

Na-khi and Proto-Lolo-Burmese:
A Preliminary Survey¹

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1. Na-khi is a Tibeto-Burman language spoken around the town of Likiang (or Li-chiang) in Yunnan, southern China. It has been classified (by Matisoff 1972) as a member of the Mosoid branch of the Loloid group of Lolo-Burmese languages within the Tibeto-Burman stock. The data upon which this preliminary survey is based are exclusively from Rock (1963) who makes a definite distinction between Na-khi and the related Moso.

Rock points out that the Chinese refer to all the people of the Likiang area as Moso, and have done so for the past hundred years. Earlier writings, however, indicate that there were (at least) two tribes in the area, the Mo and the Hsieh (or, more fully, the mó-mán^a and the xie-mán^b — the 'Mo barbarians' and the 'Hsieh barbarians' — see Rock, p. xxvii). In Chinese, when the two groups were spoken of together, mó and xie were juxtaposed in the phrase mó xie èr zhōng mǎn^c 'Mo [and] Hsien two kinds barbarians' or 'the two barbarian (tribes) Mo and Hsieh' (Rock, p. xxvii). This, coupled with the fact that xie was pronounced so when referring to a tribe could have given rise to the use of Moso to refer to both the Mo and the Hsieh. Rock believes that the name Hsieh ([ɕiɛ] in IPA) is in fact a Sinicization of the khi ([ɕi]) of Na-khi (p. xxviii).

The Moso (the 'Mo barbarians') are separated from the

a 麼 麼 b 麼 麼 c 麼 麼 = 麼 麼

Na-khi by the Yangtze River, and, though their language is closely related to Na-khi, the two tribes must communicate by means of Chinese (Rock, p. xxvi).

Rock's dictionary is based on the Na-khi written language, rather than the spoken colloquial. The Na-khi writing system, a combination of pictographs and syllabic characters, probably goes back to earlier than the 13th century (Rock, p. xx). Thus, the dictionary contains 'many archaic words' and, furthermore,

many words [have] been omitted for which no pictographs exist. Thus, the number of sound complexes found in the Dictionary are not those of the colloquial of which more exist, but those of the written language. [Rock, p. xvi]

The phonetic values given to the various written symbols are based upon a dialect of Na-khi spoken not in the town of Likiang itself (where, according to Rock, there is too much influence from Chinese so that the natives cannot pronounce certain words anymore), but rather in villages to the north and west of Likiang, in the Yangtze Valley. Only the priests read the Na-khi writing, and there is a difference between the literary language and the colloquial, as can be seen when Rock provides both forms.

Lacking a complete analysis of Rock's dictionary, it was thought best to retain his transcription system for comparative purposes, even though it is quite clear that his system could be simplified. In any event, his system is as follows:²

1. Initials

p'	t'	ts'	ch'	t'kh(y)	k'	Ø
		as'				
bp	dt	ts	ch	gky	gk	
		ds				
b	d	tz	dsn	gy	g	
bb	dd	dz	azh		gg	
mb	nd	nds	ndsh	ngy	ng	
mbb	ndd	ndz	ndzh		ngg	
ff		ss	sh	kh(y)	kh	h
v		sz, z	zh			gh
m	n			ny	ng	
	nn					
w	l			y		
	ll					

There are five major points of articulation, indicated in columns: labial (p', etc.); dental (t', etc. and ts', etc.); alveolar (actually alveo-palatal) (ch', etc.); palatal (or palatalized velar) (t'kh(y), etc.); and velar (k', etc.). In addition, there is a glottal spirant (h) and gn, a 'voiced uvular (or pharyngeal) fricative' (Rock, p. xxxi). Furthermore, a word may begin with no initial consonant (zero-initial), \emptyset in the chart.

Rock distinguishes 14 manner series (some of them confined to single points of articulation), though what some of the distinctions really are is not all that clear. In any event, the manners (indicated in the chart in rows) are: voiceless aspirated stop (or fortis affricate) (p', etc.); voiceless aspirated affricate, lenis (ds'); voiceless unaspirated stop (or fortis affricate) (bp, etc.);³ voiceless unaspirated affricate, lenis (ds); voiced stop (or affricate), lenis (b, etc.); voiced stop (or affricate), fortis and long (bb, etc.);⁴ prenasalized stop (or affricate), lenis (mb, etc.); prenasalized stop (or affricate), fortis (mbb, etc.); voiceless fricative (ff, etc.); voiced fricative (v, etc.); nasal (m, etc.); fortis and long dental nasal (nn);⁵ semi-vowel and lateral (w, etc.); and fortis and long lateral (ll).⁵ What the difference between his sz (which he identifies with IPA [z]) and his z might be cannot be determined.

There are a few important peculiarities about the transcription. Rock describes kh as a palatal fricative, which justifies considering the sequence t'kh(y) a palatal affricate (the y is written before vowels other than i). There is a sequence khu in addition to khyu, but the former may be related to h (cf. 3khu and 3hyu, both glossed as 'stomach of a ruminant'). It seems as though the only palatalized velar to become an affricate is the voiceless, aspirated one t'khy (or [tɕ'y]), probably from earlier *k'y.

Note that ng is the velar nasal [ŋ], while both ng and ngg are prenasalized velar stops. Unaspirated ch is rare (occurring only in the syllable chēr), as are ff and v. In one case Rock transcribes 4fa 'to ferment' (rather than ffa), but this is a loan from Chinese fa.^a There are several other unique initials:

dgy dtgy tgky (tkhy) dty

The first three of these perhaps represent remnants of a dental prefix. tkhy occurs as an alternate form in a single word, 3tgkye - 3tknye 'cremate', where, maybe, the prefixed palatalized unaspirated voiceless velar has become an unaspirated palatal affricate (paralleling t'khy). The

a ²⁶
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sequence dtu occurs in only one word, ³dtu 'to boil', but this seems to have developed from ³dgyu 'to boil'.⁶

II. Rhymes.

(a) simple vowels and diphthongs⁷

i	ĩ	ĩ	ü	u	ũ
ü				iu	
				ou	
e	wue	üe		o	ō wuo
ö		ěr(h)			
ä		(är)	ũ	aw/ō	
	a	ā			
	(w)uà	oa (uà)	wua		
	‘a				

A macron represents vowel length, though long vowels are rare except in words with zero-initial (and there is no word "ĩ"). The symbols are fairly straightforward except as follows: ĩ is a high front vowel, 'slightly centralized' (Rock, p. xxxi). ü is a high front rounded vowel following all initials other than gh, kh, kh, ndd, ll, gg and ngg, where it is a high back unrounded vowel. (This is Rock's list, but there is no word khũ in the dictionary.) ö is front rounded [œ]; ä is [ɛ]; ũ is [ʌ]; both aw and ō are [ɔ] (though aw is often confused with a). ěr is a 'retroflexed mid-central vowel with slight pharyngeal constriction' (Rock, p. xxxi); ern is the same as ěr, but written in what Rock identifies as Chinese loan words; är is probably the same, slightly lower, following only h. wuà (uà after initial w) has 'prominence' on a; wua (uà) after initial w has 'prominence' on u (Rock, p. xxxii). Finally, ‘a is a 'low back vowel with laryngeal constriction like Arabic ‘asin' (Rock, p. xxxi).

(b) nasalized rhymes

	<u>un</u>	
	<u>ùn</u>	
	<u>on</u>	
an	ān	
uàn	uān	<u>n</u> = nasalized vowel

Nasalized rhymes in Na-kni are secondary, and have nothing to do with nasal finals in Proto-Lolo-Burmese.

(c) other rhymes

-v -ügh -ung -Ø

-v is a 'voiced labio-dental fricative, used in syllabic position after g, gk, k', dd, nd, dt, l' (Rock, p. xxxii). It is also found after ng and n, though Rock points out that the sequence nv is 'nasalized syllabic v' (p. xxxii). There is no sequence mv or ngv, so any nasal before v is simply realized as nasalized v.⁸

-ügh occurs only in the sequence ghügh (and gh- occurs only before -ügh). Rock says that ü following gh is [w] (see above), but what final gh is is not clear, since there are no final consonants in Na-khi (besides this and -ung).

-ung is apparently [uŋ] and occurs only in the sequence ch'ung. Its status is not certain.

-Ø represents zero-rhyme, allowing for the syllables ds, dz, ss, ts.

III. Tones

There are four tones in Na-khi, indicated by a superscript number preceding the syllable. The contours of the tones are:

- 1 low falling
- 2 mid level
- 3 high, short
- 4 'from low to high rising, modulated' (Rock, p. xx)

Rock notes that tone 4 'occurs mostly in loan words from the Chinese or Tibetan languages' (p. xxxv). No Na-khi words with Lolo-Burmese cognates have been found in tone 4, so we may ignore it for the rest of this survey.

2. The reconstructed Proto-Lolo-Burmese (PLB) forms are taken from Matisoff 1972, Burling 1967, or are reconstructed by me, usually based on written Burmese (WB). The reconstructed in Burling 1967 have been modified to fit the schema presented in Matisoff 1972. Several reconstructions were obtained from Matisoff by personal communication.

2.1. In the chart below, the PLB and Na-khi (NK) initial correspondences are shown. Glosses refer to the actual forms listed in Appendix A.

<u>PLB</u>	<u>NK</u>	<u>examples</u>
*voiceless > NK		aspirated
*p	p'	bubble, chaff, decision, lose, male, open, price, tie up, untie, white
*C-p	p'	vomit
*t	t'	handspan, sharp
*t'-t	t'	emerge
*ts	ts'	break in two, ten
also	t'khy	bore (see discussion below)
also	ch'	wash (see discussion below)
*t'-ts	ts'	bite down onto
*c	ch'	medicine
*V-c	ds'	goat (see discussion below)
*ky	ch'	weigh (see discussion below)
also	t'kh	deer, sweet (see discussion below)
*k	k'	basket, bitter, crossbow, cup, dog, foot, horn, smoke, steal
*t'-k	k'	year
*krw	ch'	daughter-in-law (see discussion below)
*C-kr	ch'	six (see discussion below)
*k-r	t'khy	ant (see discussion below)
*voiced > voiced (fortis or lenis), sometimes voiceless		unaspirated (conditioning unknown)
*b	b	enjoy, swoilen, vulva
also	bb	give, hatch, write
also	bp	carry
*d	d	ability, insect
also	dɬ	beseech, weave
also		alive
*dz	--	(no examples)
*j (dž)	dzh	market
*gy	dzh	debt
*g	g	body, crooked
also	gk	empty (?)

<u>PLE</u>	<u>NK</u>	<u>examples</u>
*preglottalized voiceless > voiceless aspirated (see discussion below)		
*ʔp	p'	male, grandfather
*ʔt	t'	cut by blow
*ʔts	ts'	build
	also ch'	lung (see discussion below)
*ʔc	--	(no examples)
*ʔky	--	(no examples)
*ʔk	ʔ	(examples not very good; see 'cold', 'dry', 'fear' and discussion below)
*preglottalized voiced > voiceless unaspirated (see discussion below)		
*ʔb	bp	father, frog, porcupine
*ʔd	dt	box, mutual action, place, thousand
*ʔdz	ch	join, joint
*ʔj	--	(no examples)
*ʔgy	gky	little bit
*ʔg	gk	branch, outer covering (also 'between' and 'roast' -- see discussion below)
*prenasalized, voiced or voiceless > prenasalized voiced (fortis or lenis, conditioning unknown)		
*Np	mb	fall over
	also mbb	explode
*Nb	mb	bee, to fly
*Nt	--	(no examples)
*Nd	nd	poison
*Nts	--	(no examples)
*Ndz	nds	bridge, tooth
	also ndz	eat
*Nc	--	(no examples)
*Nj	--	(no examples)
*Nky	--	(no examples)

<u>B</u>	<u>NK</u>	<u>examples</u>
gy	ndsh	beat
k(r)	ndsh	fear
g	ng	nine
gr	ngy	lac
s	ndz	tree

nasal or prefixed nasal > nasal (except *mr — see below; see also footnote 5)

m		female, fire, mushroom, negative, sky, thumb
-m	m	blow, dream
-m	m	son-in-law
-m(y)	m(i)	
	- n(i)	eye
l>*ny	ny	penis
	n	black, smell
also ny		knead, sun, two (Rock writes <u>nyi</u> , never <u>ni</u> ; the palatalization is due to the following NK <u>i</u>)
also nn		you
-n	n	bean, lips
also nn		heart
y		(see *ml)
(y)	ny	fish
	<u>ng</u>	I (see discussion below)
also n		silver, weep (before NK <u>-v</u> ; see discussion of rhymes, above)
also w		five (see discussion below)

lotted nasal > voiceless fricative

m	ff	feather
n	h	deep, drive, ear, red, rib
ny	--	(no examples)
q	--	(no examples)

<u>PLB</u>	<u>NK</u>	<u>examples</u>
*spirant	> spirant (voiced or voiceless same as PLB)	
*s	ss	blood, dry-2, know, three
*sr	ss ~ sh	otter
*C-s	ss	breath, kill
*Ns		(see list of prenasalized consonants, above)
*š	sh	iron, meat
*C-š (*V-š)	sh	new
*z	z	child, descend
	also zh	leopard (before NK <u>i</u>)
	also ss	he (devoicing unexplained)
*voiced lateral	> voiced lateral (fortis or lenis)	
*l	l	fathom, four, grandchild, hand, maggot, road, stone, warm, wrap
	also ll	boat, bow, come, heavy (before NK <u>ü</u>)
*preglottalized lateral	> voiceless fricative	
*ʔl	h	moon, wind (air), winnow
	also kh	tongue (before NK <u>i</u>)
*semi-vowel	> semi-vowel	
*w	w	far (?)
*y	y	right, sheep, sleep, take
*prefixed semi-vowel	> voiced (usually) stop (see discussion below)	
*C-w	b	flower, pig, sole
	also g	bear, egg, head
	also gk	hide (?)
*k-r-w	bp	leech (cf *preglottalized semi-vowel, below)

PLB	NK	examples
<u>*preglottalized semi-vowel (few examples)</u>		
*ʔw		
<*k-r-w	ff	rodent (cf. *prefixed semi-vowel, above)
*ʔy	y	antelope

*r > various (usually zero) (conditions unknown)

*r	Ø	bone, chicken, copper, shadow
	also z	laugh
	also gh	skin (ʔ)

*ʔr > voiceless fricative

*ʔr	h	eight, gold, night, stand
	also kh	hundred (before NK <u>i</u>)
	also kh	rain (before NK <u>ü</u>)

*h > h

*h	h	food, may
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Special development: *mr and *ʔmr (see discussion below)

*mr	zh	horse (and other examples in discussion)
*ʔmr	sh	high, say, thrum (and other examples in discussion)

Several aspects of the PLE:NK initial correspondences are worth special discussion.

(1) Prefixes: For the most part, the only prefixes generally reflected in Na-khi are *N (prenasalization) and *ʔ (preglottalization). These two will be discussed separately below.

Outside of the resonant initials, the other prefixes (indicated *C-, *ʔ-, *V- and even *s-) usually have no effect whatsoever. This is clearly the case before stops and affricates and, significantly, before nasals. Na-khi maintains a distinction between *s- and *ʔ- before nasals, such that *s- has no effect while *ʔ- results in a voiceless fricative. This might indicate that in some words (those indicated *s-) the prefix was lost before *s > *ʔ, while in others (those indicated *ʔ-) it was retained and was involved in subsequent sound change. On the other hand,

the difference may indicate separate origins for *s- and *ʔ- words (Proto-Tibeto-Burman *s- and *H-) maintained in PLB, at least in Mosoid. The evidence is far too scanty to determine whether the prefix *V (rather than *C) has anything to do with the lenis, rather than fortis, affricate initial in 'goat' NK ʔds 'I' < PLB *V-cit.

Despite the general disregard for prefixes, there are two cases in which the prefix 'won out' over the root-initial: NK ʔshou-lndo 'to be ashamed' < PLB *š-rak; and NK shēr 'seven' < PL *sɪ < PLB *snit. In both cases, the spirant + sonorant cluster became a spirant in Na-khi.

There is one case in which a dental prefix seems to have been preserved: NK ʔdgyu - ʔdtyu 'boil' cf. PLB *gyak 'to boil', *ʔgyak 'cause to boil'. The Na-khi forms seem to point to something like PLB *d-gyak. The first NK form is probably the more archaic, found only in the phrase ʔdgyu-lmun-l'a 'boil dead chicken' which is the name of a funeral rite. The second NK form could easily have come from the first.

The case of prefixed resonants is more complex, and will be discussed separately below.

(2) Prenasalization: Na-khi (or Na-khi and Moso), in some cases, provides the only evidence for reconstructing prenasalized initials in certain PLB words. Since PLB words with prenasalization justified by evidence from other languages (e.g. voiced stops in Lahu) have prenasalized initials in Na-khi, it was felt proper to add prenasalized alternants to the PLB reconstructions whenever Na-khi had a prenasalized initial. Thus, the words in which only Na-khi points to a *prenasalized initial are:

bee, bridge, eat, to fly, lac, nine, tooth, tree

Since the distinction between prenasalized voiced and voiceless stops (and affricates) was lost in Na-khi, there is no way to determine, for the above words, whether the initial should be reconstructed with a prenasalized voiced or voiceless consonant. Thus, the prefix *N- was simply added to whatever initial happened to occur in the non-prenasalized alternant(s).

Note, finally, that the prenasalized spirant in 'tree' becomes a prenasalized affricate in Na-khi: NK lndzēr < PLB *N-sik or *N-siŋ (NK gives no clue here regarding stop vs. nasal ending).

(3) Preglottalization: In stopped syllables, a distinction must be recognized between preglottalized voiced and voiceless stops (and affricates) to account for certain tonal phenomena (see Matisoff 1972). In Na-khi, this distinction

not affect tone, but it is apparently maintained in initial. Thus, in stopped syllables which must (for all reasons) be reconstructed with preglottalized voiceless stops (or affricates), Na-khi shows aspirated stops (or affricates):

build, cut by blow, lung

syllables reconstructed with preglottalized voiced stops (or affricates), Na-khi has unaspirated voiceless stops (or affricates):

branch, join, joint, mutual action

In stopped syllables showing an alternation between voiced and voiceless preglottalized initials, therefore, the correct ancestor of the Na-khi cognate may be determined by the aspiration or lack of aspiration of the Na-khi initial. Thus,

PLB *ʔkyik - *ʔgyik - *gyik 'little bit'

NK ʔgkyi 'small' < *ʔgyik

PLB *ʔkuk - *ʔguk 'outer covering'

NK ʔgkv 'skin of a fruit; shell of an egg'
< *ʔguk

In both cases, the lack of aspiration in Na-khi points to the preglottalized voiced alternant. (*gyik can be eliminated as the ancestor of NK ʔgkyi 'small' on the basis of tonal development -- see below.)

Thus far, in PLB reconstructions, no distinction has been kept between preglottalized voiced and voiceless initials in non-stopped syllables, since there was no evidence (segmental or tonal) for such a distinction. If Na-khi seems to maintain the distinction in stopped syllables, however, there is no reason to suppose that it does not do so in non-stopped syllables. Thus, *preglottalized stopped syllables with aspirated initials in Na-khi may be reconstructed with PLB preglottalized voiceless initials, and those with non-aspirated initials in Na-khi may be reconstructed in PLB voiced initials. (See examples given in the chart above.)

Since PLB preglottalized voiced stops seem to regularly correspond to NK unaspirated stops, while PLB voiced stops at least occasionally give NK voiced stops, this difference, perhaps, may be used to choose between preglottalized and plain initial alternants:

PLB *gra² - *ʔgra² 'between'

NK ʔgko < *ʔgra²

and perhaps:

PLB *gaŋ¹ ~ *ʔgaŋ¹ 'roast, broil'

NK ɿgkwua 'a hearth; cooking place; furnace'
 < *ʔgaŋ¹

In both cases (or, if the second is not a good set, in the case of 'between'), the voiceless unaspirated -- rather than voiced -- initial in Na-khi may be evidence for the preglottalized PLB form.

If this is so, then perhaps the Na-khi voiceless unaspirated reflexes of PLB voiced initials may really be reflexes of preglottalized variants. See: 'alive', 'carry', and perhaps also 'empty'.

Of course, things are never as regular as they appear. We also find PLB *ʔtap 'adhere, stick together', WB thap 'place on one another; add to; repeat, do again', NK ɿdta 'to add to; additional'. Here, Na-khi shows an unaspirated, rather than the expected aspirated, voiceless initial. Whether this is really an exception or points to a PLB *ʔd- variant cannot be determined at this time.

Note also the sets:

PLB *Nkrak ~ *ʔkrak ~ *Nkraŋ¹ 'cold'

NK ɿt'khi < *ʔkrak

PLB *ʔkrak 'dry, dried up'

NK ɿgko

cf. WB khrok

PLB *grok ~ *Nkrok/*ʔkrok 'fear, frighten'

NK ɿchër

If the Na-khi word for 'cold' is really cognate to the PLB form, it does show the expected aspirated reflex of the PLB preglottalized voiceless initial, with palatalization (due to the *r ? -- see below). The word for 'dry', however, has the same PLB initial (indeed, same PLB reconstruction) as 'cold', but a non-palatalized, unaspirated reflex in Na-khi. This might point to a *ʔg- variant, or else maybe the Na-khi is related to the Burmese word, which, lacking further data, may easily descend from PLB *ʔgruk or the like. The word for 'fear' involves a simplex/causative pair. The PLB *N- variant is the simplex, and the *ʔ- the causative. The plain voiced initial variant is also simplex, so there may be another causative version *ʔgrok as the Na-khi unaspirated initial (and gloss) suggest (despite the palatalization).

(4) Medial glides and affricates: Except with velars and the special cluster *(?)mr, medial glides *r, *w, *y play no part in the Na-khi initial reflexes. Furthermore, it is probably safe to say that the medial *w is best considered part of the rhyme, even with the velars.

The sequence velar + *y usually gives rise to the Na-khi palatalized velar series, including the affricate t'kh(y) (e.g., 'deer', 'sweet'), and the palatalized velar stops gky (e.g., 'little bit'), etc. Sometimes, however, the initial is further fronted to the alveo-palatal series; thus:

PLB *kyin¹ 'weigh' NK 2ch'i

PLB *gyoy² 'debt' NK 2dzhu 'an account; a debt;
a claim'

PLB *Ngyök - *Nkyök 'beat/shake' NK 1ndshi 'to strike;
to beat'

The Na-khi word for 'weigh' may be the wrong cognate, since there is another form gkyi 'a scale; a balance; to weigh' which better fits the tone correspondence (2ch¹ would have to be considered an irregular tone correspondence -- see below), but its initial points to a variant *gyin¹, for which there is no further evidence. What happened in the other two examples is not clear, since both gyu and ngyi do occur in other Na-khi words.

The situation is even more complicated in the case of medial *r. Here there are examples in which the *r either has no effect (or may be part of the rhyme), such as 'between', 'crossbow', 'dry', 'foet', 'horn'; has a palatalizing effect, as in 'ant', 'cold'; fronts all the way to an alveo-palatal, as in 'daughter-in-law', 'six'; or does something else.

Included in the 'something else' category are: PLB *krup² 'Jew's harp' > NK 2kwuo; PLB *Ngrip 'lac' > NK 1ngye 'resin'. What Rock means by the transcription kwuo is not clear, since aspirated stops are written k and unaspirated by gk.

There is not enough data yet to determine whether the final has any influence on what *r does to the initial.

It is possible that the various reflexes of velar + *y or *r are further complicated by the fact that there is not perfect regularity in the reflexes of the PLB affricates *ts and *c (and their voiced, prenasalized and preglottalized counterparts). Thus, in addition to 'regular' correspondences of *ts (etc.) to ts (etc.) and *c (etc.) to ch (etc.) we find:

*dental > alveo-palatal

PLB	*tsiy ²	>	NK	² ch'ěr	'wash'
	* ² tsut	>		³ ch'ěr	'lung'
	* ² dzak	>		³ chung	'join'
	* ² dzik	>		³ chěr	'joint'

*dental > palatal (palatalized velar)

PLB	*tsow ²	>	NK	² t'khyu	'bore'
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*palatal > dental

PLB	*V-cit	>	NK	³ ds'ĩ	'goat'
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In the case of 'wash' and 'joint', perhaps the following PLB *i is involved in the palatalization, though 'goat' goes exactly the other way around.

At this point, we can do no more than to admit that the status of affricates, especially alveo-palatal and palatal, whether from PLB affricates or velar + *y or *r, is unsure, and requires a great deal more work. It is likely that the finals are involved, since the finals -ěr, -ung and -ĩ are rather restricted.

(5) *mr and *²mr: There appears to have been a special development of the PLB initials *mr and *²mr, resulting in Na-khi zh and sh respectively. The examples of this development, some of which are not included in Appendix A because of various other complications, include:

*mr > zh

'grass'	*mruk - *mrak	>	¹ zhou
'horse'	*mraq ²	>	² zhwua
'noise'	WB mrañ	NK	¹ zhěr
'snake'	WB mrwe	NK	¹ zhi

*²mr > sh

'high'	* ² mraq ¹	>	¹ shwua
'say'	* ² mrwak	>	³ shou

We may perhaps also include: WB mrwāp 'gash obliquely, or any way', NK ²shwua in ²shwua-³ds'ĩ 'castrated goat' (< *²mrwāp ??); PLB *mraq¹ 'see', NK ¹shu 'search' (< *²mraq¹ ??); WB mru 'minute particle of floating dust', NK ¹shou 'sand' (< *²mru ??); WB mrit-cha 'thrum, the threads by which the warp of a new piece to be woven is connected in the loom', NK ¹shi 'to stretch or spread the thread on a loom' (< *²mrit ?? or open syllable variant ??).

The most convincing pair of examples is 'horse' and 'high', in which the only difference in PLB is the preglottalization,

the only difference in Na-khi is the voicing of the initial. The suggested cognate in 'castrated goat' also fits this pattern perfectly. The evidence for the vocalization in 'high' is not from Na-khi alone, but required for PLB in general (see Burling 1967:84); and justifies positing *ʔmr for the other NK sh words.

Not all the examples above are sure ones. NK lzhër may be related, rather, to WB sam 'sound' and Lisu 'a noise' (Lisu form, from Hope, provided by Graham Good, personal communication), implying PLB *sam or like. Likewise, the word for 'sand', NK lshou, may now be related to PLB *say (though the tone correspondence would be irregular), also meaning 'sand'.

In any event, there are no counter-examples. One recent counter-example is the set:

WB mri NK 2man 'tail'

3r is aberrant, however (see Benedict 1972:64), the PLB reconstruction being *mi2 - *ʔmi2, though here it looks a bit more like the Proto-Tibeto-Burman form 3r (Benedict 1972:64).

6) *w: The Na-khi words corresponding to PLB words beginning with *w have complex developments, involving, possibly, PLB prefixes or else the nature of certain PLB words with zero-initial. Only one example was found of *w becoming NK w: PLB *wi2 'far' > NK 3wu 'far, distant'. This may not be a good cognate, however, since tone 3 corresponds to PLB stopped syllables (see above). On the other hand, perhaps the Na-khi form reflects a stopped variant such as *wit. The rounding of PLB w after w in Na-khi is not all that strange, especially if it is seen that *-it corresponds to NK -o even without a preceding w: PLB *rit > NK 3ho 'eight'.

Whether 'far' is a good cognate or not, the correspondence is certainly the rarest one. More common is *w > NK l stop. Two voiced stops are involved here, b and g. NK b words are:

PLB <u>*wat</u>	NK <u>lba</u> - <u>lbaw</u>	'flower'
<u>*wak</u>	<u>ltu</u>	'pig'
<u>*wa2</u>	<u>2toa</u>	'sole'

Surprisingly enough, all three of these words have Proto-Tibeto-Burman (PTB) reconstructions with initial bilabial (PTB forms are all from Benedict 1972):

PTB <u>*bwat</u>	'flower'
<u>*pak</u> = <u>*pwak</u>	'pig'
<u>*pa</u> = <u>*pwa</u>	'sole'

The implication, perhaps, is that Na-khi, at least, retained these stops before *w and the w was lost due to lack of contrast between ba and bwa, while the other Lolo-Burmese languages treated the stop as a prefix, and dropped it before w. That is, there may have been a sequence like:

PTB *bwat > PLB *bwat > NK ¹ba ~ ¹baw 'flower'
 *^owak > *^owak > ¹bu 'pig'
 *^opwa > *^obwa² > ²boa 'sole'

On the other hand, it is possible that *w simply developed into NK b, though this seems less likely than the above interpretation due to other reflexes of *w, discussed below.

When a prefix is reconstructed in PLB, Na-khi develops either a voiceless unaspirated bilabial stop initial (bp), or else, if the prefixation caused (or became) preglottalization Na-khi shows the expected voiceless fricative:

PLB *k-r-wat > NK ³bpö 'leech'
 *k-r-wak > ³ffü 'rodent, rat'

Why these two identical PLB initial sequences should develop differently is not apparent, but perhaps the PTE ancestors again shed some light: PTB *r-pat 'leech', *rwak 'rodent'. Again, the PTB form for 'leech' might point to a PLB *k-r-bwat, and that for 'rodent' to PLB *k-r-wak. The sequence *k-r- could have given rise to pre-NK preglottalized initials: Pre-NK *^obwat 'leech', *^owak 'rodent'. Then, as with the words for 'pig', etc., the w was lost after the bilabial stop. The normal reflex for *^ob is bp, and that for *^ow should be ff. (This is also support for treating the words for 'pig', etc., as coming from PLB *bw- rather than simply *w-.)

In addition, there are a few words where PLB *w seems to correspond to g or gk. In two of these words, however, the PLB reconstruction is simply *u. Since there is no contrast between *u and *wu (and, perhaps, *^ou, if such a reconstruction is necessary), these can, for the time being at least, be considered examples of *w-:

PLB *u³ = *wu³ = *^ou³ > NK ²gv 'egg'
 *u² = *wu² = *^ou² > ²gkv 'head'
 *wam¹ > ¹gv 'bear'

Once again, the PTE reconstructions may prove helpful: PTB *s-gaw 'head'. If this PTB *s- prefix gave rise to preglottalization, there would be a PLB form *^ogu² which would develop quite regularly into NK ²gkv. By analogy, we may posit PLB *gu > NK ²gv 'egg'; PLB *gwam > NK ¹gv

'bear'. The set appears even more regular if we reconstruct *gwu rather than *gu. Then, the *w is lost before u, or else the velar initial (or prefix) has a labial component which does not show up before u (cf. the apparent relationship between *ŋ and w below).

(7) *r: The fate of PLB *r in absolute initial position seems to be complete (or almost complete) loss. Thus, PLB *r- > NK Ø in 'bone', 'copper', 'shadow'. Its effect might be felt in 'chicken' as laryngealization: PLB *k-rak > *rak > NK l'a. Similarly, the laryngeal aspect might be involved in PLB *(Nk)riy > NK ghūgh 'skin, hide', though here the tone correspondence is irregular.

There appears to be one (unexplainable, if cognate) case of *r > z, again with laryngealization: PLB *ray > NK z'a 'laugh'. (NB ray is irreg.)

How the development of initial *r ties in with that of medial *r (see above), if it does at all, is not apparent, except in those cases where medial *r seems to be lost.

(8) *ŋ: Na-khi initial ng is very rare, the only good cognate being PLB *ŋa > NK ngo 'I'. The Na-khi vowel here seems to point to labialization, and the only cause of this labialization could be PLB *ŋ. This is not as ad hoc as it may seem, as the possessive form of the first person pronoun (with tone shift) ngo-ggo 'my, mine' has an alternate form with initial w: wu-ggo 'mine'. Note also the Na-khi word for 'five': PLB *ŋa > NK wua. (Of course, the possibility that wu 'mine' and wua 'five' are loans from Chinese [Mandarin wō and wū respectively] cannot be ignored.)

The other good cognate with PLB *ŋ should be reconstructed with medial *y (as PTB suggests): PTB *ŋya > PLE *ŋ(y)a > NK nyl 'fish'. In this light, how NK nyu 'I, self, me' fits in with *ŋa (if it does) is not clear. It may be due to the rarity of NK ng and represent simply ngo > nyo > nyu with the palatal nasal (the closest in point of articulation to the velar) being far more frequent. As noted earlier, all nasals go to n before y ('silver', 'weep').

2.2. In general, no attempt has been made to account for all the various Na-khi reflexes of the Proto-Lolo-Burmese rhymes. What follows, then, is merely a list of correspondences with conditioning factors pointed out only where they are fairly obvious. The logical next step in working Na-khi into PLB is to determine the distribution of Na-khi initials vs. rhymes.

As with the list of initial correspondences, the glosses refer to words to be found in Appendix A.

<u>PLB</u>	<u>NK</u>	<u>examples</u>
*-ak	-a	black, crossbow, hand, mutual action, sharp
	-aw	breath, descend, to hide (?), night, weave
	-o	basket, branch, deep, dry (?) (after NK velar or <u>h</u>)
	-u	boil, pig
	-ũ	rodent (after NK <u>ff</u> in this single form)
	-ung	join (after NK <u>ch</u> in this single form)
	-un	son-in-law (after NK <u>m</u>)
	-ʼa	chicken (after PLB * <u>r</u> > NK <u>Ø</u>)
*-(r)ak	-i	cold (after PLB * <u>?kr</u> > NK <u>t'kh</u>)
	-ou	ashamed (after PLB * <u>š-r</u> > NK <u>sh</u>)
*-wak	-u	emerge (after NK <u>t'</u>)
	-wua	cup (after NK <u>k'</u>)
	-o	ant (after PLB * <u>k-r</u> > NK <u>t'khy</u>)
	-ou	say (after PLB * <u>?mr</u> > NK <u>sh</u>)
*-yak	-i	tongue (after * <u>?l</u> > <u>kh</u>)
	-iu	eye (after * <u>m</u> > <u>m</u> - <u>n</u>)
*-ik	-ěr	joint, leopard, tree (?)
	-i	little bit, new
	-ũ	one
*-uk	-ěr	write
	-v	maggot, outer covering
	-u	build
	-ũ	explode
*-ok	-ěr	fear
	-un	bean (after NK <u>n</u>)
	-ũ	hatch
	-v	crooked, poison, year (after NK velar or <u>nd</u>)
	-wua	six

<u>PLB</u>	<u>NK</u>	<u>examples</u>
*-yok	-i	lose
*-ek	-ū	give (?)
*-ök	-u	cut by blow (?)
	-i	beat (after PLB * <u>y</u>)
*-at	-aw ~ -a	flower (after NK <u>b</u>)
	-aw	bite down onto
	-a	alive
	-ö	leech
	-ü	kill, vomit
	-ø ~ -ēr	break in two
	-ʼa	ability
*-rat	-i	decision (?)
*-it	-ī	goat
	-i	two
	-ēr	seven (PLB * <u>snit</u> > Proto-Lolo * <u>ši</u> ²)
	-o	eight
*-i·t	-i	thrum (?)
*-ut	-un -ēr	blow, lips (after NK nasal)
	-u	lung
	-u	may
*-yet	-i	vulva
*-ap	-a	add
	-ö	stand
*-yap	-iu	fall over

<u>PLB</u>	<u>NK</u>	<u>examples</u>
*-ip	-i	sleep (after * <u>y</u>)
	-ō	shade (after * <u>r</u> > Ø)
	-v	wrap (after <u>l</u>)
*-rip	-ye	lac
*-aq	-ü	sheep, you (after NK <u>y</u> and <u>nn</u>)
	-o	drive
	-ī	he
	-un	dream (?) (after NK <u>m</u>)
	-aw	food
	-wua	empty (?), high, horse (the second two after * <u>(?)mr</u> > <u>zh</u> or <u>sh</u>), roast (?)
*-waq	-u	open
*-iq	-ēr	tree (? -- see * <u>-ik</u>)
	-ü ~	heart (after n or <u>nn</u> ; the nasalized vowel is in the colloquial form; cf. * <u>-aq</u> reflex of 'you' vs. 'dream')
	-un	
*-uq	-v	beseech, stone, thousand (after NK <u>dd</u> , <u>l</u> , <u>dt</u>)
(or *-oq)	-u	bubble (after NK <u>p'</u>)
*-ruq	-wuo	Jew's harp (after * <u>k</u> > <u>k</u>)
(* <u>-roq</u>)		
*-an	--	(no examples)
*-in	-i	weigh
*-un	--	(no examples)
*-am	-u	fathom, iron, otter, road
	-un	smell (after NK <u>n</u>)
	-o	bridge, rib
	-v	bear (after NK <u>g</u>)

PLB	NK	examples
*-wam	-ö	swollen
*-yam	-i	to fly
*-im	--	(no examples)
*-um	-u	three
	-v	warm (after <u>l</u>)
*-a	-a	box, father, frog, place (after labials and dentals)
	-aw	bitter (after <u>k'</u>)
	-i	{ ^h antelope, meat, right (after * <u>(?)y</u> or * <u>š</u>)
	-ī	eat (after <u>ndz</u>)
	-ü	come (after <u>ll</u> , thus NK <u>ü</u> is [w])
	-o	child, I (after * <u>z</u> , * <u>q</u>)
	-ä	ear, moon, thumb (after <u>h</u> or <u>m</u>)
	-un	female (after <u>m</u> ; cf. 'thumb', 'negative')
	-uàn	negative (after <u>m</u> ; cf. 'female', 'thumb')
	-uà	five (after NK <u>w</u> ; really same as *- <u>a</u> > - <u>a</u>)
	-u	male (after <u>p'</u> ; PTB *- <u>wa</u>)
*-wa	-ü	handspan, rain (the latter begins with NK <u>kh</u> , thus NK - <u>ü</u> is [w], but front rounded [ü] in 'handspan')
	-oa	sole (after <u>b</u>)
*-ra	-o	between
	-'a	bee (or *- <u>ya</u>)
*-ya	-i	fish, hundred (see also 'bee')
*-ay	-'a	laugh (after * <u>r</u> > <u>z</u>)
	-i	knead
	-ä ~	ten
	-er	
*-way	-üe	chaff
	-a	tie up, tooth

<u>PLB</u>	<u>NK</u>	<u>examples</u>
*-raw or *-yaw	-ʼa	enjoy
*-i	-i	fire, insect, penis (?)
	-ĩ	know (after <u>ss</u>)
*-iy	-i	deer, market, sun
	-ěr(h)	copper, medicine, wash
	-ār	wind (air), winnow (after *ʔl > h)
	-ũ	boat, bow, heavy (after <u>li</u> , thus <u>ü</u> = [w])
	-ügh	skin (?)
	-u	far, four
	-v	grandchild (after <u>l</u>)
	-ö	red (after *ʔn > h)
*-wiy	-ö	dog
	-an	blood (after <u>ss</u> (!))
	-v	silver
	-a	gold (after *ʔr > h)
	-o	dry-2
*-riy	-ö	foot
	-ěr	untie
*-(r)wiy	-ěr	daughter-in-law
*-u	-v	egg, head (after NK velars)
	-ũ	take (after <u>y</u>)
*-ru	-ö	porcupine
	-ěr	white
*-uw	-u	grandfather, price (after labials)
	-v	body, nine, smoke, steal, weep (after PLB velars)
	-o	horn (after *kr > k')
	-ö	bone (after *r > Ø)

<u>PLB</u>	<u>NK</u>	<u>examples</u>
	- <u>un</u>	mushroom (after <u>m</u>)
	- <u>uan</u> ~	sky (after <u>m</u>)
	- <u>un</u>	
	- <u>ũ</u>	feather (after * <u>ʔm</u> > <u>ff</u>)
	-a	carry
	-i	sweet (?)
	- <u>är</u>	green (after * <u>ʔny</u> > <u>h</u>)
*-oy	-u	debt
*-ow	-u	bore (?)

2.3. In open syllables, (that is, those not ending in PLB *-p, *-t, *-k), with remarkably few exceptions PLB Tone *1 became Na-khi tone 1, and PLB Tone *2 became Na-khi tone 2 (Rock's tone numbers just happen to work out very nicely). Examples of *1 > 1 are:

bear, boat, bridge, deer, drive, enjoy, fathom, to fly, gold, green, handspan, high, I, insect, iron, knead, laugh, mushroom, otter, porcupine, rain, red, rib, right, road, roast, sheep, silver, smell, sweet, take, ten, thousand, tree (may be stopped), untie, warm, weep, white

Examples of *1 corresponding to Na-khi tone 2 do exist; they are relatively few and I have no explanation for them. Perhaps, however, tone sandhi, which is quite common in the language, is involved somehow. The words showing *1 > 2 are:

body, come, dream (may be stopped), foot, horn, hundred, skin (?), sun, tooth, weigh (?), wind, you

Examples of *2 > 2 are:

antelope, bee, beseech, between, bitter, blood, bone, bore (?), bow, box, carry (?), chaff, child, copper, daughter-in-law, debt, dog, ear, eat, empty (?), fire, five, food, four, frog, grandchild, grandfather, he, head, heavy, horse, Jew's harp, know, male (or *3), market, meat, medicine, negative, nine, place, price, seven, sky, sole, steal, wash

There are only four exceptions to this correspondence. In three, *2 corresponds to Na-khi tone 1: 'penis', 'smoke', 'three'. In the fourth, *2 corresponds to Na-khi tone 3, suggesting, as will be seen, a stopped variant: 'far'.

There are fewer examples of PLB Tone *3 than *1 or *2. In almost all cases, *3 > NK tone 2:

dry-2, egg, father, feather, male (or *2),
open, stone, swollen, thumb, tie up, winnow

here are two examples of alternation, involving the literary vs. colloquial forms:

*3 > 2 (literary) ~ 3 (colloquial): 'heart'

*3 > 2 (colloquial) ~ 1 (literary): 'moon'

inally, there is one example of *3 corresponding to Na-khi tone 1 ('female'), but compare this to 'thumb' which may contain the same morpheme.

The Proto-Lolo-Burmese stopped syllables are more interesting. As Matisoff (1972:5) points out, Na-khi (and Mosoid in general) did not undergo the checked syllable onal split found in all the other 'Loloid' languages (thus ustifying the setting up of two branches of Loloid: Mosoid n the one hand, Loloish on the other). There are, however, wo Na-khi tones corresponding to PLB checked syllables: and 3. Citing data from Moso, Matisoff (1972:5) notes:

it appears that all checked syllables beginning with voiced or pre-nasalized stops, the lateral l, nasals, or zero have low pitch (11), while those beginning with plain or aspirated stops or spirants have high pitch (55), so that tone is automatic and non-distinctive in checked syllables.

The Moso low pitch corresponds to Na-khi tone 1, and the high pitch to tone 3. Generally speaking, Matisoff's observations apply to the Na-khi data. There are examples of lateral and nasal initial words in tone 3 (the high pitch), but these are few indeed compared with the lateral and nasal initial words in low tone 1. Furthermore, there are only about a dozen prenasalized words occurring in tone -- quite an insignificant number compared to those occurring in tones 1 and 2 (from stopped and non-stopped PLB syllables). From a synchronic perspective, however, tone is certainly not automatic and non-distinctive in proto-stopped syllables, ince it does serve to distinguish 1la from 3la etc., there eing nothing in Na-khi itself to determine whether 1a should have tone 1 or 3, or even if 1a is a checked or on-checked syllable in PLB.

If, on the other hand, we take an historical viewpoint, the assignment of tone 1 or 3 is automatic. As will be explained below, the type of PLB initial determined whether the checked syllable developed into the Na-khi high tone (tone 3) or low tone (tone 1). Note that, leaving out all the details, this sounds exactly like the underlying mechanism of the Loloish tonal split: the type of initial determined the

tonal class (high or low) of the checked syllable. The major difference between the Loloish tonal split and the Na-khi split is that in Loloish, the type of initial can frequently be determined only by the tonal reflex, while in Na-khi the various types of PLB initials are, for the most part, reflected differently. Thus, since Na-khi has a great number of different kinds of initials, the tone class (tone 1 or tone 3) can, to a rather large degree, be determined from the type of initial.

What all this may lead to, then, is that the mechanism for a checked syllable tonal split can be ascribed to Loloid in general (not just Loloish), but the details (no doubt involving the maintenance vs. loss of various initial distinctions) are different.

The details of the Na-khi tonal split are fairly simple: voiced initials (including voiced stops, affricates, fricatives, and prenasalized stops, affricates and fricatives) gave the low tone class (NK tone 1); voiceless initials (including voiceless stops, affricates, fricatives, and preglottalized stops and affricates) gave the high class (NK tone 3). It is important to note that if the prefix is reflected in Na-khi (as are *N- and *ʔ-), the voicedness of the prefix is taken into account (*N- is voiced; *ʔ- is voiceless) and this -- not the voicedness of the root initial consonant -- is what determines the tonal class of the syllable. If the prefix is not reflected in Na-khi (such as those transcribed *C-, *ʃ-, *V-, as well as *s-), then the prefix is ignored as far as the tonal class is concerned, and the voicedness of the root initial consonant determines the tonal class.

There are some exceptions to this analysis, but it seems to hold up in by far the majority of cases.

Examples of PLB voiced initials (as defined above) giving rise to Na-khi tone 1 in stopped syllables are:

ability, bean, beat, black, blow, chicken, crooked,
descend, explode, eye, fall over, fear, flower,
give (?), hand, hatch, lac, leopard, pig, poison,
shadow, tree, two, weave

Only three cases of Na-khi tone 1 coming from a stopped syllable with PLB *voiceless initials were found among the vocabulary used principally in this survey (Appendix A):

PLB *C-tik - *ti ²	>	NK lddü	'one'
*prat	>	l p'i	'decision'
*ʔmri-t	>	l shi	'thrum'

The word for 'one' is unusual in other Lolo-Burmese languages. For example, although the PLB form has a voiceless initial, both written Burmese and Lahu show plain (rather than

expected aspirated) initials: WB tac, Lahu tê. Perhaps this points to something like *dik - *dīʔ, which would account for the WB and Lahu, as well as the Na-khi initial and tone.

The word for 'decision' is poorly supported (being reconstructed on WB evidence alone: WB phrat-ca 'a decision in writing') and the Na-khi may, perhaps, not even be cognate.

The word for 'thrum' is also based on WB: WB mrit-cha 'thrum, the threads by which the warp of a new piece to be woven is connected in the loom'; the preglottalized variant is added to account for Na-khi sh (rather than zh) in shī 'to stretch or spread the thread on a loom'. Since the low tone occurs with a voiceless initial within Na-khi, this may point to an open syllable, PLB Tone *1, alternant, something like *ʔmriy1.

Examples of PLB voiceless initials (as defined above) giving rise to Na-khi tone 3 are:

add (?), ant, ashamed, basket, beat, bite down
onto, branch, break in two, breath, build, cold,
crossbow, cup, cut by blow (?), deep, dry, eight,
emerge, fear, goat, join, joint, kill, leech, little
bit, lose, lung, may, mutual action, new, night,
outer covering, rodent, say, sharp, six, stand,
tongue, vomit, year

There are a number of exceptions here (that is, a number of examples of tone 3 words coming from PLB voiced initials). Note, for example, PLB *dat > NK 3ɗta 'alive'. The initial here is also irregular: we would expect, ideally, NK d (or dd) from *d. If this can be used as evidence for a preglottalized variant *ʔdat, both the Na-khi tone and initial are regular.

Another exceptional set is:

PLB *gyak 'boil'
*ʔgyak 'cause to boil'
NK 3dgyu - 3dyu 'boil'

As was noted earlier, this is a unique set, perhaps implying a prefixed dental of some kind. Whatever the case, the fact that the tone is also apparently irregular (if the Na-khi comes from *d-gyak or the like) is of no major consequence in such an aberrant form.

Compare also PLB *wak - *ʔwak 'hide', NK 3gkaw 'to hide (clouds hide sun or moon)'. This is similar to the case of 'head' (see the above discussion on the reflexes of *w); if the Na-khi form comes from *ʔgwak, it is perfectly regular.

We would expect PLB *s-nut > NK 3nun 'lips' to behave like 'bean', 'black' and 'eye' and have an initial nasal with

tone 1 (since the *s- prefix does not affect the Na-khi initial). Either this is a true exception, or else sandhi may play a role: the full colloquial form for 'lips' is 3nun-lbi.

Since there is no contrast in PLB between *y¹ip and *ʔ¹ip, the set PLB *y¹ip > NK 3y¹i 'sleep' may be evidence for an actual glottal stop initial (at least in some pre-Na-khi form). The *ʔ, being voiceless, would, quite regularly, give tone 3.

As with 'lips', the set PLB *z-mak 'son-in-law' > NK 3mun is either a true exception, or else a result of sandhi, the full form in Na-khi being 3mun-2ghugh.

There are two more sets which, if cognate, must be considered true exceptions:

PLB *byet 'vulva' > NK 3bi 'vagina'

*Npuk - *Nbuk 'write', NK 3bbēr < *buk (?)

Finally, two sets may lead us to change our views on the lack of influence of 'lost' prefixes on tone:

PLB *k-luk > NK 3lv 'maggot'

*lip 'wrap, roll up' > NK 3lv 'wrap; wind up
like a string on
a stick'

In the word for 'maggot', it appears that the prefix, though leaving no trace in the Na-khi initial, has contributed to the high tone 3. This is a counter-example to the assumption that prefixes which do not affect the initial do not affect the tone either. The word for 'wrap', on the other hand, has no evidence for such a prefix, yet it too turns up in NK tone 3. The evidence for PLB *lip 'wrap' is scant, the form reconstructed on the basis of WB lip 'wrap, roll up', with some support from Lahu li² 'to coil', though Matisoff (in his unpublished Lahu-English Dictionary) follows this word with the notation '(Loan?)'. Perhaps there are some instances of lost prefixes affecting the tone (though they would be likely to be lost voiceless prefixes) as in Loloish. If not, we leave this preliminary look at Na-khi and Proto-Lolo-Burmese with no idea about how words with voiced initials ever got into Na-khi tone 3.

APPENDIX A

Cognate Sets

The Na-khi and Proto-Lolo-Burmese forms used in preparing the preceding analysis are listed below, in alphabetical order according to the English gloss used to refer to them throughout the text. Letters following the PLB forms refer to the source of the reconstruction:

- B Burling 1967 (retranscribed after Matisoff 1972)
- C obtained from James A. Matisoff by personal communication in spring, 1973
- M Matisoff 1972
- N supplied by me as the proposed source for the Na-khi reflex, based on regular sound correspondence in other sets
- O supplied by me, usually reconstructed on the basis of Written Burmese alone, sometimes with corroboration from Loloish

- ABILITY *dat O 'able, know how, be skilled in', NK ¹d'a 'ability, power'
- ADD *ʔtap M 'adhere, stick together', NK ³dta 'to add to; additional'; cf. WB thap 'place one on another; add to; repeat, do again'
- ALIVE *dat M 'be alive', NK ³dta 'alive, living'
- ANT *k-rwak M, NK ³t'khyo-²lo; also PLB *p-rwak ~ *s-rwak M
- ANTELOPE *ʔya² B,C 'antelope, serow, mountain goat', NK ²yi 'serow'
- ASHAMED *š-rak M, NK ³shou-¹ndo 'to be ashamed'; also *g-rak M
- BASKET *kak M, NK ³k'o 'a basket made from a small bamboo' (also in other terms for 'basket')
- BEAN *(s-)nok M, NK ¹nun 'yellow pea', ¹nun-²dze 'a very small bean'
- BEAR *wam¹ B, *gwam¹ N (see above discussion on *w), NK ¹gv
- BEAT *Ngyök ~ *Nkyök M 'beat, shake', NK ¹ndshi 'to strike; beat'; *ʔgyök N, NK ³dshi-²dshi 'to shake; to wiggle (like a large animal shaking its body)'
- BEE *bʔa² E, *Nbra² N, NK ²mb'a 'a bee, a honey bee'; cf. PTB *bʔa = *bʔa ~ *bra (Benedict 1972)
- BEESECH *duq² or *doq² O 'ask for, demand', NK ²ddv 'to beseech; to implore beseechingly'

BETWEEN *ʔgra² C, NK ʔgko; also *gra² C
 BITE DOWN ONTO *ʔ-tsat M, NK ʔts'aw
 BITTER *ka² E, NK ʔk'aw
 BLACK *(s-)nak M, NK ʔna
 BLOOD *swiy² B, NK ʔssan
 BLOW, to *s-mut M, NK ʔmun
 BOAT *ʔliy¹ C, *liy¹ N, NK ʔllü 'a boat; a wooden rowboat'
 BODY *guw¹ O, NK ʔgv, ʔgv-ʔmun
 BOIL *gyak M 'boil', *ʔgyak M 'cause to boil', *d-gyak N
 'boil' (see discussion on prefixes above), NK ʔdgyu -
 ʔdtyu 'boil'
 BONE *ruw² C, NK ʔo
 BORE *Ntsuk - *ʔtsuk M 'pierce/stab', *tsow² M 'thorn',
 NK ʔt'khyu 'to bore; to bore a hole'; cf. NK ʔndshwua
 'to drive a stake into the ground'
 BOW *liy² C 'bow, slingshot', NK ʔllü-ʔmä 'a bow'; also
 *ʔliy² C
 BOX *ʔda² N, O, NK ʔdta-ʔssaw 'box locked; a locked box';
 also *da¹ O
 BRANCH *ʔgak M, NK ʔgko 'branch detached from tree'; also
 *ʔkak M
 BREAK IN TWO *tsat - *ʔ-tsat M 'break in two, cut through,
 conclude', NK ʔts' - ʔts'ər 'to cut -- used for other
 objects than grain; mainly employed for cutting soft
 objects as rope'
 BREATH *C-sak M, NK ʔssaw
 BRIDGE *dzam¹ B, *Ndzam¹ N, NK ʔndso 'a wooden bridge'
 BUBBLE *puŋ² or *poŋ² O, NK ʔp'u 'a bubble; to leaven'
 BUILD *ʔtsuk M, NK ʔts'u 'to erect; to construct; to build'
 CARRY *buw² C, B 'carry on back', (*ʔbuw² ?? N -- see discussion
 on preglottalization above), NK ʔbpa-ʔbpa 'to carry on
 the back'; cf. NK ʔmbu 'to carry on the shoulder'
 CHAFF *pway² B, O, NK ʔp'üe - ʔpp'üe (unique occurrence
 of pp')
 CHICKEN *k-rak M 'chicken, fowl', NK ʔa
 CHILD *za² C, NK ʔzo 'sgn', ʔzo-ʔbbü 'holding a child;
 pregnant'; also *tsa² C
 COLD *ʔkrak M, NK ʔt'khi; also *Nkrak - *Nkraŋ M
 COME *la¹ B, NK ʔllü 'come, coming'

- COPPER *griy² B,O, NK ²ēr^h (transcription implies loan from Chinese)
- CROOKED *gok M, NK ¹gv 'crooked; bent; twisted'
- CROSSBOW *krak M, NK ³k'a 'to shoot (bow and arrow)'
- CUP *kwak B,O, NK ³k'wua
- CUT BY BLOW *ʔtök M 'cut by blow, hack away at', NK ³t'u 'to take out; or cut out as a chip from a log'; also *Ntök M
- DAUGHTER-IN-LAW *krwi² C, NK ²ch'ēr-²mä
- DEBT *gyoy² C, NK ²dzhu 'an account; a debt; a claim'; also *Nkyoy² C
- DECISION *prat O, NK ¹p'i 'to decide; to judge; verdict; decision'
- DEEP *ʔnak M, NK ³ho; also *nak M
- DEER *kyiy¹ B,O 'barking deer', NK ¹t'khi 'deer (yellow deer)
- DESCEND *zak M, NK ¹zaw
- DOG *kwiy² C, NK ²k'ō
- DREAM *s-maq¹ M, NK ²mun; also *s-mak M
- DRIVE *ʔna¹ O 'to drive along, drive away', NK ¹ho 'to drive, as cows, sheep, horses, etc. together'
- DRY *ʔkrak M, NK ³gko; cf. WB khrok (see discussion on preglottalization above)
- DRY-2 *swiy³ O 'become dry', NK ²sso
- EAR *ʔna² B,O, NK ²hā, ²hā-¹dsu (colloquial); also *na² B,O
- EAT *dza² B, *Ndza² N, NK ²ndzī
- EGG *u³ B, *gu³ N (see discussion on *w above), NK ²gv
- EIGHT *ʔrit M, NK ³ho
- EMERGE *ʔ-twak ~ *ʔtwak M, NK ³t'u 'to drive out; chase; exit; go out'; also *Ntwak M; also NK ³ndü 'to chase; drive out'; also *ʔdwak M
- EMPTY *gan² C (see discussion on preglottalization above), NK ²gkwua 'unreality; emptiness; void'; cf. NK ¹k'wua 'empty'; cf. 'roast'
- ENJOY *byaw¹ O 'enjoy one's self; be happy', *braw¹ N, NK ¹b'a 'pleased; happy; delighted'; cf. PTE *pro (Benedict 1972)
- EXPLODE *Npuk M, NK ¹mbbü 'to explode; blow up'; also *ʔpuk M
- EYE *(s-)myak M, NK ¹miu - ¹niu

FALL OVER *Np(y)ap M, NK ¹mbiu 'to collapse'

FAR *wiy² C, NK ³wu 'far, distant' (NK points to a stopped syllable variant: *wit ???)

FATHER *ʔba³ O, NK ¹ä-²bpa (colloquial)

FATHOM *lam¹ C 'fathom, arm-spread', NK ¹lu 'a length measure between two rounded outstretched arms; the arms are held as if embracing someone'; cf. NK ³lēr 'to estimate; to fathom' (this last form might point to a stopped variant: *lap ???)

FEAR *Nkrok M, NK ¹ndshēr 'fright; to have a fright; frightened; fear'; *ʔkrok M, *ʔgrok N, NK ³chēr 'to startle, frighten'; also *grok C; also NK ²zhēr 'to be afraid', ³gkyi 'to be afraid' (how this word family fits together is not entirely clear)

FEATHER *muw³ B 'feather/body hair', *ʔmuw³ N, NK ²ffū 'hair; the hair of all animals except sheep, yak and goats; also the feathers of all birds'

FEMALE *ma³ B 'female suffix', NK ¹mun 'female'

FIRE *mi² C, NK ²mi; also *ʔmi² C

FISH *qa² B, *nya² N, NK ²nyi; cf. PTB *nya (Benedict 1972)

FIVE *qa² B, NK ²wuà

FLOWER *sə-wat M, *bwat N, NK ¹ba - ¹baw

FLY, to *byam¹ C, *Nbyam¹ N, NK ¹mbi (colloquial)

FOOD *haq² O 'cooked rice', NK ²haw

FOOT *kriy¹ C, NK ²k'ō

FOUR *liy² C, NK ²lu

FROG *ʔpa² B, *ʔba² N, NK ²bpa

GIVE *bek M, NK ¹bbū 'give, present, offer'

GOAT *V-cit M, NK ³ds'ī

GOLD *ʔrwiyl¹ C, NK ¹ha 'gold, yellow'

GRANDCHILD *liy² C, NK ²lv-²bbū; also *ʔliy² C

GRANDFATHER *ʔpuw² C, NK ¹ä-²p'u, ²p'u

GREEN *ʔnyuw¹ B,O, NK ¹hār 'green, the color of faded turquoise'; also *nyuw¹ B,O

HAND *lak M, NK ¹la

HANDSPAN (?) *twa¹ C, NK ¹t'ü 'a measure; the section of a grain box consisting of boards of equal width; each width of such a board is called one t'ü. When the box is full it is said to contain so many t'ü of grain'

HATCH *bok O, NK ¹bbū 'to hatch (as an egg)'

- HE *zaq² C 'he/she/it', NK 2ssī
- HEAD *u² B, *ʔgu² N (see discussion on *w above), NK 2gkv
- HEART *s-niŋ³ M, NK 2nnü 'heart, mind'; cf. NK 3nun-2mä (colloquial); also *s-nik M
- HEAVY *liy² C, NK 2llü; also *ʔliy² C
- HIDE, to (?) *wak - *ʔwak M, *ʔgwak N (see the discussion of tone above), NK 3gkaw 'to hide (clouds hide sun or moon)'
- HIGH *ʔmraq¹ B,O, NK 1shwua; also *mraq³ B,O
- HORN *kruw¹ B,O, NK 2k'o
- HORSE *mraq² B,O, NK 2zhwua
- HUNDRED *ʔra¹ C, *ʔrya¹ N, NK 2khi; cf. PTB *r-gya (Benedict 1972) probably = *g-rya
- I *qa¹ B, NK 1ngo
- INSECT *di¹ O 'earthworm', NK 1di 'insect'
- IRON *šam¹ B, NK 1shu
- JEW'S HARP *kruŋ² or *kroŋ² O, NK 2kwuo-1kwuo
- JOIN *ʔdzak M, NK 3chung 'to unite; to join; connect up'; also NK 3chung-2chung 'to join together; put together'
- JOINT *ʔdzik M, NK 3chěr 'a bone joint; a joint'
- KILL *C-sat M, NK 3ssū
- KNEAD *nay¹ B,O, NK 1nyi 'knead; rub, as between hands'
- KNOW *si² - *si³ O, NK 2ssī
- LAC *ʔgrip M 'lac, pine resin', *Ngrip N, NK 1ngye 'resin'
- LAUGH *ray¹ C, NK 1z'a
- LEECH *k-r-wat M, *ʔbwat N (see discussion on *w above), NK 3bpø
- LEOPARD *zik M, NK 1zhěr; cf. NK 2ndshi (points to pre-nasalized, open-syllable variant?)
- LIPS *s-nut O, NK 3nun, 3nun-1bi (colloquial)
- LITTLE BIT *ʔgyik M, NK 3gkyi 'small'; also *ʔkyik - *gyik M; cf. NK 1gkyi 'a span; between index finger and thumb' (how all this fits together, if it does, is unclear)
- LOSE *pyck O, NK 3p'i 'to lose (to get lost); to lose oneself'; also *byok - *ʔbyok O
- LUNG *ʔtsut M, NK 3ch'ěr; also *tsi² M
- MAGGOT *k-luk M, NK 3lv; also *k-luq' M

- MALE *pa³ ~ *pa² B,O, NK ²p'u; cf. NK ¹bbü 'male, but only used with animals as yak, goat, muskdeer, half-breed yak and serow' (the NK aspirated form may come from either of the PLB variants)
- MARKET *jiy² O, NK ²dzhi
- MAY *hut O, NK ³hu 'may, in conjunction with ²bä', ²bä ³hu 'it shall be; may that be (done); may that be (fulfilled), expressing a wish' (NK ²tä = 'to do')
- MEAT *ša² B, NK ²sni
- MEDICINE *ciy² C, NK ²ch'ër
- MOON *ʔla³ C, NK ²hä, ²hä-²mä (colloquial); cf. NK ¹lä (literary)
- MUSHROOM *muw¹ B 'mushroom, fungus', NK ¹mun 'a specimen; mould; sample; custom'
- MUTUAL ACTION *ʔdak M, NK ³dta 'together'; also *Ndak M
- NEGATIVE *ma² B 'negative prefix', NK ²muän 'not'
- NEW *C-šik or *V-šik M, NK ³shi
- NIGHT *ʔrak M, NK ³haw 'night; to sleep'
- NINE *guw² C, *Nguw² N, NK ²ngv
- ONE *C-tik M, NK ¹ddü (see discussion on tone above); also *ti² M
- OPEN *pwaq³ O, NK ²p'u 'to open, as a gate'
- OTTER *sram¹ (Benedict 1972:107), NK ¹ssu-²zo 'a river otter' ~ ¹shu-²zo (colloquial)
- CUTER COVERING *ʔguk M, NK ³gkv 'skin of a fruit; shell of an egg'
- PENIS (?) *ʔmli² C > *ʔnyi² C,B, *mli² > *nyi² N, NK ¹nyi
- PIG *wak M, *bwak N (see discussion on *w above), NK ¹bu
- PLACE *ʔta² B, *ʔda² N, NK ²dta 'to place; to put'
- POISON *Ndok M, NK ¹ndv; also *dok ~ *ʔdok M
- PORCUPINE *ʔbru¹ B,N, NK ¹tö-²szi
- PRICE *puw² B, NK ²p'u 'price of an object'
- RAIN *ʔrwa¹ C, NK ¹khü; also *rwa¹ C
- RED *ʔniy¹ E,O, NK ¹hö; also *niy¹ B,O
- RIB *nam¹ O, *ʔnam¹ N, NK ¹no
- RIGHT (side) *ya¹ B,O, NK ¹yi
- ROAD *lam¹ C 'road, path', NK ¹lu 'to travel'
- ROAST (?) *ʔkaŋ¹ C 'roast, broil', *ʔgaŋ¹ N, NK ¹gkwua 'a hearth; cooking place; furnace' (cf. 'empty'); also *gaŋ¹ C

- RODENT *k-r-wak M 'rodent, rat', *ʔwak N (also Matisoff 1970:31 -- see discussion on *w above), NK ʔffū 'rat'
- SAY *mrwak O 'utter, speak', *ʔmrwak N, NK ʔshou 'to say; to tell; to relate'
- SEVEN *snit > *N-šit ~ *ši² M, NK ʔshēr
- SHADOW *k-rip M 'shadow, shade', NK ʔō 'shadow of an object or person or image; a reflection', ʔndaw-ʔō 'shadow'; cf. NK ʔō 'shadow; image of an object reflected; shade'
- SHARP *tak ~ *ʔ-tak M, NK ʔt'a (the NK may come from either PLB form)
- SHEEP *yaŋ¹ B, NK ʔyū
- SILVER *ŋwiŋ¹ O, NK ʔnv
- SIX *C-krok M, NK ʔch'wua
- SKIN (?) *(Nk)riy¹ C, NK ʔghüh 'skin; hide, of either an ox or cow; a fresh skin, uncured'
- SKY *muw² B, C, NK ʔmuan ~ ʔmun 'heaven' (the second alternant is 'the more correct rendering' [Rock, p. 274]) (Rock [p. 273] comments on the pronunciation of ʔmuan:
The sound is pronounced through the nose, while ʔmuan = not, is pronounced with side open mouth with accent on the a.)
- SLEEP *yip M 'sleep', *ʔyip M 'put to sleep', *ʔip N 'sleep' (see discussion on tone above), NK ʔyi 'sleep'
- SMELL *nam¹ C, NK ʔnun 'to smell'
- SMOKE *kuw² C, NK ʔmun-ʔk'v 'smoke; smoke arising from a fire', ʔmuen-ʔk'v (colloquial)
- SOLE *wa² B 'sole, palm', *bwa² N (see discussion on *w above), NK ʔboa 'sole of foot; palm of hand'
- SON-IN-LAW *z-mak M, NK ʔmun-ʔghüh
- STAND *ʔrap M, NK ʔhö 'to stand (erect); to stand up; standing; to dwell in a place' (Rock [p. 176] comments: 'It is nearer ʔhū, the difference in the pronunciation of these two diphthongs is almost indistinguishable.')
- STEAL *kuw² B, C, NK ʔk'v
- STONE *k-loŋ³ M, O, NK ʔlv; also *k-lok M
- SUN *niy¹ C, NK ʔnyi 'sun; day-time'; also NK ʔnyi-ʔdzhi 'day-time'
- SWEET *kyuw¹ C, NK ʔt'khi
- SWOLLEN *ʔbwam³ O, *bwam³ N, NK ʔbö 'swollen, as a swollen wrist; coarse in texture; thick; large; great in circumference'; cf. PTE *bwam = *(s-)bwam (Benedict 1972) 'swollen'

- TAIL *mi² B, NK ²man; also *ʔmi² B
- TAKE *yu¹ C 'take, hole', NK ¹yü 'to take (in the hand)'
- TEN *tsay¹ B, O, NK ¹ts'ä (in counting) - ¹ts'ër (prefixed by 1, 2, 3, etc.)
- THOUSAND *ʔduŋ¹ or *ʔdog¹ N, O, NK ¹dtv
- THREE *sum² B, NK ¹ssu
- THRUM *mri:t O > WE mrit-cha 'thrum, the threads by which the warp of a new piece to be woven is connected in the loom' (Judson 1921:790), *ʔmri:t N, NK ¹shi 'to stretch or spread the thread on a loom'
- THUMB *lak-ma³ O, NK ¹la-²mä (the first syllable is 'hand'; the second is the one of interest here -- cf. 'negative' and 'female')
- TIE UP *pway³ O 'bind together, connect', NK ²p'a 'to tie up'
- TONGUE *m-lyak M 'lick', *ʔlyak M 'cause to lick', NK ³khi 'tongue'; cf. *ʔlya¹ C 'tongue'
- TOOTH *dzway¹ C, *Ndzway¹ N, NK ²ndsa 'fangs, of a predatory animal; canine teeth'
- TREE *sik - *siŋ¹ M, *Nsik or *Nsiŋ¹ N, NK ¹ndzër; cf. NK ²ss 'wood; tree' (NK ²ss might go back to the non-prenasalized variants. Perhaps we may ignore the tone problem, since it should be quite difficult to determine the tone of a syllable with no vowel and is voiceless throughout.)
- TWO *nit M, NK ¹nyi; also *ni² - *ʔnit M
- UNTIE *priy B, O, N, NK ¹p'ër; also *briy¹ - *ʔbriy¹ O
- VOMIT *C-pat M, NK ³p'ü
- VULVA *b(y)et M, NK ³ti 'vagina'
- WARM *lum¹ C, NK ¹lv
- WASH *tsiy² O 'to wash', NK ²ch'ër
- WEAVE *dak M, NK ¹ddaw; also *tak - *rak - *k-rak M
- WEEP *ŋuw¹ C, B, NK ¹nv
- WEIGH *kyin⁴ C, NK ²ch'i 'to weigh (as on a scale)'; cf. NK ¹gkyi 'a scale; a balance; to weigh' (what the relationship between the two NK words and the PLB form [or other variants] is is not clear)
- WHITE *pru¹ B, O, NK p'ër
- WIND (air) *ʔliy¹ C, NK ²här; also *liy¹ C
- WINNOW *ʔliy³ O, NK ²här-¹lër
- WRAP *lip O 'wrap, roll up', NK ³lv 'wrap; wind up like a string on a stick'

WRITE *Npuk ~ *Nbuk M, *buk N, NK ʒbbēr
 YEAR *ʒ-kok M 'return/give back; year', NK ʒk'v 'a year'
 YOU *naŋ¹ C, NK ʒnnü 'you'; cf. NK ʒnun (derogatory -- used towards low caste people)

APPENDIX B

Suggestive Sets

In the list that follows are additional Na-khi words and possible Written Burmese or Proto-Lolo-Burmese cognates or related words. These words were not included in the preceding analysis, either because of insecurity about their actually being cognates, or else due to some kind of irregularity. It was felt best to deal with as many 'regular' cases as possible (that is, cut 'irregularity' down to a minimum) before considering other evidence.

A few of the following sets are sure cognates, but are included here, rather than in Appendix A, because of some doubtfulness about the PLB form.

ACHE NK¹ngu; cf. WB kuik

AWAKE NK ʒnon 'to disturb, to annoy', PLB *nuw² C 'be awake', *ʒnuw² C 'to awaken'

BRAIN NK ʒgkv-ʒffü (ʒgkv = 'head'), PLB *nok ~ *ʒnok
 ~ *nuw² M

BUG/VERMIN NK ʒbā-¹di 'an insect; a worm (colloq.)',
 ʒbbēr-¹ddēr 'a caterpillar of the type of army worm, which appears overnight and devours crops', ʒbbū-²k'o
 'a snail', ʒmbēr-¹dzi 'mosquito', ʒmbēr-³ler 'ordinary house-fly'; PLB *buw² ~ *ʒbuw² C

BUTTERFLY NK ʒp'ä-¹lä; cf. WB lip-pya (pya 'bug')

BUY NK¹ha, PLB *way¹ B, O

CATTLE NK ʒnon 'domestic animals, cattle' LOAN < Tibetan
 nog 'cattle'; also NK ʒnnü 'domestic animals', ʒmun 'ox',
 PLB *nwa² C 'cattle'

CHAIN, KEY, LOCK NK ʒndzu-¹gkv 'key', PLB *Nts(r)ok (this is the only example of ndzu in Rock's Dictionary)

CHANGE NK ʒbbüe 'to change; transform', ʒbpiu 'to change into; to metamorphose', ʒbpa 'to change into; to produce, as by sexual intercourse', ʒbiu 'change; to change into'; Proto-Lolo *pa¹ B, WB prôn 'change; be altered; alter'

CHIP NK ʒbpa 'a chip of wood', WB pok 'to make a motion similar to that in chopping wood', WB thân-pok 'chip (noun)' (in Judson 1956, but not Judson 1921)

- CHOKER NK ²ho 'to choke', WB naŋ 'to stop in the throat;
to choke' (Could NK come from a preglottalized variant?)
- CLIMB, ASCEND NK ²ndo 'to ascend, to step up as on a ladder;
to climb, climbing', PLB *Ntak - *²tak M (Tone is the
problem: NK could come from a *² open-syllable variant,
maybe.)
- COLLAPSE NK ¹mbiu, PLB *pak - *²pak M
- COMB NK ³bbēr 'a comb', WB phrî - phî 'to comb, brush', WB
b'î 'a comb, brush', Lahu pî - pî 'to comb', Lahu pî-kâ
'a comb'
- COMPLETE, FINISH NK ²bpiu 'to complete; to perfect; to finish',
WB prañ 'to be full', WB phrañ 'fill, complete, replenish',
WB prî 'be done, completed', Lahu pā 'be finished, completed'
- CROW NK ³gkyi-²gkan 'a species of crow; the chorugh', ²lā-¹gk'a
'a crow (Corvus)', WB kyî-kân
- CUT OBLIQUELY NK ²shwua ³ds'î 'castrated goat', WB mrwân
'gash obliquely, or any way'
- DEFECATE NK ²t'khye, WB khyê
- DIE NK ²shi 'dead', ³ssu 'dead', PLB *siy¹ C, PTB *siy =
*səy (Benedict 1972)
- DISTRIBUTE NK ¹zhwua 'to deal out; to count out', WB we
'to distribute; to dispense' (Regarding the initial
zh- in NK, cf. NK ²zhwua 'superlative in Li-chiang; to
the north of Li-chiang the word ¹wuà is used'.)
- DO, PERFORM NK ²bā 'to do; perform; make', WB pru' 'do,
perform, commit'; cf. NK ¹boa 'to perform a duty or
request'
- DOVE, PIGEON NK ²gko 'the crane', ³gko 'a hawk'; PTB
*m-kruw 'dove' (Benedict 1972), WB khyûi - khrûi 'dove',
Modern Burmese džôu, Lahu gû 'dove'
- DRAW WATER NK ¹wu, PLB *k-rok - *k-wok M 'pick up'; also
NK ²gkwua 'dip out; scoop; draw (water)'
- DRINK NK ¹t'ü, PLB *Ndaŋ¹ - *²daŋ¹ M
- DROP/DRI? NK ²ndshēr 'dew; a dew drop', ²ndzhēr 'dew; a dew
drop; a drop of water', PLB *Ntsak M 'drop (n.); to drip'
- DUCK NK ³aw 'tame duck', ²mb'a 'wild duck', WB b'âi, wām-b'âi
'duck'; cf. also NK ¹ō 'goose', WB nân 'goose'
- DWELL NK ³nyi 'to lodge at; to dwell', WB ne
- EMBERS NK ³ffü 'charcoal; embers', ³ffü-¹gyi (colloquial),
WB mi-hmun 'embers' (mi = 'fire'); cf. also NK ³khü
'charcoal'
- FEATHERS OF ARROW NK ³kho 'feathers of an arrow', ²llü-²ssi
³kho 'id.'; WB hmrā-rwak 'feather of an arrow' < hmrā
'arrow' + rwak 'leaf' (perhaps NK points to PLB *²rwak)

FERN NK ¹ndi 'the bracken or eagle fern', ²ndi-³li 'bracken fern -- in connection with another syllable the word ¹ndi is read in the second tone for the sake of euphony'; Lahu dà 'bracken fern'

FIELD NK ²llü 'field; fields', WB lai 'rice fields'; cf. Kuki-Naga *low 'field' (Benedict 1972:66); cf. also NK ¹llü 'to plow'

GIRDLE NK ²bbüe-³gkü 'a girdle', ³gkü 'to wear', WB khâ-pân 'girdle' < khâ 'waist' + pân 'go round the end of a thing'

GO AROUND NK ³khü-²khü 'to circumambulate; to go around; to make a circuit; to circle around; to surround', WB hlañ 'to turn around', WB wuik 'to curve round', WB wûiq 'surround'

GOOD NK ²gkaw, ²gv, WB kôq

GRASS, WEED NK ¹zhou, PLB *mruk ~ *mrak; cf. NK ²szi 'grass'

HANG UP-1 NK ²ch'i 'to suspend', WB chwâi

HANG UP-2 NK ¹ha 'to hang up; hang on; hang over the shoulder; to carry a bag by straps hung crosswise over shoulder and chest'; cf. NK ²ha-²mâ 'suspended on', WB lwai 'hang from the shoulder', Lahu hú 'hang anything up'

HAVE NK ¹dgyü 'to have, to possess, there is', ²dgyu 'there is; has; possession'; Proto-Lolo *dzo¹ B, Lahu cò, Lisu dzô B (cf. 'boil' in Appendix A)

HOUSE NK ¹gyi, WB ?im, PTB *kim = *kyim ~ *kyum (Benedict 1972)

INTESTINE NK ²bbü, PLB *u¹ B (the tone is a problem, but cf. 'pig', 'flower', 'sole' in Appendix A)

LAYER NK ³dtü 'a story; layer; stratum', WB ?ethap 'layer' (cf. 'add' in Appendix A)

LEFT (side) NK ²wan - ²wuan, WB bai, WB lak wâi (lak 'hand'), Lahu mē, PTB *bây = *bway (Benedict 1972) (Regarding w and b and bw, cf. 'flower', 'pig', 'sole' in Appendix A, and 'intestine' in Appendix B)

LIQUOR NK ²zhi 'wine', ³dsu 'a type of liquor; distilled from three sheng of rice', PLB *Ndzil M

MIX NK ³ho 'to mix; to live together', WB hnô in: rô-hnô 'to mingle', pywâm-hnô 'mixed together' (The tone is a problem, but WB implies PLB *?naw² or the like, so perhaps NK comes from *?nak; cf. 'drive' in Appendix A.)

MONKEY NK ¹yü, ³ä-lyü (colloquial), PLB *myok M (Could the NK have dropped the *m- as if it were a prefix?)

MYSELF NK ²wu 'self; myself' (see discussion on ² above)

NEEDLE NK ¹gko, PLB *k-rap ~ *rap M (cf. 'water' below)

- NOISE NK ¹zhēr, WB mrañ 'sound; produce sound'; also WB sam, ²esam 'sound', Lisu syā (Hope's form, provided by Graham Thurgood, personal communication) 'a noise'
- NOSE NK ³nyi-¹mien, PLB *s-na¹ C; cf. NK ¹nun 'to smell' (Regarding the (y)l in NK, cf. 'snot': PLB *²nap M, Jinghpaw nep - ²enep - nyep)
- ODOR NK ²bō, WB hmwē 'smell sweet, be fragrant' (This form and 'wrong' below perhaps suggest that NK ¹b comes from a prefixed m or *²m, or else, maybe, a *¹b - *²m or *²m in PLB. On the other hand, this may just be coincidence.)
- OPEN-2 NK ³haw 'to open the mouth', WB hlac 'to open'
- PHEASANT NK ²hoa 'Tibetan eared-pheasant', WB rac 'pheasant'; cf. NK ²ffū 'the stone pheasant' (NK may point to *²rw- or the like)
- POLITE NK ³dgyū-²dgyu 'formality; politeness', WB kyo' sō 'polite', kyo' 'fine, executed with taste; genteel, polished' (cf. 'boil' in Appendix A; 'have' in Appendix B)
- POWER NK ¹tu 'power; to give a person power; to invest one with power', Lisu vā (Hope form, from Thurgood) 'manpower', Lisu wā (ibid.) 'manpower, laborer', Lahu vā 'to work' (Regarding NK b, general Lolo-Burmese w, cf. 'flower', 'pig', 'sole' in Appendix A.)
- RAKE, SWEEP NK ¹b'a 'to sweep or rake in; a piece of board with a handle with which grain is raked in', PTB *pyak = *pywak 'sweep' (Benedict 1972) (cf. 'comb' above)
- SAME NK ³ddv-¹ddv 'the same; alike', WB tu 'to be like' (The NK syllable ddu occurs in names only.)
- SAND NK ¹shou, WB mru 'minute particle of floating dust'; also WB sâi 'sand', PLB *say² B 'sand'
- SAW (tool) NK ²ffū, WB hlwa'
- SEARCH NK ¹shu 'search; look for', PLB *mraq B, O 'see'; cf. WB hra 'to search for'
- SISTER-IN-LAW NK ³hoa-²mā 'sister-in-law. This term is used by the wife of a man when calling her husband's sister. A sister-in-law will call her brother's wife ²mā-²t'khi', WB yok-ma' (Perhaps NK suggests *²yok.)
- SLAVE NK ¹wu, PLE *kywan¹ C (Perhaps NK dropped the initial *²ky-)
- SNAKE NK ¹zhi, WB mrwe < *mrui (Benedict 1972)
- SNOW NK ²mbe, PLB *wa² C 'hail' (If related, maybe NK < *Nbwa²; cf. 'flower', 'pig', 'sole' in Appendix A.)
- SOUR NK ²gkyi, WB khyāñ
- SPIT, SALIVA NK ³gki-³p'i - ³gkyi-³p'i 'to spit', ³gkyi 'saliva', ³gyi-¹ddēr 'saliva', Lahu cī 'spit, saliva' (cf. 'water' below)

- STAR NK ¹gkü, ²ghüh in: ³k'v-²ghüh 'evening star', WB
krai, PTB *s-kar = *s-kər (Benedict 1972)
- TEA NK ³lä, WB lak-phak-khrok 'dried tea leaf' (phak 'leaf',
khrok 'dry') (cf. 'hand' *lak > NK ¹la; perhaps the NK
word for 'tea' is a loan)
- TESTICLE NK ²lan, PLB *(r-)lek M (This is the only syllable
lan in Rock's Dictionary.)
- THIGH NK ¹p'i 'thigh', ¹p'i-²gko 'the crotch, the groin',
WB poŋ 'thigh', poŋ-chyan 'groin'
- THIN NK ²ndsaw, WB sê 'slim' (NK suggests *Ns-; cf. 'tree'
in Appendix A)
- TIME NK ¹ddü ¹dgyu 'once', ¹ddü 'one', WB ʔəkrim 'a time,
turn', hnac-krim 'twice' (cf. 'boil' in Appendix A, and
'have' and 'polite' in Appendix B)
- WATER NK ¹gyi, PLB *riy¹ B,O; cf. NK ²ds'i 'wet, drenched'
(cf. 'needle' above)
- WINTER NK ²ts'u, WB chôn 'cold season'
- WRONG NK ²bpä, WB hmâ (see 'odor' above)

NOTES

¹ This look at Na-khi's place in Lolo-Burmese is intended to be only a preliminary one. The goal, in pulling words out of Rock's Na-khi dictionary, was not to be complete -- not to find all the cognates -- but rather to find examples of the various Proto-Lolo-Burmese initials, rhymes and tones so as to get a general idea of how Na-khi fits in. Given limitations of time (mainly) and resources, even this goal was only partially attained.

Furthermore, since this survey was undertaken before certain changes in Proto-Lolo-Burmese reconstructions were suggested (cf. Graham Thurgood's contribution to the present volume, for example), some of the comparisons are 'out of date' if not simply wrong.

Nevertheless, it is clear that Na-khi is loaded with information about Proto-Lolo-Burmese. If nothing else, by hinting at what Na-khi offers towards an understanding of the history of its linguistic family, this paper encourages further research, involving going back to Rock's dictionary with a magnifying glass as well as reassessing our picture of the proto-language. Such further examination would hopefully solve some of the problems mentioned in the present work, as well as weed out what are no doubt all too numerous errors.

² Paul K. Benedict says the following about Rock's Na-khi material:

Rock, though by nature a good linguist, has had no linguistic training and has been unable to cope with the formidable phonology of Moso [Na-khi]. His record is not wholly consistent, especially as regards tone marks, and his description of Moso speech sounds ... leaves many points in doubt. The writer [i.e., Benedict] ... has had the advantage of discussions with Rock on some of these points. [Shafer and Benedict 1939:364]

Benedict's interpretations of Rock's transcriptions will be noted where appropriate. As regards inconsistencies in tone, however, there appears to be some kind of tone sandhi going on in Na-khi compounds involving one of the three main tones shifting to another. Whether this apparent sandhi phenomenon is real, or, as Benedict suggests, a result of inconsistency remains to be analyzed. Benedict, incidentally, made his remarks about 20 years before the appearance of Rock's dictionary; even so, they remain quite useful.

³ Benedict agrees: 'Rock's dt, bp, and gk are simply unaspirated surd stops' (Shafer and Benedict 1939:364).

⁴ Benedict says: 'Rock's bb, dd, and gg are perhaps aspirated sonants, though one hesitates to postulate phonemes so foreign to Burmish-Loloish phonology in general' (Shafer and Benedict 1939:364).

⁵ Benedict comments, 'Rock's nn and ll are best interpreted as surd n and l (n̥ and l̥)' (Shafer and Benedict 1939:364). Benedict may well be correct here (though a lack of a corresponding mm and ngng becomes all the more striking), but nn was considered identical to n (and ll to l) for purposes of this present comparison. If Benedict is correct, perhaps Na-khi contains evidence for *n (> Na-khi n) vs. *s-n (> Na-khi nn). See the list of correspondences to follow.

The question of l vs. ll is different. ll occurs only before the vowel ü, whereas l occurs before numerous vowels (including ü). However, ü stands for front rounded [ü] (IPA [y]) following l, but for back unrounded [u] following ll (see description of vowels). On the other hand, l occurs before v, which Benedict (see footnote 8) considers an alternate symbol for [w].

⁶ According to Benedict, 'Rock described to the writer [Benedict] a Moso element that is unmistakably a labial trill (r̥),... but this sound cannot be traced in his recording' (Shafer and Benedict 1939:364-5).

⁷ Rock transcribes a breve for what is here rendered (for typographical convenience) with a hacek (e.g. \ddot{u} for Rock's $\underset{\cdot}{u}$).

⁸ Benedict suggests interpreting Rock's 'vocalic v as a back unrounded high vowel (ʋ) [that is, [w]]' (Shafer and Benedict 1939:364).

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