.2 Short Vowels in Agreement

Other short vowels for which cognates exist and for which all three languages are in agreement can be seen in the following sets:

i : i : i			
Jih	jih	jih	'to sew'
brih	brih	brih	'dust'
ì : ì : ì			
tapìh	sapìh	cipìh	'to burst'
cìh	cìh	cìh	'to ride'
ù : ù : ù			
jùh	jùh	jùh	'to vanish'
mùh	ramùh	ramùh	'name'
ù : ù : ù			
pùŋ	pùŋ	pùŋ	'belly'

ntrùh	santrùh	ntrùh	'to fall'
mùh	mùh	mùh	'nose'
ɔ : ɔ : ɔ			
lɔp	lɔp	lɔp	'to return'
tɔh	tɔh	tɔh	'breast'
phɔŋ	phɔŋ	phɔŋ	'dust'

5.4.6.3 Lowering and Register Shift in Kui

Some other short vowel correspondences will demonstrate the dominant pattern observed for the long front and back vowels in Kui. In addition, with some short vowels, Kui also appears to have undergone a register shift from 2nd to 1st Register, like that seen in two of the diphthong shifts (*^hia > ii and *^hua > uu) and apparent in some of the long back vowel correspondences. Thus, in some cases both the Kui vowel and register disagree with Bruu and So.

e : i : i			
teʔ	tiʔ	tiʔ	'to criticize'
peh	pih	pih	'to pinch off'
e : i̇ : i̇			
pec	piʔ	pic	'to dig'
è : è(e) : è			
rèh	rèeh	rèh	'root'
takèh	takèeh	takèh	'nine'

The last correspondence set above and the last one below illustrate another obstacle to establishing sound correspondences for short vowels: secondary vowel lengthening, particularly before *^h-h and *^h-jh, affecting almost all vowels, and generally

shared by Kui and Bruu.

ɤ : u̇ : u̇ *			
ɲɤh	taɲu̇h	taɲu̇h	'to breathe'
ɲkɤɲ	ɲk̄u̇ɲ	ɲk̄u̇ɲ	'eggplant'
ɔ : u̇ : u̇			
tɔp	t̄u̇p	t̄u̇p	'to bury'
plɔm	pl̄u̇m	pl̄u̇m	'fat'
o : u̇ : u̇			
poh	p̄u̇h	p̄u̇h	'to beat, thresh'
toɲ	t̄u̇ɲ	t̄u̇ɲ	'deaf'
ò(ɔ) : ò(o) : ò			
lòch	lòojh	lòjh ~ làjh	'wrong'

5.4.6.4 Bruu and Kui Shifts to ʌ

There are two other short vowel shift patterns that are peculiar to Bruu and Kui, both involving shifts of short, close, front and back vowels to ʌ under certain conditions and restrictions.

In Bruu the shifts involve *i occurring before ? and h . The shifts are phonetically to a diphthong [ʌi] ʌj .

e : ʌ : i			
nhe? ~ sane?	nsʌj?	ɲchi? ~ nsi?	'how many'
se?	pasʌj?	pasi?	'to regret'
ceh	cajh	cih	'to give birth'
nteh	katajh	?atih	'to knock against'

* Other correspondences for short back vowels can be found under 5.3.5, where cognate sets are mostly 1st Register but also show lowering in Kui.

This correspondence set is similar to the $e : i : i$ and $e : \dot{i} : \dot{i}$ ones in 5.4.6.3 in that we can propose $*i > e$, $*\dot{i} > e$ in Kui and $*i > i$, $*\dot{i} > \dot{i}$ in So for all 3 correspondences. The distinguishing conditioning factor for the Bruu change $*i > \Lambda$, rather than $*i > i$, would appear to be the main syllable initial consonants, i.e. s and c . Otherwise, the 3 sound correspondences agree in occurring in the environment of initial voiceless stops and usually 1st Register.

A problem arises, however, in the case of 'to knock against' under $e : \Lambda : i$ where the initial consonant is t , rather than s or c , and So has unexplained 2nd Register. Comparing this item with another $e : i : i$ cognate set where the initial consonant is also t ,

n ^h teh	kat ^h Δjh	ʔat ^h ih	'to knock against'
teh	tih	tih	'to fart'

leaves me at a loss for any further explanation of conditioning factors.

For another Bruu item perhaps we must fall back on the simplistic but sometimes forgotten adage: "every word has its own history."

bic	ba ^h jʔ	bic	'to lie down'
-----	--------------------	-----	---------------

Here we find the Bruu $*i > \Lambda$ shift following an initial voiced stop! Moreover, based on the development of $*-c$ in Bruu (dealt with in 5.3.1) and an assumed $*i > i$ development after voiced initials (see the $i : i : i$ correspondence set under 5.4.6.2), we would expect $*bic (> bijʔ) > biʔ$ in Bruu.* My only explanation is that $biʔ$ went

* Compare the explanation for the development of $piʔ$ 'to dig' in Bruu under 5.3.1.

a step further to $b\Delta j?$, paralleling the developments in $ns\Delta j?$ 'how many' and $pas\Delta j?$ 'to regret' in the $e : \Delta : i$ set on page 93. Left unexplained is Bruu $ci?$ 'to sell' (no cognates in Kui or So).

We may have a related development in Bruu of $*ii > \Delta j$ before $-\emptyset$, as evidenced in the following cognate sets:

$?ii$	$?a?ii \sim ?a?\Delta j$	$?a?ii$	'to ache'
tee	$?at\Delta j$	$?atii$	'hand'
$nc\epsilon\epsilon$	$nc\Delta j$	$ncii$	'head louse'

The 2nd Register in the So form for 'hand' is unexplained (but note parallel with 'to knock against' on page 94), as are any conditioning factors other than 1st Register and final $-\emptyset$. In contrast, note the following:

sawiil	sawiir	sawiir	'dizzy'
teep	tiip	tiip	'half-closed (eyes)'
$nr\epsilon\epsilon$	$nr\epsilon\epsilon$	$ntrii$	'pestle'

Finally, it should be further noted that an exactly parallel shift in Bruu of short close back vowels $*u/\text{r}$ and $*u/o$ to $[\Delta u]$ Δw preceding $-?$ and $-h$ was discussed in 5.3.5. This short back vowel shift itself seems to have a related development in a 1st Register long close back vowel shift in Bruu: $*uuu > \Delta\Delta w$ $[\Delta\Delta u]$ preceding $-\emptyset$:

$bluuu$	$bl\Delta\Delta w$	$bluuu$	'to flame up'
$tabuuu$	$tabuuu \sim tab\Delta\Delta w$	$tabuuu$	'evening'
Compare -	$ka?\Delta w$	$?a?uuu$	'to carry (in arms, on hip)'

and in contrast, the 2nd Register vowel development in

$j\grave{u}u$	$?aj\grave{u}u$	$?aj\grave{u}u$	'to raise'.
---------------	-----------------	-----------------	-------------

In Kui the short vowel shifts are to Λ and λ . They are restricted to the environments of final alveolar consonants, $-t$, $-n$ and $-l$, and are as complex as the Bruu shifts to Λ . They usually, but not always, involve short close front and/or back vowels of both 1st and 2nd Registers, and sometimes a shift from 2nd Register to 1st Register. Also, since there are many incomplete cognate sets, it often is difficult to reconstruct the proto vowel with any certainty. Thus, such will not be attempted and I will simply offer some selected representative cognate sets for consideration.

pat	p ^ì t	p ^ù t	'to disappear'
ɲcat	manc ^ì t	mac ^ì t	'ten'
l ^à t	l ^ì t	l ^ù t	'to pull back (foreskin)'
kab ^{an}	kub ^{en}	kab ^{un} ~kub ^{un}	'thick'
mp ^à l	mp ^ì l	mp ^ù l	'tamarind'
lam ^à l	-	lam ^ù l	'cloud'
c ^à l	c ^ì l	-	'to collide'

In conclusion, since Kui has been the focus of various posited vowel changes, it is obvious that it has undergone many independent developments: diphthongization of $*aa > ia$ and $*aa > ua$ and secondary lengthening of $*a$, $*à$ (in part shared by Bruu) and $*à$; the shifts of the diphthongs $*ia$, $*ià$ and $*iè$ to the monophthongs ii and $iì$ and the diphthongs $*ua$, $*uà$ and $*uè$ to the monophthongs uu and $ùu$; the shifts of $*\Lambda\Lambda$ and $*\omega\omega$ to aa .

Kui has also undergone extensive lowering of long front and back vowels, although it does agree with So and/or Bruu on several

long vowels, and all three languages share the *àa > ìa and *àa > ùa changes.

The three languages agree in sound correspondences for only a few short vowels. Otherwise, Kui again indicates lowering of front and back short vowels, usually with a 2nd to 1st Register shift.

In separate developments, So has undergone an *a > ε shift before palatals (in some unexplained cases shared by Kui), and Bruu and Kui have undergone shifts to ʌ, involving more or less the same vowels, but in very different environments.

The proposed vowel changes in Kui, in particular the 2 diphthong to monophthong shifts and the lowering of both long and short vowels clearly set it apart from Bruu and So. Bruu and So agree in not undergoing the 2 diphthong to monophthong shifts but the diphthongs developed differently in each language. They also agree with each other much more often than either of them agree with Kui in regard to both long and short vowels.

Thus, we conclude once again that based on vowel correspondences, Bruu and So are definitely more closely related genetically than either is to Kui.