

Notes on the Kiranti Verb (East Nepal)

Boyd Michailovsky

Introduction:

The languages of the Kiranti group in East Nepal (see map), which I take to include Hayu, Sunwar, the languages called 'Rai', and Limbu, are noted for their complex verbal morphology, which was first described by the great pioneer of all Himalayan studies, B. H. Hodgson, in the last century. The present article includes two papers in which the method of internal reconstruction is used to study the structure of verbal roots in two of the Rai languages. A similar study of Limbu verbal roots has been made by R. K. Sprigg (1966).

A Tibeto-Burmanist instinctively recoils from verbs in historical studies, especially of the Tibetan side of the family, because of the many ancient and poorly understood morphological processes that have played havoc with initials, vowels, and finals. However, the Kiranti group, where much of the verbal morphology is more transparent and perhaps more recent, illustrates the value of the verb in historical studies. The abundance of verbal forms in the paradigm gives an opportunity for the internal reconstruction of phonological processes which in fact have probably affected both verbs and nouns alike.

Part I of the present article is a fairly complete treatment of the Bahing verb. The emphasis is on the vocalism of the verbal root, which presents some interesting complexities due both to harmonic effects and to the influence of following consonants. The system of morphological suffixes, which has been well known since the work of Hodgson (1858), is not commented upon here, although a few rather complete paradigms are given.¹

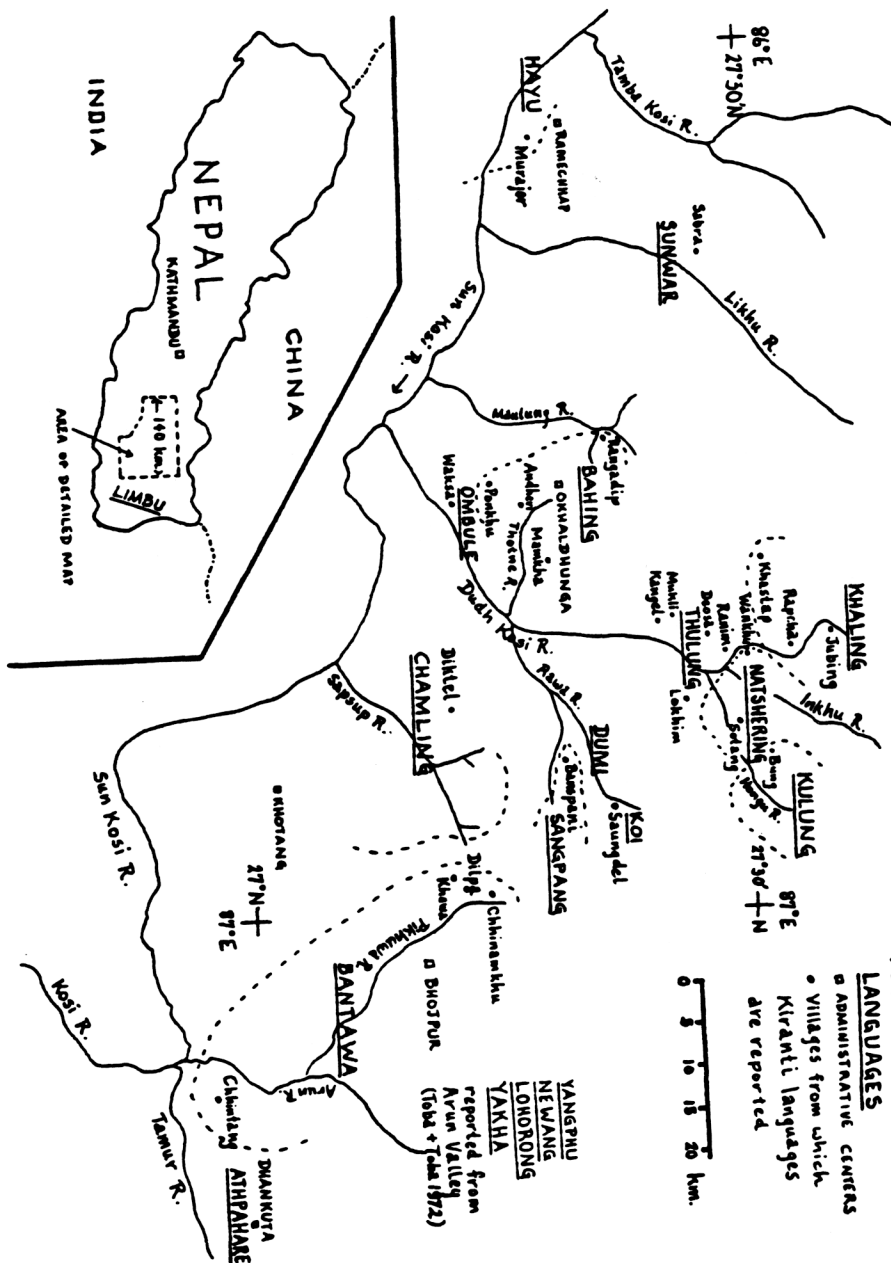
In Part II, some recently published data on Khaling is analysed briefly. The main result here is that the two-tone system of Khaling, at least on verbal roots, is shown to be a secondary development from the root finals. Stop-finals have given rise to high tone and other finals to low tone. The phonetic motivation for such a split is discussed (§3).

MAP: SOME KIRANTI LANGUAGES OF EAST NEPAL

KEY:

LANGUAGES

- Villages from which Kiranti languages are reported



I. The Bahing Verb

Introduction:

Bahing or Rumdali Rai is spoken in villages around Okhaldhunga Bazaar in Okhaldhunga District of Nepal. The present study is based on field work carried out by Martine Mazaudon and myself in Rangadip, Bigutar Village Panchayat, Okhaldhunga District, during the months of January and February 1973, under the auspices of the Institute for Nepal and Asian Studies of Tribhuvan University, Kirtipur, Nepal. Rangadip, about 8 miles NW of Okhaldhunga Bazaar, is the westernmost Rumdali village. The same dialect appears to be spoken in Andheri, a few miles SE of Okhaldhunga Bazaar, and in villages in between. In Ponkhu, to the south, a slightly different dialect, lacking the central series of vowels, is found.

1. Outline of Bahing Phonology

Bahing forms in the text will be given in phonemic transcription, set off between slashes. The reconstructed form of verb roots is a hypothetical construct, to be justified throughout this paper, with a reduced set of vowels. These reconstructed roots are transcribed in capital letters to obviate confusion with the phonological transcription introduced in this section.

1.1 Initial Consonants <C_i>

The initial consonants of Bahing are given in Table 1.

1.2 Initial Consonant Clusters <C_iC>

The initial stops of the velar and bilabial series <Table 1> may be followed by /r/ or /l/ to form initial consonant clusters.

1.3 Final Consonants <C_f>

The system of syllable-final consonants in Bahing will be familiar to students of Tibeto-Burman:

/p/, /t/, /k/, /m/, /n/, /ŋ/, /r/, /l/, /s/, zero.

1.4 Vowels <V>

There are ten vowels, as shown in Table 2. In addition, length and nasality are distinctive, but in verbal forms both can be shown to be of secondary origin.

1.5 Syllable and Word Structure

Each syllable contains one vowel. The diphthongs /Vi/ transcribed in reflexive forms of some verbs are clearly secondary in origin. Thus the canonical syllable is <C_i<C>>V<C_f>. The word is made up of one or more syllables. Final stops do not occur before nasal initials within the word, or in word-final position. Tri-consonantal clusters of the form C_fsC_i arise in some reflexive verb forms, where the reflexive marker /s/ is found between root-final and suffix-initial consonants.

2. The Finals of Bahing Verb Roots

Since Bahing verb roots are monosyllabic, it is reasonable to expect to find roots with all of the finals generally observed in the language. This is the working hypothesis of the present study.

Table 1: Bahing Initial Consonants

Stops and Nasals:

Velar	k	kh	g	gh	ŋ
Alveolar affricated	ts	tsh	dz	dzh	
Dental	t	th	d	dh	n
Bilabial	p	ph	b	bh	m
Imploded ¹	ɓ				

Continuants and Fricatives

Palatal approximant	j
Alveolar tap	r
Lateral	l
Labiovelar approximant	w
Alveolar fricative	s
Glottal	h

Notes:

Syllables may also begin with a vowel ⟨zero consonant initial⟩.

In word-initial position, /j/- occurs only before non-front vowels, and /w/- only before /a/.

Some speakers are inconsistent in distinguishing the plain voiced and breathy-voiced series of initial stops.

Table 2: Bahing Vowels

	front	central/rounded ¹	back
high	i	y	u
high mid	e	ø	o
low mid	ɛ	œ	ɔ
low	a		

It is borne out, except that no roots are identified with final /s/; all cases of /s/ preceding a verbal suffix are interpreted as the /s/ augment of the reflexive stem rather than as the inherent final of the root. The different conjugational patterns of verbs (Hodgson's 'conjugations') are shown to derive from the root finals and stem augments. In this section (§2), the conjugation of verbs in which the aspect and agreement suffixes are added directly to the verb root is described. A second class of verbs, differing from the first not in the structure of the root, but in the fact that the aspect and agreement suffixes are added to a stem, which consists of the root augmented by a consonant, is treated in §4.

2.1 Preliminary Classification of Verbs by Root Final

In Table 3, two examples, one transitive and one intransitive, are given of verbs with each of the root finals. The root final is listed in the first column, with Hodgson's roman-numeral categorization of the corresponding 'conjugation' in the second. The hypothetical reconstructed root is given in column 3, and the imperative, elicited in the field, in column 4. (The imperative is singular in number, with 3d person singular object in the case of transitive verbs.) The imperative clearly shows the root final.

2.2 Root-Final Alternations

The morphophonological processes that give rise to alternations in the root-final consonants of verbs are lenition, nasal assimilation, and deletion with compensatory lengthening. The last two processes in particular may make it impossible to identify the root with certainty from a particular verbal form and thus to predict the rest of the paradigm. Some recent word-lists of languages related to Baking have suffered from the defect that the verb form chosen for quotation has been one from which the root could not be recovered.

To illustrate the root-final alternations, Table 4 gives the singular imperative and a complete indicative paradigm of five intransitive verbs, with roots ending in zero, /t/, /k/, /n/, and /ŋ/. Verbs in -/p/ conjugate entirely as those in -/k/ (with /p/ → /m/ where /k/ → /ŋ/), and verbs in -/m/, -/r/, and -/l/ conjugate as verbs in -/n/ (i.e. with the root final remaining invariable). In the paradigms, the suffix is separated from the root by a hyphen. In the paradigm of the open root LA 'go', 'epenthetic' consonants occur between the root and the suffix; they are also marked off by hyphens (see 2.3 below).

Table 5 gives selected forms of transitive verbs in zero, -/p/, -/t/, -/k/, -/n/, and -/ŋ/. Again, verbs in -/m/, -/r/, and -/l/ conjugate as those in -/n/, and epenthetic consonants are found in the conjugation of the open root GI 'give'.

Three morphophonemic processes can be identified that will account for the observed alternations in the finals of the root-syllables of the verbal forms:

2.2.1 Deletion with Compensatory Lengthening

Root-final /t/ and /ŋ/ are deleted before suffix-initial consonants or word-boundary. In compensation, the vowel of the root syllable is lengthened. (The open-syllable opposition of long vs. short vowel is neutralized in word-final position, however.) Unexpectedly, length was not observed in

1. The first part of the document discusses the importance of maintaining accurate records of all transactions and activities. It emphasizes that this is essential for ensuring transparency and accountability in the organization's operations.

2. The second part outlines the various methods and tools used to collect and analyze data. It mentions the use of surveys, interviews, and focus groups to gather information from stakeholders. Additionally, it discusses the application of statistical analysis to interpret the collected data.

3. The third part describes the process of identifying key performance indicators (KPIs) and how they are used to measure the organization's progress towards its goals. It highlights the need for regular monitoring and reporting on these indicators to facilitate timely decision-making.

4. The fourth part addresses the challenges faced in implementing data-driven strategies. It notes that a significant barrier is the lack of sufficient data, which can lead to incomplete or biased conclusions. It also mentions the importance of ensuring the quality and reliability of the data sources.

5. The fifth part discusses the role of technology in enhancing data management and analysis. It mentions the use of data management systems, analytics software, and visualization tools to streamline the process and make it more efficient.

6. The sixth part focuses on the importance of communication and collaboration in the data-driven process. It emphasizes that all stakeholders must be involved and informed to ensure that the data is used effectively to drive organizational change.

7. The seventh part discusses the ethical considerations surrounding data collection and analysis. It mentions the need to protect personal information and ensure that data is used only for the intended purposes, in compliance with relevant regulations.

8. The eighth part provides a summary of the key findings and recommendations. It reiterates the importance of a data-driven approach and provides specific suggestions for how the organization can improve its data management practices.

9. The final part of the document is a conclusion that summarizes the overall message. It states that while there are challenges, the benefits of a data-driven approach are significant, and it is essential for the organization's long-term success.

Table 4. Intransitive Verbal Paradigm.

	ROOT:	LA	BRET	BOK	ON	GLUŋ
	gloss:	go	cry out	rise	run	exit
	imper:	la-w- \emptyset	bret- \emptyset	b \emptyset k- \emptyset	oen- \emptyset	glyŋ- \emptyset
<u>Non-past</u>						
1st ps. sg.		la-ŋa	bre:-ŋa	boŋ-ŋa	oen-ŋa	glu:-ŋa
du. in.		la-sa	bre:-sa	bok-sa	oen-sa	glu:-sa
du. ex.		la-su	bre:-su	bok-su	on-su	glu:-su
pl. in.		la-ja	bre:-ja	boŋ-ja	oen-ja	glu:-ja
pl. ex.		la-ka	bre:-ka	bok-ka	oen-ka	glu:-ka
2d sg.		la-j-e	bren-e	boŋ-e	oen-e	gluŋ-e
du.		la-si	bre:-si	bok-si	oen-si	
pl.		la-ni	bre:-ni	boŋ-ni	oen-ni	
3d sg.		la	bre	boŋ	oen	glu
du.		la-se	bre:-se	bok-se	oen-se	
pl.		la-me	bre:-me	boŋ-me	oen-me	
<u>Past</u>						
1st ps. sg.		la-ti	bre:-ti	bok-ti	oen-ti	glu:-ti
du. in.		la-tasa	bre:-tasa	bok-tasa	oen-tasa	
du. ex.		la-tasu	bre:-tasu	bok-tasu	oen-tasu	
pl. in.		la-n-taja	bre:-taja	bok-taja	oen-taja	
pl. ex.		la-k-tak \emptyset	bre:-tak \emptyset	bok-tak \emptyset	oen-tak \emptyset	
2d sg.		la-te	bre:-te	bok-te	oen-te	glu:-te
du.		la-tasi	bre:-tasi	bok-tasi	oen-tasi	
pl.		la-n-tani	bre:-tani	bok-tani	oen-tani	
3d sg.		la-ta	bre:-ta	bok-ta	oen-ta	glu:-ta
du.		la-tase	bre:-tase	bok-tase	oen-tase	
pl.		la-m-tame	bre:-tame	bok-tame	oen-tame	

Omitted forms of GLUŋ were not elicited in the field.

Table 5. Selected Transitive Verb Forms

	ROOT:	GI	TUP	IAT	POK	PLOH	KOH
	gloss:	give	beat	take	rouse	abandon	see
Subject:	Object:						
<u>Imperative</u>							
2 sg.	3 sg.	gi-w- ϕ	typ- ϕ	lat- ϕ	p ϕ k- ϕ	ploen- ϕ	k ϕ u- ϕ
<u>Non-Past</u>							
1 sg.	3 sg.	gi-na*	tub-u	lad-u	pog-u	plon-u	kon-u
1 du. 1n.	3 sg.	gi-sa	typ-sa	la:-sa	pok-sa	ploen-sa	ko:-sa
1 du. ex.	3 sg.	gi-su	tup-su	la:-su	pok-su	plon-su	ko:-su
1 pl. 1n.	3 sg.	gi-ja	tym-ja	la:-ja	pon-ja	ploen-ja	ko:-ja
1 pl. ex.	3 sg.	gi-ka	typ-ka	la:-ka	pok-ka	ploen-ka	ko:-ka
2 sg.	3 sg.	gi-i	tyb-i	lad-i	pog-i	ploen-i	kon-i
3 sg.	3 sg.	gi-w-a	tyb-a	lad-a	pog-a	ploen	ko
2/3 sg.	1 sg.	gi-ji	tym-ji	la:-ji	pon-ji	ploen-ji	ko-ji
3 sg.	2 sg.	gi-j-e	tym-e	lan-e	pon-e	ploen-e	kon-e
1 sg.	2 sg.	gi-na	tym-na	la:-na	pon-na	ploen-na	ko-na
<u>Past</u>							
3 sg.	3 sg.	gi-p-ta	typ-ta	la:-ta	pok-ta	ploen-ta	ko:-ta

* Note that transitive open roots have -/na/ where roots with non-zero final take -/u/.

the forms /ko-ji/ and /ko-na/ of the verb KOn in Table 5.

2.22 Lenition

Root-final stops are voiced before suffixes beginning with a vowel (except the $-\text{/}\phi\text{/}$ of the imperative -- an exception that seems to have no ready explanation.) Note that phonologically, the voiced root-final would be interpreted as the initial of the following syllable.

2.23 Nasality Assimilation

Root-final stops are changed to the corresponding nasals before suffix-initial nasals, and before $-\text{/}\text{j/}$, $-\text{/}\text{e/}$, and word-boundary. This process probably occurred generally in the language, accounting for the restricted distribution of syllable-final stops noted in §1.5 above. Root-syllable final $-\text{/}\eta\text{/}$ derived from $-\text{/}\text{k/}$ by this process is not subject to deletion by §2.21.*

2.3 Epenthetic Consonants

In discussing the paradigms of verbs with zero root-final above, reference has been made to epenthetic consonants. These consonants, which Hodgson styled 'devious', probably were originally inserted mainly for phonetic, rather than for morphological reasons, but it is not possible to make a conclusive argument for this view. The epenthetic consonants are of three types:

2.31 Epenthetic glides

*{1858:367}

Epenthetic $-\text{/}\text{w/}$ is inserted between the root in zero-final and the endings $-\text{/}\phi\text{/}$ '[imperative]' and $-\text{/}\text{a/}$ '[transitive with 3d sg. subject]'. In addition, $-\text{/}\text{j/}$ is inserted before the suffix $-\text{/}\text{e/}$. There is no evidence for a phonological opposition between zero and $-\text{/}\text{j/}$ before $-\text{/}\text{e/}$, however.

2.32 Epenthetic $-\text{/}\text{p/}$

This is the only one of the epenthetic consonants to carry non-redundant morphological information. Although it is treated here together with elements that appear to be epenthetic consonants inserted for phonetic reasons, the possibility that it is an independent morpheme cannot be ruled out. $-\text{/}\text{p/}$ is inserted between open roots and the endings $-\text{/}\text{ta/}$ '[past; 3d sg. subject; 3d ps. object]' and $-\text{/}\text{ti/}$ '[past; 2d sg. subject; 3d ps. object]' of transitive verbs only. It is not found with the homonymous endings of intransitive verbs, nor with the ending $-\text{/}\text{ti/}$ '[past; 2d or 3d ps. subject; 1st sg. object]' of transitives. Thus, if $-\text{/}\text{p/}$ were to be interpreted as an independent morpheme, its gloss would be '[transitive; 2d or 3d sg. subject; 3d ps. object]', and it would be limited to roots with zero final.

2.33 Reduplicative Epenthesis

This process is illustrated in the past tense of the verb LA 'go' (Table 4). Between the open root CV- and a suffix $-\text{taC}_i\text{V}$, an epenthetic reduplicated C_i is inserted, except that $-\text{/}\text{n/}$ is inserted where $\text{C}_i = \text{/}\text{j/}$ and no reduplication occurs where $\text{C}_i = \text{/}\text{s/}$ (in duals). Thus when the suffix $-\text{/}\text{tak}\phi\text{/}$ is added to the root LA 'go', the result is $-\text{/}\text{la-k-tak}\phi\text{/}$, with epenthetic reduplication of $-\text{/}\text{k/}$. But when the suffix $-\text{/}\text{tasa/}$ is added, there is no reduplication of the $-\text{/}\text{s/}$; the form is $-\text{/}\text{la-tasa/}$.

2.4 Discussion of Reduplicative Epenthesis

In order to discuss the process of reduplicative epenthesis fully, it is necessary to refer to the full paradigm of transitive verbs with open roots, e.g. the verb GI 'give' presented in Table 6. The picture here is rather more complicated than for intransitives, in that many disyllabic suffixes do not induce epenthesis, e.g. /gi-temi/ 'they gave you <sg.>'. The conditions under which epenthesis does occur may appear rather arbitrary for a phonetically motivated process: (§2.41-3 are equivalent to the conditions stated in §2.33 above, but more explicitly stated.)

2.41 The suffix must be disyllabic

2.42 If the second syllable of the suffix begins with /s/, no reduplication occurs.

2.43 The suffix must be past, with first syllable /ta/.

Condition §2.41 suggests the motivation behind the whole process of reduplicative epenthesis, which may be to give the root syllable of the verb rhythmic weight to balance the weight of the disyllabic suffix. In Hayu, a related language, a similar effect is achieved by the automatic lengthening of any open initial syllable of a polysyllabic word.

Condition §2.42, the failure to reduplicate /s/, serves to avoid homonymy with reflexive forms (see §4).

Condition §2.43 raises the difficult question of why we find, for example, /gi-temi/ 'they gave you <sg.>', not */gi-m-temi/, but /gi-m-tame/ 'they gave him', not */gi-tame/. This question arises only in the transitive paradigm, since all disyllabic suffixes in the intransitive paradigm (except duals ruled out by §2.42) meet condition §2.43 and have epenthetic consonants. In the transitive paradigm, in all of the disyllabic suffixes that do not induce reduplicative epenthesis, the second syllable of the suffix (which is evidently the most important for the reduplication) is what I would define as a 'secondary number marker'. For example, in /gi-temi/ 'they gave you <sg.>', the /te/ of the suffix signals the past tense and the fact that the object is 2d person and singular in number, and that the subject is third person. The /mi/ is secondary in that it marks the number of a second verbal argument (here the subject) when the number of one argument has already been indicated. Another example would be the present /gi-kami/ 'we <excl.> give them'. Here /mi/ marks the number of the object when the number and person of the subject has already been marked as 1st ps. plural exclusive by /ka/. Such secondary number markers are frequently omitted in speech. Perhaps this fact is related to the fact that they do not give rise to reduplicative epenthesis.

3. Verb Root Vocalism

Although 10 distinctive vowel qualities are recognized in the phonology of Bahing, it appears likely that this system derives historically from a five-vowel system which might be noted as A, E, I, O, U. In fact, it can be shown that such a system is adequate

Non-Past Aspect:

Subject:	Object:		
	3d ps. sg.	3d ps. du.	3d ps. pl.
1st ps. sg.	gi-ŋa	gi-ŋasi	gi-ŋami
1st ps. du. ex.	gi-su	gi-susi	gi-sumi
1st ps. du. in.	gi-sa	gi-sasi	gi-sami
1st ps. pl. ex.	gi-ka	gi-kasi	gi-ka(mi)
1st ps. pl. in.	gi-ja	gi-jasi	gi-ja(mi)
Subject:			
2d ps. sg.	gi-i	gi-isi	gi-imi
2d ps. du.	gi-si	gi-si(si)	gi-simi
2d ps. pl.	gi-ni	gi-ni(si)	gi-ni(mi)
Subject:			
3d ps. sg.	gi-w-a	gi-w-asi	gi-w-ami
3d ps. du.	gi-se	gi-se	gi-se
3d ps. pl.	gi-me	gi-me	gi-me

Subject:	Object:		
	2d ps. sg.	2d ps. du.	2d ps. pl.
1st ps. sg.	gi-na	gi-nasi	gi-nani
1st ps. du.	gi-su (?? responses very varied)		
1st ps. pl.	gi-ka (")		

Object:	Subject:		
	3d ps. sg.	3d ps. du.	3d ps. pl.
1st ps. sg.	gi-ji	gi-jisi	gi-jimi
1st ps. du. ex.	gi-si	gi-si	gi-si
1st ps. du. in.	gi-so	gi-so	gi-so
1st ps. pl. ex.	gi-ki	gi-ki	gi-ki
1st ps. pl. in.	gi-so	gi-so	gi-so
Object:			
2d ps. sg.	gi-j-e	gi-j-esi	gi-j-emi
2d ps. du.	gi-si	gi-si	gi-si(mi)
2d ps. pl.	gi-ni	gi-ni	gi-ni(mi)
Object:			
2d ps. sg.			
1st ps. sg.	gi-ji	gi-jisi	gi-jini
1st ps. du.	gi-si	gi-si	gi-sikini
1st ps. pl.	gi-ki	gi-ki	gi-ki

Table 6 (cont.)

Past Aspect

	Object: 3d ps. sg.	3d ps. du.	3d ps. pl.
Subject:			
1st ps. sg.	gi-ton	gi-tonsi	gi-tonmi
1st ps. du. ex.	gi-tasu	gi-tasu	gi-tasu
1st ps. du. in.	gi-tasa	gi-tasa	gi-tasa
1st ps. pl. ex.	gi-k-takø	gi-k-takø	gi-k-takø
1st ps. pl. in.	gi-n-taja	gi-n-taja	gi-n-taja
Subject:			
2d ps. sg.	gi-p-ti	gi-p-tisi	gi-p-timi
2d ps. du.	gi-tasi	gi-tasi	gi-tasimi
2d ps. pl.	gi-n-tani	gi-n-tani	gi-n-tani
Subject:			
3d ps. sg.	gi-p-ta	gi-p-tasi	gi-p-tami
3d ps. du.	gi-tase	gi-tase	gi-tase
3d ps. pl.	gi-m-tame	gi-m-tame	gi-m-tame
Object:			
2d ps. sg.		2d ps. du.	2d ps. pl.
Subject:			
1st ps. sg.	gi-n-tana	gi-n-tanasi	gi-n-tanani
1st ps. du.	?gi-tasu	(responses very variable)	
1st ps. pl.	?gi-k-takø	(")	
<hr/>			
	Subject: 3d ps. sg.	3d ps. du.	3d ps. pl.
Object:			
1st ps. sg.	gi-ti	gi-tisi	gi-timi
1st ps. du. ex.	gi-tasi	gi-tasi	gi-tasi
1st ps. du. in.	gi-taso	gi-taso	gi-taso
1st ps. pl. ex.	gi-k-taki	gi-k-taki	gi-k-taki
1st ps. pl. in.	gi-taso	gi-taso	gi-taso
Object:			
2d ps. sg.	gi-te	gi-tesi	gi-temi
2d ps. du.	gi-tasi	gi-tasi	gi-tasi
2d ps. pl.	gi-n-tani	gi-n-tani<si>	gi-n-tani<mi>
Subject:			
2d ps. sg.		2d ps. du.	2d ps. pl.
Object:			
1st ps. sg.	gi-ti	gi-tisi	gi-tini
1st ps. du.	gi-tasi	gi-tasi	gi-tasi<kini>
1st ps. pl.	gi-k-taki	gi-k-taki	gi-k-takini

Table 6. (cont.)

Imperatives

With 3d person object:

	Object: 3d ps. sg.	3d ps. du.	3d ps. pl.
Subject:			
2d ps. sg.	gi-w- ϕ	gi-w- ϕ si	gi-w- ϕ mi
2d ps. du.	gi-se	gi-se<si>	gi-semi
2d ps. pl.	gi-ne	gi-nesi	gi-nemi

With 1st person object:

	Subject: 2d ps. sg.	2d. ps. du.	2d ps. pl.
Object:			
1st ps. sg.	gi-ji	gi-jisi	gi-jini
1st ps. du.	gi-si/-siki	gi-si/-siki	gi-si/-sikini
1st ps. pl.	gi-ki	gi-ki	gi-ki<ni>

for the notation of verbal roots in the lexicon, and such a system has been used in the transcription of verbal roots (in capital letters) in this paper. The expansion of this five-vowel system into the ten vowels actually observed in the root syllables of recorded verbal forms can be predicted as the result of two processes: vowel harmony and the influence of the root-final consonant on the vowel.

To illustrate the principles of vowel harmony, three types of suffix are needed, one containing each of the three series of vowels, front, central, and back. The suffixes chosen are:

1. Back: la. -/u/. With transitive verbs except those whose roots have zero final. '[Non-past; 1st sg. subject; 3d singular object]'.
 1b. -/su/. '[Non-past; 1st ps. dual exclusive subject]'. <This ending is a better choice than -/u/ because it occurs with all verbs, but relatively few dual forms were recorded in the field.>
2. Central: -/ ϕ /. '[Singular imperative (with 3d singular object if transitive)]'.
3. Front: -/ta/. '[Past; 3d singular subject (with 3d singular object if transitive)]'. Note that /a/ behaves as a front vowel in vowel-harmony.

3.1 Vowel Height

In table 7, verb roots with every observed open or stop-final rhyme are given with the above suffixes attached. Note that the

Table 7. Vocalism of the Bahing Verb.

		suffix vowel:		back	central	front
		suffix:	-u	-su	-ɔ	-ta
Rhyme:	Root:	Gloss:				
<u>ZERO-FINAL:</u>						
-i	gi	'give'		gisu	giwɔ	gipta
-e	se	'harvest heads of grain'		sesu	sewɔ	septa
-ɛ						
-a	pa	'do'		pasu	pawɔ	papta
-o/-oe						
-o/-ɔ	dhɔ/o	'dig up'		dhosu	dhɔwɔ	dhɔpta
-u/-y	ky/u	'steal'		kusu	kywɔ	kypta
<u>-P-FINAL</u>						
-ip	nip	'squeeze'	nibu		nipɔ	nipta
-ep						
-ɛp	sɛp	'sharpen'	sɛbu		sɛpɔ	sɛpta
-ap	tap	'play music'	tabu		tapɔ	tapta
-ɔp/-oep	oep/ɔp	'scoop up'	ɔbu		oepɔ	oeppta
-op/-ɔp						
-up/-yp	typ/up	'strike'	tubu	tupsu	typɔ	typta
<u>-T-FINAL</u>						
-it	pit	'bring'	pidu		pitɔ	pi:ta
-et	bret	'shout'		bre:su	bretɔ	bre:ta
-ɛt						
-at	tat	'touch w/ foot'	tadu		tatɔ	ta:ta
-ɔt/-oet						
-ot/-ɔt	hɔt/ot	'pierce'	hodu	hosu	hɔtɔ	hɔ:ta
-ut/-yt	phyt/ut	'sow'	phudu		phytɔ	phy:ta
<u>-K-FINAL</u>						
-ik	dzik	'break (stick)'	dzigu		dzikɔ	dzikta
-ek						
-ɛk	sɛk	'break (string)'	sɛgu		sɛkɔ	sɛkta
-ak						
-ɔk/-oek	phɔk/ɔk	'separate'	phɔgu		phoekɔ	phɔkta
-oX/-ɔk	pok/ɔk	'rouse'	pogu		pɔkɔ	pokta
-uk/-yk	kuk/yk	'bend (tr)'	kugu		kykɔ	gukta (itr)

two members of each of the pairs /ɔ/~oe/, /o~/ø/, and /u~/y/ are in complementary distribution in the table; no two roots are systematically differentiated by the sole fact that one has a back and the other a central vowel. This fact will be discussed below, together with the conditions under which the opposition /back~/central/ may become phonologized in the root-syllable.

The non-occurrence of certain rhymes, marked by dotted lines across table 7, is also noteworthy. In each set of rhymes with a given final, there are two such gaps. Thus, before any given final at most five distinct vowels (treating the alternating /back~/central/ pairs as single vowels for the moment) or three distinct vowel heights are observed. This generalization holds equally well for the remaining finals </m/, /n/, /ŋ/, /r/, /l/ >, yielding the distribution of table 8.

Table 8. Rhymes Occurring in Verb Roots.

Final:	zero	-p	-m	-t	-n	-k	-ŋ	-r	-l
Vowel:									
i	x	x	x	x	x	x	x	x	x
e	x			x			x		
ɛ		x	x		x	x		x	x
a	x	x	x	x	x			x	x
ɔ/oe		x	x		x	x	x	x	x
o/ø	x			x		x	x		
u/y	x	x	x	x	x	x	x	x	x

It should be noted, however, that the system of table 8 applies only to the underlying or morphophonemic verb roots, not in all cases to the first syllable of all verbal forms. For example, in table 8 it is asserted that no root in -/ep/ can occur, and indeed none is found. But note the form /septa/ 'he harvested it' in table 7. Here the /p/ is 'epenthetic' (§2.32) -- or at least it is evidently not part of the root, which is /se/. Throughout the conjugation of /se/, the vocalism remains that appropriate to an open root, regardless of any epenthetic finals added to the root syllable in the paradigm. Thus the form /septa/ forms a minimal pair with /septa/ 'he sharpened it' (table 7) from the root /sep/. As a general rule, none of the epenthetic consonants and none of the morphophonemic changes that affect the root final consonant of the verb has any effect on the vocalism of the root syllable of a verbal form. Further examples are given in §3.3 below.

3.2 Vowel Harmony

Now we may take up the question of vowel harmony. In table 7 it has been noted that back and central vowels are always found in alternation. No root has an invariable, non-alternating back vowel or non-alternating central vowel. In fact, the back alternant always appears before a suffix with a back vowel, and the central alternant always appears before a suffix with a central vowel. Thus for the root TUP 'strike' we have /tubu/ and /tupsu/ with the back vowel /u/ in the root syllable before suffixes with the back vowel /u/, but /tupɔ/ with the central vowel /y/ in the root syllable before the suffix /ɔ/. Only the first syllable of the suffix induces harmony. This is precisely the extent of vowel harmony in Bahing; front vowels (including /a/) do not induce harmony, and they are not influenced by it.

If a suffix in a front vowel does not have any harmonic effect, what determines the choice of a back or central vowel in the root syllable before such a suffix? It is the root final. The back series appears before velar finals and the central series elsewhere. Thus, in the roots with /u/-/y/ vocalism in table 7, with the suffix -/ta/, which has no harmonic effect, we find /kyp̥ta/, /typta/, and /phy:ta/ from KU, TUP, and PIUT, but /guk̥ta/ from GUK, which has a velar final. Simplifying the table of root-rhymes (table 8) to eliminate harmonic effects, we may derive table 9. Table 9 gives all of the rhymes that are found to occur in the root-syllable of verbal forms before a suffix in a front vowel (and barring morphophonemic changes in the final of the root syllable, such as those which produced the form /septa/ discussed above in §3.1).

Table 9. Rhymes of Root-Syllables Uninfluenced by Vowel Harmony.

final:	zero	p	t	k	m	n	ŋ	r	l
root vowel:									
I	i	ip	it	ik	im	in	iŋ	ir	il
E	e	ep	et	ek	em	en	eŋ	er	el
A	a	ap	at	ak	am	an	aŋ	ar	al
O	ɔ	oep	ɔt	ok	oem	oen	oŋ	oer	oel
U	y	yp	yt	uk	ym	yn	uŋ	yr	yl

The system of rhymes of table 9 may be regarded as derived from a system of five vowels (at the left of the table in capital letters) and nine finals, which is precisely the system that is proposed in this paper for the notation of verbal roots in the lexicon. This reduced inventory of underlying rhymes is appropriate for the comparative and historical study of Bahing verb roots.

3.3 Phonologization of the 10-Vowel System

The permitted rhymes of verbal roots, in the absence of harmonic effects, were given in table 9. However, the first syllable of a verbal form is not always identical to the root; in particular, the final consonant of the syllable may be an 'epenthetic' one or it may have been assimilated to a nasal articulation or deleted. In these cases, the first syllable of a verbal form may have a rhyme not permitted by table 9. In this way, a minimal pair (e.g. /septa/~septa/ of §3.1) may arise, showing that a vocalic alternation which appears, on the morphophonemic level, to be a conditioned variation has in fact become phonologized. Such pairs also demonstrate that the vowels are not overtranscribed.

In the following sets of forms, the first member of each set contains a root-syllable rhyme not listed in table 9; thus it can not represent the underlying root of the verb but must have been modified morphonemically. The roots are given at the left.

MO	/mɔ̃pta/	'he fought'	
MOP-T	/moɛpta/	'he poured it'	(For <u>-T</u> , see §4 below)
SE	/sektakɔ̃/	'we (excl.) cut it (heads of grain)'	
SEK	/sektakɔ̃/	'we (excl.) broke it (e.g. string)'	
DZA	/dzaktakɔ̃/	'we (excl.) ate it'	
DZAK	/dzɔ̃ktakɔ̃/	'we (excl.) arrived'	
DZOK	/dzɔ̃ktakɔ̃/	'we (excl.) knew it'	
LU	/lyktakɔ̃/	'we (excl.) were afraid'	
LUK-T	/luktakɔ̃/	'we (excl.) spilled it'	
MO	/mɔ̃ktakɔ̃/	'we (excl.) fought'	
MOK-T	/mɔ̃ktakɔ̃/	'we (excl.) fed him'	
DHO	/dhɔ̃ntane/	'you (pl.) dug it'	
ON	/oɛntane/	'you (pl.) ran'	
TSE	/tsemtane/	'they twisted it'	
TSEM	/tsemtane/	'they peeled it'	
SEK	/seɲja/	'let's break it (e.g. string)'	
TEɲ	/teɲja/	'let's fell it'	

Similarly, long non-front vowels resulting from deletion of root-final -t/ differ from those resulting from deletion of -ɲ/:

RUT	/ry:ta/	'he got sick'
RUN	/ru:ta/	'he was satiated'
SOT	/sɔ̃:ta/	'he lost'
SON	/so:ta/	'he told'
GLAN	/glo:ta/	'he won'

4. Augmented Stems

It has been mentioned that there are two classes of verb in Bahing. The first, described in §2 above, adds aspect/agreement suffixes directly to the verb root. In the second, a morpheme is added to the root, forming an augmented stem to which the suffixes are added. There are two such morphemes, which may be noted as -T (realized /t/ or /d/) and -S. Verbs conjugated with these stems make up Hodgson's conjugations ix, xi, xii, and xiii. The formation of S-stems, which have a reflexive/middle sense, is a fairly productive process, at least with transitive verbs, but the formation of T-stems is not; most verbs conjugate either by adding suffixes directly to the root or as a T-stem but not both. The following are two examples of verb roots conjugated in all three ways:

Root:	PRAK ⁵	'undo (e.g. a knot)'
T-stem:	PRAK-T	'set loose'
S-stem:	PRAK-S	'get loose (e.g. an animal)'
Root:	LUK	'spill (tr.)'
T-stem:	LUK-T	'spill something on someone'
S-stem:	LUK-S	'spill (intr.)'

4.1 T-stems

From the few cases in which the same verbal root is conjugated both with and without the augment -T, the semantic value of the augment can be determined. In addition to the triplets above, the following pairs may be considered:

Root:	TUŋ	'drink'
T-stem:	TUN-D	'give drink to'
Root:	BRET	'cry out'
T-stem:	BRET-T	'call someone'
Root:	LA	'go'
T-stem:	LA-T	'take'

(Verbs of motion in general form T-stems with the sense of 'convey'.) It is clear from these examples that the meaning of -T is in the causative/benefactive area.⁵ However, it must be emphasized that the formation of T-stems is not productive, and that most verbs conjugated with the unaugmented root have no T-stem counterpart and vice versa. In addition, it is not clear that roots to which the T is permanently frozen are uniformly more benefactive or causative in meaning than those which never add -T. In fact, there are even intransitives in -T (Hodgson's conjugation xi), e.g. BOT-T 'to flower', KHIT-T 'to blow (of the wind)'. This is typical of frozen morphology in general.

To illustrate the conjugation of T-stems, table 10 gives selected forms of verbs with stems in -TT, -KT, -NT, and -ND. For an open root augmented by -T, see LA-T 'take' in table 5. Stems in -PT conjugate as those in -KT. There are also stems in -MT (conjugated as those in -NT) and stems in -MD, -RD, and -LD (conjugated as those in -ND).

In table 10, note that an epenthetic /i/ is inserted between a T-stem (from a non-open root) and all non-past suffixes with consonant initials. For example, the stem PHIK-T with the suffix /ka/ gives /phiktika/ 'we (excl.) dress him'. Thus triconsonantal clusters are avoided. In the past aspect, a kind of reduction has occurred, with the result that, except for the /tt/ that is peculiar to the past forms of stems in -TT, the past forms of T-stems have no mark to distinguish them from the past forms of unaugmented roots. There is also considerable homonymy between the past and non-past forms of T-stems from non-open roots. Vowel harmony is not affected by stem-augments.

The relationship between roots in -M, -N, and -ŋ and T-stems in -MT, -MD, -NT, and -ND is not entirely clear. From the pair TŪŋ/TUND (&4 above) and from:

Root:	GHLUn	'go out or across'
T-stem:	GHLUND	'take out or across'

Table 10. Selected Forms of T-Stems.

		ROOT:	BRETT-	PHIKT-	SENT-	G(H)LUND-
		gloss:	call	dress s.o.	recognize	take out
Subject:	Object:					take across
Imperative						
2 sg.	3 sg.		bre:t-ø	phikt-ø	sent-ø	glynd-ø
Non-Past						
1sg.	3 sg.		bre:t-u	phikt-u	sent-u	glund-u
1 du. in.	3 sg.		bre:t-i-sa			
1 du. ex.	3 sg.		bre:t-i-su			
1 pl. in.	3 sg.		bre:t-i-ja			
1 pl. ex.	3 sg.		bre:t-i-ka	phikt-i-ka		
2 sg.	3 sg.		bre:t-i	phikt-i	sent-i	
3 sg.	3 sg.		bre:t-a	phikt-a	sent-a	glynd-a
2/3 sg.	1 sg.		bre:t-i	phikt-i	sent-i	glynd-i
3 sg.	2 sg.		bre:t-e	phikt-e		glynd-e
1 sg.	2 sg.		bre:t-i-na	phikt-i-na	sent-i-na	glynd-i-na
Past						
3 sg.	3 sg.		bret-ta	phik-ta	sen-ta	glyn-ta

(Forms left blank were not elicited in the field.)

Table 11. Conjugation of the S-Stem JAnS 'Move away (intr.)'

	Non-Past	Past
1st ps. sg.	jɔnsɪnə	jɔsti
1st ps. du. in.	jɔ̃stsa	jɔstasa
1st ps. du. ex.	jɔ̃stsu	jɔstasu
1st ps. pl. in.	jɔnsɪjə	jɔ̃staja
1st ps. pl. ex.	jɔ̃nsika	jɔ̃stakø
2d ps. sg.	jɔnse	jɔste
2d ps. du.	jɔ̃stse	jɔstasi
2d ps. pl.	jɔnsine	jɔstani
3d ps. sg.	jɔnse	jɔ̃sta
3d ps. du.	jɔstse	jɔstase
3d ps. pl.	jɔnsime	jɔstame

are avoided. An example in table 11 is /jɔnsɪnə/ 'I will move away' with suffix /nə/. In these forms, and in forms where the suffix has an initial vowel, the final /ŋ/ of the root-syllable is uniformly preserved, and the /s/-augment becomes the initial of the second syllable of the form. These forms of the paradigm will be referred to as type A forms in the discussion below.

The remaining forms, here referred to as type B forms, have suffixes with initial consonants and no /i/ intervening between stem and suffix. Thus, where the verb root ends in a consonant, triconsonantal clusters <root-final + /s/ + suffix initial> would be expected. However, in type B forms, the treatment of the root-final is quite variable. Sometimes it is retained; sometimes <in the case of root-syllable-final nasals> it is realized as nasalization of the preceding vowel; and sometimes it is deleted entirely. For example, the informant from whom table 11 was elicited did not retain the root-final /ŋ/ in any type B forms, but his choice of whether to use or omit vowel nasalization on type B forms appears completely arbitrary, and it is highly unlikely that the same distribution would be recorded on another elicitation. Another informant gave the form /jɔ̃nstse/ 'you two will move away' with the /ŋ/ preserved. The data upon which the present study is based is inadequate for the study of such variation, and only the range can be indicated here.

it appears that roots in $-\eta$ augmented by $-\underline{T}$ have contributed to the $-\underline{ND}$ category. However, roots in $-\underline{N}$ appear to have formed \underline{T} -stems either in $-\underline{NT}$ or in $-\underline{ND}$, with no evident conditioning factors. Consider the following \underline{S} -stem/ \underline{T} -stem pairs:

\underline{S} -stem	KINS	'stretch oneself'
\underline{T} -stem	KINT	'stretch something'
\underline{S} -stem	SENS	'awake <itr.>
\underline{T} -stem	SENT	'know, recognize'
\underline{S} -stem	TSENS	'learn'
\underline{T} -stem	TSEND	'teach'
\underline{S} -stem	THUNS	'move <itr.>'
\underline{T} -stem	THUND	'move <tr.>'

Similarly, the origin of the split between \underline{T} -stems in $-\underline{MT}$ and $-\underline{MD}$ remains unexplained.

4.11 Three irregular verbs

There are three verbs which fit into none of the categories discussed so far, but one of them has a doublet suggesting the origin of all three. The verb 'to tell' has an imperative /sɔdɔ/ or /sɔ:dɔ/ and a past /sotta/ 'he told'. This verb is clearly related to another verb, $\text{SO}\eta$ 'to tell', which is regular. It appears likely that the irregular SOD originated as a \underline{T} -stem $^*\text{SO}\eta\text{-D}$; the / η / will have been lost and the past tense subsequently remodeled as if the stem were $^*\text{SOTT}$. There are two bits of corroborating evidence. First, the vocalism of /sotta/ 'he told' suggests a velar root final; $^*/sɔtta/$ would be expected from $^*\text{SOTT}$. Second, Hodgson detected a difference in meaning between $\text{SO}\eta$ 'tell' and SOD 'tell for another', suggesting that SOD is a benefactive \underline{T} -stem from the root $\text{SO}\eta$. The other two verbs resembling SOD in conjugation are $\text{K}\sigma\text{D}$ (? < $^*\text{KA}\eta\text{-D}$) 'put on the fire' and TUD 'gore, strike with the horns'. Hodgson treated this type of verb as a subcategory of his conjugation xii.

4.2 \underline{S} -Stems

\underline{S} -stems, with a reflexive/middle meaning, are formed essentially by adding /s/ to the root (eliminating any $-\underline{T}$ augment). Root-final stops never appear before the \underline{S} -augment; they are replaced by the homorganic nasals. Thus the root-syllable of a reflexive form may have the following finals: zero, /m/, /n/, /ŋ/, /r/, /l/. It makes no difference in the paradigm whether a nasal root-syllable final is actually the final of the underlying root or is derived from the homorganic stop. Table 11 gives the finite forms of the stem $\text{JAN}\underline{S}$ 'to move away <intr.>' as elicited from one informant; the root is presumably JAK, reflected in the \underline{T} -stem JAKT 'to move away <tr.>'.

The suffixes added to \underline{S} -stems are the same as the intransitive endings of table 4, except that the dual endings in the non-past aspect have initial /ts/ instead of /s/. Note that in non-past forms an /i/ is found between the stem and any ending (except duals) with a consonant initial, and so triconsonantal clusters

In a number of cases where a root-final /n/ or /ŋ/ would be expected in the reflexive paradigm, it appears that the whole paradigm has been remodeled as if the root had zero final. For example, related to PHIKT 'dress someone' we find a reflexive stem /phis/- (sometimes realized as /phi:s/ in type A forms) 'dress oneself'. Similarly, related to KHUKT 'put a hat on someone' is a reflexive stem giving forms like /khusiŋa/ 'I'll wear a hat'; notice the back vocalism, suggestive of a velar root-final, in comparison to the central vocalism of /khly:sina/ 'I'll hide', related to KHLUTT 'to hide something'.

Finally, a few peculiarities in the treatment of the various root-syllable finals may be listed:

/n/. In type A forms, root-final /n/ is realized as a (usually) nasalized /i/-glide after the root vowel E and probably A and O as well. Thus from the stem SENS 'wake up' we have the forms /sci:siŋa/ 'I'll wake up' and /sēsti~/sasti/ 'I woke up'. In contrast, root-final /n/ may be preserved after /i/, as in /kinsɔ/ 'Stretch yourself! Reach!' from KINS 'stretch (intr.)'. There are other reflexive stems with /i/ glides in type A forms that are not nasalized; since vowel nasality appears to be very unstable in the language anyway, it is reasonable to treat these stems here. Examples are the stem 'to try, be about to', with forms like /ɔ:siŋam/ 'I'll try' and /ɔ:sta/ 'he tried', and 'to think that' with forms /naisiŋa/ 'it seems to me' and /nasti/ 'it used to seem to me'. The /i/-glides appear to point to a dental root-final and hence to stems ONS and NANS, since no other source for /i/-glides (which occur only in the reflexive forms of verbs) is known. On the historical-phonetic derivation of /i/-glides from dental finals see Michailovsky 1975a.

/m/. Root final /m/ appears never to be reduced to vowel nasality only, but forms like /tsāpsta/ 'he played' were recorded with epenthetic /p/ resulting from devoicing of the final /m/. The root is TSAM; cf. TSAMD 'to amuse'.

/r/, /l/. Both are subject to deletion in type B forms. Thus /tsarsta~/tsasta/ 'he urinated' and /kalsta~/kasta/ 'it (hair) got matted'.

II. The Origin of Tone in Khaling

Introduction

The Khaling language of East Nepal has been under study by Sueyoshi and Ingrid Toba of the Summer Institute of Linguistics since 1971. From data and analysis presented in three of their publications, a phonology (KPS, 1972), a short article on the verb (KV, 1973), and, most important, a glossary (G, 1975), some conclusions can be drawn as to the origin of the Khaling system of two tones. Since Khaling has a four-way opposition of manner of articulation of initial stops on both tones, it appears prima facie implausible that the tonal system should have arisen from the loss of an opposition in the manner of articulation of initial stops, as has happened with such regularity in other areas of Tibeto-Burman. In fact, it appears that the Khaling tones have arisen from the influence of final consonants. The present discussion will be limited to verbal roots, since the verbal paradigm provides material for the use of the method of internal reconstruction. Although no complete treatment of Khaling verbal morphophonology exists, reference may be made to KV and to the treatment of Bahing verbal morphology in Part I of the present article. Finally, a phonetic motivation for the origin of a tonal split from an original distinction between syllables with and without final stops is proposed (§3).

1. Phonology

In the present discussion, the Tobas' 'text orthography' is used (as in G). Note that /y/ stands for IPA /j/, /ng/ for IPA [ŋ], /j/ for IPA [dz], and /c/ for IPA [ts].

Table 1 gives the inventory of initial consonants, taken from KPS:16.

Initial consonant clusters are found with stops of the velar and bilabial series followed by /l/ and /r/.

In syllable-final position, only the following consonants occur (KPS:31):

/p, t, k, m, n, ng, r, l, s/.

(In fact, however, syllable-final /h/ (KPS:19; see §2.12 below) and /y/ (KPS:52) are also transcribed; these are apparently of secondary origin.)

The Tobas recognize nine phonemic vowels, as follows:

i	ü	u
e	ö	o
ä [æ]	aa [a]	a [ɔ]

To this inventory, a tenth vowel, /waa/, will be added here.

Table 1. Khaling Initial Consonants

	Bilabial	Dental	Alveolar	Velar
Stops	p	t	c	k
	ph	th	ch	kh
	b	d	j	g
	bh	dh	jh	gh
Fricatives			s	h
Liquids			r	
			l	
Nasals	m		n	ng
Semivowels	w		y	

Although KPS is no doubt correct in recognizing /w/ as a consonant in initial position before /ä/, /e/, /o/, and /ö/, it also treats initial /Cw/- and /CCw/- as consonant clusters. Such clusters, however, only occur before the vowel /aa/, so it seems preferable to regard /waa/ as a vowel, occurring, like other vowels, either syllable-initially or after any initial consonant or cluster. Then consonant clusters with /w/ are eliminated.

There are two tones, high and low, distinguished by the pitch of the first syllable of the phonological word (or 'phonological foot' G:xii).¹ In G. only high tone words are marked, by a diacritic /' placed before the word, e.g. /'wämnä/ 'to scoop out'. In the present discussion, a second diacritic, /_/, will be used to mark low tone words as well, e.g. /_wämnä/ 'to stick in'.

2. The Verb

For each of its 500-odd verbs, the glossary gives two forms, the infinitive (suffix -/nä/) and the 1st person singular (suffix -/u/ or -/ngaa/, as in Bahing). In the present discussion, both forms will generally be cited, as follows: /_dzö-nä/, /_dzaa-ngaa/ 'eat'. The hyphens are inserted for convenience, to mark morphological, not syllabic, boundaries.

The verbal root in Khaling, as in closely related languages, is clearly monosyllabic. A basic working hypothesis of this study is that root-syllables probably have, at some level, essentially

the same structure as syllables in general in the language. Since most of the differences in conjugation between verbs are found at the boundary between root and suffix, it is not unreasonable to suppose that these differences derive from the structure of the root-syllable, and in particular from the final consonant of the root.

The distinction between verb roots with underlying stop and nasal finals is apparently neutralized (at least in the segmental phonology) before the infinitive suffix *-/nä/*, since the stop finals are changed to nasals by an assimilatory process. The ending *-/u/* of the 1st person does not have this nasalizing effect. Thus we find, for example:

/'wäm-nä/, */'wäb-u/* 'scoop out'

/_wäm-nä/, */_wäm-u/* 'stick in'

'Scoop out' may be reconstructed with root-final *-P* (capitalized to signal that it is a morphophonemic or historical, not a synchronic phonological */p/*) and 'stick in' with root-final *-M*, both on the evidence of the 1st person form. Unfortunately, some 90 or so verbs use *-/ngaa/* in the 1st person, and *-/ngaa/* has the same assimilatory effect on root-final stops as the infinitive ending *-/nä/*. For these verbs, there may be some other form in the paradigm that would be more useful than the 1st person singular listed in G.

Four additional types of verb or glossary entry in G will not be discussed further here:

1. 27 verbs for which what is apparently a 3d person or impersonal form is listed rather than a 1st person form.
2. About 15 verbs listed in reflexive forms (in *-/si-/*).
3. About 15 verbs listed in attributive form (*-/pä/*) only.
4. Five roots listed as disyllabic.

2.1 Verbs Taking the Suffix *-/u/*.

Returning to verbs that take the suffix *-/u/*, we find that there are a total of some 378 such verbs listed in G. If the consonants preceding the two suffixes (*-/nä/* and *-/u/*) are considered, these verbs may be divided into 18 categories, which are labeled *a* through *r* in table 2. An example of category *a* would be */'tam-nä/*, */'tub-u/* 'play an instrument'. It is interesting to note that 16 to 20 is roughly the number of categories that might be expected from a system of 10 root finals (probably minus */s/* and possibly minus */zero/*, if open roots take the 1st person ending *-/ngaa/*, as in Bahing) multiplied by the two types of conjugation, one adding suffixes to the unaugmented root and one adding suffixes to a root augmented by a morpheme *T* (realized */t/* or */d/*) as in Bahing.

Table 2. Root-Finals of Khaling Verbs with 1st Person in -/u/.

Category	Root-Final before Infinitive -/nã/	Root-Final before 1st Person -/u/	Number of Verbs by Tone	
			High Tone	Low Tone
a.	m	b	16	1
b.	m	pt	30	1
c.	m	m	2	37
d.	m	md	0	8
e.	zero	g	33	0
f.	zero	kt	19	0
g.	zero	ŋ	0	31
h.	zero	nd	0	5
i.	zero	ht	33	0
j.	n	ht	7	1
k.	n	d	9	10
l.	n	t	7	6
m.	n	tt	5	19
n.	y	nd	0	42
o.	r	r	0	20
p.	r	rd	0	5
q.	l	l	0	29
r.	l	ld	0	2

2.11 The Correlation of Tone and Root-Final

The most striking relationship to emerge in table 2 is the nearly perfect correlation between root-final category and tone in all but three of the categories (i.e. k, l, m). Continuing the identification of roots as above, the roots of category a may be reconstructed with final -P and those of category b with final -P and stem-augment -T. Both categories are made up almost exclusively of high tone verbs.² Categories c and d, on the other hand, representing roots in -M and stems in -MT respectively, contain almost exclusively low tone verbs.³ The generalization that suggests itself is that verb roots in final stops have the high tone, and roots in final nasals (in fact, continuants) have the low tone, regardless of any stem-augment.

Continuing to the velar finals, we find that the correlation of tone and root-final holds without exception in categories e, f, and g (roots in -K, stems in -KT, and roots in -ŋ). Note that /n/ is not observed before a consonant; hence it is lost in the infinitive forms, e.g. of /'bhro-nā/, /'bhrog-u/ 'break', a verb of category e. No doubt for the same reason, no stem ending *-nd/ is observed, so it is not yet evident where the augmented T-stems (if any) based on roots in -ŋ will be found.

Root-final resonants, as in categories o - r, invariably carry the low tone.⁴

Categories h - n, which may tentatively be presumed to be derived primarily from dental root-finals, present several difficulties of interpretation which cannot be resolved here.⁵ But study of the vocalism of the verbal roots sheds light on a few points.

2.12 Root Vocalism

Using the same data from the Glossary, it is possible to begin the study of the vocalism of verbal roots in Khaling. In table 3, the same categories a - r (table 2) are again listed, but instead of tone, the root-syllable vocalism is shown. For example, the first entry for category a states that there are two verbs in category a whose vocalism shows /a/ in the infinitive alternating with /i/ in the 1st person, e.g. /'ham-nā/, /'hib-u/ 'to cut off at the root'. The second entry in the top line states that category a contains one verb with non-alternating (at least for the two forms cited in G) /e/ vocalism; it is /'khlem-nā/, /'khleb-u/ 'cut at one point'. And so forth.

The striking fact to be observed in table 3 is that, although 10 vowels are found to be in opposition in the phonology of Khaling, none of the categories of verb roots a - r exhibits more than five distinct vowels or vowel-alternations.⁶ A system of five types of root vocalism (as in Bahing) is clearly suggested, although a full understanding of the scope and conditioning of the alternations must await more complete data.

Table 3 . Vocalism of Khaling Verb-Roots.

Root Cate- gory	Vocalism Types Observed in Each Category And Number of Verbs Exhibiting Each Type					
a.	a/i <2>	e <1>	ä <6>	waa/o <5>	a/u <3>	
b.	a <11>	e <6>	ä <6>	waa <8>		
c.	a/i <4>	e <5>	ä <18>	waa/o <5>	a/u <7>	
d.	a <6>	e <1>		waa <1>		
e.	u/i <4>	e <8>	aa <7>	o <9>	u <4>	
f.	u/i <1>	u/a <5>	aa <1>	o <3>	u <9>	
g.	u/i <6>	e <5>	aa <5>	o <10>	u <5>	
h.		e <1>	aa <1>	o <2>	u <1>	
i.		e <14>	aa <7>	o <12>		
j.		e <4>	ä <2>	waa <2>		
k-high.	a/i <1>	e <1>	ä <2>	waa <2>	a/u <3>	
k-low.	a/i <1>	e <3>	ä <2>	waa/o <2>	a/u <2>	
l-high.	a <1>	e	ä <1>	waa/o <4>		
l-low.	a/i <1>	e <1>	ä <2>	waa/o <3>		
m-high.	a <10>	e <2>	ä <7>			
m-low.	a <5>					
n.	a <15>	e <8>	ä <8>	waa <8>		
o.	a/i <1>	e <4>	ä <4>	waa/o <7>	a/u <4>	
p.	a <4>			waa <1>		
q.	a/i <4>	e <5>	ä <9>	waa/o <9>	a/u <1>	
r.	a <1>			waa <1>		

Nevertheless, in table 3 the columns have tentatively been arranged with the idea of lining up underlying vocalism types like the Bahing I, E, A, O, U (see Part I §3).

One or two points in table 3 that shed light on the root-finals may be commented upon. Note that the categories e - g, with clearly velar finals, have a characteristic vocalism distinguished by the presence of invariant (at least for the two forms cited in G) /aa/, /o/, and /u/. Now, in table 2 it was unclear which category represented roots in -n with the stem-augment -T. Category h is seen to have both the vocalism characteristic of root-final velars, and the low tone, so it appears that the -/nd/ of category h must derive from *-nT.

Another category with the characteristic velar vocalism is i, with root-final zero/ht (table 2). According to KPS:19, 'Preconsonantal /h/ has allophones [x] and [k] in the environments of [i.e. after] front and back vowels respectively.' This leaves open the question of what distinguishes the root-syllable rhyme of, e.g. /'rohtu/ 'I search' from that of /'groktu/ 'I throw'. The vocalism and high tone of category i suggest root final -K in any case, and hence, with T-augment, the same provenience as category f. Note that the verbs in category i with vowel /e/ fill a hiatus in category f. (The unique u/a vocalism found in f remains a mystery, however.)

2.2 Verbs with 1st Person -/ngaa/.

The root finals, tonality, and vocalism of the 90-odd verbs that take the 1st person non-past suffix -/ngaa/ instead of -/u/ are summarized in table 4. Six categories, s - x, are distinguished by their root finals -- nine categories if tone is also taken into account. Note that no stop finals are observed; all have been assimilated to the corresponding nasals. The obvious resonant-finals </l/ and /r/ > are again all low in tone (categories w, x). Clearly s-high and s-low, with final -/m/, must represent the finals -P and -M, respectively. T-high, by its tone and its vocalism, can only represent -K. Notice that 10 distinct vowels or vowel-alternations are found in category t-low, suggesting provenience from at least two different underlying finals. These finals must include -n (all verbs with vowels /aa/, /o/, and /u/, and presumably some of the verbs in front vowels as well) and probably the original open roots. It is likely that infinitives in /ö/ and /ü/ are characteristic of open roots in back vowels. The fact that such vocalism was not found in any of the categories a - r (i.e. with verbs taking 1st person -/u/) is related to the fact that in Bahing, verbs with open roots all have 1st person -/na/, although -/u/ might be expected in transitives. It is interesting to find that the open roots are associated with the low tone, as it leads to the conclusion that in the development of the tonal system, the root-final stops, giving rise to the high tone, are opposed to all other finals, which give rise to the low tone.

Table 4. Finals, Tone, and Vocalism of Verbs with 1st ps. *-/ngaa/*⁹

Category	Final Before -/nā/	Final Before -/ngaa/	Tone	Vocalism Types and Number of Examples of Each Type			
s.	m	m	{ high low	e <1> a <5> e <1>	waa <2> waa <3>		
t.	zero	zero	{ high low	u/i <1> i <10> e <7>	aa <2> aa <3>	o <3> o <4>	u <6> u <4>
						ö <4> ü <6>	
					ä/aa <1>	ö/aa <7>	ü/aa <1>
u.	y	y	low	a <1> e <1>	ä <1>		
v.	n	y	{ high low		ä <1>	waa <3>	
				a <1> e <1>	ä <1>	waa <1>	
w.	r	r	low	a <1> e <2>	ä <1>	waa <4>	
x.	l	l	low	a <1> e <1>		waa <1>	

Categories u and v presumably represent dental finals, but again identification is not entirely straightforward. For a discussion of the development of a [y]-glide from dental finals in Tibeto-Burman languages, see Michailovsky 1975.

There are 8 pairs of verbs in which both verbs appear to represent the same lexical root, but one verb has a dental stop as a stem-augment and one does not. The unaugmented verb takes 1st person *-/ngaa/*, while the augmented one takes 1st person *-/u/*. The pairs are listed in table 5, with the root-category <a - x> and the reconstructed root- or stem-final.

Notice that pair no. 1, by revealing a /k/ in 1b, bears out the conclusion reached on the basis of vocalism in §2.2 above that the category t-high represents final -K.

If 3b is related to 3a, as appears likely, it would be expected to fall into category h <like 2b> rather than n. Perhaps the large size of category n <table 2> is the result of such defections.

The pairs with apparently open roots are most interesting. Notice that 7b and 8b carry the low tone, even though one might expect verbs with 1st person in *-/du/* to carry the high tone, as verbs in *-/gu/* and *-/bu/* <categories a and e> invariably do, and as 6b does. It appears that in 7b and 8b <but not, for some

Table 5: Roots and Related T-Stems.

Pair No.	Verbs (T-Stem listed as b. in each pair)	Category	Final
1.	a. 'ru-nä, 'ru-ngaa 'tremble'	<u>t</u> -high	-K
	b. 'ru-nä, 'rukt-u 'shake [?'tr.]'	<u>f</u>	-KT
2.	a. <u>_</u> kho-nä, <u>_</u> kho-ngaa 'ascend'	<u>t</u> -low	-ŋ
	b. <u>_</u> kho-nä, <u>_</u> khond-u 'bring up'	<u>h</u>	-ŋT
3.	a. <u>_</u> wo-nä, <u>_</u> wo-ngaa 'enter'	<u>t</u> -low	-ŋ
	b. <u>_</u> waay-nä, <u>_</u> waand-u 'take in'	<u>n</u>	?-NT
4.	a. 'lä̃n-nä, 'lä̃y-ngaa 'exit'	<u>v</u> -high	-T
	b. 'lä̃n-nä, 'lä̃tt-u 'take out'	<u>m</u>	-TT
5.	a. <u>_</u> ngäy-nä, <u>_</u> ngäy-ngaa 'sit'	<u>u</u>	-N
	b. <u>_</u> ngäy-nä, <u>_</u> ngänd-u 'set'	<u>n</u>	-NT
6.	a. <u>_</u> pi-nä, <u>_</u> pi-ngaa 'come'	<u>t</u> -low	zero
	b. 'pan-na, 'pid-u 'bring'	<u>k</u> -high	-T
7.	a. <u>_</u> ye-nä, <u>_</u> ye-ngaa 'descend'	<u>t</u> -low	zero
	b. <u>_</u> yen-nä, <u>_</u> yed-u 'bring down'	<u>k</u> -low	?-T
8.	a. <u>_</u> hö-nä, <u>_</u> hö-ngaa 'come back'	<u>t</u> -low	zero
	b. <u>_</u> hwaan-nä, <u>_</u> hod-u 'bring'	<u>k</u> -low	?-T

reason, 6b), the low tone is maintained under a kind of morphological pressure from 7a and 8a, the verbs from which they must once have been derived. The split of tones in category k and perhaps in l (table 2) could be related to this phenomenon.³⁰

3. Phonetic Discussion

It has been shown above that the Khaling system of two tones, at least on the verbal root, is correlated with final consonants and derived from them.

Functionally, this development of tone serves to preserve some of the information that is being lost as the system of final consonants is weakened by deletion, by assimilation to following nasals, etc.

What remains to be understood is the phonetic motivation behind the development of a high tone from final stops, since final stops per se have not been observed to have a phonetic pitch-raising effect. The best clue to a possible motivation may be provided by Hayu (Michailovsky and Mazaudon 1973) and some other Kiranti languages, in which final stops (i.e. -p, -t, -k) are invariably pronounced unexploded and with a simultaneously articulated glottal stop. If Khaling final stops were once pronounced with a simultaneous glottal stop, then the high pitch that has arisen on the preceding vowels could be traced to the influence of this glottal component.

A. Haudricourt was the first to associate final glottal stop with a rise in pitch on the preceding vowel. He identified the ancient Vietnamese sắc-nặng tonal category as phonetically rising and showed that words in this tone had cognates with final glottal stop in the Palaung-Wa languages. He reached the conclusion that the rising tone of Ancient Vietnamese was derived historically from final glottal stops of an earlier, toneless stage of the language. Phonetically, he explained the development as follows (my translation from Haudricourt 1954): "Following a vowel, a glottal stop is produced by increasing the tension of the vocal cords. ... During the vowel, this increase in tension produces a rising pitch." Lombert (1975) has presented experimental evidence which supports this conclusion.

In many Tibeto-Burman languages, old stopped syllables have been observed to develop into a phonologically distinct tonal category (Matisoff 1973). These categories often preserve a glottal stop or creaky voice, but in some cases (e.g. the Lahu high-rising tone: Matisoff 1970) even these are lost. It is impossible to reconstruct the phonetic pitch which these tonal categories had at the time of their emergence; this has been obscured by subsequent developments in the checkered tonal histories of these languages. Khaling, in which the final stops are partly preserved and clearly associated with the high tone of a two-tone system, provides evidence that the stopped tones may originally have had high pitch. Such a development would parallel the development of rising pitch from final glottal stop in Ancient Vietnamese. A phonetic link between the oral final stops of Khaling and glottal stop may be provided by the glottalized final stops of Hayu.

Notes:Introduction:

1. I have previously (1974) discussed the rather similar Hayu system and its relation to the ergative syntax shared by Hayu and Bahing. (See also Bauman 1975). I take this opportunity to correct errors in the paradigms presented in that article:

Errata to "Hayu typology and verbal morphology" LTBA 1.1:

1. In the table on p. 13, in the last column (3d person intransitive) there should be two dual endings listed: non-past:

/tshik/; past: /tshe/.

2. In tables v and vi, the non-past dual endings should be listed as /tshik/ (not */tshe/); the examples should read:

{table v} /bUktshik/ 'they 2 will get up'

{table vi} /pUktshik/ 'they 2 will get him/them2 up'

(In table vi, the benefactive non-past /pUktotshe/ is correct as given.)

3. In table vii, the 3d person dual section should read:

non-past: natshik

dza:natshik 'they 2 will eat'

past: natshe

dza:natshe 'they 2 ate'

4. In table vii, in the dual column, all of the forms should have a long first syllable /dza:/.

Part I:

1. The imploded bilabial stop [ɓ] has not previously been reported from Nepal. However, it is also found in Sunwar, where it is noted (without phonetic description) as /bw/ in Bieri and Shulze (1971). A minimal pair in Bahing is /bɔkta/ 'he spoke' vs. /bɔkta/ 'he stayed'.

2. The rounding of these vowels is not entirely consistent; sometimes they are realized as central unrounded. Vocalic systems with a rounded front series are apparently confined to a small geographic area in Kiranti; they are reported in Khaling (Toba and Toba 1972), Natshering (alias 'Sotoring' or 'Sotange': Hari 1972), and Thulung (Allen 1975).

3. Cf. BOK 'rise' in table 4. The verb BAK 'exist, stay' is irregular in that the derived -/ŋ/ is deleted by §2.21. Thus in the 3d person the forms are:

/bo/ 'it exists'

/bɔkse/ 'they 2 exist'

/bɔ:me/ 'they exist'

4. Suffixes in parentheses in table 6 were observed to be commonly omitted. However, many of the forms were elicited only once, so the variability of forms is certainly under-represented. Hodgson's paradigms, which show more regular use of secondary number suffixes than table 6, may be more reliable as a guide to the full forms. In addition, they include non-finite and negative forms, and his informants were able to give forms for 1st person non-singular subjects acting on 2d person objects without resorting to periphrases.

5. Cf. also: root: BRAK 'get loose (e.g. an animal)'

BRAK-S 'come undone'

The roots BRAK and PRAK are related by a no longer productive morphological process of causative-formation that is well known in Tibeto-Burman. Cf. BOK/POK of table 3 and Hodgson (1858:388).

Notes to Part I (cont.)

6. Cf. Hodgson (1858:388) and Benedict (1972:100ff.) In Fugu, the parallel forms are the benefactives (Michailovsky 1974:100).
7. Notation of reflexive stems without a hyphen, e.g. JAnS, is used to avoid a decision on underlying JAK-S or JAn-S; here there happens to be clear evidence for JAK-S.
8. The high-mid vocalism of forms of ONS may suggest that the underlying root must be OT rather than ON.

Notes to Part II:

1. A two-tone system is also reported for Sunwar (Bieri and Schulze, 1971a, b), Natshering (Hari 1972), Kulung (Holzhausen 1973) and Thulung (Allen 1975). Only the Sunwar and Khaling systems have been adequately described. Limbu, Bantawa, Bahing, and Hayu are non-tonal.
2. The exceptional items are:
 /_kham-nä/, /_khib-u/ 'cook'
 /_bhlem-nä/, /_bhlept-u/ 'topple'
3. Exceptions:
 /'pham-nä/, /'phum-u/ 'smother'; /'som 'pham-nä/ 'exhale'
 /'ghwaam-nä/, /'ghom-u/ 'block'
4. Apparent exceptions in KV:8 are all listed as low in G.
5. Two verbs in -/u/ have been omitted from the categorization of table 2 as apparently irregular:
 /_nä-l-ä _cwaan-nä/, /_-- _cwaand-u/ 'jabber'
 [perhaps for /_cwaay-nä/, /_cwaand-u/ 'jump up?']
 /'plem-nä/, /'pleht-u/ 'flatten dough'
6. In category c, a sixth type of vocalism is recorded in /_cwaam-nä/, /_cum-u/ 'cut: lengthwise'. Since the alternation waa/o is not found elsewhere, I have provisionally emended to /com-u/.
- In category o, a sixth type of vocalism is recorded in /wör-nä/, /wör-u/ 'chew (popcorn)', omitted from table 3. Possibly /wör/ was heard for /wär/ because of the influence of /w/.
7. KV table 5 shows 3-way alternations in root vocalism.
8. In table 3, /a/ frequently appears in alternations with both /i/ and /u/ in a single category (categories a, c, k, o, q). Where a non-alternating /a/ is found, it is one of not more than four vocalism classes (categories b, d, l-high, m, n, p, r, all of which appear, incidentally, to have the stem-augment -T). Very likely the non-alternating /a/ vocalism has two proveniences, reflecting both underlying /i/ and /u/, in these cases, but it is arbitrarily assigned to the first column in table 3.
9. One verb with unique vocalism is omitted from table 4:
 /_kö _twaan-nä/, /_kö _tö-ngaa/ 'see (because of light[?])'
10. There are three pairs of verbs showing an alternation between root-final stops and corresponding nasals. No difference in meaning is evident; the difference in transitivity in nos. 2

and 3 would depend rather on the initial consonant alternation (nos. 2, 3c; v. Part I, n. 5) or the T-augment (no. 3b). It is conceivable that the pairs are relics of some morphological use of root-final stop/nasal alternation.

- 1a. /lā phlām-nā/, /lā phlām-u/ 'fold'
- 1b. /'phlām-nā/, /'phlāpt-u/ 'fold'
- 2a. /lo jhām-nā/, /lō jhām-u/ 'be frightened'
- 2b. /lo 'cām-nā/, /lo 'cāb-u/ 'frighten'
- 3a. /ghu-nā/, /ghu-ngaa/ 'bend over (itr.)'
- 3b. /'ghu-nā/, /'ghukt-u/ 'bend over (tr.)'
- 3c. /'ku-nā/, /'kukt-u/ 'bend, revenge, hurt with words'

References:

- Allen, N. J. 1975. Sketch of Thulung grammar. Cornell University. East Asia papers no. 6. Ithaca.
- Bauman, James J. 1975. Pronouns and pronominal morphology in Tibeto-Burman. Thesis. University of California. Berkeley.
- Benedict, Paul K. 1972. Sino-Tibetan a conspectus. Cambridge.
- Bieri, Dora, and Marlene Schulze. 1971a. Sunwar phonemic summary. Revised. S. I. L. Kirtipur, Nepal. Mimeo.
- 1971b. A guide to Sunwar tone. S. I. L. Kirtipur, Nepal. Mimeo.
- Hari, Maria. 1972. Preliminary instructions for a phonological survey report. C. Phonological survey report of Sotoring. S. I. L. Kirtipur, Nepal. Mimeo.
- Haudricourt, André G. 1954. De l'origine des tons en vietnamien. JA 242:69-82.
- Hodgson, Brian H. 1858. Analysis of the Bahing dialect of the Kirānti language. Pp. 320-392 in Hodgson 1880. Reprinted from JASB 26:486-522 and 27:393-442.
- Hodgson, Brian H. 1880. Miscellaneous essays on Indian subjects. London.
- Holzhausen, Andreas. 1973. Phonological survey report of the Kulunge language. S. I. L. Kirtipur, Nepal. Mimeo.
- Hombert, Jean-Marie. 1975. Development of tone from segmentals: evidence from contour tone perception. To appear in: Proceedings of the Eighth International Congress of Phonetic Sciences. Leeds.
- Hyman, Larry M., ed. 1973. Consonant types and tone. Southern California occasional papers in linguistics no. 1. University of Southern California. Los Angeles.
- Matisoff, James A. 1970. Glottal dissimilation and the Lahu high-rising tone. JAOS 90.1:13-44.
1973. Tonogenesis in Southeast Asia. In Hyman 1973.

Michailovsky, Boyd. 1974. Hayu typology and verbal morphology.
LTBA 1.1:1-26.

1975. On some Tibeto-Burman sound changes. Proc. of the
first annual meeting of the Berkeley Linguistics Society.
Berkeley.

Michailovsky, Boyd, and Martine Mazaudon. 1973. Notes on the
Hayu language. Kailash 1.2:135-52. Kathmandu.

Sprigg, R. K. 1966. Phonological formulae for the verb in Limbu.
In: In memory of J. R. Firth. London.

Toba, Ingrid. 1973. The Khaling verb. [KV]. Nepal studies in
linguistics 1:1-14. S. I. L. Kirtipur, Nepal.

Toba, Sueyoshi and Ingrid Toba. 1972. Khaling Phonemic Summary.
[KPS]. S. I. L. Kirtipur, Nepal. Mimeo.

1975. A Khaling-English English-Khaling glossary. [G].
S. I. L. Kirtipur, Nepal.