

Conditions for Tonogenesis and Tone Split in Tibetan Dialects

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This paper discusses the nature, functional typology, origin, and diversification of tone in modern Tibetan dialects on the basis of tonal data on ten Tibetan varieties recorded by the author. It is contended that tonal Tibetan dialects probably all underwent a stage of 'natural tones' conditioned by associated features of old Tibetan onsets and codas. The distinctive function of such syllable elements was gradually reduced and transphonologized, leading to the genesis of phonemic tone. Tonogenesis in different modern tone systems did not always observe the dictum 'high tone if (the original syllable onset was) voiceless; low tone if voiced', but traversed varied developmental paths.*

Introduction

This paper explores the conditions for the development and diversification of tone in Tibetan dialects by comparing the phonological structures of Written Tibetan¹ with those of the following varieties of modern Tibetan:

Tibet: *Lhasa*

Shigatse (Jiacuo Township 加措鄉, Rikeze City 日喀則市)

Lixin 立新 (=Sherpa, Lixin Village 立新村, Zhangmu Kouan 樟木口岸)

Yunnan: *Zhongdian* 中甸 (Zongdian Town 中甸鎮)

Sichuan: *Muya* 木雅 (Muya Township 木雅鄉, Yingguan District 營官區, Kangding County 康定縣)

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¹ This is to be understood as largely equivalent to Old Tibetan as codified by the standard Tibetan orthography. The standard system of Tibetan transliteration proposed in Wylie 1959 will be adopted. [Trans.]

Dege 德格 (Babangsi 八邦寺, Dege County 德格縣)

Ruoergai 若兒蓋 (Mazang Village 麻藏村, Qiuji Township 求吉鄉,

Baxi District 巴西區, Ruoergai County 若兒蓋縣)

Daofu 道孚 (Yuke District 玉科區, Daofu County 道孚縣)

Aba (Aba Town 阿壩縣城, Aba Prefecture 阿壩州)

Gansu: *Zhouqu* 舟曲 (Kanba Village 坎壩村, Gongba Township 拱壩鄉, Zhouqu County 舟曲縣)

Qinghai: *Yushu* 玉樹 (Zhangang Village 戰崗村, Jieduo Township 結多鄉, Zado County 雜多縣)

Pakistan: *Balti*

These varieties represent the following major dialects: Central or Dbus-Gtsang (Lhasa, Shigatse), Southern (Lixin),² Khams (Zhongdian, Muya, Dege, Ruoergai, Zhouqu, and Yushu), Amdo (Aba, Daofu), and Western (Balti).³

1. The Nature of Tone

There are two different views regarding the physical correlates of tone. In one view, tone has to do exclusively with pitch (Ma 1981:52); the other view holds that tone refers not only to pitch height and movement, but also to the temporal dimension of length. Thus, Luo and Wang (1981:125) state that 'if we take both pitch and length into account, we can represent these two factors as two axes of the coordinate plane, the resulting curve being an accurate representation of the tonal contour' (cf. Liu 1924: 19-20; Chao n.d.: 871).

Experimental studies of tone in Lhasa Tibetan vindicate the second view: tones in Lhasa differ significantly not only in pitch height and contour, but also in length (Tan and Kong 1991). In general, initials contribute little to syllable length since voiceless initials do not manifest length in the absence of vocal cord vibrations, and the duration of voiced initials is very brief. Syllable length is carried mainly by the rhyme. Length of syllable rhyme, however, is not always equivalent to that of the nuclear vowel. Contrast the average duration (in milliseconds) of main vowels vs. rhymes in the Lhasa examples below:

	k^hop⁵³ 'stupid'	ta⁵³ 'horse'	t⁵³sa: 'root'	par⁵⁵ 'photo'	nam⁵⁵ 'sky'
<i>nuclear vowel</i>	105 msec	165 msec	298 msec	160 msec	158 msec
<i>rhyme</i>	105 msec	165 msec	298 msec	300 msec	313 msec

Table 1

² Hereafter to be referred to as Sherpa. [Trans.]

³ All forms cited are from the author's own field records.

Of the first three test words, **k^hop⁵³** contains a checked coda, while **ta⁵³** and **t⁵³a:** have no coda at all. For all three, rhyme length equals syllable length. The other two test words **par⁵⁵** and **nam⁵⁵** contain a sonorant-coda. Here rhyme length (comparable to that in **t⁵³a:**) is almost double vowel length (compared to that in **k^hop⁵³** and **ta⁵³**). Thus these five high-toned words are to be subclassified into two categories (long and short) based on rhyme length rather than vowel length. Tan and Kong 1991 contains this claim in the concluding section:

Long and short vowels do not necessarily correspond to long and short tones...on the other hand, rhyme length and tone regularly correspond to each other synchronically as well as historically. In this light, the opposition between 'long and short vowels' in open syllables should rather be looked at in terms of vocalic rhymes, i.e. an opposition between long vs. short rhymes or tones.

Adopting this viewpoint, I regard both rhyme length and pitch modulations as relevant tonal features for Lhasa and other tonal dialects of Tibetan.

The term 'tone' normally refers to phonemic tone. However, 'tone' in some Tibetan dialects displays modulations in pitch height, contour, and length, but does not contrast lexical meaning. In order to differentiate these two senses of 'tone', I shall refer to environmentally conditioned non-distinctive tones as 'natural tones'.

2. A Functional Typology of Tonality in Tibetan Dialects

The development of tone is unbalanced among modern Tibetan dialects. The following functional types have been observed (the examples are restricted to monosyllables, as polysyllables often involve complicated sandhi changes):

2.1. Tone of any kind is completely lacking: In the Amdo dialect of Aba, syllables of all types invariably carry a high falling pitch 53. For example:

tshæ ⁵³	'salt'	ʂɲu ⁵³	'silver'	na ⁵³	'ill'
ʂtɛx ⁵³	'tiger'	ɣgo ⁵³	'door'	nɔn ⁵³	'read'

2.2. There are 'natural' but no phonemic tones: In the Amdo dialect of Daofo, three natural tones are found: two long (55, 24) and one short (53). These phonetic tone values correspond to structures of the Old Tibetan (hereafter OT) syllable in the following way:

Tone Value	OT Initial	OT Rhyme
55	voiced or voiceless, with consonantal prefixes	with continuant codas (-m, -n, -ng, -r, -l, -s, and -') or open rhymes plus the suffix -ba
53	voiced or voiceless, with consonantal prefixes, and, in certain cases, unprefixd voiced initials (already devoiced in this dialect)	with final stop (-b, -d, -g) or no coda
24	voiced initials without prefixed consonants and (in a few cases) voiced or voiceless aspirated initials with consonantal prefixes	irrelevant

Table 2

For example (on the left are the OT etyma):

	<i>Old Tibetan</i>	<i>Daofu Tibetan</i>	<i>gloss</i>	<i>Old Tibetan</i>	<i>Daofu Tibetan</i>	<i>gloss</i>
<i>Tone 55</i>	tshil sder gna'	tsh ⁵⁵ rder ⁵⁵ kna ⁵⁵	'fat; grease' 'plate' 'before'	gcin rjes pho-ba	χtcin ⁵⁵ rdzi ⁵⁵ ha ⁵⁵	'urine' 'trace' 'belly'
<i>Tone 53</i>	so skyed gzig	sho ⁵³ skjet ⁵³ kzik ⁵³	'tooth' 'interest' 'leopard'	snabs lcags gri	snap ⁵³ χtceq ⁵³ kjə ⁵³	'nasal mucus' 'iron' 'knife'
<i>Tone 24</i>	ri zam mdang	ra ²⁴ zam ²⁴ mdəŋ ²⁴	'mountain' 'bridge' 'last night'	'od nas 'thung	γət ²⁴ ne ²⁴ ŋt ^h uŋ ²⁴	'light n.' 'barley' 'drink'

Daofu preserves the OT syllable canon relatively well, maintaining many original voiced and clustered initials as well as all OT consonantal codas except -s and -l. No tonally differentiated minimal pairs have been noted in our sample of around 2,000 lexical items. Further, in some lexical items pitch values can also be variable. Hence, 'tones' in Daofu Tibetan are merely allophonic features habitually associated with different syllable types.

2.3. Tone is distinctive, but few lexical items are tonally differentiated:

This type is represented by Balti Tibetan⁴ where most monosyllables and

⁴ The Balti Tibetan data reported here were elicited from Mr. S. M. Abbas Kazmi in 1989 at the first International Conference on the Epic Gesar held at Beijing, which he attended as an invited speaker from Pakistan.

disyllables carry one of five steady tone values: 51, 132 (long), 53, 21 (short), and 24 (long or short).⁵ From among the 155 monosyllabic words that I elicited, only the following tonally distinguished sets are found:

ts ^h a ⁵¹	'hurt'	ts ^h o ¹³²	'hot'
ts ^h a ⁵³	'salt'	ts ^h o ⁵³	'lake'
		ts ^h o ²⁴	'grandson'
ts ^h e ¹³²	'harm'	p ^h aq ⁵³	'behind the back'
ts ^h e ⁵³	'life'	p ^h aq ²⁴	'pig'
ts ^h e ²⁴	'rhubarb'		
jaŋ ¹³²	'again'		
jaŋ ²⁴	'thou (hon.)'		

The low falling tone 21, which occurs only in a handful of monosyllabic words, such as **la**²¹ 'mountain', **lo**²¹ 'year, age', **wa**²¹ 'fox', and **bja**²¹ 'chicken', does not seem to contrast with the other tones. However, two minimal pairs are discovered from among 155 elicited disyllabic words where 21 contrasts with the high falling tone 53:

snam ²¹ sul ⁵³	'nose'	thaq ²¹ pa ²⁴	'rope'
snam ⁵³ sul ⁵³	'woolen blanket'	thaq ⁵³ pa ²¹	'twist'

Hence we can conclude that although Balti has developed phonemic tones, the functional load of tonality is minimal.⁶

2.4. Tones are not minimally distinctive, but co-occur with associated features: In Yushu Tibetan, for instance, one can distinguish as many as nine phonetic-level tones, which fall into three groups according to pitch-register: high (41, 53, 44), mid (31, 32, 23), and low (121, 21, 12). Alternatively, they can also be classified according to syllable type into three long unchecked (41, 31, 121), three short unchecked (53, 32, 21), and three short checked (44, 23, 12) tones. For example:

ta ⁴¹	'bleed vt'	ta ⁵³	'horse'	ta ⁴⁴	'tiger'
da ³¹	'grind'	da ³²	'exist'	da ⁷²³	'self'
tfa ¹²¹	'now'	tfa ²¹ ta ⁵³	'now'	tfa ⁷¹²	'correct'

Syllables with sonorant initials lack the mid-register tones:

⁵ 53 is realized as 42 in syllables with voiced initials.

⁶ This finding is however at odds with Sprigg's view that pitch in Balti is distinctive only in disyllabic and trisyllabic words (Sprigg 1966:186-90). [Trans.]

ʔna: ⁴¹	'argali'	ʔna ⁵³	'ear'	ʔnaʔ ⁴⁴	'pus'
na: ¹²¹	'marsh'	na ²¹	'sick'	naʔ ¹²	'forest'

As shown in the above examples, syllables with voiceless or preglottalized initials are high-toned, those with voiced obstruent initials are mid-toned, and those with breathy or (un)glottalized sonorant initials are low-toned. Long, short unchecked, and short checked tones go respectively with long vowels, short vowels, and the glottal-stop coda. We can set up six tonemes for Yushu Tibetan if we collapse the mid and the low tones, omitting both vowel length and the glottal features. Or, we can recognize a distinctive glottal-stop coda and collapse the short unchecked and checked tones. If we further recognize vowel length, then the tonemic inventory in Yushu can be reduced to a simple opposition of high versus low registers. Even if we adopt the two-tone analysis, tone register is still not minimally distinctive. Obstruent initials are predictably voiceless in the high tone, and voiced or breathy in the low tone; sonorant initials are predictably preglottalized in the high tone.

2.5. Tones carry few associated features, but certain tones are variable and unstable, affecting the overall distinctiveness of tone: The Dege dialect, for example, has four tonemes and six tone values: two long—51 and 131—and two short—55 (53)⁷ and 13 (231).

la ⁵¹	'muskdeer'	la ⁵⁵ (53)	'spirit'	laʔ ⁵⁵	'wave'
la ¹³¹	'woolen cloth'	la ¹³ (231)	'mountain'	laʔ ¹³	'say'

Certain instances of the 13 (132) tone borne by syllables which had voiced cluster initials vary freely with the corresponding high tones:

bsdad	dɛʔ ^{13~55}	'sit'	'bod	mbeʔ ^{13 ~ 55}	'cry'
sga	ga ¹³ (231) ~ 55 (53)	'saddle'	mgo	ŋgo ¹³ (231) ~ 55 (53)	'head'

2.6. Tone values are relatively stable and independently distinctive: Lhasa Tibetan, for example, has four tonemes and six tone values, two long—55 and 113—and two short—53 (54, 52) and 13 (12, 132):

ka ⁵⁵	'pillar'	ka ⁵³ (54)	'decree'	kaʔ ⁵³ (52)	'hinder'
ka ¹¹³	'install'	ka ¹³ (12)	'saddle'	kaʔ ¹³ (132)	'be clogged'

54 and 52, the positional allotones of 53, and 12 and 132, the positional allotones of 13, are conditioned by the presence versus absence of the glottal stop respectively.

⁷ Enclosed in parentheses are variant tone values.

Tones are even more fully developed in Shigatse Tibetan, which has six phonetic tones and six corresponding tonemes, usually with no associated features.

ka ⁵⁵	'pillar'	ka ⁵⁴	'decree'	ka ⁵¹	'hinder'
ka ¹¹³	'swim'	ka ²³	'saddle'	ka ²³¹	'be clogged'

All of the other dialects to be mentioned in this paper also exemplify this type. Following are their tonemic systems and tonal values:

Muya: Three tonemes, three tonal values: 55, 53, 13. For example: na⁵⁵ 'wild goat', na⁵³ 'pus', na¹³ 'black'. The long tone 55 occurs very infrequently.

Zhongdian: Two or four tonemes depending on the analysis, six tonal values: 55 (54), 13 (23), 53, 231. For example: na⁵⁵ 'argali', na¹³ 'ill', na⁵³ 'pus', na²³¹ 'forest', ɕə⁵⁵ (54) 'powder', ɕə¹³ (23) 'write'. The short allotones 54 and 23 and the long allotones 55 and 13 are associated with different vowel qualities, -e and non-e vowels respectively. The other two tone values 53 and 231 co-occur with the glottal stop coda and can hence be regarded as allotones of 55 and 13 with which they are in complementary distribution.

Zhouqu: Five tonemes, six tonal values: 121, 53 (42), 342, 12 (~22), 21. For example: ka¹²¹ 'pillar', ka⁵³ 'hoe', ka³⁴² 'hinder', ky⁵³ 'dig', ky³⁴² 'winter', ky²¹ 'chive', t'u⁵³ (42) 'dense', t'u¹² 'drink'. 121 and 12 are long tones; the rest are short ones. The falling tone 53 has the variant 42 occurring with voiceless aspirated initials, while the two low tone values 12 and 22 vary freely.

Ruoergai: Four tonemes, six tonal values: 44, 112, 54 (53), 23 (232). For example: se⁴⁴ 'gold', se¹¹² 'heart', se⁷⁵⁴ (53) 'kill', ke⁴⁴ 'boil', ke⁵⁴ 'neck', ke⁷⁵⁴ (53) 'voice', ke⁷²³ (232) 'laugh'; ɳe²³ 'fire', ɳe⁷²³² 'find'. 54 and 23, which co-occur with the glottal coda, are in complementary distribution with 53 and 232 respectively.

Sherpa: Five tonemes, five tonal values: 42, 221, 54, 32, 24. For example: na⁴² 'argali', na²²¹ 'highland barley', na⁵⁴ 'oath', na³² 'ill', ɕi²⁴ 'four', ɕi⁵⁴ 'die', dzim²⁴ 'catch (imperative)', dzim³² 'catch (perfective)', jip²⁴ 'hide (imperative)', jip³² 'hide (perfective)'. The tone 24, which rarely occurs outside of verbal paradigms, may have arisen specifically for differentiating grammatical meanings, as it does not seem to correlate with either old initial or rhyme distinctions.

3. Conditions for the Genesis and Diversification of Tone

The tonal types discussed above by and large represent various tonogenetic stages in Tibetan.

Ngaba typifies the Amdo dialect. The phonological structure of Amdo Tibetan in general resembles that of OT as codified in the traditional Tibetan script, keeping for example the OT voicing distinction in the obstruent initials, as well as relatively more cluster initials and distinct codas. Since enough of the original segmental means for distinguishing meanings were preserved, there was no need to resort to tonogenesis. From the existence of atonal modern Amdo dialects one can infer that OT must also have been atonal.

The 'natural tones' of Daofu were conditioned by OT initials and codas such that voiceless and voiced cluster initials yielded high (phonetic) register whereas plain voiced initials yielded low register. In the high register, continuant codas yielded level pitch whereas zero and stop codas yielded falling pitch.

Natural tone represents the embryonic stage of tonogenesis, part of the history of probably all the tonal dialects. Phonemic tone arose as a consequence of sound changes leading to the gradual increase of the distinctive function of syllable initials and codas, and the corresponding decrease of the function of natural tones.

The diversification of tone was far from uniform across Tibetan dialects. In general, tonal register had to do only with OT initials; whereas tonal length and checkedness had to do only with OT codas. In some dialects, however, tonal register had to do with both syllable slots. In what follows, the main conditions for tonal diversification in ten dialects will be discussed. Actual monosyllabic tone values rather than tonemes will be presented, as the latter often subsume several variant or sandhi values and tend to obscure the connections with the conditioning OT syllable structures.

3.1. Tone Splits Producing Register Distinctions

Tones in Tibetan dialects fall under two (high and low) or sometimes three (high, mid, low) registers. Phonetic variables of the OT syllable onset which induced register split include:

- (1) Voicing (vd) vs. absence of voicing (vl)
- (2) Obstruency (obs) vs. sonorancy (son)
- (3) Aspiration (asp) vs. absence of aspiration (nonasp)
- (4) Presence (C-) vs. absence (Ø-) of preradical consonants
- (5) Presence of nasal (N-) vs. non-nasal (O-) preradicals
- (6) Presence of s- vs. other (non-s-) preradicals

These variables also combine and interact. Table 3 summarizes the correspondence patterns of tone register and the nature of the OT syllable onsets in the ten modern dialects (illustrative examples in each dialect follow Table 3):

	High	Nature of OT onset	Low	Nature of OT onset	Mid	Nature of OT onset
Balti	51, 53, 42	vd; vl	132, 24, 21	ø-vd (a few cases); vl (a few cases)		
Muya	55, 53	vl; C-son	13	vd obs; ø-son		
Lhasa	55, 54, 52	vl; C-son	113, 12, 132	vd obs; ø-son		
Shigatse	55, 54, 51	vl; C-son	113, 23, 231	vd obs; ø-son		
Dege	51, 53, 55	vl; p-son; C- vd obs (some cases)	131, 231, 13	ø-vd obs; C- vd obs (some cases)		
Zhongdian	55, 54, 53	vl; C-son; C- vd obs (most cases)	13, 23, 231	ø-vd obs; C- vd obs (a few cases); vl asp (a few cases)		
Yushu	41, 53, 44	vl; C-son	121, 21, 12	ø- vd; N- vd obs	31, 32, 23	O- vd obs; zl-
Zhouqu	53, 42	vl asp; s-son (53); vl unasp (42)	121, 21, 12 (~22)	ø- vd; C- vd obs (some cases); vl asp (other cases)	342	non-s- obs; C- vd obs (some cases)
Ruoergai	44, 54, 53	vl unasp; ø- vd; vl-asp (zero or stop coda)	112, 23, 232	p-vd; vl asp (continuant coda)		
Sherpa	42, 54	vl unasp; C-son; vl asp (some cases)	221, 32	vd obs; ø-son; vl asp (some cases)		

Table 3

OT	Balti	gloss	OT	Balti	gloss
tsha-ba	ts'a ⁵¹	'hurt'	da	ta ⁵³	'now'
nad	nat ⁴²	'ill'	sgo	go ⁴²	'door'
kha-ba	k'a ¹³²	'snow'	ka-ba	ka ¹³²	'pillar'
nga	ŋa ²⁴	'I'	lo	lo ²¹	'year; age'
OT	Muya	gloss	OT	Muya	gloss
gla-ba	la ⁵⁵	'muskdeer'	rta	tæ ⁵³	'horse'
kha	k'æ ⁵³	'mouth'	mngag	ŋa ⁵³	'dispatch'
na	næ ¹³	'ill'	brgyad	dze ¹³	'eight'
OT	Lhasa	gloss	OT	Lhasa	gloss
gla-ba	la ⁵⁵	'muskdeer'	lnga	ŋa ⁵⁴	'five'
stag	ta ⁷⁵²	'tiger'	khirms	tʂ'im ⁵²	'law'
mar	ma ¹¹³	'butter'	nga	ŋa ¹²	'I'
sbas	pɛ ⁷¹³²	'bury'	zhabs	ɕap ¹³²	'foot (hon.)'
OT	Shigatse	gloss	OT	Shigatse	gloss
gla-ba	la ⁵⁵	'muskdeer'	rta	ta ⁵⁴	'horse'
dmag	ma ⁵¹	'soldier'	sems	sem ⁵¹	'mind'
mgo-bo	ko ¹¹³	'head'	sbas	piɛ ²³¹	'bury'
ba	p'a ²³	'cow'	zhabs	ɕap ²³	'foot (hon.)'
OT	Dege	gloss	OT	Dege	gloss
gla-ba	la ⁵¹	'muskdeer'	rta	ta ⁵³	'horse'
gnangs	noŋ ⁵³	'day after tomorrow'	rdzas	dze ⁵³	'gun powder'
dmag	mɔ ⁷⁵⁵	'soldier'	slebs	tse ⁷⁵⁵	'arrive'
nam	nɔ̃ ²³¹	'when'	gzhis	ɣi ²³¹	'property'
nu-bo	nu ¹³¹	'younger brother'	brgyad	dze ⁷¹³	'eight'

OT	Zhongdian gloss		OT	Zhongdian gloss	
gla-ba	la ⁵⁵	'muskdeer'	mag	na ⁷⁵³	'pus'
gnangs	nu ⁵⁵	'day after tomorrow'			
rta	ta ⁵⁵	'horse'	rdar	diu ⁵⁵	'grind'
chu	tɕʰɛ ⁵⁴	'water'	sder	diu ¹³	'dish'
shwa	ʂa ¹³	'deer'	thon	tʰuei ¹³	'finish'
nags	na ⁷²³¹	'forest'	ri	re ²³	'mountain'

OT	Yushu gloss		OT	Yushu gloss	
gla-ba	la ⁴¹	'muskdeer'	rta	ta ⁵³	'horse'
spre'u	pi ⁵³	'monkey'	snabs	pap ⁴⁴	'snot'
gzhas	zi ³¹	'dance; sport'	gdangs	dan ³¹	'melody'
gda'	da ³²	'exist'	rdib	di ⁷²³	'collapse'
kha-ba	kfa ¹²¹	'snow'	'dang	nɕen ¹²¹	'enough'
ja	ja ²¹	'single'	dus	tɕi ²¹	'time'
yag	ja ⁷¹²	'good'			

OT	Zhouqu gloss		OT	Zhouqu gloss	
rta	ta ⁵³	'horse'	sman	mie ⁵³	'medicine'
lcags	tɕa ⁵³	'iron'	phag	p'a ⁴²	'pig'
mag	na ³⁴²	'pus'	'gel	ngia ³⁴²	'carry burden'
ka-ba	ka ¹²¹	'pillar'	mdang	nɕu ¹²	'yesterday'
sems	s'e ¹²	'mind'	'phur	p'u ¹²	'fly v.'
nya	na ²¹	'fish'	ded	ti ²¹	'chase (imp)'

OT	Ruoergai gloss		OT	Ruoergai gloss	
ka-ba	ka ⁴⁴	'pillar'	rta	tæ ⁵³	'horse'
phag	p'a ⁷⁵³	'pig'	'khyags	tɕ'a ⁷⁵³	'cold'
nas	ne ⁴⁴	'highland barley'			
zangs	zo ⁴⁴	'copper'	nga	ŋæ ⁵⁴	'I'
kha-ba	k'a ¹¹²	'snow'	chang	tɕ'o ¹¹²	'wine'
sga	kæ ²³	'saddle'	brgyad	tɕe ⁷²³²	'eight'

OT	Sherpa	gloss	OT	Sherpa	gloss
ka-ba	ka ⁴²	'pillar'	'then	t'en ⁴²	'pull'
gnangs	na ⁵⁴	'day after tomorrow'	gtub	tup ⁵⁴	'cut'
thob	t'op ³²	'receive'	'gam	gam ³²	'swallow dry'
kha-ba	k'a ²²¹	'snow'	sgam	gam ²²¹	'box'
nas	na ²²¹	'highland barley'	tshigs	ts'i ²²¹	'joint'
tshang	ts'an ²²¹	'nest'			

The dictum '*high tone if (the original syllable onset was) voiceless; low tone if voiced*' has often been cited to describe the conditions for the genesis of high and low registers in Tibetan. On the basis of the foregoing table, this generalization seems to hold true only for a subset of modern Tibetan dialects. Voiced initials gave both high and low registers in all dialects surveyed, while in certain dialects *aspirated* initials also yielded both registers.

Although OT syllables with voiceless unaspirated initials became associated with high register in the majority of dialects, in Zhongdian, Zhouqu, Ruorgai, and Sherpa a number of such syllables carry low register instead. In Ruorgai, this split seems clearly conditioned by phonological structure, such that syllables with aspirated initials take high register when ending in zero or stop codas, and take low register when ending in continuant codas. The conditioning factors for this type of register split in the other dialects are less clear. However, a number of forms are uniformly low-registered across these dialects:

	'see'	'drink'	'snow'	'wine'	'nest'
OT	mthong	'thung	kha-ba	chang	tshang
Zhongdian	t'uŋ ¹³	t'ɔ̃ ¹³	k'a ¹³	---	---
Zhouqu	---	t'u ¹²	k'a ¹²¹	tɕ'uɔ ¹²	ts'uɔ ¹²
Ruorgai	t'u ¹¹²	t'u ¹²	k'a ¹¹²	tɕ'ɔ̃ ¹¹²	ts'ɔ̃ ¹¹²
Sherpa	t'onj ³²	t'uŋ ¹³	k'a ²²¹	tɕ'anj ²²¹	ts'anj ²²¹

In all dialects surveyed OT voiced root initials underwent the high-low tonal split, although the conditioning factors are diverse. In most dialects, tone split in syllables with sonorant initials was determined by oral preradicals: high-toned if oral preradicals were present and low-toned if not. In Zhouqu, only the s- preradical conditioned high tone whereas the other preradicals produced mid tone. In Muya, Lhasa, Shigatse, and Sherpa, voiced obstruent

initials regardless of preradicals yielded low tone. In Dege and Zhongdian, however, only plain voiced obstruent initials conditioned low tone; tone produced by OT voiced obstruent initials with preradicals is high in some cases and low in others (with unclear phonological motivation), or variable in still other cases. In Yushu, voiced obstruent initials yielded low and mid tones when carrying nasal and oral preradicals respectively. Ruogergai is anomalous in that plain voiced initials became high-toned whereas prefixed voiced initials became low-toned. In Balti the majority of syllables, voiced or not, received high tone, although a small number of syllables with unprefixes voiced or voiceless initials became low-toned (phonological motivation unclear). Although Balti has developed a few tonally differentiated minimal pairs, most syllables of any type are associated with a contrastive high falling pitch, as in the Amdo Aba dialect. Thus, Balti exemplifies a budding stage of tonogenesis, with its tone split apparently proceeding in a *diffusional* rather than conditioned manner.

3.2. Tone Split Producing Length Distinctions

All of the dialects surveyed in this paper contrast long and short tones. Tone length was conditioned by the following variables concerning OT syllable codas, as shown in Table 4:

- (1) Presence vs. absence (-Ø) of codas
- (2) Continuant vs. stop codas
- (3) -s vs. other continuant codas
- (4) Single vs. cluster codas
- (5) Presence vs. absence of the suffixes -ba, -bo, -'u and -'i in the case of open-syllable roots

	Long Tones		Short Smooth Tones		Short Checked Tones	
	51, 132	with coalesced suffixes		53, 42, 24, 21	elsewhere	
Balti	55	with coalesced suffixes		53, 13	elsewhere	
Mura	55, 113	-Ø with coalesced suffixes; non-s continuant codas	54, 12 -Ø		52, 132 -s; stop codas; cluster codas	
Lhasa	55, 113	-Ø with coalesced suffixes; non-s continuant codas	54, 23 -Ø; -b, -bs, -g (those with modern reflex in -Ø); with modern reflex in /-k/		51, 231 -s, -d, -g (those with modern reflex in -Ø); cluster codas except -bs	
Shigatse						
Dege	51, 131	-Ø with coalesced suffixes	53, 231 -Ø; continuant codas; cluster codas -ms, -ngs		55, 13 stop codas; cluster codas -gs, -bs	
Zhongdian	55, 13	-Ø with coalesced suffixes; -Ø (with modern non- <i>v</i> vowels); continuant codas; cluster codas -ms, -ngs	54, 23 -Ø (with modern - <i>v</i> vowel)		53, 231 stop codas; cluster codas -gs and -bs	
Yushu	41, 31, 121	-Ø with coalesced suffixes -ba, -bo; continuant codas -m, -n, -ng, and -r as well as -l, -s preceded by the vowel -a; cluster codas -ms, -ngs	53, 32, 21 -Ø with coalesced suffixes -i and -u; -l, -s preceded by vowels other than -a		44, 23, 12 stop codas; cluster codas -gs, -bs	
Zhouqu	121, 12 (-22)	-Ø with coalesced suffixes; continuant codas; cluster codas -ms, -ngs	53, 42, 21 -Ø; stop codas; cluster codas -bs, -gs		342 elsewhere	
Ruoergai	44, 112	-Ø with coalesced suffixes; continuant codas (in part); cluster codas -ms, -ngs	54, 23 -Ø		53, 232 stop codas; cluster codas -gs, -bs	
Sherpa	42, 221	-Ø with coalesced suffixes; continuant codas (in part); cluster codas -gs, -ms, -ngs	54, 32 -Ø; stop codas; -bs; continuant codas (in part)			

Table 4

From Table 4 it is clear that the predominant source of modern long tones was via contraction of open root syllables with the suffixes -ba, -bo, -i, and -u (In Yushu contracted syllables involving the suffixes -i, and -u resulted in short tones, however).

In dialects other than Balti, Muya, and Dege, continuant codas also contribute significantly to tonal length; this has to do with the fact that these codas have greater intrinsic duration. Since the continuant codas themselves had divergent phonological histories, they did not affect tone length in the same way in the different dialects.

In Yushu, OT -l and -s generated long tones after -a but not after non-a vowels, probably because these codas dropped sooner after non-a vowels. The -s coda in Lhasa and Shigatse yielded short rather than long tones, for -s had first gone to -ʔ in these dialects.

In Sherpa, certain OT syllables with continuant codas are pronounced long, while others are pronounced short. This is because before such codas Sherpa vowels split into long and short varieties, for example:

tum ⁵³	'wrap up'	tu:m ⁴²	'wrap up (imp)'
gam ³²	'swallow st. dry'	ga:m ²²¹	'box'
raŋ ³²	'self'	ra:ŋ ²²¹	'honey'

A subset of OT continuant-coda syllables with cluster onsets containing voiced obstruent root initials yielded long-tone reflexes in Zhouqu (e.g. bdu:n/ty:¹²¹ 'seven'; bzang/zu:¹²¹ 'good'), probably because this particular phonological environment retarded the loss of the nasal codas -n and -ng. In Zhongdian, Yushu, Zhouqu, Ruogergai, and Sherpa, the cluster continuant codas -ms, -ngs (as well as -gs in Sherpa) also conditioned long tones.

OT syllables which did not coalesce with the suffixes mentioned above have all become short-toned in Balti and Muya; this is largely true also of Sherpa. In Lhasa, Shigatse, Dege, Zhongdian, Yushu, Zhouqu, and Ruogergai, OT open and checked syllables yielded short smooth tones and short checked tones respectively. Minor differences, however, exist among these latter dialects. In Lhasa, -s conditioned the same checked tone as the stop codas. In Shigatse, OT syllables with -b and some with -g (those with modern reflexes in /-k/) behaved tonally like syllables with zero codas, while those with -d and some with -g (those with modern reflexes in -Ø) yielded a different set of tones. In Zhongdian, historically open syllables carry smooth short tones only if the modern nuclear vowel is -e, otherwise, they are long-toned. OT syllables with the cluster codas -bs and -gs led to short checked tones in Dege, Zhongdian, Yushu, and Ruogergai. In Shigatse, OT -gs, -ms, and -ngs yielded short checked tones but -bs behaved like the zero-coda in conditioning short smooth tones. All of the cluster codas -ms, -ngs, -bs, and -gs resulted in short checked tones

in Lhasa, whereas OT -ms, -ngs in Dege and -bs, -gs in Zhouqu gave short smooth tones instead.

There are two competing views regarding the chronological order of tonal splits in Tibetan. In one view the high-low register split induced by OT initials preceded secondary splits caused by OT codas (Hu 1980), while the other view advocates the reverse order (Feng 1984). More argumentation is clearly needed to resolve this controversy either way.

There is no necessary phonological correlation between types of the original syllable initials and rhymes and the resultant pitch contours. More often than not, OT continuant codas generated level tones in the high register and rising tones in the low register. In several dialect localities, nevertheless, the same OT prototypes developed into falling tones in the high register and double-gliding (rise-fall/fall-rise) or falling tones in the low register. OT stop codas conditioned high falling and low double-gliding checked tones in most cases; yet in Dege and Yushu we find high *level* and low *rising* checked tones instead.

4. Conclusions

Two major conclusions emerge from the foregoing discussions.

First, a stage of 'natural tone' may have preceded the phonemicization of tone in Tibetan dialects. Phonemic tone stemmed from sound changes (such as obstruent onset devoicing, attrition of initial consonant clusters, and loss or coalescence of consonantal codas) leading to the gradual decrease of the distinctiveness of the original initials and rhymes and the corresponding increase in function of the once redundant 'natural tones'.

Second, the main trends in the development of tonal registers in Tibetan dialects were for OT syllables with obstruent onsets to induce low register when the latter were voiced, and high register otherwise, and for OT syllables with sonorant onsets to induce low register if (oral) preradicals were absent, and high register otherwise. As for the development of tonal length, the major scenario was that continuant codas and contracted suffix syllables yielded long tones, whereas stop and zero codas produced short tones. However, the precise conditions for tonal diversification vary from one dialect to another, depending on the trend and rate of sound changes in each dialect.

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APPENDIX

Major Publications by Huang Bufan 黃布凡
on Tibeto-Burman Linguistics

- 1981a. "A preliminary study of four Old Tibetan translations of the Chinese classic *Shangshu*" 《尚書》四篇古藏文譯文的初步研究. *Yuyan Yanjiu* 語言研究 1:203-32.
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1988. "Linguistic relations among the Tibetan communities in western Sichuan" 川西藏區的語言關係. *China Tibetology* 中國藏學 3:142-50.
1989. "PTB 'horse' and Archaic Chinese *mrung 藏緬語的 '馬' 與古漢語的 '駝'." *Bulletin of the Central College of Nationalities* 中央民族學院學報 2:63-8.
- 1990a. "Phonology and verbal conjugation in the Daofu language" 道孚語語音和動詞形態變化. *Minzu Yuwen* 民族語文 5:23-30.
- 1990b. "Brief sketch of the Zhaba language" 扎壩語概況. *Bulletin of the Central College of Nationalities* 4:71-82.
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