LANGUAGE, DIALECT AND RIOTOUS SOUND CHANGE: THE CASE OF SA'BAN

Robert Blust

University of Hawai'i

ABSTRACT

Sa'ban (also known as Saban), an obscure and poorly described member of the North Sarawak group of languages, can be shown on lexicostatistical grounds to be a dialect of Kelabit-Lun Dayeh. However, it has undergone extraordinarily rapid and extensive sound changes which have destroyed intelligibility with any of its better-known sister dialects/languages. These changes are surprising for several reasons. First, contrary to universal tendencies, they exhibit a strong pattern of 'erosion from the left' which appears to be at least partly independent of prosody. This canonical feature, as well as the unusual phonetic content of some changes which must have taken place over a very short time, forces us to confront the question whether all sound changes are phonetically motivated. Second, despite many recurrent correspondences with other dialects of Kelabit-Lun Dayeh, these changes exhibit massive irregularity. Finally, sound change has triggered a major restructuring of verb morphology in relation to voice marking. This restructuring has produced not only new patterns of affixation, but also many new problems in relating the members of morphological paradigms to an underlying base of constant shape, and so almost certainly have complicated the task of first language acquisition.

1. **Language and dialect.** The language/dialect distinction has vexed linguists for generations. Under what conditions can we say that two speech communities are dialects of a single language, and when can we say they are

two different languages? Answers to this question have appealed to essentially two types of evidence: 1) intelligibility, and 2) cognate percentage in basic vocabulary. Both types of evidence are problematic, and as will be seen, there is no guarantee that they will agree.

Intelligibility offers a commonsense approach to the language/dialect question: if the speech of two communities is mutually comprehensible the two should be considered dialects of a single language; if not, they should be considered different languages. In many ways this approach is appealing, but in practice it is fraught with complications. First, intelligibility may be non-mutual. The fact that speakers in community A profess to understand speakers in community B is no guarantee that the experience will be reciprocated. Second, intellibility may be delayed. Americans arriving in Australia to live often have difficulty understanding the local dialect for a period of weeks or months, particularly when dealing with certain semantic domains (hardware, automobiles, etc.). But the differences seem to 'wear off' with exposure, and full intelligibility generally is achieved with no special effort on the part of the new arrival. Finally, in chaining or network situations there may be no meaningful or non-arbitrary way to distinguish dialects from languages. If a chain of dialects ABCDE exists such that mutual intelligibility decreases with distance, A and E may be mutually unintelligible, but so long as intermediate dialect gradations exist it is impossible to draw a language boundary anywhere within the chain. However, if dialects B, C and D should become extinct the result would be two languages. Somewhat ironically, in such a situation dialect death can be said to result in language birth.

Another criterion that has been used to define the language/dialect distinction is percentage of cognate basic vocabulary. Dyen (1965) used the expression 'language limit' to mark the boundary between two communities which speak

dialects of a single language vs. two communities which speak different languages. He suggested that the language limit be set at 70% cognation, a figure which reportedly shows a high degree of correspondence with the limits of mutual intelligibility. Wurm (1971:552), on the other hand, as well as other linguists working in Australia, have suggested 81% as corresponding closely with the limits of mutual intelligibility.

The belief that a lexicostatistically-defined language limit will tend to correlate closely with the limits of mutual intelligibility is based on the tacit assumption that rates of linguistic change are roughly homogeneous throughout a language: if lexical change is rapid it is unlikely that phonological or grammatical change will be slow, and vice versa. Historical linguists have not made much progress in the study of rates of linguistic change, and the assumption of homogeneity in all components of a language is an article of faith more than a well-established product of carefully conducted research.

With upwards of 1,000 languages that represent the linguistic residue of a generally rapid expansion out of Taiwan over island Southeast Asia and the Pacific during the past four or five millenia, the Austronesian language family offers a vast laboratory for the study of language change. Impressionistically it is not difficult to think of languages in which some components appear to be conservative, but others innovative. Atayal of northern Taiwan is quite conservative in preserving the distinctive system of multiple voice marking known in the Austronesian literature as 'focus', but it is lexically and phonologically highly innovative. Trukese of the eastern Caroline islands of Micronesia, on the other hand — like other members of the large Oceanic subgroup — is grammatically quite innovative, and phonologically extremely innovative, although it is lexically rather conservative. Sa'ban,

spoken in the border region of northern Sarawak and Kalimantan, exemplifies a case of extremely rapid sound change which has run far ahead of lexical replacement and given rise to extensive morphosyntactic complications that surely cannot have facilitated the task of first language acquisition. As a general consequence of these changes Sa'ban must be classified on lexical grounds as a dialect of Kelabit, but on grounds of morpheme structure, phonology, morphology or intelligibility it is clearly a distinct language. The principal aim of this paper is to raise these statements from the level of general impressions to that of well-supported claims.

2. **The linguistic position of Sa'ban.** The Austronesian (AN) family as a whole divides into perhaps ten primary branches. Nine of these branches are represented among the 15 surviving languages in Taiwan (Blust 1999). All of the remaining 1,000-1,200 AN languages outside Taiwan belong to the Malayo-Polynesian (MP) subgroup, which in turn divides into Central-Eastern Malayo-Polynesian (the AN languages of eastern Indonesia and the Pacific exclusive of Palauan and Chamorro), and Western Malayo-Polynesian (WMP), a large collection of MP languages in the Philippines and western Indonesia. Although WMP may turn out to be an innovation-defined subgroup, it is best regarded for the present as a collection of heterogeneous MP languages linked by certain exclusively shared features of verb morphology. The most notable of these shared features is the process of homorganic nasal substitution used to form active verbs from unaffixed word bases, as in Malay /pukul/ 'hit' : /me-mukul/ 'to hit' : /di-pukul/ 'be hit'. Nasal substitution and its complementary process nasal accretion, takes various forms in individual languages. Presumably under the influence of a family-wide disyllabic canonical target, a number of languages in Indonesia have come to form active verbs by nasal substitution alone, without an accompanying

CV- prefix, as with Javanese /buntut/ 'tail' : /muntut/ 'to follow'.

Sa'ban (known to younger speakers as Saban) is a member of a linguistic subgroup which includes most of the languages of northern Borneo as far south as the basin of the Baram river in northern Sarawak. Its immediate ties are with the Kelabit-Lun Dayeh dialect complex, which forms part of a larger North Borneo group:[1]

THE NORTH BORNEO GROUP

1. Sabahan branch: the 30-40 indigenous languages of Sabah, exclusive of recent immigrants from the Philippines such as Ilanun.

2. North Sarawak branch: a collection of perhaps fifteen languages centered in the basin of the Baram river, in the Fourth Division of Sarawak.

2.1. Kelabit-Lun Dayeh: generally divided into two languages: Lun Dayeh ('people of the interior'), also known as Lun Bawang ('people of the country'), spoken in the Fifth Division of Sarawak, bordering Brunei and Sabah, and Kelabit, spoken in many dialect variants around the headwaters of the Baram river and further east into Kalimantan.

2.2. Berawan-Lower Baram: consists of Berawan, a collection of four dialects representing perhaps two languages, and six or seven Lower Baram languages, spoken in the lower course of the Baram river or in coastal settlements such as the town of Miri.

2.3. Kenyah: a collection of several languages and many dialects within them; the basic division appears to be between 'Highland Kenyah' and 'Lowland Kenyah'.

2.4. Bintulu: a single language spoken in the coastal town of Bintulu and neighboring parts of the Fourth Division of Sarawak.

How close is the relationship of Sa'ban to other Kelabit-Lun Dayeh languages? Table 1 reproduces a matrix of lexicostatistical cognate percentages taken from Blust (1984:109), with minor modifications (SAB = Sa'ban, LD = Long Semado dialect of Lun Bawang, BAR = Bario Kelabit, LTT = Tring dialect of Long Terawan):[2]

TABLE 1

Cognate percentages between Sa'ban, Lun Dayeh, Bario Kelabit and Long Terawan Tring (after Blust 1984)

	SAB	LD	BAR
LTT	76	75	81
BAR	83	80	
LD	72		

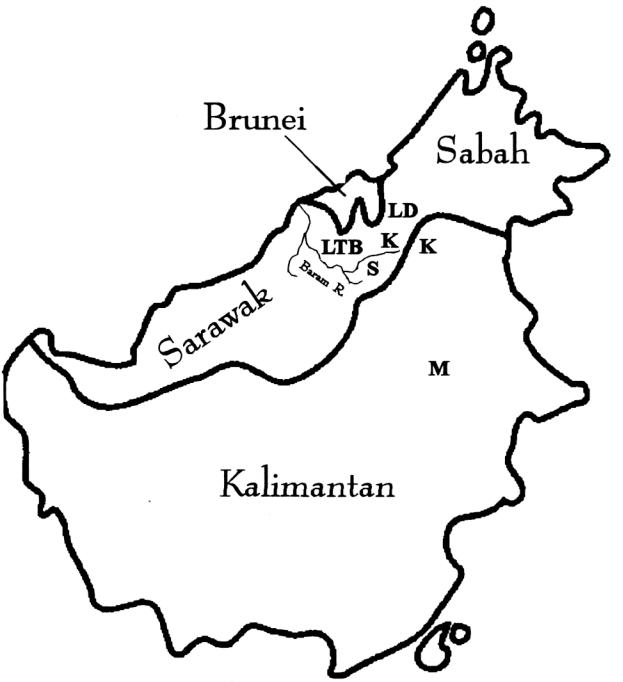
Jollie Udau, the only Sa'ban speaker who I was able to work with, knew Bario Kelabit well, and he materially assisted my task in comparing Sa'ban and Bario by offering the Bario equivalents of many Sa'ban forms. Although it was clear to me that he understood many of the sound correspondences that distinguish the two languages, it is worth noting that Jollie consistently gave *semantic* equivalents regardless of cognation. In this connection it is also worth stressing that I have NOT done cognate searching, but have confined myself to homosemantic cognates in arriving at the figures seen in Table 1. To illustrate, for the Swadesh meaning 'to scratch' I was forced to narrow the sense specifically to 'scratch an itch', since the meaning on the Swadesh list covers several distinct senses, most notably 'to scratch an itch' vs. 'to scratch hard, as a cat'. Sa'ban apparently uses

/lamIt/ 'to scratch' as a general term, but the Bario Kelabit word for 'to scratch an itch' is /ngaro/. Bario also has /nge-ramit/ 'scratch hard, as a cat', which is cognate with the Sa'ban form. Since the test-list meaning is 'scratch an itch' this comparison is discarded.

Despite these controls, over 80% of Sa'ban basic vocabulary turned out to have cognates in Bario Kelabit. In the great majority of cases these are homosemantic cognates, and where they are not, as with BAR /nge-ramit/ 'to scratch hard, as a cat', SAB /lamIt/ 'to scratch (in general)', or BAR /taqeng/ 'mouth', SAB /ta'ang/ 'voice', they were not compared. The cognate percentage of general vocabulary was nearly as high, with figures for Lun Dayeh (Labo Pur 1965) scoring about 10% lower. Although this overwhelmingly common vocabulary was obvious to Jollie Udau, and presumably to many other Sa'ban speakers, it was not to Kelabit speakers. Kelabit speakers from Bario who readily recognized other Kelabit dialects that differed in various particulars from the standard they knew, considered Sa'ban a 'completely different language'. In sharp contrast the reaction of Sa'ban speakers — at least to judge from Jollie Udau — was that they were privy to a great secret, as they could readily recognize the multiple points of common origin linking the two systems. To what extent this awareness was a product of exposure to Bario Kelabit — the lingua franca of the Kelabit dialect region — remains unclear.

3. **Proto-Kelabit-Lun Dayeh.** Dialects of Kelabit-Lun Dayeh are spoken in the Kerayan-Kelabit highlands of northern Sarawak and adjacent portions of Indonesian Borneo, at elevations generally in excess of 3,000 feet above sea level (see Map). Like other indigenous ethnic groups of central and western Borneo, the Kelabit-Lun Dayeh live in longhouse communities typically numbering 200-300 people. Un-

BORNEO



Legend	
K	Kelabit
LD	Lun Dayeh
LTB	Long Terawan Berawan
M	Modang
S	Sa'ban

like most other interior populations of Borneo many Kelabit groups traditionally practiced wet rice agriculture.

The most fundamental ethnographic and linguistic division among these groups has traditionally separated the Lun Dayeh ('people of the interior'), who reside in the river valleys of Sarawak's Fifth Division bordering Brunei and Sabah, from the Kelabit, who reside in the intermontane valleys of the Kerayan-Kelabit highland somewhat further to the south and east. In addition, there are KLD groups which go by other names, as the Tring and the Sa'ban, whose exact affiliations remain in dispute.

The major dialect of Kelabit is that of Bario, an important settlement by local standards located at an elevation of about 3,000 feet near Mt. Murud, and best known through the colorful descriptions of the English adventurer Tom Harrisson (1959). The Bario dialect has high prestige in the Kelabit world, and is known by speakers of most other dialects for some distance around.

Based on the surviving evidence it appears that Proto-Kelabit-Lun Dayeh (PKLD) was spoken about a millennium ago. It is possible that other, more distantly related languages in this group have disappeared, or exist in Kalimantan, but are yet to be described. If so, the time depth for this proto-language may have been greater. There are also some indications that Kelabit-Lun Dayeh and Berawan-Lower Baram shared a common proto-language after the break-up of Proto-North Sarawak.

In examing the historical phonology of Sa'ban the highest language in the AN family tree to which reference will be made is Proto-Malayo-Polynesian (PMP). Like other North Sarawak languages PKLD had a typologically rare series of

true phonemic voiced aspirates (not murmured stops). Table 2 shows the development of consonants, vowels and diphthongs from PMP to PKLD (PMP *c = voiceless palatal affricate, *q = pharyngeal stop, *z = voiced palatal affricate, *j = palatalized voiced velar stop, *r = alveolar flap, *R = alveolar trill, *e = mid-central vowel; PKLD *q = glottal stop, *e = mid-central vowel):

TABLE 2

Development of consonants, vowels and diphthongs from Proto-Malayo-Polynesian to Proto-Kelabit-Lun Dayeh

PMP	PKLD
p	p
t	t
c	h
k	k, -q-
q	-q-, -q
b	b, bh
d	d, dh
z	d, dh
j	d, dh
g	g, gh
s	h, zero
l	l, r
r	r
R	r
w	w
y	y
a	a
e	e
i	i
u	u
-ay	-ay

-aw	-aw
-uy	-uy
-iw	-iw

Table 3 shows the PKLD phoneme inventory which resulted from changes to PMP:

TABLE 3

The Proto-Kelabit-Lun Dayeh phoneme inventory

1. Consonants

p	t	k	q
b	d	g	
bh	dh	gh	
m	n	ŋ	
	s		h
	l		
	r		
w	y		

2. Vowels

i		u
	e	
	a	

3. *Diphthongs*

uy	iw
ay	aw

PMP *k underwent a conditioned change to -q- in intervocalic position, but *k elsewhere. There are some exceptions which may point to borrowing. PMP *q (probably a

pharyngeal stop in PMP) merged with zero in initial position, and between unlike vowels the first of which was high (*-uqa-, etc.), but otherwise became glottal stop (written *q in PKLD). The earlier sequences *lVr, *lVR, *rVl or *RVl assimilated to PKLD *rVr.

The most remarkable set of changes in PKLD is the split of the original voiced obstruents into a series of plain voiced stops and a series of voiced aspirates which in Bario Kelabit alternate morphophonemically with their plain voiced counterparts in some morphemes. This development is shared with other North Sarawak languages, where the corresponding consonants are implosive stops (as in Bintulu and Lowland Kenyah dialects), or are noteworthy in other ways, as where Kiput shows /s/ corresponding to Bario Kelabit /bh/. Indeed, the history of these voiced aspirates is also shared with the languages of Sabah, although among these languages the effects of the change are clearly preserved only in the Ida'an languages of the Kinabatangan River basin. This series of consonants has been described elsewhere (Blust 1974a, 1974b, 1993), and will receive no further attention here.

Lun Dayeh dialects differ from Kelabit dialects in retaining three of the four PAN focus possibilities, characteristic of 'Philippine-type' languages, and in retaining a productive reflex of the PAN stative prefix *ma-, as in /me-berat/ 'heavy', /me-buda?/ 'white', /me-sia?/ 'red', /me-kapal/ 'thick, of materials', or /me-dedcem/ 'dark' (where /e/ = schwa). By contrast, Kelabit has only a two-voice system similar (but not identical) to the active/passive contrast of many other languages, and only fossilized reflexes of the stative prefix. Phonologically, Lun Dayeh differs from Kelabit in two noteworthy respects. First, it retains a contrast between *a, *i and *u in prepenultimate (pretonic) syllables. Second, it retains the sequence *ti without change. In Kelabit dialects, including Tring, prepenultimate *a, *i and *u have merged

as schwa except in the passive/perfective infix -/in/- (which varies between-/in/- and -/en/-), and *t has become /s/ before a high front vowel, a conditioned change which has left a residue in the synchronic phonology, as in Bario Kelabit /tabun/ 'a heap' : /nabun/ 'to heap up' : /s-in-abun/ 'was heaped up'. Like other languages of northern and central Sarawak (Blust 1997), the KLD dialects have also developed a system of verbal ablaut in bases that contain penultimate schwa, as in Bario /telen/ 'swallowing' : /nelen/ 'to swallow' : /silen/ 'was swallowed'.

Apart from a few unexplained /s/ reflexes which are difficult to explain as loans, PMP *c and *s disappeared both in Kelabit and in Lun Dayeh, but in intervocalic position Sa'ban sometimes retains the latter as -/h/-. Similarly, both Kelabit and Lun Dayeh have monophthongized the diphthongs *-ay and *-aw to -/e/, -/o/ respectively, but Sa'ban reflects them in complex ways which show that monophthongization had not yet occurred in their immediate common ancestor. These changes show that despite its remarkably innovative phonology, with regard to some features Sa'ban is more conservative than either Kelabit or Lun Dayeh.

4. **Sa'ban phonology**. To understand Sa'ban historical phonology we first need to have some idea of its synchronic system. Table 4 shows a tentative analysis of the phonemes of Sa'ban:

TABLE 4

Phonemes of Sa'ban

1. Consonants

p	t	c	k	'
b	d	j		
m	n		ng	
hm	hn		hng	
	s			h
	l			
	hl			
	r			
	hr			
w		y		

PLUS LENGTH

2. Vowels

i		u
I		U
é		o
ɛ	e	ɔ
	a	

3. Diphthongs

ie			ue
ée			oe
oy	ey	ew	
ay			aw

4. Triphthongs

uey	iew
oey	éew
	oew
aey	aew

Voiceless stops are unaspirated and occur in all positions. /p/ was occasionally heard as a somewhat rounded voiceless bilabial or labiodental fricative (transcribed [f^{w}]). Two phonetic details of the voiceless stops are atypical for languages of western Indonesia and the Philippines: 1) whereas /t/ is dental and /d/ and /n/ alveolar in many of the languages of insular Southeast Asia, in Sa'ban both were recorded as alveolar, 2) stops in final position are clearly released, a very unusual feature. /'/ is the glottal stop, /c/ and /j/ are palatal affricates and /r/ is an alveolar flap. Voiced stops do not occur word-finally,

Sa'ban is strikingly different from other languages in insular Southeast Asia in having both initial geminates and voiceless sonorants. In fact, Sa'ban appears to be unique among the world's languages in having geminate consonants *only* in initial position (Thurgood 1993). Consonants that may occur geminated include all stops except /c/, and /'/. It should be stressed that the term 'geminate' is a phonemic cover term for a phonetically variable class of consonants. Tape-recordings made in the field suggest that /ss/ is a preglottalized sibilant, as in /ssuek/ [ʔsuək] 'short-tailed monkey'. Although the difference between geminated and preglottalized voiceless stops probably could be detected without instrumental aid by observation of the movement of the laryngeal muscles, such observations were not made in the field, and the precise phonetic characterization of the long stops remains unclear. The difference between single and geminated liquids appears to be one of length (simple duration for /l/, and contrast between a flap vs. a 3-4 tap trill for /r/). Geminate consonants occur only initially in monosyllables or in disyllables which contain a -VV- sequence of which the second vowel is an 'extrametrical' schwa, as in /bbéeng/ 'k.o. wild cat' or /jjuek/ 'tobacco'. This schwa is historically secondary, and is transparent to the normal rule of final stress. Ideally it should be treated as non-phonemic, but if it

is not included in underlying representations there does not seem to be any clear way in which it can be predicted. Finally, sequences of identical nasals present a somewhat more complicated picture. The sequence /nn/ occurs within a morpheme in examples such as /nnu'/ 'enemy', but all cases of /mm/ and /ngng/, as well as most cases of /nn/ occur in active verbs where the first nasal can be seen as a prefix, as in /n-naw/ 'to think' (cp. /hnaw/ 'thought'). Since such nasal sequences are separated by a morpheme boundary they must be treated as consonant clusters, not as geminate consonants. Moreover, in all sequences of like nasals, both those which are intra-morphemic and those which are not, the first nasal is syllabic. Since no sequences of like nasals in Sa'ban are tautosyllabic it is doubtful whether true geminate nasals exist in the language.

I recorded the voiceless nasals and liquids only in initial position, although Clayre (1992:212) reports rare examples word-medially. As will be seen, in many cases they alternate morphophonemically with their voiced counterparts.[3]

The most serious transcription problems in Sa'ban are encountered with the vowels, as these sometimes exhibit phonetic qualities which are quite unknown elsewhere in the region. Many North Sarawak languages retain the simple four vowel system of PAN (the vowel triangle plus schwa). Sa'ban has developed a number of novel distinctions, and the exact phonetic values of these innovative vowels are not always clear. Before final dentals /u/ appears to be somewhat centralized, approaching the value of a rounded high central vowel: cp. /lut/ [lɨwt] 'wing' vs. /lewt/ [ləUt] 'peeling'. Although /I/ is common, /U/ is rare, perhaps appearing only in loans from Malay, as /rasUn/ 'poison'. The mid-front tense vowel /é/ is found in penultimate (unstressed) syllables, but is very rare in final (stressed) syllables, where the diphthong /ée/ is far more common. Other phonetic details that merit some notice are that the vowel which I write as

'open o' appears to be centralized, approaching the value of a rounded mid central vowel. Finally, although /a/ and /e/ clearly contrast in forms such as /pat/ 'bottom' vs. /pet/ 'to throw', the two seem to vary freely before final /h/, where I recorded -/eh/ at some times, but -/ah/ at others.

Sa'ban appears to have four centering diphthongs (with mid-central offglide) and four rising diphthongs. Although PKLD allowed diphthongs only word-finally, in Sa'ban they may occur in any final (stressed) syllable, open or closed. As in many of the coastal languages of Sarawak, there appears to be a particular preference for centering diphthongs /ie/, /ue/, etc. before final /k/ and /ng/. In addition, like members of the Lower Baram subgroup of North Sarawak languages, it has a rich system of triphthongs. The phonetic value of /aey/ and /aew/ is all but indistinguishable from [a:y] and [a:w], and is posited here on the basis of pattern symmetry, since there is no unambiguous evidence of length distinctions in the vowels. Gaps are found both in the system of diphthongs (no /éw/), and in the system of triphthongs (no /éey/). Examples of contrast are given in Table 5:

TABLE 5

Evidence of contrast between simple and geminate consonants, voiced and voiceless sonorants, vowels, diphthongs and triphthongs

/peng/ 'paddy dyke'	:	/ppeng/ 'felling of trees'
/tet/ 'back (anat.)'	:	/ttat/ 'to separate, divorce'
/ko'/ 'bracelet'	:	/kkɔt/ 'prop'
/béeng/ 'hole'	:	/bbéeng/ 'k.o. wild cat'
/dew/ 'grass'	:	/ddeu'/ 'seven'
/jeu'/ 'shame'	:	/jjin/ 'plate'
/seu'/ 'to cease'	:	/ssew/ 'gall (bladder)'
/luen/ 'life'	:	/lluen/ 'to roll s.t. up'
/ruel/ 'cluster of fruit'	:	/rruet/ 'to bring down'

/lamIt/ 'to scratch'	:	/hmɛt/ 'heel'
/nah/ 'that, those'	:	/hnah/ 'that way'
/ngal/ 'plank'	:	/hnga'/ 'window'
/lew/ 'head'	:	/hlew/ 'correct'
/roet/ 'vein, vessel'	:	/hrol/ 'egg'
/alit/ 'ear'	:	/anIt/ 'skin'
/anIt/ 'skin'	:	/hmɛt/ 'heel'
/aré' aré'/ 'serrated'	:	/pɛ'/ 'side'
/lepun/ 'smoke'	:	/rasUn/ 'poison'
/ma'on/ 'old (things)'	:	/jInto'ɔn/ 'star'
/pat/ 'bottom'	:	/pet/ 'to throw'
/ajiep/ 'rice sieve'	:	/m-ajéep/ 'to startle'
/kkuet/ 'foot/leg'	:	/ng-koet/ 'to dig'
/aray/ 'to come'	:	/arey/ 'housepost'
/alaw/ 'eight'	:	/blew/ 'feather'
/apuey/ 'fire'	*:*	*/langoey/ 'to swim'*
/éloy/ 'sprout, shoot'	:	/langoey/ 'to swim'
/biriew/ 'wind'	:	/bréew/ 'to chase away'
/m-ray/ 'to dry up (stream)'		/m-raey/ 'to give'

Stress is normally final, but surface contrasts are found in the sequence /ueC/, as in [lúwək] 'spoon' : [luwə́k] 'chest (anat.)', or [luwə́l] 'intestinal worm' : [súwəl] 'woman'. The question of how these stress differences should be marked is a difficult one. Since stress is normally final it is simplest to leave the default case unmarked. However, in the sequence /ueC/ the schwa is extrametrical, and stress is normally penultimate. This leaves oxytonal /ueC/ as the non-default case which requires some kind of distinctive marking. Since these cases are quite rare, rather than use a diacritic I have decided to mark the stress contrast through a contrast of segmental phonemes /ueC/ (paroxytone) vs. /uweC/ (oxytone), hence /luek/ 'spoon', but /luwek/ 'chest'. Alternatively, if phonological conditions could be found to predict the distribution of extrametrical schwa, the former word could be written /luk/ and the latter /luek/. At present,

this type of analyis cannot be adopted, since /uC/, /ueC/ and /uweC/ appear to contrast.

In sum, the following typological contrasts can be identified as distinguishing Sa'ban from other PKLD dialects:

1. STRESS. In PKLD and all of its known descendants other than Sa'ban stress is penultimate. In Sa'ban, as just noted, it is generally final, but may be marginally phonemic, depending upon the interpretation of extrametrical schwa in the sequences -/ieC/ and -/ueC/.

2. CANONICAL SHAPE. In PKLD and all of its known descendants other than Sa'ban canonical shape is CVCVC, where all of the consonants are optional. In Sa'ban it is much more variable, but unlike other KLD dialects it contains many monosyllabic content morphemes. Some of these are of the shape CVC, as /pat/ 'four', /ɔh/ 'right side', /un/ 'leaf' or /wei'/ 'fruit' (with an internal diphthong); others are of the shape CCVC, as /blin/ 'moon', /hmɛt/ 'heel', /hrol/ 'egg', /ddeu'/ 'seven', or /ssuel/ 'woman, wife' (where the last vowel is extrametrical.

3. VOICED ASPIRATES. PKLD had a series of phonemic voices aspirates *bh, *dh, *gh which have been preserved as such in a few of its descendants such as Bario Kelabit. As in some other less innovative KLD dialects, Sa'ban reflects these as simple voiceless obstruents /p/, /s/ and /k/.

4. VOICELESS SONORANTS. PKLD had only voiced sonorants, but Sa'ban has developed /hm/, /hn/, /hng/, /hl/ and /hr/.

5. GEMINATE CONSONANTS. PKLD had no geminates, but these have developed in Sa'ban, where they are found only in initial position: /ppew/ 'sugarcane', /ttay/ 'lower leg', /kkew/ 'node in bamboo', /bbéeng/ 'tiger-cat', /ddeu'/ 'seven', /jjuek/ 'tobacco', /ssew/ 'gall, gall bladder'. As noted already, the nasals are more problematic,

and probably should be treated as consonant clusters even when they occur within a morpheme.

6. VOWELS. PKLD had four vowels; Sa'ban has an undetermined number ranging from at least eight to ten or more.

7. TRIPHTHONGS. PKLD had none; Sa'ban has at least seven.

8. MORPHOLOGY. At the heart of its verb morphology PKLD evidently had a reduced Philippine-type three-focus system (Actor Focus, Patient Focus, Benefactive Focus). This is reportedly preserved in Lun Dayeh (Clayre 1991). In all reported Kelabit dialects, however, it has reduced to a two-way active-passive voice system. The morphology of voice marking falls into two patterns: 1) homorganic nasal substitution, as in Bario Kelabit /dalan/ 'path, road' : /nalan/ 'to walk', 2) ablaut, found only in bases of the form CeCVC (where /e/ = schwa), and effectively only for the passive voice: /pepag/ 'slapping, way of slapping' : /mepag/ 'to slap' : /pipag/ 'was slapped'. In Sa'ban phonological change has skewed the relationships of bases to their affixed forms in often surprising ways, as with /alin/ 'path, road' : /m-alan/ 'to walk', /na'/ 'mother (vocative)' : /hna-n/ 'his mother', /pako'/ 'a nail' : /mako'/ 'to nail' : /i-ako'/ 'was nailed.'

The languages of northern Sarawak — and Sa'ban in particular — came as something of a shock when I began to record them in the field in 1971. I had been misled by the myth of the 'phonetically simple' western Indonesian language, and apart from the special series of phonemic voiced aspirates in Bario Kelabit and their correspondences in other languages had no reason to expect anything out of the ordinary. In this respect Sa'ban gave me a rude awakening, and for many years I hesitated to publish my data on this

language out of concern over possible transcriptional inaccuracies. Inaccuracies undoubtedly remain, but this no longer strikes me as a sufficient reason to withhold publication, as it is unlikely that a better description will become available anytime soon. The history of Sa'ban is simply too fascinating and theoretically important to allow perfectionism to stand in the way of the dissemination of marginally flawed information.

5. **Sa'ban historical phonology**. Very little has been written on Sa'ban. Among the few papers which have targeted the language for special consideration are two by Beatrice Clayre (Clayre 1972, 1992). Both of these studies recognize that Sa'ban is a member of the Kelabit-Lun Dayeh dialect complex, and note the striking differences between it and other KLD dialects. However, inferences about change are made on a purely synchronic basis, as neither paper makes use of linguistic reconstruction. Clayre (1972) is quite preliminary, and is fully superseded by the second publication. Although Clayre (1992) compares Lun Bawang and Sa'ban to show how the voiceless sonorants and geminates probably arose, this paper has very limited aims. There is no attempt to make the description of change in Sa'ban more exact through the association of reflexes with reconstructed forms, and no overall description is given for either the synchronic or historical phonology of the language (there is not even an attempt to provide a list of the consonant and vowel phonemes). Even more seriously, a number of errors appear both in transcription and in interpretation.

The most critical transcriptional error in Clayre (1992) is the persistent confusion of /a/ and /e/ in Lun Bawang (both written /a/), as in /darak/ for /derak/ 'to tear', /pano/ for /peno/ 'to steal', /nakap/ for /nekap/ 'to seek' (this example may be a typo, since Clayre writes the base form /tekap/), /amung/ for /emung/ 'to collect, gather', and /m-aré/ for

/m-eré/ 'to give'. With rare exceptions, ablaut operates only on verb bases with penultimate schwa (Blust 1997), and the Lun Bawang ablaut paradigms in Clayre (1992:213) are unsystematic if her transcriptions are taken at face value. Moreover, if the Lun Bawang forms are taken as the equivalent of reconstructions in the way that Clayre offers them for comparative purposes, the historical treatment of penultimate vowels in Sa'ban is critically obscured by these errors, since low vowels behave differently from non-low vowels in penultimate position. My own transcriptions for the Lun Bawang dialect of Long Semado show /e/ where Clayre has written /a/ in each of the above forms, and this is further confirmed by Bario Kelabit.[4] Errors of interpretation include Clayre's assumption that the morphology of the Sa'ban Undergoer Focus is invariably cognate with that of Lun Bawang rather than a structural reworking of an earlier pattern (213), her failure to recognize that the correspondence of Lun Bawang /t/ to Kelabit /s/ is the product of a regular conditioned sound change *t > /s/ before *i which continues to be synchronically productive in Kelabit (Blust 1974b), and her claim that [l] and [r] are in free variation in Sa'ban (216; as in Tring, they contrast intervocalically, but the contrast is neutralized as /l/ at word margins).

Perhaps the most valuable contribution of Clayre (1992) is its firsthand account of changes in the Sa'ban spoken in Long Banga' as it was recorded in 1967-68, and again in 1991. Not only does the language already have an impressive record of extensive phonological and morphological change, but rapid change appears to be an ongoing process.

5.1. *Preliminary matters.* Kelabit-Lun Dayeh dialects can conveniently be classfied into types based on their reflexes of the distinctive voiced aspirates of Proto-Kelabit-Lun Dayeh. Due to operation of convergent changes there is no guarantee that this classification reflects the historical order of splits, although it probably does in some cases:[5]

PROTO-KELABIT-LUN DAYEH : *bh, *dh, *gh

TYPE 1 dialects: /bh/, /dh/, /gh/ (Kelabit: Bario, Long Lellang; Lun Dayeh: Long Semadoh)

TYPE 2 dialects: /p/, /t/, /k/ (Kelabit: Pa' Mada)

TYPE 3 dialects: /p/, /c/, /k/ (Kelabit: Long Terawan Tring; Lun Dayeh: Long Pala)

TYPE 4 dialects: /p/, /s/, /k/ (Kelabit: Pa' Dalih, SA'BAN)

TYPE 5 dialects: /f/, /s/, /k/ (Kelabit: Long Napir, Long Seridan)

5.2. *The classification of theoretically interesting sound changes in Sa'ban.* Sa'ban historical phonology offers such a wealth of detail and so many challenging problems that one could easily become lost and never see the forest amid the chaos of trees. One fundamental issue which will be deferred to the end is the challenge that Sa'ban presents to the Neogrammarian Hypothesis that all sound change is regular. Before facing this issue, however, it will be useful to provide a classification of theoretically interesting sound changes in Sa'ban in those cases where changes are well-attested and puzzling. The order of presentation in the following sections will thus be:

(1) Change normal, conditions bizarre

(2) Change bizarre

(3) Erosion from the left

(4) Syncope of an unstressed vowel

(5) Unconditioned phonemic splitting = massive irregularity

5.2.1. *Type 1: Change normal, conditions bizarre.* The vowels of PKLD will be labelled V1, V2 and V3 from the end of the word. V1 is thus the last-syllable vowel, V2 the penult and V3 the prepenultimate vowel. Rarely PKLD had morphemes with more than three syllables, and vowels earlier than V3 will be separately labelled as necessary.

RULE 1: FRONTING OF *a1. *a1 was fronted if there was a voiced obstruent anywhere earlier in the word.

Appendix 2 list 209 reflexes of *a1, with the following distributions: 1. *a > /a/ : 107, 2. *a > /ée/ : 27, 3. *a > /i/ : 24, *a > /oe/ : 17, 5. *a > /ae/ : 15, 6. *a > /ie/ : 9, 7. *a > /ei/ : 7, 8. *a > /é/ : 2, 9. *a > /e/ : 1. Fronting of *a occurs in 69 cases (types 2,3,6,7,8). Some of the differences in details of fronting can be explained by phonological conditioning, but for others no condition has yet been identified. What is most important is the general opposition of fronted vs. non-fronted reflexes.

There are 69 cases in which PKLD *a1 is reflected as a front vowel. In 67 of these 69 cases, or 97%, *a1 follows a voiced obstruent, either as the first or second consonant. The fronting of *a1 is thus an almost perfect predictor of an earlier voiced obstruent, with two known exceptions: 1) *liqaw > /lé'éw/ 'clear, of water', 2) *mikat > /ncéet/ 'difficult; expensive'. In /ncéet/ the rare palatal consonant (reflecting *-ikV) may have caused vowel fronting. Table 6 provides a sample of the relevant data to illustrate the condition for fronting of *a. To insure that the sample shows no selection bias I present all recorded reflexes of PKLD *-an. Other relevant data can be found in Appendix 2 (PIL = parent-in-law, CIL = child-in-law):

TABLE 6

Sa'ban reflexes of PKLD *-an

1. *aban > abin 'because'	1. *awan > awan 'spouse'
2. *beladan > beladin 'turtle'	2. *deŋan > ngan 'and/with'
3. *bulan > blin 'moon'	3. *kiran > iran 'breadfruit'
4. *buqan > in 'tote basket'	4. *k-um-an > man 'to eat'
5. *daan > rien 'field hut'	5. *laŋan > langan 'blowgun dart'
6. *dadan > adin 'old'	6. *mawan > mawan 'visible'
7. *dawan > la'in 'branch'	7. *meman > m-man 'to feed'
8. *dalan > alin 'path, road'	8. *nalan > malan 'to walk'
9. *edhan > sin 'ladder'	9. *pedekan > kkan 'to choke'
10. *iban > ibin 'PIL, CIL'	10. *ratan > latan 'a leak'
11. *idan > din 'when?'	11. *tina-n > hna-n 'his mother'
12. *majan > majien 'papaya'	12. *uan > wan 'to own, possess'
13. *naban > mabin 'elope'	13. *upan > pan 'bait'
14. *ŋadan > adin 'name'	14. *punan > hnoen 'Punan'
15. *udan > din 'rain'	15. *tunan > hnoen 'handle'

There are 78 PKLD forms in which C1 or C2 is a voiced stop. In 64 of these, or 82%, *al fronts. Without further qualification the presence of a voiced stop earlier in the word thus allows us to predict the fronting of *a1 with better than 80% accuracy. This is a somewhat weaker unilateral correlation than that between fronting and the presence of an earlier voiced obstruent:

vd. stop	—— 82% ——	fronting
vd. stop	—— 97% ——	fronting

But a closer look at conditioning and rule ordering shows that we can actually do better than this.

CONSTRAINT 1: Voiceless stops as blocking consonants. If a voiceless stop /p/, /t/ or /k/ intervenes between the voiced stop and *al fronting did not occur: 1) *baka > /aka/ 'wild pig', 2) *bata > /atang/ 'log', 3) *bataq >

/ata'/ 'green', 4) *bekaŋ > /kang/ 'kind of carrying basket', 5) *butaq > /toe'/ 'sleep in the eye', 6) *ditaq > /pé ta'/ 'above'; /be-lta'/ 'high', 7) *guta > /toe/ 'to ford, cross a river', 8) *pedekan > /kkan/ 'to choke on water'. Glottal stop did NOT act as a blocking consonant: *baqaw > /bi'iew/ 'beads', *buqan > /in/ 'carrying basket', *daqan > /la'in/ 'branch.'

REVISED RULE 1: ***a1 was fronted if there was a voiced obstruent anywhere earlier in the word unless /p/, /t/ or /k/ intervened between the conditioning segment and the target segment.**

At first sight the fronting of *a1 in Sa'ban appears doubly strange:

1. why did voiced obstruents cause fronting of a low vowel?

2. why did this fronting influence act *at a distance*? (cp. PKLD *dalan > /alin/ 'path', not **ilin, etc.).

There are six known cases where fronting of *a1 is expected, but does not take place: 1) *beŋar > /ngal/ 'plank', 2) beraqaŋ > /bel'ang/ 'molar tooth', 3) *denak denak > /nak nak/ 'suddenly', 4) *deŋan > /ngan/ 'and/with', 5) *gerawat > /pelawet/ 'complicated', 6) *tabat > /tabat/ 'medicine'. Since Pa' Dalih Kelabit also had /ngan/ 'with', it is possible that *deŋan had reduced to a monosyllble prior to the fronting of *a1, and a similar explanation may apply to /ngal/ 'plank', and /nak nak/ 'suddenly.'

RULE 2: ROUNDING OF *a1. *a1 was rounded in the phoneme sequence *uCa.

There are 37 reflexes of the PKLD phoneme sequence *uCa. Rounding occurs in 18 cases, but does not occur in 19 others:

TABLE 7

Reflexes of PKLD *uCa in Sa'ban

1.	*butaq > toe' 'sleep in eye'	1.	*budaq > di' 'white'
2.	*guta > toe 'cross a river'	2.	*bulan > blin 'moon'
3.	*kulat > loet 'mushroom'	3.	*buqan > in 'tote basket'
4.	*kuyad > yoet 'grey macaque'	4.	*buraw > bréew 'chase off'
5.	*lukaq > lekoe'/kkoe' 'fall'	5.	*buyaw > yiew 'citrus'
6.	*muka > ngkoe 'early'	6.	*k-um-an > man 'eat'
7.	*mulaq > loe' 'many'	7.	*lubaŋ > bbéeng 'hole'
8.	*m-uraq > m-roe' 'transfer'	8.	*nubaq > bi' 'cooked rice'
9.	*pulaŋ > ploeng 'ringwort'	9.	*rudap > diep 'sleep'
10.	*punan > hnoen 'Punan'	10.	*rumaq > ma' 'house'
11.	*tulaŋ > hloeng 'bone'	11.	*tubaŋ > bléeng 'wild cat'
12.	*tunan > hnoen 'handle'	12.	*tudaq > ddei' 'how much?'
13.	**tunap > hnoep 'winnowed'*	*13.*	**udan > din 'rain'*
14.	*tunaw > hnoew 'hammer'	14.	*udaŋ > udéeng 'shrimp'
15.	**ŋ-ukat > ng-koet 'dig'*	*15.*	**ukab > wap 'opened'*
16.	*urat > roet 'vein'	16.	*upa > pa 'splitting'
17.	*urat > roet 'wound'	17.	*upan > pan 'bait'
18.	*utaq > toe' 'vomit'	18.	*upaq > pa' 'yam'
		19.	*utap > tap 'shield'

QUALIFICATION 1: Fronting bleeds rounding. A comparison of the material in Table 7 with that in Table 6 shows clearly that the Rule 1 (fronting *a1) occurred first, thus removing *a1 from participation in the rounding rule. There are seven apparent exceptions: items 6, 10, 15, 16, 17, 18 and 19 show *neither* fronting nor rounding. But closer inspection shows that the absence of fronting or rounding in these cases is phonologically conditioned.

CONSTRAINT 2: Labials as blocking consonants. In all but one of these apparent expections C2 is a labial. No form in which C2 is labial appears in col. 1. Hence we can state a subregularity: the rounding of *a1 in the sequence *uCa

was blocked if C was labial. The only true exception appears to be *utap > /tap/ 'shield', for which no explanation can currently be suggested. Hence, the rule of *a1 rounding can be restated as:

REVISED RULE 2: **After Rule 1 applied *a1 was rounded if there was a *u in the preceding syllable and no labial consonant intervened.**

3. RULE 3: FRONTING OF *a2 and *a1. *a2 and *a1 were fronted following *b.

Penultimate *a is found in over 200 PKLD etyma with reflexes in Sa'ban. It is fronted to /é/ or, less commonly, to /i/ in 16 known cases. All but one of these follow /b/, which derives from *b or, less commonly, *d. The single deviant case of fronting follows /r/ from *d. In every case where *a2 is affected fronting also occurs to any following *a1:

TABLE 8

Reflexes of PKLD *ba- and *da- in Sa'ban

1. *bada > /bidi/ 'sand'
2. *bahaq > /bihi'/ 'wet'
3. *balaŋ > /béléeng/ 'tiger cat
4. *balih > /béley/ 'lie, deceive'
5. *baliw > /biliew/ 'change state, metamorphose'
6. *baqaw > /bi'iew/ 'beads'
7. *baraq > /béré'/ 'to swell'
8. *barat > /bérét/ 'veranda'
9. *bareh > /béreh/ 'ember'
10. *bariw > /biriew/ 'wind'
11. *baur > /béwel/ 'satiated'
12. *dadem > /bédem/ 'chills and fever'
13. *dalem > /bélem/ 'deep'
14. *daluh > /bélew/ 'quarrel; angry'
15. *pedalaq > /bélei'/ 'fishing net'
16. *daqet > /ré'et/, /et/ 'bad'

In two known cases a low vowel does not front following *b: *bakul > /bakol/ 'kind of basket', *baŋet > /banget/ 'sea'. At least the latter may be a loan, since the Sa'ban traditionally knew of the sea only by hearsay. In nearly 200 additional cases *a either remains /a/ or contracts with a following vowel after the loss of *q.

We might ask whether Rule 1 and Rule 3 are be positional variants of a single rule. But the evidence weighs heavily against this interpretation. Consider *dalan > /alin/ 'path, road', where the initial consonant must have been present at the time Rule 1 applied, but must have disappeared before Rule 3 applied. A number of other etymologies (*bulan > /blin/ 'moon', *daqan > /la'in/ 'branch', *baraq > /béré'/ 'to swell', *bariw > /biriew/ 'wind', *bawaŋ > /awéeng/ 'country', *bataŋ > /atang/ 'log', etc.) also support the following order of changes:

1) fronting of *a1 (Rule 1), 2) rounding of *a1 (Rule 2), 3) (sporadic) loss or change of C1, 4) fronting of *a2 (Rule 3)

SAMPLE DERIVATIONS

*bawaŋ	*dalan	*baraq	
bawéeng	dalin	barée'	Rule 1
awéeng	alin		Loss of C1
		bérée'	Rule 3

Since Rule 2 is a straightforward rule of rounding assimilation there can be no question that it is phonetically motivated. However, Constraint 2, which blocks rounding following a labial consonant, requires some discussion.

It is common to think of labial consonants as associated with roundness, since labialization is achieved by a superimposed feature of lip rounding, as in /b^w/, /p^w/ or /m^w/.

Likewise, within the theory of Natural Phonology rounded vowels are described as 'labialized' (Donegan 1985, 1993). But, on the basis of instrumental studies Thurgood and Javkin (1975) have shown that labial stops and nasals are produced with lip spreading, not lip rounding. On purely phonetic grounds we would thus expect a rounded vowel followed by a labial stop or nasal to present a conflict of articulatory gestures. In Sa'ban reflexes of the sequence *uBa, where B is any labial stop or nasal, rounding is arrested at the point of lip spreading, and fails to reach the following low vowel. It need not be stressed that any such explanation which is based on general phonetic considerations should apply universally, and we would therefore anticipate similar contraints in other languages. This claim remains to be tested in the general arena of linguistic theory. With regard to Austronesian languages it is somewhat difficult to assay, since most cases of low vowel assimilation are regressive, as in Tongan, where *aCi > /eCi/ and *aCu > /oCu/. However, historical changes in some Oceanic languages show clearly that the rounding of a vowel may be transferred to a following labial consonant, thus overriding the feature of lip spreading. In many of the Nuclear Micronesian languages POC *Rumaq 'house' is reflected with a front unrounded vowel in the first syllable, and a labiovelar nasal, as in Trukese /iimw/ 'house', /imwa/ 'house (combining form)'. Similar processes are synchronically active in some of the languages of the Admiralty Islands, as Loniu, where /kaman/ 'men's house' following the general marker of location /lo/ results in a surface form [lokom^{w}an] 'in the men's house'. Note that in neither Trukese nor Loniu is the last /a/ rounded, despite the rounding of the preceding consonant. All that appears safe to conclude, then, is that in Sa'ban the articulatory gesture of lip spreading appears to dominate that of lip rounding in constraining the form of Rule 2, whereas in most Oceanic languages the gesture of lip rounding appears to dominate that of lip spreading.[6]

By contrast, Rules 1 and 3 have no immediately obvious phonetic motivation. Graham Thurgood (p.c.) has nonetheless provided a stimulating series of suggestions as to what might lie behind these changes. Before discussing Thurgood's suggestions, however, it will be worthwhile to widen our view of sound change in the languages of Borneo by way of a few general remarks.

As odd and perplexing as Rules 1 and 3 appear to be in Sa'ban, they present an even greater challenge when we discover than a very similar change has taken place in Berawan, a member of the Berawan-Lower Baram division of North Sarawak languages which: 1. shares only about 31 percent of its basic vocabulary with Sa'ban, and 2. is geographically separated from Sa'ban by a distance of at least 100 miles and a number of other Kelabit dialects which do not show the change. Berawan is spoken in four known dialects, Long Terawan (LTB), Batu Belah (BB), Long Teru (LT) and Long Jegan (LJ). All four Berawan dialects have fronted *a following a voiced stop, a change which apparently took place in Proto-Berawan (PB). Unlike Sa'ban, PB had a single rule of low vowel fronting which apparently affected the *first* low vowel after a voiced stop: cp. PMP *zalan > LTB /ilan/, Sa'ban /alin/ 'path, road', where both languages show vowel fronting, but not of the same positionally determined vowel, *bulan > LTB /bulin/, Sa'ban /blin/ 'moon', *dahun > LTB /dion/, Sa'ban /un/ 'leaf', *batu > LTB /bittoh/, Sa'ban /ataw/ 'stone', but *anak > LTB /ana'/, Sa'ban /anak/ 'child', *taneq > LTB /tana/, Sa'ban /tana'/ 'earth', *manuk > LTB /mano'/, Sa'ban /manok/ 'bird/chicken'. As in Sa'ban, the fronting of *a in Berawan took place before various other changes which eliminated the conditioning factor. The most notable of these changes was a bizarre change of intervocalic devoicing, where PMP *b and *R (probably a uvular /r/) merged

as /k/, through earlier /g/ (which caused fronting before devoicing): *tuba > /tukkIh/ 'fish poison, derris root', *kaRaw > /kikiw/ 'to scratch'. In addition to changes which eliminated a voiced obstruent after fronting of *a had already taken place, other changes had to produce voice obstruents before fronting could occur, as with PMP *Ratus > LTB /gittoh/ 'hundred' (cp. PKLD *me-ratu, Sa'ban /p-lataw/ 'hundred').

These differences of detail distinguishing the history of vowel fronting in Sa'ban and Berawan, and the fact that no other known KLD dialect shows vowel fronting make it abundantly clear that the change was historically quite independent in the two languages. In addition it should be noted that in Long Jegan Berawan the fronted vowel often does not raise: PMP *Ratus > LJ /gætɔʔ/ 'hundred', *Ramut > /gæmauk/ 'root', *batu > /bættaw/ 'stone', *bawaŋ > /bæwang/ 'lake', *dalem > /cælem/ 'deep'.

Finally, Collins (p.c.) points out that PMP *a is fronted following voiced obstruents in some subdialects of Sambas Malay, spoken near the westernmost tip of Borneo, well over 400 miles distant from either Sa'ban or Berawan, and that *a is backed and rounded in Kutai Malay, spoken on the coast of East Kalimantan. What can possibly be the explanation for these bizarre changes?

5.2.1.1. *The breathy phonation hypothesis.* Thurgood (1999:134, 179, 190, 197ff, 235) notes that in the Chamic languages of Vietnam and adjacent regions in mainland Southeast Asia voiced obstruents gave rise to a prosodic feature of breathy voice, which carried through the word unless *interrrupted by an intervening consonant, normally a voiceless* stop. The most conspicuous effect of breathy voice apart from the voice timbre itself is its tendency to produce vowel raising. Thurgood credits the initial recognition of this phenomenon to Henderson (1952), and observes

that it is widespread in the phonological history of mainland Southeast Asian languages. Given this pattern of change in mainland Southeast Asia the application of a similar explanation to the Bornean facts would appear to be straightforward: not only would the earlier presence of a phonation type of breathy voice help to account for vowel fronting at a distance in Sa'ban, but even the constraints on spreading of breathy voice are closely matched by Constraint 1, which states that an intervening voiceless stop blocks the raising of vowels despite the presence of an earlier voiced stop. Thurgood is careful to point out that although breathy voice in the Chamic languages evidently arose as a result of contact with Mon-Khmer languages, a hypothesis of earlier breathy voice in Sa'ban or Berawan does not require the somewhat improbable scenario of contact with Mon-Khmer languages in fairly remote interior regions of Borneo (see Map). Rather, breathy voice can arise spontaneously, as it apparently has in Javanese (Fagan 1988, Ladefoged and Maddieson 1996:63ff).[7]

There can be no question that Thurgood's proposal has great intrinsic appeal, as it serves to provide a phonetic motivation for changes which occur under conditions which are otherwise very puzzling. However, in trying to apply this explanation to the data at hand we find that the breathy phonation hypothesis raises perhaps as many questions as it answers. We will deal with these one at a time.

First, breathy phonation tends to raise vowels. Rules 1 and 3 can be seen as raising rules, since *a is reflected as either /i/ or /é/. But is the essential feature here one of raising or one of fronting? Collins (p.c.) maintains that *a was backed and rounded following voiced obstruents in Kutai Malay, but the facts in both Sa'ban and Berawan suggest that raising is simply an incidental feature of vowel fronting. If vowel fronting in Sa'ban and Berawan is an inevitable consequence of the phonetic pressures of breathy phonation one

might ask 1) Why is *e (schwa) impervious to the change, when it could have been raised to a high central vowel?,[8] 2) Why does the height of the raised vowel vary, while fronting remains constant?, 3) Why does Long Jegan Berawan show fronting to a low vowel /æ/ in forms such as PMP *batu > /bættaw/ 'stone'?, and 4) Why does *a never raise to a back vowel, even when the first syllable contains *u, as in PKLD *bulan > /blin/ 'moon', or *udaŋ > /udéeng/ 'shrimp'?

With regard to question 2), there clearly is some conditioning in Rule 1 (e.g. *-an always produces -/in/ or -/ien/, *-aŋ always produces -/éeng/, and *-aq always produces -/ei'/ or -/ée'/) in the fronting environment), but with regard to Rule 3, vowel height seems to vary capriciously while fronting remains constant, as with PKLD *baqaw > /bi'iew/ 'beads' or *bariw > /biriew/ 'wind', but *bareh > /béreh/ 'hot coal, ember' or *baur > /béwel/ 'satiated'. With regard to question 3, since Long Jegan Berawan sometimes reflects *i as /æ/ it is possible that *a > /æ/ 'stone' passed through an an intermediate stage with /i/. If so, however, it is unclear why some reflexes of PMP *i remain unchanged, as with *lima > LJ /dimyé/ 'five', *Ribu > /gikkew/ 'thousand', *dipen > /jipien/ 'tooth', or *ñilu > /ñilew/ 'sensation caused by eating something very sour'.

Second, if breathy phonation is a prosodic feature that spreads from left to right it should affect all vowels following a voiced obstruent unless interrupted by a voiceless stop.[9] This appears to be true of Rule 3, but in Sa'ban, Rule 1 paradoxically affects only *a1. Compare PKLD *dalan > /alin/ 'path, road', or *daraq > /arée'/ 'blood' where *a2 is unaffected, or the examples of *a2 following a voiced obstruent in trisyllables such as PKLD *beladan > /beladin/ 'freshwater turtle', *belatik > /latéek/ 'spring-set arrow trap', *geramih > /jelamey/ 'rice straw', *gerawat > /pelawet/ 'complicated', or *pegamuŋ > /pejamueng/ 'tangled', where a similar immunity prevails (*pedalaq > /bélei'/ 'casting

net', by contrast, is governed by Rule 3). Long Terawan Berawan presents a complementary problem for the breathy phonation hypothesis. Whereas Sa'ban Rule 1 enigmatically skips a vowel which should be subject to the same raising as *vowels that follow it, Long Terawan Berawan allows fronting* at a distance, as with PMP *bulan > /bulin/ 'moon', but sometimes does not allow it to spread through sonorants, as in PMP *bana > /bineh/ 'husband', *bawaŋ > /biwang/ 'lake', or *zalan > /ilan/ 'path, road'.

Third, in Sa'ban fronting of *a1 occurs after reflexes of PKLD voiced aspirates, as in *bebhat > /piet/ 'a share', *ebhaq > /pei'/ 'water', *ebhar > /péel/ 'loincloth', *edhan > /sin/ 'notched log ladder', *edhaŋ > /séeng/ 'light, brilliance', *edhaw > /siew/ 'day, sun', *kedha > /nsi/ (?) 'able to endure pain', *kelelebhang > /lepéeng/ 'butterfly', *lidhaq > /lesei'/ 'to spit', *tebhaq > /t-el-pei'/ 'thorn', or *tedhak > /séek/ 'pumpkin'. Yet both the phonetics of the Bario Kelabit voiced aspirates and the sound correspondences linking these phonemes to their correspondences in other Kelabit dialects and other North Sarawak languages show clearly that the voiced aspirates had a *voiceless* termination. This is reflected in the Sa'ban reflexes of PKLD *bh, *dh, *gh as /p/, /s/, /k/. It is an unresolved issue as to why voiced stops which had a voiceless termination would have the same fronting effect on following vowels as fully voiced stops, but the facts seem both reasonably clear and difficult to reconcile with a hypothesis of breathy phonation.

Fourth, breathy phonation is an essential part of the phonetic description of many Mon-Khmer languages of mainland Southeast Asia and of some of the Chamic languages which have been in longstanding contact with them. In such a context when a language like Haroi lacks breathy voice but exhibits a pattern of vowel raising effects that are associated with this phonation type, a hypothesis of historically earlier breathy voice is plausible (Thurgood 1999:197ff). But is the

Bornean context similar? During my own fieldwork in 1971 I collected firsthand data on eight KLD dialects, and on over 40 speech communities in central and northern Sarawak generally. None of these had any phonetic feature which could be interpreted as breathy voice. Hudson (1970) provides data on several other Kelabit dialects, and although he does sometimes comment on the phonetics of the material he collected, he never mentions any peculiarity of the phonetics of the voiced stops apart from the voiced aspirates. In fact, *no* language of Borneo has ever been reported as having breathy voice or anything that might reasonably be interpreted as being breathy voice. This leaves the breathy phonation hypothesis for the fronting of *a in Sa'ban and Berawan in a very awkward position. Should we believe that breathy voice arose in a single dialect of KLD, in Proto-Berawan, and in some subdialects of Sambas Malay, triggered vowel fronting and then invariably disappeared without leaving any other trace?

Finally, if breathy phonation is the correct explanation for the fronting of low vowels in Sa'ban and Berawan, why have similar effects not been observed in Javanese? As Ladefoged and Maddieson (1996) note, slack voice in Javanese is not quite the same thing as breathy voice, although it differs only in quantitative detail, not in fundamental form.

In short, the Breathy Phonation Hypothesis offers tantalizing hints of a possible phonetic basis for the otherwise bizarre conditioning of vowel fronting in Sa'ban and Berawan, but founders on a number of unanswered questions.

5.2.2. *Type 2: Change bizarre.* What is peculiar about Rules 1, 2 and 3 is not the content of the change, but rather the conditions under which the change takes place. Sa'ban has at least one reasonably well-exemplified change, however, which presents a serious challenge to the view that sound change must proceed one feature at a time: PKLD *g

is reflected as a voiced palatal affricate /j/ before a vowel (any vowel), and as /p/ word-finally. Since the situation is somewhat more complex than this Sa'ban reflexes of PKLD *g are presented in full in Table 9:

TABLE 9

Reflexes of PKLD *g in Sa'ban

*g- > zero :	5
*g- > j :	4
*g- > p :	2
*g- > l :	1
*-g- > j :	7
*-g > p :	8
*-g > k :	1

There are 28 known Sa'ban reflexes of PKLD *g in a total of 26 different lexical items (*agag 'rice sieve' and *gileg 'skittish' each contain two instances of *g). The best-attested reflexes in addition to loss are *g > /j/ in eleven examples, four in initial and seven in medial position, and *g > /p/ in ten examples, all but two in final position. For convenience of reference the reflexes of *g > /p/ are listed here: *gerawat > /pelawet/ 'tangled, complicated', *gileg > /pélep/ 'skittish, easily startled', *agag > /ajiep/ 'rice sieve', *areg > /arep/ 'crumbs, rubbish', *beluqug > /bel'up/ 'wasp', *eleg > /lep/ 'to stop, as work', *ileg > /élep/ 'to separate, divorce', *pepag > /ppap/ 'a slap', *ru-rug > /hrop/ 'to fall, pour out'.

It is clear that PKLD *g was a voiced velar stop. The phonemes /g/ and /j/ differ in at least three classic feature values (back, coronal, delayed release), and the phonemes /g/ and /p/ differ in at least four (voice, high, back, anterior). Whatever feature system is used, it is evident that either change, but particularly the change *g > /p/ is theoretically unexpected. Since Sa'ban has devoiced all final

stops it is possible that the reflex *g > /p/ in final position was a two-stage change, *g > /b/, followed by final devoicing. This at least would have the advantage of relating velars to labials through their acoustic similarity. However, the two instances of *g > /p/ in initial position weigh against this interpretation, suggesting that *g simply became /p/ in a single step. Additional support for this view is found in the occasional reflex *k- > /p/, as in *kadaŋ > /padéeng/ 'tall', *kapeh > /papeh/ 'how?', *me-keluk > /plok/ 'slack, as a rope', *pe-keneh > /panah/ 'to believe', or *kereb > /parep/ 'able, capable'. Advocates of the view that such reflexes must be the result of cumulative changes of a phonetically more plausible type must recognize that Sa'ban has not been separated from other KLD dialects for more than perhaps twenty five or thirty generations. Sound change must have proceeded at an extraordinary rapid pace in this language community, but even so it is somewhat difficult to imagine a series of steps involving single-feature changes which could have led from *g to /p/ in such a short time interval.

Nearly as perplexing but not so well-attested as the preceding change is the recurrent change of dentals to labials in initial position. The change *d > /b/ is seen in PKLD *dadem > /bédem/ 'chills and fever', *dalem > /bélem/ 'deep', and *me-daluh > /bélew/ 'quarrel; angry.' Although PKLD *n normally became Sa'ban /l/ in initial position, the PKLD prefixal allomorphs /m/-, /n/- and /ŋ/- all fell together as /m/ in non-assimilatory contexts: *ŋ-abet > /m-abet/ 'to tie', *ŋarit > /m-arIt/ 'to write', *nalan > /m-alan/ 'to walk', *nari > /m-arey/ 'to measure'. Since this change is attested only with prefixal phonemes it is not clear whether it was phonological or morphological.

5.2.3. *Type 3: Erosion from the left.* The erosion of word endings is so common a change that is has acquired a

name: 'erosion from the right.' Sa'ban shows very little evidence of erosion from the right. The closest approximation to the weakening of final segments is perhaps seen in final devoicing. What is remarkable about Sa'ban (among many other things), however, is the fairly extensive evidence of erosion from the left, manifested primarily through the sporadic loss of initial consonants, but also in the less frequent loss of initial vowels. Examples of the loss of initial consonants include PKLD *baka > /aka/ 'wild pig', *bebher > /pel/ 'fan for the fire', *bibir > /ibiel/ 'lip', *buaq > /wei'/ 'fruit' (with resyllabification of prevocalic *u), *datuq > /ato'/ 'durian', *diri > /arey/ 'housepost', *dueh > /weh/ 'two', *gaiŋ > /ayeng/ 'spinning top', *getimel > /hmel/ 'bedbug', *guta > /toe/ 'ford, cross a river', *kamih > /amay/ 'we, us (excl.)', *keliq > /lée'/ 'to know', *kilat > /ilat ilat/ 'lightning', *kulub > /lup/ 'ridgepole cover', *lalid > /alit/ 'ear', *lekuq > /ko'/ 'bracelet', *limeh > /émah/ 'five', *luŋun > /nguen/ 'coffin', *marih > /aray/ 'to come', *menebhur > /puel/ 'rice porridge', *mulaq > /loe'/ 'much, many', *namuk > /muek/ 'sandfly', *nuper > /èpel/ 'rope', *pahaqen > /ahan/ 'shoulder pole', *pidhet > /sset/ 'taut, as a rope', *pudut > /dduet/ 'way, manner, shape', *ramut > /muet/ 'fibrous roots', *reraq > /ra'/ 'ant', *riruh > /éraw/ 'a laugh', *rudap > /diep/ 'to sleep', *saget > /ajIt/ 'quickly', *taruq > /aro'/ 'to make', tepu-q > /pu'/ 'grandparent (address)', *tidhuq > /seu'/ 'hand', and *tuked > /kɔt/ 'prop'. In virtually every case phonemically very similar forms can be found which did not lose the initial consonant: *bakul > /bakol/ 'basket', *begheh > /bekeh/ 'deaf mute', *birar > /béréel/ 'yellow', *buaya > /boyeh/ 'crocodile', etc. (see Appendix 2). Among the few generalizations that appear to be possible from this data are: 1. that initial *p and *t show a strong tendency to be preserved before *a (17 of 18 cases with *pa-, 18 of 19 cases with *ta-), and 2. that initial voiced stops show a strong tendency to drop, particularly if

they are followed by a voiceless stop as the onset of the next syllable.[10]

Table 10 summarizes the evidence for loss of voiced stops in initial position. Zero reflexes = 68/124, or about 55%:

TABLE 10

Reflexes of PKLD initial voiced stops in Sa'ban

*b	> 0 : 41	*d	> 0 : 21	*g	> 0 : 5
	> b : 36	*d	> l : 8	*g	> j : 4
	> m : 1	*d	> b : 3	*g	> p : 2
	>	*d	> r : 2	*g	> l : 1

Examples of the loss of initial vowels are less common, but include *akep > /kep/ 'river snail', *amuŋ > /mueng/ 'all', *m-anud > /m-lut/ 'to flow', *aqit > /ét/ 'pain', *aquk > /ok/ 'a ladle', *idan > /din/ 'when?', *ideh > /deh/ 'they, them', *idhuŋ > /sueng/ 'nose', *iguq > /jeu'/ 'shame', *ikab > /kap/ 'smoke vent', *imet > /met/ 'to hold', *ina-q > /na'/ 'mother (address)', *ineh > /nah/ 'that, those', *inih > /nay/ 'this, these', and *ikuh > /cew/ 'elbow'. Initial *e was regularly lost, and initial *u before a consonant was lost in every form except *ulih > /éloy/ 'sprout, shoot.' Again, phonemically very similar forms can often be found which did not lose the initial vowel: *akat > /akat/ 'courage', *anak > /anak/ 'child', *iban > /ibin/ 'parent-in-law, child-in-law', *ulih > /éloy/ 'sprout, shoot', etc. As a general tendency initial *i tended to become /é/ before the liquids *l and *r, although this was not true of *u.

5.2.4. *Type 4: Syncope of an unstressed vowel.* One likely precondition for erosion from the left in Sa'ban was a shift from the PKLD pattern of penultimate word stress to final stress. What might have triggered this change itself remains obscure, but once it was in place various other changes seem to have followed from it. First among these

was a tendency (it cannot be stated as more than that) for word onsets to be lost — that is, for 'erosion from the left.' A similar, but distinct change was the syncope of a non-low vowel in forms of the shape CVCVC. Clayre (1992) has looked at this change in a preliminary way, but because her orthography sometimes confuses /a/ and /e/ she was unable to state conditions for it. Syncope of the penultimate vowel in PKLD disyllables produced the most radical and obvious typological changes in Sa'ban, including: 1) reduction of many disyllables to monosyllables, 2) the creation of initial consonant clusters, 3) the creation of initial geminates, and 4) the creation of voiceless sonorants. Examples of these changes appear in Table 11:

TABLE 11

Syncope non-low penultimate vowels in reflexes of PKLD disyllables

No.	PKLD	Sa'ban	English
1.	*bebhek	ppek	pounded fine
2.	*bedhuk	ssuek	coconut monkey
3.	*belih	bley	purchases
4.	*melih	mley	to buy
5.	*berat	bréet	heavy
6.	*beti	ttay	calf of the leg
7.	*bukuh	kkew	node, joint
8.	*buyur	jjuel	too long (clothes)
9.	*getimel	hmel	bedbug
10.	*k-inih	hnay	this way; now
11.	*me-keluk	plok	slack, as a rope
12.	*lulun	lluen	roll something up
13.	*muka	ngkoe	early
14.	*muned	nnet	correct
15.	*perek	prek	crowded, packed in
16.	*pudut	dduet	way, manner; shape
17.	*ŋerimer	mmel	to wrinkle

18.	*rurug	hrop	to fall; pour out
19.	*rurut	rruet	bring down
20.	*telen	hlen	swallowed
21.	*teneb	hnep	cold
22.	*teŋaq	hnga'	window
23.	*tera	hra	hard, of wood
24.	*timun	hmuen	cucumber
25.	*tubeh	bbeh	Derris elliptica
26.	*tuduq	ddeu'	seven
27.	*tukuŋ	kkueng	mosquito
28.	*tulaŋ	hloeng	bone
29.	*tumeh	hmah	clothes louse
30.	*tunaw	hnoew	hammer
31.	*turun	hruen	to descend
32.	*tutuq	tto'	to fall, as fruit

In general, when two obstruents came together as a result of vowel syncope a geminate consonant resulted, although in many cases I recorded single consonants in a nearly identical environment (*bedhek > /sek/ 'nasal mucus', but *bedhuk > /ssuek/ 'coconut monkey'). If the second consonant was *l or *r following a labial or velar stop the cluster remained without further change. Voiceless nasals and liquids arose from voiceless stop + sonorant clusters. Occasional exceptions such as *rurug > /hrop/ 'to fall; pour out', or *peŋinud > /hnot/ 'story' are unexplained, although the latter may be due to medial vowel syncope, reduction of the nasal cluster and devoicing of /n/ by /p/.

Some etymologies, such as *tulaŋ > /hloeng/ 'bone' provide further information on the ordering of changes, since here rounding had to occur before syncope of the penultimate vowel and the development of a centralizing offglide before final velar nasals, and syncope had to occur before the voiceless lateral could arise (from earlier *tloŋ). In a few cases, as *begheh > /bekeh/ 'deaf, mute', *bibir > /ibiel/

'lip', *bikuŋ > /békong/ 'adze' or *bulan > /blin/ 'moon', a non-low penultimate vowel did not delete.

By contrast, penultimate *a generally did not disappear. Nearly all of the apparent exceptions in which penultimate *a did disappear precede *q, and so may be conditioned:[11] *aqay > /ay/ 'frog', *aqit > /ét/ 'pain', *aquk > /ok/ 'ladle', *baquŋ > /ueng/ 'banana', *daqeh > /eh/ 'chin, jaw', *daqet > /et/ 'bad', *daqun > /un/ 'leaf', *laqal > /al/ 'chicken', *naqem > /em/ 'no, not', *raquŋ > /ong/ 'sun hat'. But it would be unlike Sa'ban to have no further complications: not every *a2 before *q was lost. In particular, and again with reference to possible conditions which are surprising both in their specificity and lack of apparent phonetic motivation, penultimate *a following an initial voiceless stop and preceding *q is always retained in the material to hand: *paqen > /pa'en/ 'areca palm and nut', *paqit > /paqét/ 'bitter', *paquh > /pa'aw/ 'fern', *taqeng > /ta'ang/ 'mouth; voice', *taqiq > /ta'é'/ 'feces', *me-taqut > /ta'eut/ 'afraid'. A similar tendency may be present in *daqet > /ré'et/ (next to /et/) 'bad', and *raqit > /la'it/ 'raft', where the final voiceless stop may have contributed to the retention of penultimate *a even though it preceded PKLD *q.

Syncope of a non-low penultimate vowel also occurred in trisyllables, producing many medial consonant clusters, both underlying and derived: *belunuq > /belnu'/ 'small red jackfruit', *beluqug > /bel'up/ 'wasp, hornet', *deket > /leket/ 'to stick, adhere', but *me-deket > /pe-lket/ 'sticking, adhering', *demulun > /lemluen/ 'slave', *pe-diŋi > /pe-lngaey/ 'opposite bank', *me-ditaq > /be-lta'/ 'high', *genuluh > /jenlew/ 'empty rice head', *lemek 'fat, grease', but *me-lemek > /pe-lmek/ 'soft', *l-em-idik > /lemdiek/ 'to cut underbrush', *lemulun > /lemluen/ 'person', *lemuned > /lemnet/ 'middle', *me-lipi > /pelpay/ 'thin, of materials', *me-liqaw > /pel'éew/ 'clear, of water', *lukaq >

/lekoe'/ or /kkoe'/ 'to fall, as a person', but /ng-koe'/ 'let something fall', *menelen > /menlen/ 'python', *menipal > /menpal/ 'scorpion', *menipeh > /benpeh/ 'snake',[12] *terutuŋ > /teltong/ 'porcupine', etc. Clusters of three consonants are avoided. Thus *gituqen > /jInto'ɔn/ 'star' does not allow deletion of *u, since that would produce a -CCC- cluster. Similarly, the irregular transitive or causative form /ng-koe'/ shows a stem allomorph with loss of the initial syllable or degemination of the onset in order to avoid a non-permitted cluster /nglk/ or /ngkk/.

It remains unclear whether syncope of the penultimate vowel in disyllables and the similar change in trisyllables should be considered one or two changes. Vowel deletion in the environment VC–CV has occured in the history of many other Austronesian languages, and remains in the synchronic phonology of some, as in Tagalog. As with syncope in disyllables, a low vowel generally did not delete in penultimate position in trisyllables, except before *q: *beladan > /beladin/ 'freshwater turtle', *belatik > /latéek/ 'spring-set arrow trap', *me-dadaŋ > /pe-ladéeng/ 'to warm by a fire', *geramih > /jelamey/ 'rice straw', *gerawat > /pelawet/ 'complicated', *pe-kabiŋ > /pé' abieng/ 'left side', *lematek > /lematek/ 'jungle leech', *pedalaq > /bélei'/ 'casting net', *pegamung > /pejamueng/ 'tangled', *me-ratan > /p-latan/ 'leaking, of a roof', *me-ratu > /p-lataw/ 'hundred', *t-em-araq > /t-em-ara'/ 'to fell trees', *temalem > /temalem/ 'spend the night in the forest', *teŋanuh > /lanaw/ 'weave mats', but *beraqaŋ > /bel'ang/ 'molar', *beraquk > /bel'uek/ 'toad', *delaqih > /ley/ 'male', *me-raqen > /pel'en/ 'light weight', *suŋaqiŋ > /song'éeng/ 'incubus', *tekaquk > /ta'ok/ 'rooster', *telaqaw > /tel'aw/ 'the muntjac deer', *temaqud > /tem'ot/ 'Achille's tendon'. The only exceptions to this statement are seen in *pinahaw > /penhew/ 'needle', and possibly *pekahaq > /paha'/ 'to change, as a name' and *seraway > /sawaey/ 'behavior'.

The change seen in *teŋaŋaq > /tanga'/ 'to gape' probably results from haplology.

5.2.5. *Type 5: Unconditioned phonemic splitting = massive irregularity.* Many examples of irregular, or apparently irregular sound changes in Sa'ban have already been noted. A few additional examples will be given here to try to provide some idea of the magnitude of this problem. Table 12 revisits 'erosion from the left' by comparing PKLD etyma of similar phonemic shapes which have had dissimilar outcomes in Sa'ban:

TABLE 12

Dissimilar Sa'ban outcomes from similar PKLD etyma

PART A

1) *bebhek > /ppek/ 'pounded fine'
2) *berat > /bréet/ 'heavy'
3) *buluh > /blew/ 'body hair; feathers'
4) *dadan > /adin/ 'old'
5) *dalan > /alin/ 'path, road'
6) *daqan > /la'in/ 'branch'
7) *kapal > /apal/ 'thick'
8) *lekuq > /leko'/ 'joint'
9) *lipaŋ > /lipang/ 'empty rice husk'
10) *lulud > /lut/ 'shin'
11) *namuk > /muek/ 'sandfly'
12) *ramit > /lamIt/ 'scratch'
13) *tari > /tarey/ 'measurement'
14) *telen > /hlen/ 'swallowed'
15) *tutuk > /tok/ 'a stroke in pounding'

PART B

1) *bebhen > /pen/ 'cover, lid'
2) *berek > /rek/ 'domesticated pig'
3) *buluq > /leu'/ 'bamboo'
4) *dadaŋ > /ladéeng/ 'heat of a fire'

5) *dalem > /bélem/ 'deep'
6) *daqun > /un/ 'leaf'
7) *kapeh > /papeh/ 'how?'
8) *lekuq > /ko'/ 'bracelet'
9) *lipen > /épen/ 'tooth'
10) *lulun > /lluen/ 'roll up'
11) *nanaq > /lana'/ 'pus'
12) *ramut > /muet/ 'fibrous roots'
13) *taruq > /aro'/ 'to make'
14) *teluh > /lew/ 'three'
15) *tutuq > /tto'/ 'to fall, as fruit'

Finally, Rule 2, which rounds *a1 in the sequence *uCa, is roughly paralleled by a change affecting *e1 in the sequence *uCe. Unlike Rule 2, however, the rounding of last-syllable schwa produced an unconditioned phonemic split in Sa'ban, as seen in 1) *anak buleŋ > /anak lɔng/ 'only child', 2) *tuked > /kɔt/ 'prop', 3) tuqed > /to'ɔt/ 'tree stump', or 4) *uker > /kɔl/ 'wide open, of the eyes', but 5) *muned > /nnet/ correct;, 6) *uled > /let/ 'maggot, caterpillar', 7) *duder > /del/ 'freshwater eel', or *nuper > /épel/ 'rope'.

There are other conditioned changes which are generally regular, as the offgliding of last-syllable *i or *u before a final velar nasal, but even here apparent exceptions exist: *butuŋ > /tueng/ 'corpse', but *buluq betuŋ > /leu' tong/ 'bamboo variety', *buduk > /duek/ 'mountain peak', but *baduk > /madok/ 'jackfruit', *tukuŋ > /kkueng/ 'mosquito', but *takuŋ > /takong/ 'pond', etc.

In a nutshell, Sa'ban historical phonology is not only exuberantly innovative and rich with theoretically puzzling types of change, it is also highly irregular. Wang (1969) suggested that sound change in general begins in restricted portions of the lexicon and gradually spreads to other relevant forms. Due to the extraordinary pace of innovation in

Sa'ban many changes have perhaps been cut short by later innovations before they were able to run their full course.

6. **Consequences of sound change on Sa'ban morphology.** PKLD had a moderately rich verbal morphology, and no language could undergo the massive sound change that Sa'ban has experienced without fairly important consequences for the morphological system as well. Although Lun Dayeh reportedly retains a true, if reduced, Philippine-type focus system, Kelabit dialects have only two verbal voices, an active and a general passive. The morphology of the Kelabit voice system is summarized in Table 13:

TABLE 13

Allomorphs of the Kelabit voice-marking affixes

Base form	Active voice	Passive voice
a-	ng-a-	n-a-
e-	ng-e-	i-
i-	ng-i-	n-i-
u-	ng-u-	n-u-
b-	m-	b-in-
d-	n-	s-in-
g-	ng-	g-in-
k-	ng-	k-in-
l-	nge-l	l-in-
m-	zero	m-in-
n-	zero	n-in-
ng-	zero	ng-in-
p-	m-	p-in-
r-	nge-r-	p-in-
s-	n-	s-in-
t-	n-	s-in-

To illustrate: /abuh/ 'ashes' : /ng-abuh/ 'to make dusty or cover with ashes' : /n-abuh/ 'was covered with dust or

ashes', /bulat/ 'open the eyes wide' : /mulat/ 'look at someone or something' : /b-in-ulat/ 'was looked at by someone', /dinger/ 'hearing; way of hearing' : /ninger/ 'to hear, listen to' : /s-in-inger/ 'was heard by someone, was listened to by someone', /kilu'/ 'bend or curve (as a road)' : /ngilu'/ 'to bend something, as a wire' : /k-in-ilu'/ 'was bend by someone; what was bent or curved', /lanit/ 'skinning, peeling off' : /nge-lanit/ 'to skin, to peel' : /l-in-anit/ 'was skinned by someone', /pa'id/ 'anything used to wipe' : /ma'id/ 'to wipe' : /p-in-a'id/ 'was wiped by someone', /rier/ 'to turn, roll over' : /nge-rier/ 'to turn or roll something over' : /r-in-ier/ 'was turned or rolled over by someone', /si'ier/ 'eyesight' : /ni'er/ 'to see' : /s-in-i'er/ 'was seen by someone', /tutuk/ 'stone or wooden pestle' : /nutuk/ 'pound with a pestle' : /s-in-utuk/ 'was pounded by someone with a pestle'.

The two most important points to note about this morphological system are: 1. that the passive voice is obligatorily perfective, and 2. that stems with penultimate /e/ (schwa) show a pattern of verbal ablaut in the passive: /belih/ 'buying' : /melih/ 'to buy' : /bilih/ 'was bought by someone', /deket/ 'sticky' : /neket/ 'stick something to a surface' : /s-in-eket/ 'was stuck to something', /engep/ 'a kiss' : /ng-engep/ 'to kiss' : /ingep/ 'was kissed by someone', /ketep/ 'mark left by a bite' : /ngetep/ 'to bite' : /kitep/ 'was bitten by someone or something', /peman/ 'feeding' : /meman/ 'to feed someone' : /piman/ 'was fed by someone', /rerek/ 'incision made in the throat of a slaughtered animal' : /nge-rerek/ 'to slit the throat, to slaughter' : /rirek/ 'was slaughtered by someone', /tekub/ 'a knock from underneath, as on a longhouse floor by someone outside' : /nekub/ 'to knock from underneath' : /sikub/ 'was knocked from underneath by someone'.

This fairly straightforward system has been fundamentally transformed in Sa'ban as a result of the disruptive consequences of sound change. The following is a preliminary sketch of patterns of base : active : passive relationships:

1) zero alternation between base active and passive voice: /laruet/ 'sewing' : /laruet/ 'to sew' : /laruet/ 'be sewn by someone' : /éek laruet talon/ (I sew clothes) 'I am sewing clothes' : /talon ay aro' éek laruet/ (clothes AY make me sew) 'the clothes were sewn by me'

2) zero alternation between active and passive voice: /bihi'/ 'wet' /mihi'/ 'make something wet' : /mihi'/ 'was made wet by someone', /bréet/ 'heavy' : /mréet/ 'make something heavy' : /mréet/ 'was made heavy by someone'

3) base : m-base (A) : i-base (P) : /abet/ 'tying' : /m-abet/ 'to tie' : /i-abet/ 'was tied by someone' : /éek m-abet kelabo'/ (I ACT-tie mosquito net) 'I am tying up the mosquito net' : /kelabo' ay i-abet éek/ (mosquito net AY PASS-tie me) 'the mosquito net was tied up by me'

Before a base that begins with a liquid /m/- may appear as a nasal or as a copy of the base-initial consonant:

/ruel/ 'lowering' : /m-ruel/ or /r-ruel/ 'to lower' : /i-ruel/ 'was lowered by someone'

4) base : m-base (A) : é-base (P) : /tep/ 'piece of something cut' : /n-tep/ 'to cut' : /étep/ 'was cut by someone' : /yeh n-tep épel ay aro' yeh hmu'/ (he ACT-cut rope AY make him short) 'he cut the rope to make it short' : /épel ay yeh é-tep ay aro' yeh hmu'/ (rope AY him PASS-cut AY make him short) 'the rope was cut by him to make it short'

5) base : C-base (A) : é-base (P) with degemination, cluster reduction or alternation of voiced and voiceless sonorants. In this pattern C = a homorganic nasal before following nasals or obstruents and generally a homorganic liquid

before following liquids (except in /m-la'/). The base is alternatively retained intact in the passive form of stems with initial voiceless sonorants:

/bbeh/ 'fish poison, derris root' : /m-beh/ 'to stun fish with derris root' : /é-beh/ 'were stunned, of fish poisoned with derris root'

/blit/ 'flat' : /m-lit/ 'to flatten' : /i-lit/ 'was flattened by someone'

/plo'/ 'hot' : /l-lo'/ 'to heat' : /é-lo'/ 'was heated by someone'

/ppa'/ 'chewing' : /m-pa'/ 'to chew' : /é-pa'/ 'was chewed by someone'

/ppuet/ 'tracking of game' : /m-puet/ 'to track game' : /i-puet/ 'was tracked by someone'

/sset/ 'taut' : /n-set/ 'to stretch tight' : /é-set/ 'was stretched taut by someone'

/ttuel/ 'broken' : /n-tuel/ 'to break' : /i-tuel/ 'was broken by someone'

/hla'/ 'thrown away' : /m-la'/ 'to throw away' : /é-la'/, /é-hla'/ 'was thrown away by someone'

/hnep/ 'cold' : /n-nep/ 'to cool' : /é-nep/ 'was cooled by someone'

/hlen/ 'swallowed' : /m-len/ 'to swallow' : /é-len/ 'was swallowed by someone'

/hno'/ 'full' : /n-no'/ 'to fill' : /é-no'/, /é-hno'/ 'was filled by someone'

/hrop/ 'poured' : /r-rop/ 'to pour' : /é-rop/ 'was poured by someone'

6) base : mé-base (A) : é-base (P) with degemination, cluster reduction or alternation of voiced and voiceless sonorants.

This is a rare pattern, recorded only in:

/hray/ 'straight' : /mé-ray/ 'to straighten' : /é-ray/ 'was straightened by someone'

7) base : NS-base (A) : i-base (P). In disyllabic bases a base-initial consonant may undergo homorganic nasal substitution in the active voice, as in Bario Kelabit, but the passive form lacks the stem-initial consonant. To account for this pattern we must posit a synchronic rule which drops a base-initial consonant in disyllabic stems before the addition of the passive prefix. This is arguably the same rule which degeminates a base-initial consonant, reduces a base-initial consonant cluster or voices a voiceless sonorant in patterns 4) and 5):

/badiel/ 'gun' : /madiel/ 'shoot with a gun' : /i-adiel/ 'was shot with a gun by someone'

/katem/ 'wood plane' : /ngatem/ 'to plane wood' : /i-atem/ 'was planed by someone'

/pasiew/ 'selling' : /masiew/ 'to sell' : /i-asiew/ 'was sold by someone'

8) base: taCVC : maCVC (A) : i-base (P). In disyllabic bases which begin with taCVC : maCVC (A) : i-base (P). In disyllabic bases which begin with /ta/- the active voice of the verb begins with /ma/-. Since this alternation can no longer be ascribed to homorganic nasal substitution it raises questions about the shape of the base:

/tabat/ 'medicine' : /mabat/ 'medicate, treat with medicine' (Bario: /tabat/ : /nabat/)

/tadem/ 'sharp' : /madem/ 'sharpen' (Bario: /tadem/ : /nadem/

/tanem/ 'burial' : /manem/ 'bury' (Bario: /tanem/ : /nanem/)

/tarey/ 'measurement' : /marey/ 'to measure' (Bario: /tari/ : /nari/)

9) Irregular vowel alternations within a base. In a few forms the fronting rule for *a1 has given rise to different forms of the simple and affixed base:

/alin/ 'path, road' : /m-alan/ 'to walk'

10) Reanalysis of the base. In a few forms the base has been reanalyzed due to a phonemic ambiguity, and as a result its passive form differs from that of the simple or affixed bases:

/yop/ 'blowing' : /n-yop/ 'to blow' (ambiguous for /n-yop/ or /n-nyop/) : /é-nyop/ 'was blown by someone or something'

11) Other patterns. In two known bases the active voice is formed by the addition of /lu/-:

/wek/ : 'fence' : /lu-wek/ 'to fence something' : /lu-wek/ 'was fenced by someone'

/wen/ 'above' : /lu-wen/ 'to put on top of something'

Comparison of the pattern of base : active : passive forms in Sa'ban with those in Bario Kelabit shows that the Sa'ban passives are not direct reflexes of PKLD passive-perfectives with *-in-. Thus Sa'ban /abet/ 'tying' : /m-abet/ 'to tie' : /i-abet/ 'was tied by someone' corresponds structurally to Bario /abet/ : /ng-abet/ : /nabet/, but only the first two forms correspond phonologically. The pattern in Bario which provides the model for this Sa'ban pattern is clearly that seen in bases with a penultimate schwa, as in

/epid/ 'act of braiding' : /ng-epid/ 'to braid' : /ipid/ 'was braided by someone'. In forming its passive constructions Sa'ban thus appears to have generalized an originally restricted ablaut pattern to all verbs regardless of the original penultimate vowel. Forms such as Sa'ban /hlen/ 'swallowed' : /m-len/ 'to swallow', /é-len/ 'was swallowed by someone', next to Bario /telen/ 'swallowing' : /nelen/ 'to swallow', /silen/ 'was swallowed by someone' show further that the Sa'ban passive derives specifically from a generalization of the pattern in PKLD bases of the shape *eCVC (Note that *tilen would have yielded the passive form **hlen, identical with the base).

Given the limited data collected and the space available here we can only scratch the surface of Sa'ban historical morphology. The overall impression that the above material leaves, however, is that contemporary Sa'ban morphology contains a far larger number of subpatterns and outright irregularities than is true of other Kelabit dialects, thus presumably complicating the task of language acquisition by placing a greater burden on memorization.

7. **Motivations for change.** As the poet Shelley mused somewhat wistfully in philosophizing about the human propensity to long for permanence 'All that remains is mutability.' Granted that languages, like all things in Nature must inevitably change, why do some languages change so much more rapidly than others? Kelabit dialects vary in interesting ways, mostly in relation to their reflexes of the PKLD voiced aspirates *bh, *dh, *gh. But the extent of change in Sa'ban exceeds that of any other known Kelabit dialect by several orders of magnitude. What could set such an avalanche of linguistic events in motion?

Since purely internal pressures to change should be similar in all dialects of a language we are almost inevitably

drawn to speculate about the possible role of contact influence in triggering the remarkable series of innovations which have taken place in Sa'ban. Thurgood (1999:253ff) has suggested that the role of external factors (i.e. contact) has been seriously underestimated in accounting for language change. For the Chamic languages of mainland Southeast Asia 'it is contact, not the existence of a language-internal disequilibrium, that both sets the changes in motion and determines the direction of change.'

There are, indeed, some indications that Sa'ban may have begun to diverge from other Kelabit dialects as a result of contact with non-KLD languages. The most convincing evidence comes from the pronouns, which differ sharply from those of other KLD dialects, but bear a striking resemblance to those of Kayan-Murik languages. Table 14 gives the personal pronouns of Bario Kelabit, Uma Juman Kayan and Sa'ban for purposes of comparison:

TABLE 14

Personal pronouns of Bario Kelabit, Uma Juman Kayan and Sa'ban

	Bario Kelabit	Uma Juman Kayan	Sa'ban
sg.			
1	uih	akuy/ak	éek
2	iko	ika'/im	ceh
3	ieh	hia'/na'	yeh
dual			
1in	kiteh	itu'	tah
1ex	kediweh	kawa'	amew
2	medueh	kau'	kéeh
3	diweh	dahu'	déeh
trial			
1in	teluh	telu'	—
1ex	keteluh	kalu'	mélaw
2	meteluh	kelu'	kalaw
3	deteluh	dehalu'	dalaw

	Bario Kelabit	Uma Juman Kayan	Sa'ban
pl.			
1in	tauh	itam	tam
1ex	kamih	kami'	amay
2	muyuh	ikam	ciem
3	ideh	daha'	deh

The singular pronouns of Kayan belong to either of two sets, labelled Set A and Set B in Blust (1977:40). Set A pronouns occur as the actor of an active verb or as the patient/goal. Set B pronouns occur as the actor of a passive verb; in addition /im/ occurs optionally in positive, and possibly also in negative injunctions. The Sa'ban pronouns appear a priori to derive in part from PKLD and in part from a Kayan dialect, as follows:

1sg. : Sa'ban /éek/ reflects *ak, thus pointing rather distinctively to a Kayan-Murik source, since all other known Kelabit dialects reflect PKLD *uih.

2sg. : Sa'ban /ceh/ reflects *(i)ka, again pointing clearly to a Kayan-Murik source; the expected reflex of PKLD *ikaw would be **caew. The addition of final glottal stop is historically secondary in Kayan (Blust to appear).

3sg. : Sa'ban /yeh/ appears to be a native form, although we cannot completely rule out the possibility that it is a borrowing of a Kayan form /hia/.

1dl in. : Sa'ban /tah/ appears to be a native form, reflecting PKLD *kiteh.

1dl ex. : Sa'ban /amew/ is of uncertain provenance.

2dl. : Sa'ban /kéeh/ may reflect *kua, but this is unclear.

3dl. : Sa'ban /déeh/ may reflect *dahu, but this is unclear.

1tl in. : Jolly Udau insisted that there was no 1p. trial inclusive pronoun in Sa'ban, but such a gap in an otherwise symmetrical system would be surprising.

1tl ex. : Sa'ban /mélaw/ is of uncertain provenance.

2tl : Sa'ban /kalaw/ reflects *kalu or *kelu, thus pointing clearly to a Kayan-Murik source.

3tl : Sa'ban /dalaw/ reflects *dalu or *delu, a form which appears to be compatible with Uma Juman /dehalu'/, but not with Bario /deteluh/.

1pl in. : Sa'ban /tam/ reflects *etam, *itam or *utam, and is clearly connected with the Kayan form.

1pl ex. : Sa'ban /amay/ is non-distinctive for a PKLD or Kayan-Murik source.

2pl. : Sa'ban /ciem/ reflects *ikam, and is clearly connected with the Kayan form.

3pl. : Sa'ban /deh/ appears to be a native form, reflecting PKLD *ideh.

In short, at least six of the Sa'ban personal pronouns appear to be of Kayan origin: the 1st and 2nd person singulars, the 2nd and 3rd person trials, and the 1st person inclusive and 2nd person plural forms. In addition, the 2nd and 3rd person dual pronouns in Sa'ban may have a Kayan source. Kayan is most closely related to Murik, spoken in interior portions of the basin of the Baram river of northern Sarawak, and to Modang, spoken in East Kalimantan. Kayan dialects are widely distributed throughout central Borneo in the upper portions of the major river basins (Kahayan, Mahakam, Kapuas, etc.), the result of a strong pulse of migration, probably out of Kalimantan, within the past millennium. Although Kayan dialects themselves do not exhibit highly

innovative phonologies, Modang dialects do. Very little reliable information is available on Modang, although Revel-Macdonald (1982) provides a preliminary sketch of some features of the historical phonology.

Unfortunately, Revel-Macdonald does not provide data on the pronouns of Modang, but she does draw attention to: 1. its tendency to monosyllabism, as in PMP *quzan > /si:n/ 'rain', *lesuŋ > /sɔng/ 'mortar', or *buhuk > /wɔk/ 'head hair', 2. the development of sometimes peculiar and presumably unstable consonant clusters in initial position, as in *manuk > /mnɔk/ 'bird', *punti > /ptəɛ/ 'banana' or *tulaŋ > /tluang/ 'bone', and 3. innovative diphthongs. All of these features are reminiscent of changes in Sa'ban, and the fronting of the vowel in *quzan > /si:n/ 'rain' may even be evidence of an innovation similar in form to Sa'ban Rule 1. The changes in Modang are, of course, not identical to those in Sa'ban, but their general character is highly similar. Moreover, some phonologically altered Modang forms may represent stages through which Sa'ban passed at an earlier time, as with PMP *tuqelaŋ > Modang /tluang/, Sa'ban /hloeng/ 'bone', where the voiceless lateral of Sa'ban clearly derives from an earlier *tl- cluster.

These observations certainly suggest that the highly divergent character of Sa'ban among the Kelabit dialects may owe its origin to sound changes initiated through heavy contact with Modang. If this is true, however, it is surprising that very little lexical evidence of contact with a Kayan-Murik language can be identified outside the system of personal pronouns. Moreover, although the phonological evidence suggests contact with Modang, the pronominal evidence suggests borrowing with Kayan.[13] To further complicate the problem of identifying possible contact influences, Sa'ban also shows at least one sound change which points to connections on the opposite side of the island of Borneo from Modang. In an area which appears to center on the

Melanau dialect chain of coastal Sarawak many languages have innovated a rule of vowel breaking in which high vowels are pronounced with a centralizing glide (schwa) before final /k/ and /ng/ (but not before final /g/). This change is found in coastal Sarawak and in lower portions of the Baram and Rejang river systems, but is generally absent from upriver areas. Most notably, it is not known to occur in any other KLD dialect, even though many of these are closer than Sa'ban to the coast of Sarawak. Although one might argue that in Sa'ban a centralizing glide has been innovated in a more general environment, as with PKLD *apuy > /apuey/ 'fire', or PKLD *atay > /ataey/ 'death', there is no denying the close similarity of the changes seen in *amuŋ > /mueng/ 'all', *apiŋ > /apéeng/ 'ends of the longhouse', *apuk > /apuek/ 'dust', or *betik > /téek/ 'tattoo' to those characteristic of coastal Sarawak (Blust 1988).

What are we to make of these mixed signals? Perhaps Sa'ban has been in contact with several different groups of non-KLD languages. Although the Sa'ban themselves favor a fantastic origin story which derives them from 'a mixture of Malays, Indians and Chinese' who travelled up the basin of the Kapuas river in West Kalimantan to their historical seat, it is probable from its geographical position and its embedding in a network of other KLD dialects that Sa'ban has always been an interior language and that contact with other language groups has taken place in the interior of Borneo. As noted in an earlier publication (Blust 1984), there is some evidence that Sa'ban was in contact with the Tring dialect of Long Terawan — one of a cluster of KLD dialects which also has traditions of long-distance migration. But Tring could not have been the stimulus which started Sa'ban on its wild course of phonological change, and although there is some evidence that Tring was also in contact with a Kayan-Murik language (cf. /kam/ '2pl.'), it shows far less phonological change than Sa'ban.

Finally, although Sa'ban arguably remains a KLD dialect, it might prove worthwhile to know whether Sa'ban itself is dialectally heterogeneous, since this could provide new avenues to understanding at least some aspects of an unusually complex history. To date all information on the language comes from the speech of Long Banga'. Are other Sa'ban communities found in Kalimantan? What is the relationship of Sa'ban to the unknown and moribund Lengilu, which initial reports suggest is another divergent dialect of KLD? (Wurm and Hattori (1981)). Whatever answers we are ultimately able to provide to the many questions that Sa'ban historical phonology raises, it is perhaps more forcefully clear now than before that every language community, even it is 'only a dialect', has its potential contribution to make toward an understanding of the nature and possibilities of linguistic change.

APPENDIX 1

A lexicostatistical comparison of Sa'ban with three other KLD dialects

[Letters 'A', 'B', etc. indicate membership in same or different cognate sets.]

No.	Tring	Bario	Lun Dayeh	Sa'ban	English Glosses
001.	ticuq A	tidhuq A	tidhuq A	seu' A	hand
002.	kabing A	kabing A	kabing A	abieng A	left side
003.	tuquh A	senuqeh B	tinueh B	ɔh B	right side
004.	ukut A	kukud A	kukud A	kkuet A	leg
005.	ukut A	kukud A	kukud A	kkuet A	foot
006.	nalan A	nalan A	nalan A	malan A	walk
007.	dalan A	dalan A	dalan A	alin A	path/road
008.	marih A	marih A	eméq B	arey A	come
009.	be-liel A	r-em-ier A	lumi B	liel A	turn
010.	pe-languy A	languy A	languy A	langoey A	swim
011.	mupuq A	mupuq A	mupuq A	m-pu' A	wash
012.	maqit A	maqid A	mid A	n-yo' B	wipe
013.	nyidu L?	maqid A	ngesa B	n-yo' C	rub
014.	luyuq A	kotor L	me-lutak B	kotor L	dirty
015.	apuk A	apuk A	abuh B	apuek A	dust
016.	anit A	anit A	kubil B	anIt A	skin

017.	ketet A	keted A	keted A	tet A	back
018.	batek A	batek A	batek A	atek A	belly
019.	tulang A	tulang A	tulang A	hloeng A	bone
020.	tenaqiq A	senaqih A	tineiq A	sen'ay A	guts
021.	ate A	ate A	ate A	ataey A	liver
022.	ate A	ate buduk A	pusuq B	temduek A	heart
023.	kiliq A	keliq A	keliq A	lé' A	know
024.	be-pikil L	nge-linuh A	mikir L	n-naw A	think
025.	taqut A	taqut A	me-tot A	ta'ewt A	fear
026.	daraq A	daraq A	daraq A	arée' A	blood
027.	uluh A	uluh A	uluh A	lew A	head
028.	liqel A	riqer A	dier A	oeng B	neck
029.	puk A	ebhuk A	ebhuk A	puk A	hair
030.	icung	idhung A	idhung A	sueng A	nose
031.	n-iat A	n-iat A	nge-niat A	n-yat A	breathe
032.	nge-lanung A	muen B	nge-buen B	m-win B	smell
033.	taqeng A	taqeng A	tang A	yong B	mouth
034.	lipen A	lipen A	lipen A	épen A	tooth
035.	dilaq A	dilaq A	dilaq A	ili' A	tongue
036.	diruh A	riruh A	me-riruh A	p-éraw A	laugh
037.	nangih A	nange A	nangih A	mangay A	cry
038.	ng-utaq A	ng-utaq A	k-utaq A	n-toe' A	vomit
039.	nge-licaq A	nge-lidhaq A	nge-lidhaq A	lesei' A	spit
040.	kuman A	kuman A	kuman A	man A	eat
041.	nge-lak A	nge-laak A	nge-lak A	m-wel B	cook
042.	ng-irup A	m-irup A	ng-irup A	m-érop A	drink

043.	ngetep A	ngetep A	ngetep A	m-biet B	bite
044.	n-uqut A	n-uqut A	ng-ut A	m-wet A	suck
045.	lalit A	lalid A	lalid A	alit A	ear
046.	ningel A	ninger A	ninger A	n-nyel A	hear
047.	matah A	mateh A	mateh A	ateh A	eye
048.	niqel A	niqer A	nier A	n-nel A	see
049.	ludap A	rudap A	rudap A	diep A	sleep
050.	selubit A	selubid A	telubid A	bit A	lie down
051.	tudo A	tudo A	tudo A	leku' B	sit
052.	mudul A	mudur A	tuped B	duel A	stand
053.	lemulun A	lemulun A	lemulun A	lemluen A	person
054.	(de)laqih A	delaqih A	deley A	ley A	man
055.	dicul A	dedhur A	dedhur A	ssuel A	woman
056.	anak A	anak A	anak A	anak A	child
057.	awah A	awa-n A	awa-n deley A	awa-n A	husband
058.	awah A	awa-n A	awa-n dedhur A	awa-n A	wife
059.	tinah A	te-sineh A	tina-n A	hna-n A	mother
060.	tamah A	te-tameh A	tama-n A	tama-n A	father
061.	adan A	ngadan A	ngadan A	adin A	name
062.	pe-buriq A	mala B	mala B	maneh C	say
063.	upel A	nuper A	nuper A	épel A	rope
064.	ng-abet A	ng-abet A	ng-abet A	m-abet A	tie
065.	napit A	me-deket B	nerut C	laruet C	sew
066.	unah lep A	kelibung B	pakay L	talon C	clothing
067.	nganuk A	nge-raad B	ngilip C	rat B	hunt
068.	madil L	madil L	madil L	madiel L	shoot

069.	nepek A	nebhek A	nebhek A	m-pek A	stab
070.	mupuk A	mupuq B	meper C	m-pu' B	hit
071.	ke-daluh A	pe-daluh A	peke-daluh A	patay B	fight
072.	ng-ate A	ng-ate A	ng-ate A	m-atay A	kill
073.	m-ate A	m-ate A	m-ate A	m-atay A	die
074.	m-ulun A	m-ulun A	m-ulun A	m-luen A	live
075.	nge-lekem A	ngaro B	ngukut C	lamIt D	scratch
076.	nerat A	ngeteb B	ngeteb B	n-tep B	cut
077.	kayuh A	kayuh A	kayuh A	ayew A	stick/wood
078.	ng-epak A	n-epak A	m-epak A	m-pa B	split
079.	tadem A	tadem A	me-tadem A	tadem A	sharp
080.	ngadel A	ngadel A	me-ngadel A	padel A	dull
081.	ngekuel A	kereja L	kerejaq L	kelja L	work
082.	milik A	raut B	me-rot B	n-nyen C	play
083.	be-laguq L	me-nani L	me-nani L	me-nani L	sing
084.	kanyet L?	ngarang A	ng-elay C	m-arang A	dance
085.	baraq A	baraq A	me-baraq A	bérée' A	swell
086.	merek A	merek A	medhit B	m-rek A	squeeze
087.	ng-imet A	ng-imet A	ng-imet A	met A	hold
088.	ng-ukat A	n-ukat A	ng-ukat A	ng-koet A	dig
089.	mere A	mere A	mere A	m-ray A	give
090.	ng-inat A	ng-inat A	ng-inat A	m-énat A	pull
091.	menul A	ng-edhuh B	menul A	n-sew B	push
092.	nelaq A	nelaq A	m-itung B	m-pet C	throw
093.	datuq A	tutuq B	mebheh C	tto' B	fall
094.	ukuq A	ukuq A	ukoq A	ku' A	dog

095.	manuk A	manuk A	suit B	manok A	bird
096.	terul A	terur A	terur A	hrol A	egg
097.	buluh A	buluh A	buluh A	blew A	feather
098.	ilat A	elad A	ilad A	lut B	wing
099.	temalut A	temulud A	temulud A	hlut A	to fly
100.	pung A	puung A	pung A	pueng A	animal
101.	uang A	uang A	uang A	wang A	meat
102.	lemek A	lemek A	lemek A	lemek A	fat/grease
103.	iul A	iur A	iur A	yol A	tail
104.	lipah A	selanguy B	menipeh A	benpeh A	snake
105.	latih A	kelatih A	kelatih A	mal B	earthworm
106.	kutuh A	kutuh A	kutuh A	tew A	louse
107.	lawit A	luang B	lawid A	awit A	fish
108.	kayuh A	kayuh A	kayuh A	ayew A	tree
109.	buruk A	buruk A	me-buruk A	bruek A	rotten
110.	daqun A	daqun A	don A	un A	leaf
111.	anit kayuh A	anit kayuh A	anit A	anIt ayew A	bark
112.	lamut A	ramut A	uat B	wat B	root
113.	ilung A	ilung A	ilung A	élong A	seed
114.	bucak A	busak A	busak A	bonge' L	flower
115.	buaq A	buaq A	buaq A	wei' A	fruit
116.	uduh A	uduh A	uduh A	dew A	grass
117.	tanaq A	tanaq A	tanaq A	tana' A	earth
118.	batuh A	batuh A	batuh A	ataw A	stone
119.	bada A	bada A	bada A	bidi A	sand
120.	paq A	ebhaq A	ebhaq A	pei' A	water

121.	murul A	m-anud B	m-anud B	m-lut B	flow
122.	lupung A	lupung A	lupung A	lapueng A	float
123.	tucuq A	tudhuq A	tudhuq A	seu' A	salt
124.	legen A	takung B	takung B	takong B	lake
125.	arul A	ebhaq B	ebhaq B	pei' B	river
126.	buduk A	buduk A	peghung B	kut C	mountain
127.	pulung A	pulung A	pulung A	plueng A	forest
128.	langit A	langit A	langit A	langɛt A	sky
129.	matah co A	mateh edho A	mateh edho A	(ateh) siew A	sun
130.	tekuqen A	getuqen A	gituen A	jInto'ɔn A	star
131.	laput A	laput A	laput A	lapuet A	cloud
132.	laput A	laput A	laput A	lapuet A	fog
133.	udan A	udan A	udan A	din A	rain
134.	barέw A	bariw A	buy B	biriew A	wind
135.	ng-iup A	ng-iup A	ng-iup A	n-nyop A	blow
136.	lauq A	lauq A	me-lauq A	p-lo' A	hot
137.	tenep A	teneb A	me-teneb A	hnep A	cold
138.	melang A	pering B	me-kering B	prang A	dry
139.	baq A	baaq A	me-baq A	bihi' A	wet
140.	alut L	tepi A	me-selud B	pahat C	smooth
141.	berat A	berat A	me-berat A	bréet A	heavy
142.	apuy A	apuy A	apuy A	apuey A	fire
143.	nutut A	nutud A	ngeseb B	n-tuet A	burn
144.	lepun A	rebhun A	rebhun A	lepun A	smoke
145.	abuh A	abuh A	abuh A	abew A	ash
146.	m-item A	m-item A	m-item A	m-étem A	black

147.	budaq A	budaq A	me-budaq A	di' A	white
148.	siaq A	siaq A	me-siaq A	ssa' A	red
149.	biral A	birar A	me-birar A	béréel A	yellow
150.	bataq A	bataq A	me-bataq A	ata' A	green
151.	it A	iqit A	sut B	ciek C	small
152.	layah A	rayeh A	rayeh A	rah A	big
153.	kemuq A	kemuq A	me-kemuq A	hmu' A	short
154.	kadang A	kadang A	me-kadang	adeu' B	long
155.	lipi A	lipi A	me-lipi A	pe-lpay A	thin
156.	kapal A	kapal A	me-kapal A	apal A	thick
157.	it A	iqit A	sut B	ciek C	narrow
158.	layah A	rayeh A	rayeh A	rah A	wide
159.	tupet A	tuped A			
		siri B	me-siri B	hray B	straight
160.	lemeral A	ngered B	me-ngered B	maret B	old
161.	beruh A	beruh A	me-beruh A	brew A	new
162.	doq A	dooq A	doq A	wei' A	good
163.	daqet A	daqet A	dat A	ré'et A	bad
164.	keneh A	muned B	muned B		
		tulu C		hlew C	correct
165.	didem A	dedhem A	dedhem A	sem A	night
166.	co A	edho A	edho A	siew A	day
167.	lak A	laak A	lak A	lak A	year
168.	idan A	idan A	idan A	din A	when?
169.	atek A	ngi B	dei' C	lem D	at
170.	lem A	lem uang A	ban B	lem A	in

171.	inih A	ng-inih A	ien nih A	way B	here
172.	inah A	ng-ineh A	dei' B	nah A	there
173.	nih A	inih A	inih A	h-nay A	this
174.	nah A	ineh A	idi' B	nah A	that
175.	meru A	muneng B	muneng B	nong B	near
176.	mado A	mado A	mado A	adiew A	far
177.	pah A	ng-apeh A	i apeh A	pah A	where?
178.	uih A	uih A	uih A	éek B	I
179.	ko A	iko A	iko A	ceh B	you
180.	iah A	ieh A	ieh A	yeh A	he/she/it
181.	tauh A	tauh A	tew A	tam B	we (incl.)
	kamih A	kamih A	kay A	may A	we (excl.)
182.	kam A	muyuh B	muyuh B	ciem A	you (pl.)
183.	dah A	ideh A	ideh A	deh A	they
184.	nun A	enun A	enun A	non A	what?
185.	ie A	iih A	idé B	ay A	who?
186.	iah nah A	beken B	edheh dih C	———	other
187.	mulaq A	ibal B	sebuang C	sewéeng C	some
188.	mulaq A	mulaq A	mulaq A	loe' A	many
189.	siqit A	ibal B	sesut C	ciek D	few
190.	abi A	abi A	amung B	mueng B	all
191.	ngan A	mé B	em C	ngan A	and
192.	ngan A	mé B	dengan L	ngan A	with
193.	geran A	kadiq B	ngedheh kuh C	abin D	because
194.	mun L?	tulu A	kudeng B	kay C	if
195.	kupah A	kapeh A	kudeng apeh A	papeh A	how?

196.	naqem A	naqem A	na B	em A	no/not
197.	ng-iap A	ng-inam B	ng-iap A	m-énam B	to count
198.	cah A	edheh A	edheh A	seh A	one
199.	duah A	dueh A	dueh A	weh A	two
200.	teluh A	teluh A	teluh A	lew A	three

APPENDIX 2

Sa'ban reflexes of Proto-Malayo-Polynesian (PMP) and Proto-Kelabit-Lun Dayeh (PKLD)

[Material is ordered alphabetically by the PKLD base.]

No.	PMP	PKLD	Sa'ban	English
001.		aban	abin	because
002.		abet	abet	tying; rope
		ŋ-abet	m-abet	to tie
			i-abet	was tied
003.	abin	ŋ-abin	m-abin	to hold in the lap
004.	qabu	abuh	abew	ashes
		m-abuh	m-abew	covered with ashes
005.		adaq	adei'	shadow; ghost
006.		m-adaq	m-adei'	to advise, teach
007.	qajeŋ	adeŋ	adeng	cold charcoal
008.	huaji	adi-n	arI-n	younger sibling
009.	agag	agag	ajiep	rice sieve
010.		ŋ-agap	m-ajéep	to startle
011.		akaq	aka'	saliva
012.		akat	akat	courage

013.		akep	kep	river snail
014.	qalad	alad	alit	wall
015.	alap	alap	alak	to get, fetch
016.	qaleb	aleb	alep	knee
017.	alem	alem	alem	evening, night
018.		aliq	alé'	dirt on the skin
019.		m-aliq	le-malI'	pregnant
020.		alud	alut	boat
021.		m-alug	malok	to trick
022.	qahelu	aluh	alaw	rice pestle
023.		amuŋ	mueng	all
024.	anak	anak	anak	child
025.		anam	anam	act of picking up
		ŋ-anam	m-anam	to pick up
026.	qanit	anit	anIt	skin
027.	qañud	m-anud	m-lut	to flow
028.		p-aŋel	p-angel	walk arm-in-arm
029.		apet	apet	bush, thicket
030.		apiŋ	apéeng	ends of longhouse
031.	hapuk	apuk	apuek	dust
		m-apuk	m-apuek	dusty
032.	hapuy	apuy	apuey	fire
033.		aqay	ay	frog
034.	sakit	aqit	ét	pain

035.		n-aqit	m-a'It	to wait
036.		aquk	ok	a ladle
037.		araŋ	arang	a dance
		ŋaraŋ	m-arang	to dance
038.	salaR	arar	aral	nest
039.		areg	arep	crumbs, rubbish
		m-areg	m-arep	full of rubbish
040.		arit	arIt	design
		ŋ-arit	m-arIt	to write
041.	aluR	arur	arol	channel
042.	hasaŋ	asaŋ	aséeng	gills
043.	ataŋ	ataŋ	atang	house beams
044.	ataq	ataq	ata'	rice grain with husk
045.	atay	atay	ataey	death
	p-atay	patay	p-ataey	to quarrel
	m-atay	matay	m-ataey	to die; dead
046.	qatay	atay	ataey	liver
047.		atay uduk	temduek	heart
048.	qateb	ateb	atap	deadfall trap
049.		atur	atol	generation
050.		m-awa	m-awa	disappointed; regret
051.	qasawa	awa-n	awa-n	spouse
052.		m-ayaq	maya'	to imitate
053.		ayek	ayek-ayek	whispers

054.		ayen ayen	ayien	slowly
055.	badas	bada	bidi	sand
056.		baduk	madok	jackfruit
057.	baseq	bahaq	bihi'	wet
058.		baka	aka	wild pig
059.	bakul	bakul	bakol	basket
060.	balaŋ	balaŋ	béléeng	tiger cat
061.	bali	balih	béley	to lie, deceive
062.	baliw	baliw	biliew	to change state
063.		baŋeh	angah	plate
064.		baŋet	banget	sea
065.		baqaw	bi'iew	beads
066.		baquŋ	ueng	banana
067.	baReq	baraq	béré'	to swell
068.		barat	bérét	veranda
069.	baRah	bareh	béreh	hot coal, ember
070.	baRiuh	bariw	biriew	wind
071.	bataŋ	bataŋ	atang	log
072.	bataq	bataq	ata'	green
073.		batek	atek	belly
074.	batu	batuh	ataw	stone
075.	besuR	baur	béwel	satiated
076.	bawaŋ	bawaŋ	awéeng	territory, country

077.		bebhat	piet	a share
		mebhat	m-piet	to share
078.	bekbek	bebhek	ppek	pounded fine
079.	benben	bebhen	pen	cover, lid
080.		bebher	pel	fan for the fire
081.		bedhek	sek	nasal mucus
082.	bediq	bedhiq	sei'	vagina
083.		bedhuk	ssuek	coconut monkey
084.		begheh	bekeh	deaf, mute
085.		bekaŋ	kang	k.o. carrying basket
086.	beken	beken	ng-ken	different
087.		belad	blit	flat, level
088.		beladan	beladin	freshwater turtle
089.	balatik	belatik	latéek	spring-set arrow trap
090.	beli	belih	bley	purchases
		melih	mley	to buy
091.	balunuq	belunuq	belnu'	small red jackfruit
092.		beluqiŋ	ieng	hoe
093.		beluqug	bel'up	wasp, hornet
094.		beŋar	ngal	plank
095.	baŋelih	beŋelih	bongley	tusk of wild boar
096.	beRas	bera	brée	husked rice
097.	baReqaŋ	beraqaŋ	bel'ang	molar tooth
098.		beraquk	bel'uek	toad

099.	beReqat	berat	bréet	heavy
100.	beRek	berek	rek	domesticated pig
101.	baRuaŋ	beruaŋ	belwéeng	Malayan sun bear
102.	baqeRu	beruh	brew	new
103.	bitiqes	beti	ttay	calf of the leg
104.	betik	betik	téek	tattoo in progress
105.	bituka	betueh	bentueh	bowels
106.	betuŋ	betuŋ	leu' tong	bamboo sp.
107.	bibiR	bibir	ibiel	lip
108.	bikuŋ	bikuŋ	békong	adze
109.		birar	béréel	yellow
110.	buaq	buaq	wei'	fruit
111.	buqaya	buayeh	boyeh	crocodile
112.	bubu	bubuh	bew	fish trap
113.		bubhuq	peu'	ventral incision
114.		bubhuq	bong peu'	door
115.		budaq	di'	white
116.	bunduk	buduk	duek	mountain peak
117.	bahu-en	buen	win	odor
		muen	m-win	to smell
			i-win	was smelled by s.o.
118.	buku	bukuh	kkew	node, joint
119.	bulan	bulan	blin	moon

120.	buleŋ	anak buleŋ	anak lɔng	only child
121.	bulu	buluh	blew	body hair, feathers
122.	buluq	buluq	leu'	bamboo
123.		buqan	in	carrying basket
124.	buRaw	buraw	bréew	to chase away
125.	buRuk	buruk	bruek	rotten
126.		buruq	bru'	washed off (paint)
127.		burur	bruel	body
128.		butaq mateh	toe' atah	eye mucus
129.		butuŋ	tueng	corpse
130.	butuq	butuq	tu'	penis
131.		buaq buyaw	wei' yiew	orange
132.		buyur	jjuel	too long (clothes)
133.		daan	rien	field hut
134.	dadan	dadan	adin	old, long time
135.	daŋdaŋ	dadaŋ	ladéeng	heat of a fire
		me-dadaŋ	pe-ladéeng	to warm by a fire
136.	dajem	dadem	bédem	chills and fever
137.	zalan	dalan	alin	path/road
	z-um-alan	nalan	m-alan	to walk
138.	dalem	dalem	bélem	deep
139.		me-daluh	bélew	quarrel; angry
140.	daqan	daqan	la'in	branch

141.		daqeh	eh	chin/jaw
142.	daqet	daqet	et/ré'et	bad
143.	dahun	daqun	un	leaf
144.	daRaq	daraq	arée'	blood
145.		datuq	ato'	durian
146.	daya	dayeh	pé' ayeh	short way upriver
147.	demdem	dedhem	la' sem	night
148.		dedhen	sen	downward pressure
149.		dedhur	ssuel	woman/female
150.	deket	deket	leket	to stick, adhere
	me-deket	me-deket	pe-lket	sticking, adhering
151.		delaw	liew	freshwater eel
152.		demulun	lemluen	slave
153.		denak denak	nak nak	suddenly
154.		dengan	ngan	and/with
155.		deŋur	ngol	bass (voice)
156.	depa	depeh	lepah	fathom
157.	dilaq	dilaq	ili'	tongue
158.		pe-diŋi	pe-lngaey	opposite bank
159.	hadiRi	dirih	arey	housepost
160.		pe-ditaq	pé' ta'	above
		me-ditaq	be-lta'	high
161.	diRuq	diuq	yeu'	take a bath
162.		niuq	n-yeu'	bathe someone

163.		d-in-iuq	é-nyeu'	was bathed
164.		duaq (?)	wei'	good
165.		duder	del	small edible eel
166.	duha	dueh	weh	two
167.	zuRuq	duruq	ru'	honey
168.	bahaq	ebhaq	pei'	water
169.	bahaR	ebhar	péel	loincloth
170.		ebheŋ	peng	accusation
		ŋ-ebheŋ	m-peng	to accuse
171.		ebheŋ	peng	dyke in paddy
172.		m-ebhuh	m-pew	to refuse
173.	buhek	ebhuk	puek	head hair
174.		ebhul	pul	skewer for meat
175.	haRezan	edhan	sin	notched log ladder
176.		edhaŋ	séeng	light, brilliance
177.	qalejaw	edhaw	siew	day; sun
178.		edheh	seh	one
179.		edhen	sen	work
180.		edhiŋ	sieng	arrival
181.		edhuh	sew	pushing
		ŋ-edhuh	n-sew	to push
182.		laqal ekiw	al kéew	white egret
183.	qekuŋ	ekuŋ	kong	owl

184.	qelad	elad	lut (?)	wing
185.		eleg	lep	to stop, as work
186.		eluŋ	long	estuary
187.		emuŋ	mueng	collection
188.	enem	enem	nem	six
189.		enun	non	what?
190.		p-eŋep	hngep	to kiss e.o.
		ŋ-eŋep	ng-ngep	to kiss s.o.
191.		eŋi	hngay	that
192.	epat	epat	pat	four
193.		ŋ-epid	lepIt	to braid
194.		epin	pIn	mat
195.	qepit	epit	pIt	forceps
196.	semput	eput	puet	blowpipe
		ŋ-eput	m-puet	shoot with blowpipe
197.		ŋ-eseb	n-sep	to burn
198.		ŋ-esu	pel-sew	continue; immediate
199.		etun	ton	front
200.		etun	ton	long handle
201.	gasiŋ	gaiŋ	ayeng	spinning top
202.		gareŋ	reng reng	to roar
203.	gatel	gatel	jatel	itchy
204.	gemel	ŋemel	m-mel	to grasp, squeeze

205.		genuluh	jenlew	empty rice head
206.	geRami	geramih	jelamey	rice straw
207.		gerawat	pelawet	complicated
208.		getimel	hmel	bedbug
209.		gileg	pélep	skittish
210.	bituqen	gituqen	jInto'ɔn	star
211.		giwen	lawen (?)	messy, untidy
212.	guliŋ	guliŋ	lieng lieng	shake head sideways
213.		guta	toe	to cross a river
214.		iat	yat	breath
		n-iat	n-yat	to breathe
215.	isaw	iaw (?)	yaew	knife
216.		iban	ibin	PIL, CIL
217.	ijan	idan	din	when?
218.	ida	ideh	deh	they (plural)
219.	ijuŋ	idhuŋ	sueng	nose
220.	ia	ieh	yah	he/she
221.		iguq	jeu'	shame
		m-iguq	n-jeu'	ashamed
222.	i-sai	iih	aey	who?
223.		ikab	kap	smoke vent
224.		m-ikat	n-céet	expensive; difficult
225.		ileg	élep	to separate, divorce

226.		ilek	élek	armpit
227.		m-iluh	mélaw	to eat s.t. poisonous
228.	silu	ilu-n	élon	fingernail
229.		iluŋ	élong	seed
230.		ilut		rattan cane
		ŋ-ilut	m-élot	to whip
231.		imet	met	to hold
232.	t-ina	ina-q	na'	mother (add.)
		t-ina-n	hna-n	his mother
233.		ng-inam	m-énam	to count
234.		ŋ-inat	m-énat	to pull
235.	i-na	ineh	nah	that, those
	i-na	k-ineh	hnah	that way
236.	ini	inih	nay	this, these
		k-inih	hnay	this way; now
237.		iqik	éek	small
238.		ŋ-iqir	m-i'ir	to sharpen
239.	siku	ikuh	cew	elbow
240.		irat	érat	to emerge, come out
241.	hiRup	irup	érop	drinking
		m-irup	mérop	to drink
242.		iseh	ésah	a file
243.	qitem	m-item	métem	black
244.		iuk iuk	yok yok	little-by-little

245.		iuŋ	yong	hulling platform
246.	hiup	iup	yop	blowing
		ŋ-iup	n-yop	to blow
247.	ikuR	iur	yol	tail
248.	siwa	iwaq	éwa'	nine
249.		pe-kabiŋ	pé' abieng	left side
250.	kazaŋ	kadaŋ	padéeng	tall
251.		kak kak	kak kak	to cackle (onom.)
252.	kami	kamih	amay	we, us (excl.)
253.	k-um-aen	k-um-an	man	to eat
	k-in-aen	k-in-an	énan	was eaten
254.	ma-kapal	kapal	apal	thick
255.		kapeh	papeh	how?
256.		kataw	ataew	grasshopper
257.	katem	katem	katem	wood plane
258.	kahiw	kayuh	ayew	wood, tree
259.		kebher kebher	pel pel	flapping (wings)
260.		keduit	wiet	ladle, scoop
261.		kedha	nsi (?)	able to endure pain
262.	kezep	kedhep	sep	close the eyes
263.		kekeb	kap	lid, cover
264.		kekelit	lalIt (?)	insectivorous bat
265.		kelabet	labet	gibbon
266.		kelelebhaŋ	lepéeng	butterfly

267.		keliaw	liaew	wild cow
268.		keliq	lée'	know
269.		me-keluk	plok	slack, as a rope
			m-lok	to slacken
270.		kemuq	hmu'	short
271.		ken	ken	question marker
272.		pe-keneh	panah	to believe
273.	kaen-en	kenen	nen	fodder
274.		keniw	néew	eagle
275.		kereb	parep	able, capable
276.		kereruer	luél	intestinal worm
277.		kerin	rieng	k.o. bell bracelet
278.		keruk	rok-rok	a snore
279.	keteb	keteb	tep	piece made by cutting
		ŋeteb	n-tep	to cut
280.		keted	tet	back
281.	kihkih	ŋiki	n-cey	to shave
282.		kikid	pé' ket (?)	rice porridge dish
283.	kilat	kilat	ilat ilat	lightning
284.	kiluq	kiluq	kélo'	bent
285.		kiran	iran	breadfruit
286.	kita	kiteh	tah	we (dual incl.)
287.		kuir	wél	clouded leopard

288.		kukel	kkɔl	wrist
289.	kudkud	kukud	kkuet	foot/leg
290.	kulat	kulat	loet	mushroom
291.	kulub	kulub	lup	ridgepole cover
292.	kutu	kutuh	tew	head louse
293.		kuyad	yoet	grey macaque
294.	lasak	me-laak	p-lak	cooked, ripe
295.		laak	lak	year
296.		laba	labi	to pass, surpass
297.	labaw	labaw	abiew	rat, mouse
298.		labuh labuh	abew abew	dusty
299.		lalid	alit	ear
300.		lamud	lamuet	mixture
301.		laŋan	langan	blowpipe dart
302.	laŋaw	laŋaw	langaew	horsefly
303.	laŋit	laŋit	langɛt	sky
304.		laŋuq	lango'	brother-in-law
305.	laŋuy	laŋuy	langoey	swim
306.		laput	lapuet	cloud
307.		laqal	al	chicken
308.	la-laki	de-laqih	ley	male
309.		lataw	lataew	oil, oily
310.	lasuq	me-lauq	p-lo'	warm/hot

311.		lawid	awit	fish
312.	layu	layuh	layew	to wither
313.		lekuq	ko'	bracelet
314.	lekuq	lekuq	leko'	joint
315.		leleŋ	leng	dam of branches
316.	(da)lem	lem	lem	at, in, inside
317.	qali-matek	lematek	lematek	jungle leech
318.	lemek	lemek	lemek	fat, grease
	me-lemek	me-lemek	pe-lmek	soft
319.		l-em-idik	lemdiek	to cut underbrush
320.		lemulun	lemluen	person
321.		lemuned	lemnet	middle
322.	leŋen	leŋen	lengen	arm
323.		leŋu	hngaw	slipped off, shed
324.		lepaq	lepa'	foam, froth
325.	lepaw	lepaw	paew	granary
326.		liaŋ	yang	under, beneath
327.	libut	libut	lebuet	to surround game
328.	ludaq	lidhaq	lesei'	to spit
			ései'	was spit
329.	qalia	lieh	liah	ginger
330.	lima	limeh	émah	five
331.		linuh	hnaw	thought
		ŋe-linuh	n-naw	to think

332.		lipaŋ	lipang	rice husk with grain
333.	lipen	lipen	épen	tooth
334.	ma-nipis	me-lipi	pelpay	thin (materials)
335.	lisehaq	liqa	lé'ée	nit, louse eggs
336.		me-liqaw	pel'éew	clear (water)
		liqaw	lé'éw	clear (water)
337.	lubaŋ	lubaŋ	béeng	hole
338.		lubid	lebit	to roll s.t. over
339.		lukaq	lekoe'/kkoe'	to fall (person)
			ng-koe'	to let s.t. fall
340.	lulud	lulud	lut	shin
341.	lulun	lulun	lluen	to roll s.t. up
342.		lun	lun	person
343.		luŋun	nguen	coffin
344.		lupuŋ	lapueng/lepueng	to float
			apueng-apueng	floating
345.		luun	wen	above
		luun	luwén	to put on top
346.		maaw	maew	yes
347.	ma-buhek	mabuk	mabuek	drunk
348.	ma-zauq	madaw	adiew	far
349.	ma-asiq	mahéq	mahI'	to love
350.		majan	majien	papaya
351.		manuk	manok	chicken

352.		maqad	ma'at	to stutter, stammer
353.		maqun	ma'on	old (things)
354.	um-aRi	marih	aray	come
355.		masiw	masiew	to sell
356.	ma-etaq	mataq	mata'	raw
357.	mata	mateh	atah	eye
358.		matuq	mato'	look after (a child)
359.		mawan	mawan	visible
360.		may	maey	to go
361.		mayad	mayat	to dribble out
362.		mayaq	maya'	to follow
363.		mayuŋ	mayong	to spear
364.		melay	m-laey	cheap; easy
365.		menad	nnat	to climb
366.		menebhur	puel	rice porridge
367.		menelen	menlen/mlen	python
368.		menipal	menpal	scorpion
369.		menipeh	benpeh	snake
370.		mepet	m-pet	to throw
371.	beRay	meray	m-raey	to give
372.		meri	mray	dried up (stream)
373.		metiq	mote'	to kick
374.		muka	ngkoe	early
375.		mulaq	loe'	many

376.		muned	nnet	correct
377.		muneŋ	nɔng	near
378.		munuq	nnu'	enemy
379.		mupun	se-mpuen	grandchild
380.		muraq	m-roe'	to transfer
381.		mutuh	n-tew	to ask
382.		nahun	jahon	steam
383.	ñamuk	namuk	muek	fly, sandfly
384.	nanaq	nanaq	lana'	pus
385.		naqem	em	no, not
386.	natad	natad	satat	cleared area by house
387.		natad	latat	to remind
			i-atat	was reminded
388.		nedheh	n-seh	to leave behind
389.		nepipin	m-pIn	to arrange
390.		ne-piaq	nepca'	to sneeze
391.		nerut	laruet	to sew
392.	deŋeR	niŋer	n-nel	to hear
			é-nel	to be heard
393.		niqer	n-yel	to see
			é-nel	to look
394.		nubaq	bi'	cooked rice
395.		nuk	nok	thing

396.		nuper	épel	rope
397.		nutun	n-tuen	to taste
398.		nutuy	ntuey	stay behind
399.	ŋajan	ŋadan	adin	name
400.	ŋazel	ŋadel	padel	dull, blunt
401.		ŋaŋat	ng-ngat	pull up a post
402.		ŋapeh	pah	where?
403.		ŋegheŋ	macéeng	to lift
404.		ŋenaq	nna'	to recede (water)
405.		ŋered	maret	old (animates)
406.		ŋi	may	at; to
407.		ŋilaŋ	mélang	to soothe
408.		padek	padek	rice husk
409.		pahad	pahat	even, level
410.	pasaqan	pahaqen	ahan	shoulder pole
411.		mahaqen	m-ahan	carry on shoulder pole
412.		pak pak	pak pak	sound of lapping water
413.		pakel	pakel	decorative leg binding
414.	palaj	palad	palit	palm of the hand
415.	palid	palid	palit	carried off by wind
416.		paliq	palé'	to heal
417.		paluh	palaw	sago flour
418.	panas	pana	pana	hot/sweat

419.		panid	panIt	each, every
420.		paŋaw	pangaew	bald
421.		paqen	pa'en	areca palm and nut
422.	paqit	paqit	pa'ét	bitter
423.	paqu	paquh	pa'aw	fern
424.		parir	parél	blowpipe poison
425.		patot	patot	to copulate
426.		pawat	pawat	fruit bat
427.		payaw	payaew	sambhur deer
428.		pedalaq	bélei'	casting net
429.		pedekan	kkan	to choke on water
430.		pedhiq	ssei'	salty
431.	qapeju	pedhuh	ssew	gall (bladder)
432.		pegamuŋ	pejamueng	tangled
433.		pekahaq	paha'	to change, as a name
434.		pekupat	mpat	turned contrariwise
435.		peliw	pléew	slip from one's grasp
436.		peman	hman	feeding
		meman	m-man	to feed
		piman	é-man	was fed
437.		penaw	hnaew	theft
		menaw	nnaew	to steal
438.	penuq	penuq	hno'	full
439.		peŋinud	hnot	story, fable

440.		pepag	ppap	a slap
441.		pepaq	ppa'	chewing
442.		peraqit	pel'ét	thunderclap
443.		peregaiq	jarei'	all together
444.		perek	prek	crowded, packed in
445.		merek	m-rek	to squeeze
446.		petad	ttat	to separate
447.		ne-piaq	nepca'	to sneeze
448.		pidhet	sset	taut, as a rope
		midhet	n-set	taut
449.		piket	pacIt	to overtake s.o.
450.		pilat	pélat	scar
451.		p-ilaw	pélaew	dazzling
452.	piliq	piliq	pélé'	choice
		miliq	mélé'	to choose
453.		pinahaw	penhew	needle
454.	pusej	pued	pwet	navel
455.		puet	pat	bottom
456.		pudut	dduet	way, manner; shape
457.		pulaŋ	ploeng	ringworm
458.		puluŋ	plueng	forest
459.	puluq	puluq	plu'	ten
460.	pulut	pulut	pluet	sap, latex
461.		Punan	hnoen	Punan

462.		pupud	ppuet	tracking of animals
463.		pupuq	ppu'	washing; drumstick
		mupuq	m-pu'	to hit, wash clothes
464.		p-i-puq	ipu'	was hit, was washed
465.	puqun	puqun	pu'uen	base of tree
466.	putul	putul	ttuel	broken
467.		puuŋ	pweng	animal
468.		ŋe-raad	rat	to hunt
469.	Rabut	rabut	labuet	pluck, uproot
470.		ŋe-ramit	lamIt	to scratch
471.	Ramut	ramut	muet	fibrous roots
472.	aRani	ranih	anay	harvest
473.		raqaw	la'aew	cork
474.		me-raqen	pel'en	light (weight)
475.	Rakit	raqit	la'et	raft
476.		raquŋ	ong	sun hat
477.		pe-raruh	paraw	lost
478.		ratan	latan	a leak
		me-ratan	p-latan	leaking (roof)
479.	Ratus	me-ratu	p-lataw	hundred
480.	Raya	rayeh	rah	big, large
481.		rebhun	lepun	smoke
482.		me-rerak	p-rak	torn
483.		reraq	ra'	ant

484.		ŋe-rerek	m-rek	to strangle
485.	Ribu	me-ribuh	pe-lbew	thousand
486.		riek	liek	a cough
		me-riek	pe-lyek	to cough
487.		rier	liel	turn the head
488.		ŋe-rimer	mmel	to wrinkle
489.	niRu	rinuh	énaw	winnowing basket
490.		rirek	érek	strangle
491.		riruh	éraw	a laugh
		pe-riruh	péraw	to laugh at e.o.
492.		rudap	diep	to sleep
493.	Rumaq	rumaq	ma'	house
494.		rurug	hrop	to fall; pour out
495.		rurut	rruet	bring down
496.	Rusuk	ruuk	(lu)wek	chest
497.	sandaR	sadar	sadéel	to lean on
498.		saget	ajIt	quickly
499.		sakay	sakay	visitor, guest
500.		salaq	sala'	wrong, in error
501.		sebuaŋ	séwéeng	some
502.		seraway	sawaey	behavior
503.		siaq	saa'	red
504.		sinuŋ	hnoeng	happy, successful
505.		siri	hray	straight

506.		sukup	sekup	spade
507.		suŋaqiŋ	song'éeng	incubus
508.		naban	mabin	run off with s.t.
509.		tabat	tabat	medicine
510.	tazem	tadem	tadem	sharp
511.		nadem	madem	to whet, sharpen
512.		tadur	taduel	bridge
513.		takaŋ	takang	spread wide (legs)
514.		taked	taket	popliteal space
515.		takep	takep	room of a house
516.		takuŋ	takong	pond
517.		talun	talon	buckskin; clothing
518.	tama-q	tama-q	tama'	father (add.)
519.	taneq	tanaq	tana'	earth
520.	tanem	tanem	tanem	burial
		nanem	manem	to bury
	taŋis	taŋi	———	
521.		naŋi	mangay	to cry
522.		tapih	tapay	honeycomb
523.		tapuq	tapu'	to marry
		napuq	mapu'	to give in marriage
524.		taqeŋ	ta'ang	mouth; voice
525.		taqiq	ta'é'	feces

526.	takut	me-taqut	ta'eut	afraid
527.	taRaq	t-em-araq	t-em-ara'	to fell trees
528.		tari	tarey	measurement
		nari	marey	to measure
529.		taruq	aro'	to make
530.	taRutuŋ	terutuŋ	teltong	porcupine
531.		tebiriŋ	tebirieng	turn at an angle
532.		tebhaq	t-el-pei'	thorn
533.	tebek	tebhek	ppek	to be pricked
		nebhek	m-pek	to prick, to stab
			é-pek	to be stabbed
534.	tebeŋ	tebheŋ	ppeng	felling of trees
535.	tebuh	tebhuh	ppew	sugarcane
536.		tedhak	séek	pumpkin
537.		tedhin	i-sin	left behind
538.		tegeker	teja'el	to shiver
539.	tageRaŋ	tegeraŋ	tejaréeng	ribs
540.		tekap	kkap	to seek, search for
541.		tekaqok	ta'ok	rooster
542.		tekip	kkIp	girl's sarong
543.		telaq	hla'	thrown away
544.		telaqaw	tel'aw	muntjac deer
545.	telen	telen	hlen	swallowed
		nelen	mlen	to swallow

546.		teletad	teltat	cockspur
547.		teliad	telyat	to slip
548.	telu	teluh	law	three
549.		temaqud	tem'ot	Achille's tendon
550.		temalem	temalem	overnight in forest
551.		temedhur	temsuel	rhinoceros
552.		temeŋaŋ	menngan	hornbill
553.		teneb	hnep	cold
554.		teŋanuh	lanaw	to weave mats
555.		teŋaŋaq	tanga'	to gape
556.		teŋaq	hnga'	window
557.		teŋeb	hngep	riverbank
558.	t-empu-q	tepu-q	pu'	grandparent (add.)
559.	teRas	tera	hra	hard (of wood)
560.		terad	hrat	cut oneself
		nerad	m-rat	cut something
561.	teRep	terep	hrep	tree like breadfruit
562.	qateluR	terur	hrol	egg
563.		tidhuk	suek	beak
564.		tidhul	sul	pointing
565.		tidhuq	seu'	hand
566.		tilubid	bit	to lie down
567.	qatimun	timun	hmuen	cucumber
568.	tinaqi	tinaqih	sen'ay	guts

569.		tinien	telnyen	catfish
570.		pe-tinuqeh	pé' ɔh	right side
571.		tubaŋ	bbéeng	wild cat
572.	tuba	tubeh	bbeh	derris root
573.		tudaq	ddei'	how much?
574.		tuduŋ	ddueng	shoulder
575.	tuzuq	tuduq	ddeu'	seven
576.		tudhuq	seu'	salt
577.		tuhuŋ	tohong	a box
578.	tuked	tuked	kɔt	prop
579.		tuked	kɔt	slope of a mountain
580.		tukuŋ	kkueng	mosquito
581.	tuqelaŋ	tulaŋ	hloeng	bone
582.		tulu	hlew	true, correct
583.		tulud	hlut	to fly
584.	tumah	tumeh	hmah	clothes louse
585.	tumij	tumid	hmɛt	heel
586.		tunan	hnoen	short handle
587.		tunap	hnoep	winnowed
588.		tunaw	hnoew	hammer
589.	tunu	tunuh	hnew	roasting, smoking
590.		tupeh	ppah	to pound rice
591.	tuqed	tuqed	to'ot	tree stump

592.		tuqeh	to'oh	hard, durable
593.		tuqen	en/ɔn	to make, to do
594.	tuRun	turun	hruen	to descend
595.		tutud	ttuet	burning
		nutud	n-tuet	to burn; to light
596.	tuktuk	tutuk	tok	a stroke in pounding
597.	tutuŋ	tutuŋ		
		nutuŋ	n-tueng	to burn
598.		tutuq	tto'	to fall (fruit)
599.		uab	wap	yawn
600.		uan	wan	to have, to own
601.		uaŋ	wang	meat/muscle
602.		uaŋuaŋ	wang wang	naked
603.		uaq	wa'	repayment
604.		uar	wal	vine
605.		m-uat	m-wat	to gossip
606.		uat	wat	root
607.	qubi	ubi	bey	tapioca
608.		ubhir	piel	to overflow
609.		udan	din	rain
610.	qudaŋ	udaŋ	déeng	freshwater shrimp
611.		m-udeŋ	dɔng	to stay at home
612.		udud	dut	comb

613.		udah	dew	grass
614.		udu ŋ kayuh	dueng ayew	top part of tree
615.		m-udur	duel	to stand
616.		udhuq	seu'	to cease
617.		uit	wIt	to bring
618.	hukab	ukab	wap	opened
619.		ŋ-ukat	ng-koet	to dig
620.		ukep	kkep	sleep in forest
621.		uker	kɔl	wide open (eyes)
622.		ukuq	ku'	dog
623.	qulej	uled	let	worm; maggot
624.	suli	ulih	éloy	sprout, shoot
625.	qulu	uluh	lew	head
626.	qulun	ulun	luen	life
		m-ulun	m-luen	living, alive
627.		upa	pa	splitting
		ŋ-upa	m-pa	to split
628.		upan	pan	bait
629.		upaq	pa'	yam
630.	hepi	upih	pay	dream
		m-upih	m-pay	to dream
631.		upun	puen	to run

632.		uqut	wet	smoking pipe
		n-uqut	m-wet	to suck, smoke
			é-wet	be sucked, smoked
633.	uRat	urat	roet	vein, vessel
634.	suRat	urat	roet	wound
	suRat	m-urat	m-roet	wounded
635.		urur	ruel	cluster, as of fruit
636.	huluR	urur	ruel	lowering of s.t.
637.		usin	sin	money, coin
638.		utap	tap	shield
639.	utaq	utaq	toe'	vomit
		ŋ-utaq	n-toe'	to vomit
640.	qutek	utek	tek	brain
641.		uud	wet	return, go back
642.		uyut	yuet	carrying basket
643.	walu	waluh	alaw	eight

APPENDIX 3

Probable Loanwords

01.	adat 'customary law'	(Malay /adat/)
02.	atol 'arrangement'	(Malay /atur/)
	ng-atol 'arrange'	(Malay /meng-atur/)
03.	bawang 'onion'	(Malay /bawang/)
04.	bayar 'to pay'	(Malay /bayar/)
05.	bel'di 'bucket'	(Malay /baldi/, /beldi/, from Portuguese)
06.	bébéek 'duck'	(Malay /bébék/)
07.	bilUn 'airplane'	(Malay /bilun/, from English 'balloon')
08.	bonge' 'cultivated flower'	(Malay /bunga/)
09.	buku 'book'	(Malay /buku/)
10.	céem 'you' (pl.)	(Kayak /ikam/)
11.	dapur 'kitchen'	(Malay /dapur/)
12.	deloyEn 'durian'	(Malay /durian/)
13.	éek 'I'	(Kayan /ak/)
14.	gaji 'salary'	(Malay /gaji/)
15.	gaun 'skirt'	(Kelabit /gaun/, probably from English 'gown')
16.	geleng 'armlet'	(Kelabit /geleng/)
17.	gola' 'sugar'	(Malay /gula/)
18.	guting 'cut the hair'	(Malay /gunting/ 'scissors')
19.	ibUn 'jambu'	(Kelabit /libuh/)
20.	jam 'watch'	(Malay /jam/)
21.	jjin 'plate'	(Malay /pinggan/, Kelabit /bigan/, from Tamil)
22.	jjuek 'tobacco'	(cp. Kelabit /siguk/, LD /sigup/)
23.	ka'bel 'picture'	(Malay /gambar/)
24.	kapak 'axe'	(Malay /kapak/)
25.	kasUt 'shoes'	(Malay /kasut/)
26.	kawin 'to marry'	(Malay /kawin/, used by younger speakers)
27.	kebun 'garden'	(Malay /kebun/)
28.	kelabo' 'mosquito net'	(Malay /kelambu/)

29.	kela'bun 'soap'	(Malay /sabun/, from Portuguese)
30.	kelingay 'mirror'	(Kayan /kelingi/)
31.	kel'ja 'work'	(Malay /kerja/)
32.	kelobaw 'carabao, water buffalo'	(Malay /kerbau/)
33.	kertas 'paper'	(Malay /kertas/)
34.	ko'da' 'horse'	(Malay /kuda/)
35.	korang 'lacking, short of'	(Malay /kurang/)
36.	kotor 'dirty'	(Malay /kotor/)
37.	kupi 'coffee'	(Malay /kopi/)
38.	lapong 'lamp'	(Malay /lampu/)
39.	lawet 'wire'	(Malay /kawat/)
40.	madiel 'to shoot (with a gun)'	(Tamil, through Malay, /badil/)
	i-adiel 'to be shot (with a gun)'	(Tamil, through Malay, /me-madil/)
41.	masuk 'enter'	(Malay /masuk/)
42.	méek 'goat'	(Kelabit /mék/)
43.	meja 'table'	(Malay /méja/, from Portuguese)
44.	mukut 'punch'	(Kelabit /mukut/)
	pe-bukut 'punch each other'	(Kelabit /pe-bukut/) [NOTE: with irregular perservation of penultimate *u]
45.	ngajar 'to teach'	(Malay /meng-ajar/)
46.	ngorang 'lower the price'	(Malay /kurang/; /me-ngurang-i/)
47.	nyak 'oil; kerosene'	(Malay /minyak/)
48.	nyoh 'coconut'	(Kayan /ñuh/)
49.	otang 'debt'	(Malay /utang/)
	ng-otang 'to borrow'	
50.	padi 'riceplant'	(Malay /padi/)
51.	pako' 'nail'	(Malay /paku/)
52.	pa'dang 'field'	(Malay /padang/)
53.	payung 'umbrella'	(Malay /payung/)
54.	pelanok 'mousedeer'	(Malay /pelanduk/)
55.	pensil 'pencil'	(Malay, from English)
56.	pérak 'silver'	(Malay /pérak/)
57.	poket 'dragnet'	(Malay /pukat/)

58.	ramaey 'lively, bustling' nge-ramay 'to entertain'	(Malay /ramai/)
59.	rasun 'poison'	(Malay /racun/) [NOTE: /nge-rasun/ 'to poison', with prefix /nge/ not otherwise attested]
60.	sakol 'hoe' nyakol 'to hoe, dig with a hoe'	(Malay /cangkul/)
61.	sala'/mala' 'wrong'	(Kelabit /sala'/mala'/)
62.	sape' 'cow'	(Malay /sapi/)
63.	sekola 'school'	(Malay /sekolah/, from English)
64.	sekUp 'spade'	(Malay /sekop/ 'spade', from Dutch)
65.	seluen 'pants, trousers'	(Malay /seluar/, from Persian or Arabic through an Indic language)
66.	sorat 'letter'	(Malay /surat/)
67.	tam 'we' (pl. incl.)	(Kayan /itam/)
68.	tebangan 'scale for weighing'	(Malay /timbang-an/)
69.	tising 'finger ring'	(Malay /cincin/)

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NOTES

1. Sa'ban data were collected during an eight-month fieldtrip in the Baram District of Sarawak's Fourth Division from April to November, 1971. During this trip 41 speech communities were studied, and the quantity of data obtained for any given language was therefore necessarily limited. For Sa'ban I collected a vocabulary of about 800 words, and perhaps 250 sentences. A serious attempt was made in the time available to obtain an accurate picture of the phoneme system and an outline of the morphology. Eighty-four forms illustrating perceptually difficult contrasts were recorded on tape. All material was collected from Jollie Udau, then a student at Marudi Government Secondary School. Jollie, who was born about 1955 in the longhouse of Long Banga' on a small stream which flows into the extreme upper Baram near the Sarawak-Kalimantan border, truly lived up to his name — he was a constantly cheerful person with a smile that rarely left his face. Wherever he is today, I send him my 'aloha' for teaching me something of his remarkable language.

2. Clayre (1992:209) reports that 'Sa'ban is 75% cognate with Lun Bawang'. However, she gives no basis for this statement, no source for the percentage, and no reference to the table in Blust (1984). Supporting evidence for the percentages cited here is given in Appendix 1, where the Swadesh list meanings were narrowed for better comparability in the following ways: 11. wash = wash clothes, 29. hair

= head hair, 32. smell = sniff, 39. spit = expectorate, 41. cook = general term rather than specific types, 50. lie down = lie down to sleep, 64. tie = tie by knotting rather than binding, 70. hit = hit with a stick = wash clothes, 74. live = be alive, 75. scratch = scratch an itch, 76. cut = cut wood, 77. stick = wood, 78. split = split wood (not bamboo), 79. sharp = sharp blade (not point), 109. rotten = rotten meat (not vegetables), 140. smooth = level, 153/154. short/long = short/long of objects, not time, 155. thin = tenuous, not emaciated, 156. old = old, of people, 172. there = there by the hearer. Figures on which the percentages are based are: LTT:SAB 143/190 = 75.6%, LTT:LD 142/190 = 75.1%, LTT:BAR 154/190 = 81.3%, BAR:SAB 157/189 = 83.1%, BAR:LD 151/190 = 79.8%, LD:SAB 136/189 = 72.4%. The list employed was Hudson's (1967) modification of the Swadesh 200-item test list. Lexical items followed by the same letter are considered cognate if that letter is not (L), and for each cognate pair a "plus" is tallied. (L) marks known or suspected loanwords, mostly from Malay. These are scored as "minus" in comparisons with the other letter values, but are discarded in comparisons with one another so as to avoid distortion that would come about through borrowing from a common source. Thus, in no. 14 the comparison LTT *luyuq*, BAR *kotor* 'dirty' is scored "minus," whereas the comparison BAR, SAB *kotor* is discarded. Duplication or partial duplication of cognate sets presents a number of problems. Where two meanings on the (modified) Swadesh list are treated as a single meaning by all of the languages compared the two are conflated, as with 4. 'leg', and 5. 'foot', or 57. 'husband', and 58. 'wife'. Where the same word base is employed but the meanings are distinct the two are not conflated, as with 6 and 7. Where the two meanings on the Swadesh list are treated as a single meaning by some but not all of the languages compared the two are conflated only for those language pairs which do not make a distinction, as with 120 and 125 for the pairs

BAR:LD, BAR:SAB and LD:SAB. Multiple terms for the same meaning have been included, and where these point to more than one cognate set each set is counted, as with 107, 159 and 181. Finally, the cross-linguistic worthlessness of some items on the Swadesh list is amply illustrated by 187. 'some', where it is evident that the Tring response = 'many', and the Bario response = 'few'.

3. Clayre (1992) implies that Sa'ban also has a phonemic palatal nasal. However, in view of the fact that she recognizes such syllable-initial consonant clusters as /by/, /py/ and /ly/ it is difficult to rule out the interpretation of ñ] as a consonant cluster /ny/.

4. Cf. Bario Kelabit /nge-rerak/ 'to tear', /meno/ 'to steal', /nekap/ 'to seek, search for', /ng-emung/ 'to gather', and /meré/ 'to give'. My Lun Bawang material was collected from Baru Langub, born in Long Semado around 1954, and a student at Marudi Government Secondary School in the second half of 1971. Clayre is not alone in confusing /a/ and /e/, especially in penultimate position, as native speakers in writing Kelabit or Lun Dayeh often do the same, apparently based on a misguided missionary tradition (cf. Labo Pur 1965, where he writes e.g. /acheh/ 'one', /apat/ 'four', /anem/ 'six', /babpat/ 'share', or /kali'/ 'to know', where I recorded /edheh/, /epat/, /enem/, /bebhat/, /keli'/, etc.).

5. Sources of information on these developments are my own fieldnotes from April-November, 1971, and Hudson (1970).

6. Note, however, that such segments as /pw/ and /mw/ in some Oceanic languages are describes as 'velarized' rather than 'labialized', and are said to be produced with lip spreading rather than rounding when not preceding a rounded vowel.

7. Ladefoged and Maddieson (1996:63) characterize the difference between e.g. Javanese /p/ and /b/ as one of 'stiff voice' vs. 'slack voice'. They regard slack voice as involving the same articulatory mechanism as breathy voice, but as differing in degree: 'These stops have a slightly increased glottal aperture beyond that which occurs in modal voice, and a moderate increase in flow. When there is a considerable glottal aperture and a high rate of flow of air while the vocal folds are vibrating, we will say that the sound is pronounced with breathy voice...'.

8. With reference to the Chamic languages Thurgood (1999:205) notes that breathy voice 'caused various mid vowels to raise and the low vowels to develop a barred-ɨonglide.' In both Sa'ban and the four Berawan dialects the schwa shows no raising effects when following a voiced obstruent.

9. In describing spreading patterns for breathy phonation in the Chamic languages Thurgood (1999:235ff) observes that breathy voice spreads through sonorants in all of the languages discussed (Western Cham, Phan Rang Cham, Haroi, Tsat), and through *s and *h with the possible exception of Haroi (data unclear). Voiceless stops, on the other hand, block the spread of breathy phonation in the first three languages, but not in Tsat. In Sa'ban, vowel fronting following a voiced obstruent is blocked by 1) an intervening voiceless stop, or 2) possibly certain consonant clusters which arose from the syncope of a vowel in the environment VC–CV in original trisyllables, as in PKLD *beraqaŋ > /bel'ang/ 'molar tooth' (but not *beruaŋ > /belwéeng/ 'the Malayan honey bear: *Ursus Malayanus*', where /w/ is evidently too vocalic to add substantial weight to the cluster).

10. Juliette Blevins (p.c.) has pointed out that voiced stops are generally shorter than voiceless stops, and 'Under

syllable compression, where short gestures become shorter, the voiced stop gesture is lost in its entirety.'

11. Whether *q also drops in these forms is a moot point since, like most languages of insular Southeast Asia, Sa'ban does not allow a contrast of glottal stop and zero in initial position.

12. Clayre (p.c.), who has had far greater exposure to Sa'ban than I, believes that /menpal/ is a Kelabit form. She gives Sa'ban /pangyu'/ 'scorpion'.

13. The pronouns of Murik, insofar as they are known, differ somewhat from those of Kayan, and are a less likely source of the borrowed pronouns of Sa'ban (Blust 1974c). As noted already, Revel-Macdonald (1982) provides no data on Modang pronouns, and although pronominal data do appear in Ray (1913), only two Modang forms are included: /kui/ '1st sg.' and /kih/ '2nd sg.'.

REFERENCES

Blust, Robert. 1974a. *The Proto-North Sarawak vowel deletion hypothesis.* Unpublished Ph.D. dissertation, 319pp. Honolulu: Department of Linguistics, University of Hawai'i at Mānoa.

_____. 1974b. A double counter-universal in Kelabit. *Papers in Linguistics* 7.3-4:309-324.

_____. 1974c. A Murik vocabulary, with a note on the linguistic position of Murik. *The Sarawak Museum Journal* 22.43 (N.S.): 153-189.

_____. 1977. Sketches of the morphology and phonology of Bornean languages 1: Uma Juman (Kayan). *Papers in Borneo and Western Austronesian Linguistics* No. 2. Pacific Linguistics A-33:7-122. Canberra: Department of Linguistics, Research School of Pacific Studies, The Australian National University.

_____. 1984. The Tring dialect of Long Terawan. *The Sarawak Museum Journal* 33.54(n.s.):101-135.

_____. 1988. Sketches of the morphology and phonology of Bornean languages 2: Mukah (Melanau). *Papers in Western Austronesian Linguistics* No. 3. Pacific Linguistics A-78:151-216. Canberra: Department of Linguistics, Research School of Pacific Studies, The Australian National University.

_____. 1993. Kelabit-English vocabulary. *The Sarawak Museum Journal* 44.65(new series):141-226.

_____. 1997. Ablaut in Northwest Borneo. *Diachronica* 14:1-30.

_____. 1999. Subgrouping, circularity and extinction: some issues in Austronesian comparative linguistics. In Elizabeth Zeitoun and Paul Jen-kuei Li, eds., *Selected Papers from the Eighth International Conference on Austronesian Linguistics*:31-94. Symposium Series of the Institute of Linguistics (Preparatory Office), Academia Sinica. Taipei: Academia Sinica.

_____. to appear. Formalism or phoneyism? The *history of Kayan final glottal stop. To appear in a memo*rial volume in honor of D.J. Prentice.

Clayre, Beatrice. 1972. A preliminary comparative study of the Lun Bawang (Murut) and Sa'ban languages of Sarawak. *The Sarawak Museum Journal* 20.40-41(new series):319-329.

_____. 1991. Focus in Lundayeh. *The Sarawak Museum Journal* 42.63 (New Series):413-434.

_____. 1992. Sa'ban: a case of language change. In Peter W. Martin, ed., *Shifting patterns of language use in Borneo: Papers from the Second Bi-Ennial International Conference, Kota Kinabalu, Sabah, Malaysia, July, 1992*:209-225. Borneo Research Council Proceedings Series, vol. 3. Williamsburg, VA: Department of Anthropology, The College of William and Mary in Virginia.

Donegan, Patricia J. 1985. *On the natural phonology of vowels.* New York and London: Garland Publishing, Inc.

_____. 1993. On the phonetic basis of phonological change. In Charles Jones, ed., *Historical linguistics: problems and perspectives*: 98-130. London and New York: Longman.

Dyen, Isidore. 1965. *A lexicostatistical classification of the Austronesian languages.* Memoir 19 of the International

Journal of American Linguistics. Indiana University Publications in Anthropology and Linguistics. Baltimore: Waverly Press.

Fagan, Joel L. 1988. Javanese intervocalic stop phonemes: the light/heavy distinction. In Richard McGinn, ed., *Studies in Austronesian linguistics*: 173-200. Ohio University Monographs in International Studies, Southeast Asia Series, No. 76. Athens, Ohio: Ohio University Center for International Studies, Center for Southeast Asia Studies.

Harrisson, Tom. 1959. *World within: a Borneo story.* London: The Cresset Press.

Henderson, Eugénie J.A. 1952. The main features of Cambodian pronunciation. *Bulletin of the School of Oriental and African Studies (London)* 14.1:149-174.

Hudson, A.B. 1967. *The Barito isolects of Borneo: a classification based on comparative reconstruction and lexicostatistics.* Southeast Asia Program Data Paper no. 68. Ithaca: Department of Asian Studies, Cornell University.

_____. 1970. Linguistic relations among Bornean peoples with special reference to Sarawak: an interim report. In Mario D. Zamora, Vinson Sutlive and Nathan Altshuler, eds., *Linguistics and Development Problems. Studies in Third World Societies* 3:1-44.

Labo Pur, Samuel. 1965. *Kamus Lun Dayeh.* Kuching: Borneo Literature Bureau.

Ladefoged, Peter, and Ian Maddieson. 1996. *The sounds of the world's languages.* Oxford: Blackwell.

Ray, Sidney H. 1913. The languages of Borneo. *The Sarawak Museum Journal* 1.4:1-196.

Revel-Macdonald, Nicole. 1982. Synchronical description at the phonetic and syllabic level of Modang (Kalimantan Timur) in contrast to Kenyah, Kayan and Palawan (Philippines). In Amran Halim, Lois Carrington and S.A. Wurm, eds., *Papers from the Third International Conference on Austronesian Linguistics, vol. 2: Tracking the travellers.* Pacific Linguistics C-75:321-331. Canberra: Department of Linguistics, Research School of Pacific Studies, The Australian National University.

Thurgood, Graham. 1993. Geminates: a cross-linguistic examination. In Joel Ashmore Nevis, Gerald McMenamin, and Graham Thurgood, eds., *Papers in honor of Frederick H. Brengelman on the occasion of the twenty-fifth anniversary of the Department of Linguistics, CSU Fresno*:129-139. Fresno, Calif.: Department of Linguistics, California State University, Fresno.

_____. 1999. *From ancient Cham to modern dialects: Two thousand years of language contact and change.* Oceanic Linguistics Special Publication No. 28. Honolulu: University of Hawaii Press.

_____, and Hector Javkin. 1975. An acoustic explanation of a sound change: *-ap to -o, *-at to -e, and *-ak to -ae. *Journal of Phonetics* 3.3:161-165.

Wang, William S-Y. 1969. Competing changes as a cause of residue. *Language* 45:9-25.

Wurm, S.A. 1971. The Papuan linguistic situation. In Thomas A. Sebeok, ed., *Current Trends in Linguistics, vol. 8: Linguistics in Oceania*:541-657. The Hague: Mouton.

_____, and Shirô Hattori. 1981. *Language atlas of the Pacific area.* Canberra: The Australian Academy of the Humanities in collaboration with the Japan Academy.