A PHONOLOGICAL RECONSTRUCTION OF PROTO-WESTERN TIBETAN

by

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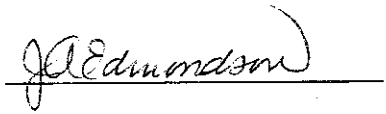

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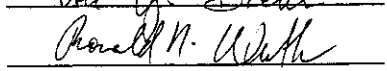

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ABSTRACT

A PHONOLOGICAL RECONSTRUCTION OF PROTO-WESTERN TIBETAN

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Balti, Purik, and Ladakhi are the westernmost modern spoken varieties of the Tibetan language. Using data from these western varieties, a Proto-Western Tibetan phonemic system has been reconstructed by the comparative method. Each of the reconstructed proto phonemes is listed with its reflexes in each of the modern daughter varieties, and examples are given for each reflex. The sound change rules necessary to derive the various reflexes are then displayed and explained. The rules are categorized according to the type of phonological process involved, and possible motivations for each of the various kinds of sound changes are discussed. Special emphasis is given to the prominent role of the proto phoneme *r in many of the sound changes. The phonemic inventories of each of the daughter varieties are compared with that of the proto language, revealing that Eastern Balti is the most conservative of the modern varieties studied.

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LIST OF ABBREVIATIONS AND SYMBOLS

affr.	affricate
alv.	alveolar
asp.	aspirated
B	entry from Bailey (1915)
C	consonant
cons	consonantal
cont	continuant
cor	coronal
del rel	delayed release
E	Eastern Balti
excl.	exclusive
fric.	fricative
H	entry from Hoshi (1978)
incl.	inclusive
K	entry from Kargil Purik word list taken in Skardu
L	Ladakhi
O	entry from Rondu word list (Western Balti)
n.	noun
NC	no cognate form available
obs	obstruent
P	Purik
plos	plosive
R	entry from Rangan (1975 or 1979)

retro	retroflexed
S	entry from Skardu word list (Western Balti)
son	sonorant
T	entry makes use of Written Tibetan form to help determine an otherwise ambiguous reconstructed Proto-WT form
V	vowel
vb.	verb
vl.	voiceless
vd.	voiced
W	Western Balti
WT	Western Tibetan
ygr.	younger
Z	entry from Zanskar Ladakhi word list (Karsha village)

*	Proto form
~	alternates with
/ /	phonemic form
[ ]	allophonic (phonetic) form
‹ ›	Written Tibetan form
--›	became
0	null segment or zero
#	word boundary
+	morpheme boundary (when not within [ ])
---	no entry available
?	denotes uncertain segment in a reconstructed word
(?)	denotes uncertain reconstruction

[blank]

1.0 INTRODUCTION

This reconstruction of Proto-Western Tibetan is based on data from Balti, Purik, and Ladakhi, the three westernmost modern spoken Tibetan varieties. These three are spoken in an area which, from about 1400 to 1840 A.D., comprised what has been called the Western Tibetan Kingdom (Francke 1986[1907]:60-120).[1] Balti is presently spoken by about 300,000 people in the Karakoram mountain region of northeastern Pakistan, while Purik and Ladakhi are spoken in the adjacent area of northern Jammu and Kashmir state in India. Purik, sometimes considered a transitional variety between Balti and Ladakhi, is spoken by about 50,000 people,[2] primarily in the vicinity of Kargil, near the Indian-Pakistani ceasefire line. Ladakhi is spoken throughout the rest of Ladakh district, east and south of Purik territory, by perhaps 70,000 people.[3]

While these three varieties are often referred to simply as Tibetan dialects, they are distinct from one another, and even more so from the central Tibetan varieties, for sociolinguistic, as well as for linguistic, reasons. For the purposes of this study I have further divided Balti into two varieties, Western Balti and Eastern Balti, even though most Balti speakers consider the language to be one (Backstrom 1992:26-27).

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[1]The domain of the kingdom varied throughout this period with the vicissitudes of internal wars and external invasions. As a result, Baltistan was sometimes under the control of the king in Leh, sometimes not.

[2]Rangan (1975:5) cites a 1971 census figure of 40,136 *Balti* speakers in India. In his 1979 work he acknowledged that these people prefer to call their language *Purki*. Although the linguistic boundary between Balti and Purik may not be so clear-cut, current usage seems to apply the term Balti to that which is spoken in Pakistani-controlled territory, and Purik (or Purki) to that found in Indian-controlled territory.

[3]Grimes lists a 1971 census figure of 56,737 (1992:550).

1.1 Purpose of the study

The purpose of this study is to reconstruct the phonological system of Proto-Western Tibetan by the comparative method, using data from Western and Eastern Balti, Purik, and Ladakhi. It is hoped that this reconstruction will help to increase our understanding of the history of the Western Tibetan varieties and the processes involved in their development and divergence. It is also hoped that this will help us to determine to what extent, if any, Proto-Western Tibetan was already distinct from classical, seventh century A.D., Tibetan, as preserved in the Tibetan writing system, before the four daughter languages represented in this study began to be differentiated from one another.

1.2 Nature of the data

In my own research in Baltistan I collected word lists of approximately 350 items from six different Balti-speaking locations, as well as one such list from two Purik speakers who had migrated from their home area, now a part of India, to Baltistan shortly afrer the partition of British India in 1947. After extensive comparison of the six Balti word lists, I determined that they could be divided into two phonologically distinct groups, which I have called Western Balti and Eastern Balti. I then chose one location from each group to represent their respective groups in this analysis. I chose Shigar to represent Western Balti, and Chorbat to represent Eastern Balti (see map of Baltistan & Ladakh). I have used a small number of words from the other two Western Balti locations, Rondu and Skardu, to supplement my Western Balti list where the Shigar list did not, for one reason or another, provide an appropriate word for the desired cognate set. All such substitutions have been noted in the word lists in appendix A.

The data used here to represent Purik and Ladakhi is taken primarily from word lists collected by my colleagues in the Summer Institute of Linguistics. Their

lists correspond to the first 236 words on my word lists. Consequently, it is these 236 words that are the principal basis for the comparative analysis presented here. The Purik list was contributed by a woman from the village of Mulbekh, in the southeastern part of the Purik-speaking area. I have occasionally found it necessary to supplement this list with words taken either from my own Purik list, or from one of the sources available in the literature, i.e. either Rangan (1975 and 1979) or Bailey (1915). To represent Ladakhi I have chosen a word list from Leh, a central location, and also the capital of Ladakh. Occasionally, I have augmented this list with words from the Zangskar region of Ladakh, located to the southwest of Leh. The latter have been taken either from my colleagues' list from that area, or from Hoshi (1978), and, of course, they have been credited as such.

1.3 Research questions

This study seeks to provide answers to the following research questions:

(1) What was the phonological system of Proto-Western Tibetan like, and how does it compare with the systems of its daughter languages?

(2) What are the sound change rules which are responsible for the observed phonological changes between Proto-Western Tibetan and its various daughter languages?

(3) What generalizations, if any, can be made about these sound changes?

1.4 Limitations

This study was subject to the following limitations:

(1) The word lists contain only 236 words from which sound correspondences may be determined.

(2) The word lists were not all elicited by the same linguist, so it is likely that possible cognate sets have been missed for some glosses. Therefore, the

number of glosses which have a complete set of cognates, i.e. a cognate word in each of the four varieties under consideration, is significantly less than 236. Also, minor variations in phonetic transcription are possible. These may in turn affect the phonemicization of the data.

(3) In some cases, word lists were elicited from single individuals whose speech is assumed to be representative of the speech of their respective regions.

(4) The Purik list, although taken primarily from a single source, has been substantially augmented with words from various other sources in order to obtain cognate words for the maximum number of comparisons. Since Purik itself has significant regional variation, ranging from Eastern Balti-like varieties to Ladakhi-like varieties, there is some inconsistency in the application of some of the sound change rules for Purik. Ladakhi also has regional variation which cannot be adequately addressed in this study.

1.5 Classification

Balti, Purik, and Ladakhi are generally classified as belonging to the Western branch of the Bodish (Tibetan) section of the Bodic division of the Tibeto-Burman language family.[4]

1.6 Previous studies in the phonology of Western Tibetan varieties

H. A. Jäschke, an important nineteenth century scholar of the Tibetan language, was one of the first to comment on the great phonological diversity of spoken Tibetan varieties. In his monumental Tibetan-English dictionary, published in 1881, he made the following observations on the patterns of survival or non-survival of the classical, Written Tibetan pronunciations:

[4]For a detailed display of several major attempts at classifying the Tibeto-Burman language family, see Hale (1982:18-35).

> the purest and most striking forms of this survival have their homes in those districts, which are most remote from and least subject to the disintegrating and dissolving influences of the actual centre of Tibetan civilisation, the capital Lhasa. Thus the prefixes and the superscribed consonants, for the most part, are still sounded at each extremity of the whole territory, within which the language is spoken, both on the Western and the Eastern frontier (1881:XII-XIII).

More recent scholarship has confirmed that the most phonologically conservative Tibetan varieties are located at the extremities of the former Tibetan empire. Balti, at the western extremity, is perhaps the most conservative of all, while Amdo Tibetan, over a thousand miles to the east, also preserves many archaic features.[5] Neither the Western Tibetan varieties nor Amdo have developed tone,[6] and both preserve, to different extents and in different ways, many of the so-called preradical consonants of Written Tibetan.[7] As for vowels, the Western varieties seem again to be the most conservative. Balti has maintained the simple five vowel system of Written Tibetan (Bielmeier 1985:50), while Central Tibetan varieties, and even Amdo, at least in some of its varieties (Sun 1986:31), have developed more complex systems.

Of all the Tibetan varieties, those of Central Tibet, including the prestigious Lhasa variety, are the most innovative. They have generally lost all of the preradical consonants, as well as voicing on initial obstruents, preserving the necessary contrasts by means of a system of tones. Similarly, many final consonants

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[5]The similarities between the Western Tibetan varieties and Amdo varieties have led some to believe that they have a close genetic relationship as well. Sun (1986:3), following Nishida, proposes that Proto-Tibetan first split into three branches: Old Central Tibetan, Old Khams Tibetan, and Old Amdo Tibetan. The latter then split into Amdo Tibetan and West Tibetan. Both of these groups were historically comprised largely of nomadic herders, so it is not difficult to surmise that they may have once lived in proximity to each other and subsequently migrated to their present locations.

[6]Although Sprigg has contended that Balti is tonal in a very limited way (1966:200-201), Bielmeier holds that it should be analyzed in terms of stress, rather than tone (1985:69).

[7]Amdo has several different subvarieties, many of which have been studied very little or not at all by Western scholars. In the Ndzorge śæme Xora dialect, although initial clusters have been simplified to single units phonemically, the preradical consonants (those which precede or are written above the main syllable initial consonant in Written Tibetan) have generally left traces in the form either of preaspiration or prenasalization (Sun 1986:139).

and clusters have been eliminated, their contrasts being replaced by a larger and more diverse set of vowels (Chang 1992:158).

One of the most widespread changes which have occurred in modern Tibetan varieties is the coalescence and retroflexion of original word initial clusters consisting of a stop followed by /r/. Jäschke noted in the last century that West Tibet was one of the few places where this had not uniformly occurred. He states, "In some parts of the country, as in Purig, these combinations are pronounced literally, like *kra, khra* etc., but by far the most general custom is to sound them like the Indian cerebrals" (1954:7-8).

Similarly, A.F.C. Read made reference to some of the differences between the varieties I refer to as Western Balti and Eastern Balti in his *Balti Grammar* (1934:3). He notes that

> the following combinations when initial are in some districts, particularly around Skardu, pronounced differently ...
> 'gr' becomes 'dr'
> 'br' becomes 'bl'
> 'kr' becomes 'tr'
> 'khr' becomes 'thr'

More recently, Sprigg (1966, etc.) and Bielmeier (1985) have made significant contributions in the area of Balti phonology from both synchronic and diachronic perspectives.

Michiyo Hoshi has published a useful thousand word vocabulary of the Zangskar variety of Ladakhi (1978). He compares each Zangskar word with the Written Tibetan form from which it has apparently descended, and lists the consistent sound changes that have occurred.

In spite of its unique position, Purik seems to have attracted less linguistic attention to date than either Balti or Ladakhi. Bailey (1915) and Rangan (1975, 1979) have both compiled Purik vocabularies with grammatical sketches. Rangan's

also includes a lengthy phonological analysis, which unfortunately is made less convincing by his overreliance on loan words to prove a number of contrasts.

2.0 RECONSTRUCTION OF PROTO-WESTERN TIBETAN

The Proto-Western Tibetan phonemes shown below were derived by the comparative method using the words in the word lists shown in Appendix A. Phoneme charts for Balti, Purik, and Ladakhi are found in Appendix B. The analysis presented in this chapter will be arranged in the order of the proto phonemes as shown in Table 1. Only the consonants will be presented since the vowels have remained relatively stable. The few minor changes that have occurred in the vowels do not seem to follow any consistent pattern that can be identified in the limited data available here.

Table 1. Consonant system of Proto-Western Tibetan

	Labial	Dent./Alv.	Palato-alv.	Velar	Glottal
vl. stops	p	t		k	
vl. asp. stops	p^h	t^h		k^h	
vd. stops	b	d		g	
vl. fric.		s	ʃ	x	(h)
vd. fric.		z	ʒ		
vl. affr.		ts	tʃ		
vl. asp. affr.		ts^h	$tʃ^h$		
vd. affr.		dz	dʒ		
nasal	m	n	ɲ	ŋ	
approximant		r			
lateral		l			
semi-vowel	w		j		

Table 2. Vowel system of Proto-Western Tibetan

	Front	Central	Back
Close	i		u
Close-mid	e		o
Open		a	

For each of the consonants, the Proto-WT phoneme will be listed, followed by its reflexes in each of the four representative daughter languages. Since these

reflexes will often vary according to the phonological environment in which the original phoneme occurred, they will be further arranged according to specific environments, as needed. In each case, at least three examples will be given for each phoneme in each environment, unless fewer examples occurred in the data.

2.1 Stops

2.1.1 *p

Proto-WT voiceless bilabial stop *p remained /p/ word initial before vowels in P and L. In W and E it became voiced, thus becoming /b/.

Word initial before vowels

*p --> W b, E b, P p, L p

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
19	skin	baxspa	bakspa	pakspa	pakspa	pakspa (R30)
218	knee	buxmo	buxma	puksmo	pigmo	puksmo (R30)
63	root	NC	NC	paṭak	paṭak	pa(?)ak

Proto-WT *p was deleted word initial in L and P before two consonants. In E it became /h/ in that environment.

Word initial before two consonants

*p --> W p, E h, P 0, L 0

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
160	ten	ptʃu	hstʃu	ʃtʃu (RAB)	stʃu	pstʃu (R3)

Proto-WT *p was also deleted in L when it occurred between two consonants.

Between two consonants

*p --> W ?, E ?, P p, L 0

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
48	cloud	NC	NC	sprin	rsin	sprin (R5)

For word initial *p followed by *r, see §2.2.1. In other positions, *p remained /p/ in all four language varieties.

Word medial

*p --> W p, E p, P p, L p

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
13	arm	plakpa (0)	prakpa	lakpa (K)	lakpa	prakpa/lakpa
20	bone	ruspa	ruspa	ruspa	ruspa	ruspa
37	thread	skutpa	skutpa	skutpa	skutpa	skutpa

Word final

*p --> W p, E p, P p, L p

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
38	needle	k^{h}ap	k^{h}ap	k^{h}ap	k^{h}ap	k^{h}ap

2.1.2 *p^{h}

Proto-WT voiceless aspirated bilabial stop *p^{h} occurs infrequently in the data. For its occurrence followed by *r, see §2.2.1. There are only two other examples in the data which contain cognates or partial cognates in all four varieties. They are shown below. It is not clear why *p^{h} has been deleted in Ladakhi in 194. Elsewhere, *p^{h} remained /p^{h}/.

Word initial

*p^{h} --> W p^{h}, E p^{h}, P p^{h}, L p^{h} ~ 0

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
121	evening	p^{h}iro	p^{h}iro	p^{h}itok	p^{h}itok	p^{h}iro/p^{h}itok
194	fly (vb.)	p^{h}ur	p^{h}ur	p^{h}ur	ur	p^{h}ur

2.1.3 *b

Proto-WT voiced stop *b remained /b/ word initial before vowels in W, E, and P. In L it was devoiced to /p/.

Word initial before vowels

*b --> W b, E b, P b, L p

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
54	sand	bjaŋa	bjaŋa	bjama	pema	bjema (R28)
111	son, boy	bu	bu	butsa	putsa	bu- (R28)
112	daughter, girl	boŋo	boŋo	bomo	pomo	bomo (R28)

Word initial before two or more consonants, *b was deleted in E, P, and L. In W it remained /b/ in that environment.

Word initial before two or more consonants

*b --› W b, E 0, P 0, L 0

No. Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
158 eight	bgjat	rgjat	rgjat	gjat	brgjat (R3)
164 one hundred	bgja	rgja	rgja	gja	brgja (R3)
196 run	bgjuks	rgjuks	NC	gjuks (Z)	brgjuks (R3)

Word initial before a stop, Proto-WT *b apparently became /ɪ/ in E, P, and L, while in W it remained /b/. However, since it occurs only once in the data in that environment, and since the one occurrence is in the numeral 'seven', it is possible that this /ɪ/ has occurred here by analogy with the /ɪ/ which occurs initially before a stop in the numeral 'eight', also in E, P, and L. This analogy may also be strengthened by similar correspondences in 4, 164, and 196.[8]

Word initial before a stop

*b --› W b, E r, P r, L r

No. Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
157 seven	bdun	rdun	rdun	rduŋ	bdun (R23)

Proto-WT *b was deleted in E and L when it occurred word initial before a sibilant.

Word initial before a sibilant

*b --› W b, E 0, P b, L 0

No. Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
154 four	bʒi	ʒi	rzbi	ʒi	bʒi (R4)

For word initial *b followed by *r, see §2.2.1.

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[8]It is possible that the reverse of this analogy is responsible for the appearrance of /g/ in 96 /gbul/ 'snake' in W. This /g/ may be occurring in response to the initial /ɪ/ of E, with which it also corresponds in words like 4 (/gdoŋ/ vs. /rdoŋ/) 'face' and 250 (/gduŋma/ vs. /rduŋma/) 'ceiling beam' (on my extended Balti word list). See also the similar correspondence between Western Balti's /x/ and Eastern Balti's /ɬ/ in 23.

Proto-WT *b was also deleted in L when it occurred between two consonants.

Between consonants

*b --> W b, E b, P b, L 0

No. Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
96 snake	gbul	rbul	zbrul	zrul	zbrul (R5)
234 fly (n.)	bjaŋbu	zbjaŋbu	zbjaŋbu (R)	raŋu	zbjaŋbu (R5)

Proto-WT *b was devoiced in L following any [-cont] segment, including nasals. In W and E, *b became nasalized following any nasal except /m/.

Following non-labial nasals

*b --> W m, E m, P b, L p

No. Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
220 liver	tʃʰinma	tʃʰinma	tʃʰinba	tʃʰinpa	tʃʰinba (R29)(R36)
26 house	NC	NC	kʰaŋba	kʰaŋpa	kʰaŋba (R29)
180 many	NC	NC	maŋbo	maŋpo	maŋbo (R29)
128 old	spiŋma	spiŋpa[9]	spiŋba	piŋpa (H)	spiŋba (R29)(R36)

Following labial nasals

*b --> W b, E b, P b, L p

No. Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
133 dry	skambo	skambo	skambo	skampo	skambo (R29)

2.1.4 *t

Proto-WT voiceless dental stop *t remained /t/ in all four varieties in all environments except when word initial followed by *r. For the latter case, see §2.2.1.

Word initial

*t --> W t, E t, P t, L t

No. Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
56 smoke	tutpa	tutpa	tutpa	tutpa	tutpa
191 burn (tr.)	tuks	potuks	tuks	tuks	-tuks

[9]It is not clear why Eastern Balti has a /p/ here rather than the expected /m/.

Word medial

*t --> W t, E t, P t, L t

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
35	axe	stare	stare	stare	stari	stare
184	hunger (vb.)	ɬtok	ɬtok	ɬtok	ltok	ltok
236	horse	rta	rta	ʃta	sta	rta
37	thread	skutpa	skutpa	skutpa	skutpa	skutpa
101	name	miŋtax	miŋtax	miŋtaks (K)	miŋ	miŋtaks
105	father	ata	ata	ata	NC	ata
207	we (incl.)	ŋatag	ŋatag	ŋatag	natag	ŋatag

Word final

*t --> W t, E t, P t, L t

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
158	eight	bgjat	rgjat	rgjat	gjat	brgjat
187	sleep	ɲit	ɲit	ɲit	ɲit	ɲit

2.1.5 *t^h

Proto-WT voiceless aspirated dental stop *t^h remained /t^h/ in all environments in all four varieties. It does not occur word finally.

Word initial and medial

*t^h --> W t^h, E t^h, P t^h, L t^h

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
36	rope	t^hakpa	t^hakba	t^hakpa	t^hakpa	t^hakpa
57	ash, dust	t^haltʃit	t^haltsir	t^halba	t^halba	t^halba
141	far	t^hakriŋ	t^hakriŋ	t^hakriŋs	t^hagriŋ	t^hakriŋs
185	drink	t^huŋ	t^huŋ	t^huŋ	t^huŋ	t^huŋ
15	palm	lakt^{h}il	lakt^{h}il	lakt^{h}il	lakt^{h}il	lakt^{h}il
27	roof	t^hok (0)	t^hoksa	kat^{h}ok	kat^{h}ok	-t^hok-

2.1.6 *d

Proto-WT voiced dental stop *d remained /d/ word initial in all four varieties, except when followed by *r. For those cases, see §2.2.1.

Word initial

*d --> W d, E d, P d, L d

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
123	today	diriŋ	diriŋ	diriŋ	diriŋ	diriŋ
173	these	djuŋ (0)	djun	djun (B)	di	djun (?)
189	sit	duk	duk	duk	duk	duk

Proto-WT *d also remained /d/ in all four varieties when preceded only by a consonant prefix.

Following a consonant prefix

*d --> W d, E d, P d, L d

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
4	face	gdoŋ	rdoŋ	rdoŋ (B)	ldoŋ	gdoŋ
52	stone	rdoa	rdoa	rdoa	ldoa	rdoa
157	seven	bdun	rdun	rdun	rduŋ	bdun

Proto-WT *d was deleted in W and E when it occurred following *r in an intervocalic cluster.

Following *r in an intervocalic cluster

*d --> W 0, E 0, P d, L d

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
40	ring	xsurup	surup	serdups	serdup	xsVrdups (R12)

Proto-WT *d was devoiced in L when preceded by any [-cont] segment including nasals. Elsewhere it remained /d/.

Following a nasal

*d --> W d, E d, P d, L t

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
65	flower	mendok	mendok	mendok	mentok	mendok (R29)
122	yesterday	gonde	gonde	gonde	NC	gonde

2.1.7 *k

Proto-WT voiceless velar stop *k remained /k/ word initial in all four varieties except when followed by *r (see §2.2.1).

Word initial

*k --> W k, E k, P k, L k

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
58	mud	kalak (S)	kalak	kalak	kalak	kalak
148	white	karpo	karpo	karpo	karpo	karpo
229	round	NC	NC	kirkir	kirkir	---

Proto-WT *k became /x/ in W and E when followed by a syllable final *s which is also either word final or is followed by a nasal.

Preceding a word final *s, or a syllable final *s followed by a nasal

*k --> W x, E x, P k, L k

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
101	name	miŋtax	miŋtax	miŋtaks (K)	miŋ	miŋtaks (R35)
218	knee	buxmo	buxma	puksmo	pigmo	puksmo (R35)

If, however, Proto-WT *k was followed by a sequence of *s and any non-nasal consonant, it became /x/ only in W, not in E.

Preceding a sequence of *s and a non-nasal consonant

*k --> W x, E k, P k, L k

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
19	skin	baxspa	bakspa	pakspa	pakspa	pakspa (R34)
100	spider	taxskan	takskan	tʰakskan	tʰaksrabu	tʰakskan (R34)

Proto-WT *k became voiced in L when followed by a sonorant consonant.

Preceding a sonorant consonant

*k --> W k, E k, P k, L g

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
141	far	tʰakriŋ	tʰakriŋ	tʰakriŋs	tʰagriŋ	tʰakriŋs (R32)
218	knee	buxmo	buxma	puksmo	pigmo	puksmo[10] (R32)

By a process of assimilation, Proto-WT *k became /s/ in W and E when followed by a voiceless affricate.

[10]Although Proto-WT *k is not immediately followed by a sonorant here, it still becomes voiced in Ladakhi because the intervening *s is deleted by another rule.

Preceding a voiceless affricate

*k --› W s, E s, P k, L k

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
161	eleven	tʃustʃik	tʃustʃik	tʃukʃik (B)	dʒukʃik	dʒuktʃik (R25)

Elsewhere, Proto-WT *k remained /k/ in all four varieties.

Word medial

*k --› W k, E k, P k, L k

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
37	thread	skutpa	skutpa	skutpa	skutpa	skutpa
44	star	skarma	skarma	skarma	skarma	skarma
186	thirst (vb.)	skoms	skoms	skoms	skoms	skoms
223	swim	rkjal	rkjal	ʃkjalt (K)	skjal	rkjal
15	palm	lakt^{h}il	lakt^{h}il	lakt^{h}il	lakt^{h}il	lakt^{h}il
36	rope	t^{h}akpa	t^{h}akba	t^{h}akpa	t^{h}akpa	t^{h}akpa
77	garlic	zgokpa	zgokpa	zgokpa	zgokpa	zgokpa
149	black	nakpo	nakpo	nakpo	nakpo	nakpo
107	older brother	kaka	kaka	kaka	NC	kaka

Word final

*k --› W k, E k, P k, L k

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
5	eye	mik	mik	mik	mik	mik
22	blood	ʦak	k^{h}rak	t^{h}ak	t^{h}ak	k^{h}rak
58	mud	kalak (S)	kalak	kalak	kalak	kalak
189	sit	duk	duk	duk	duk	duk

2.1.8 *k^{h}

Proto-WT voiceless aspirated velar stop *k^{h} remained /k^{h}/ in all four varieties, except when followed by *r (see §2.2.1). It occurs only word initially in the data.

Word initial

*k^{h} --› W k^{h}, E k^{h}, P k^{h}, L k^{h}

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
8	mouth	k^{h}abak	k^{h}a	k^{h}a	k^{h}a	k^{h}a
38	needle	k^{h}ap	k^{h}ap	k^{h}ap	k^{h}ap	k^{h}ap
95	dog	k^{h}i	k^{h}i	k^{h}i	k^{h}i	k^{h}i
205	he	k^{h}o	k^{h}o	k^{h}o (B)	k^{h}o	k^{h}o

2.1.9 *g

Proto-WT voiced velar stop *g remained /g/ word initial before vowels in W, E, and P. In L, it was devoiced to /k/.

Word initial before vowels

*g --> W g, E g, P g, L k

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
167	where	gar	gar	gar	karu	gar- (R28)
170	which	go	go	gadzuk	kazuk	ga- (R28)

Word initial Proto-WT *g became /r/ in E and P, and /l/ in L, when followed by *d. For word initial *g followed by *r, see §2.2.1.

Word initial preceding *d

*g --> W g, E r, P r, L l

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
4	face	gdoŋ	rdoŋ	rdoŋ (B)	ldoŋ	gdoŋ (R23)

Proto-WT *g became nasalized in W, E, and P when preceding *ɲ word medially. The *ɲ was then deleted.

Word medial preceding *ɲ

*g --> W ŋ, E ŋ, P ŋ, L g

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
162	twelve	tʃoŋas	tʃoŋas	tʃuŋis	dʒugɲis	dʒugɲis (R15)

Elsewhere, Proto-WT *g remained /g/ in all four varieties. It does not occur word finally.

Word medial

*g --> W g, E g, P g, L g

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
47	river	rgjamtso	rgjamtso	rgjamtso	gjamso	rgjamtso
158	eight	bgjat	rgjat	rgjat	gjat	brgjat
164	one hundred	bgja	rgja	rgja	gja	brgja
16	finger	NC	zogu	dzigu	dzugu	dzugu
28	door	zgo	zgo	zgo	zgo	zgo
159	nine	rgu	rgu	rgu	zrgu	zrgu
2	head	go	go	go	go	mgo

2.2 Liquids

2.2.1 *r

Proto-WT alveolar approximant *r is the most intriguing of all the Proto-WT phonemes. It is associated with, and apparently responsible for, many and varied innovations in the four daughter varieties represented in this study. I have labelled it an approximant, although it usually surfaces as either a flap or a fricative in the modern spoken varieties of Tibetan (Sprigg 1968:301). In Ladakhi, it often is sounded as an approximant, i.e. without friction or occlusion, especially when word initial before a consonant. Whatever else its ancient pronunciation might have been, it seems likely from the types of sounds it has given rise to, that it was not dental like the stops and sibilants, but rather alveolar and possibly retroflexed.

Most of the innovations associated with *r occurred in environments where *r was a member of one of the word initial consonant clusters which are so characteristic of Tibetan, especially Written Tibetan. Perhaps the most salient, and most interesting of the modern innovations are those which occur when *r follows any word initial stop. The innovations vary in some locations according to the place of articulation of the initial stop. If it is non-coronal, i.e. either labial or velar in the Proto-WT form, it will become coronal (probably alveolar) in Ladakhi, and sometimes in Purik as well. The Proto-WT *r will then generally be deleted in Ladakhi,[11] and, less consistently, in Purik as well. Also, in addition to becoming coronal, all Proto-WT voiced velar stops occurring in this environment have been devoiced in L.

These processes have not occurred in Balti. In fact, Eastern Balti has almost perfectly preserved the Proto-WT forms of these word initial consonant clusters. Western Balti on the other hand, while still being arguably closer to the Proto-WT

[11]The only exception is word number 69. It is not clear why Proto-WT *r has not been deleted there.

forms than Ladakhi or Purik in most cases, has undergone two other transformations in these environments. In words with initial labial stops, the Proto-WT *r has become lateralized to /l/.

With a word initial labial stop[12]

*pr --> W pl, E pr, P tr, L t
*br --> W bl, E br, P br ~ d, L d ~ t

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
13	arm	piakpa (0)	prakpa	NC	NC	prakpa (R21)
104	child	p^hlu	p^hru	t^hru	t^huyu	p^hru (R21)(R13)
11	chest	blaŋ	braŋ	braŋ (B)	taŋ	braŋ (R21)(R13)
71	rice	blas	bras	bras	das	bras (R21)(R13)
225	mountain	blak	brak	brak	NC	brak (R21)
232	yak (female)	NC	NC	dimo	dimo	brimo (T)(R13)[13]

On the other hand, Proto-WT words with initial *velar* stops have, in Western Balti, undergone a change similar, but not identical, to that described for Ladakhi above. As in Ladakhi, these stops have now become coronal, but instead of the *r simply being deleted (and voiced stops being devoiced), the whole unit (*kr or *gr) has become a retroflexed affricate with the same voicing value as the original stop.

[12]These examples do not include words in which the *r was followed by another consonant rather than a vowel. The changes that have occurred in those words will be discussed later.

[13]Part of the reconstruction of 232, as well as of the few other words marked with (T), relies on evidence from Written Tibetan. Such evidence has been used only when comparative analysis has failed to produce clear reconstructions, usually due to an insufficient set of correspondences from which to make reconstruction decisions. Here, the reconstruction of initial *br is based upon the Written Tibetan form for 232, ‹brimo›. It is assumed that, if Western Balti and Eastern Balti had cognate forms for this word, they would begin with /bl/ and /br/ respectively, as in the other words shown here.

With a word initial velar stop

*kr --› W ʈʂ, E kr, P kr ~ tr ~ t, L tr ~ t
*gr --› W ɖʐ, E gr, P gr ~ d, L t

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
12	belly	NC	NC	totpa	totpa	krotpa (T)(R13)
14	elbow	ʈʂimok (0)	krioŋ	krimoŋs	temaʒoŋ	krim?oŋs (R14)(R13)
22	blood	ʈʂak	kʰrak	tʰak	tʰak	kʰrak (R14)(R13)
69	wheat	ʈʂo	kro	tro	tro	kro (R14)(R13)
99	ant	ʈʂimok	kimbok	krimok (K)	temok	krem?ok (R14)(R13)
25	village	ɖʐoŋ	groŋ	NC	ʈoŋpa (H)[14]	groŋ- (R14)(R13a)
34	knife	ɖʐi	gri	gri	ti	gri (R14)(R13a)
137	cold	ɖʐaxmo	graxmo	daŋmo/ graŋmo	taŋmo	graxmo (R14)(R13)

If the Proto-WT word initial stop was dental, it will become retroflexed in Ladakhi, and often in Purik as well. When it becomes retroflexed, the *r is *always* deleted.[15] In both Eastern and Western Balti, Proto-WT word initial *tr and *dr remained unchanged.

With a word initial dental stop

*tr --› W tr, E tr, P tr ~ ʈ, L ʈ
*dr --› W dr, E dr, P ɖ, L ɖ

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
59	dirt	triŋa	triŋa	trima (B)/ ʈima (K)	ʈima (H)	trima (R13b)
88	egg	NC	NC	trul/ʈʰul (B)	ʈʰul	trul (R13b)
136	hot	NC	tronmo	ʈonmo (K)	ʈotmo (H)	tro?mo (R13b)
138	right	traŋ	traŋ	ʈaŋ (R)	ʈaŋ (H)	traŋ (R13b)
156	six	truk	truk	truk/ʈuk (R)	ʈuk	truk (R13b)
195	walk	drul	drul	ɖul (B)(R)	ɖul	drul (R13b)

It should be noted that the processes of coronalization and retroflexion observed above occurred only when the Proto-WT *r was followed by a vowel. When it was followed instead by another obstruent, the *r was deleted in W. In E,

[14]Here Hoshi's Zangskar form has been used since our Leh Ladakhi entry for this gloss is not cognate with the Balti forms. Here, as elsewhere in the Zangskar variety of Ladakhi, the stop has become retroflexed.

[15]In Zangskar Ladakhi, and possibly in Ladakhi in general, this process (retroflexion and loss of *r) apparently feeds on the coronalization described above with regard to Proto-WT labial and velar stops (Hoshi 1978:iv). Proto-WT *r causes those stops also to become retroflexed, before being itself deleted. See the discussion on R13b in §3.1.2, and the footnote there.

P, and L, it remained /r/, at least initially, while the preceding stop was deleted. The /r/ was then deleted by another rule in L only.

Preceded *and* followed by an obstruent

*r --> W 0, E r, P r, L 0

No. Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
158 eight	bgjat	rgjat	rgjat	gjat	brgjat (R6)(R7)
164 one hundred	bgja	rgja	rgja	gja	brgja (R6)(R7)
196 run	bgjuks	rgjuks	NC	gjuks (Z)	brgjuks (R6)(R7)

We turn now to words in which Proto-WT *r occurred word initially *before* a stop. If the stop was voiced, Proto-WT *r remained /r/ in W, E, and P. In L, however, *r was deleted before *g, while before *d, it became /l/.

Word initial before *g

*r --> W r, E r, P r, L 0

No. Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
47 river	rgjamtso	rgjamtso	rgjamtso	gjamso	rgjamtso (R7)
130 good	NC	NC	rgjalba (B)	gjala	rgjalba (R7)

Word initial before *d

*r --> W r, E r, P r, L l

No. Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
52 stone	rdoa	rdoa	rdoa	ldoa	rdoa (R23)

When Proto-WT *r occurred word initially before voiceless stops, it became /ʃ/ in P and /s/ in L. In W and E, it usually remained /r/. It is not clear why *r has been deleted in W and E in 18, and in W in 24.

Word initial before voiceless stops

*r --> W r ~ 0, E r ~ 0, P ʃ, L s

No. Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
18 leg	kaŋma	kaŋma	ʃkaŋ	skaŋ	rkaŋ- (R17)(R18)
24 feces	kjakpa	rkjakpa	NC	skjakpa	rkjakpa (R17)(R18)
223 swim	rkjal	rkjal	ʃkjalt (K)	skjal	rkjal (R17)(R18)
236 horse	rta	rta	ʃta	sta	rta (R17)(R18)

When Proto-WT *r occurred word initial before a voiced affricate, it was deleted in W and E. In L it remained /r/ in that environment.

Word initial before a voiced affricate

*r --> W 0, E 0, P NC, L r

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
219	neck	ʒiŋma	dʒiŋma	NC	rdʒiŋma	rdʒiŋma (R8)

Elsewhere, Proto-WT *r remained /r/.

Word initial before a vowel

*r --> W r, E r, P r, L r

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
20	bone	ruspa	ruspa	ruspa	ruspa	ruspa
92	horns	rwa	rwa	ridʒo	rudʒo/ratʃo(H	rwadʒo
94	goat	rabak	ra	rama	rama	ra-
134	long	riŋmo	riŋbo	riŋmo	riŋmo	riŋmo

Word medial, contiguous with consonants

*r --> W r, E r, P r, L r

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
40	ring	xsurup	surup	serdups	serdup	xsVrdups
44	star	skarma	skarma	skarma	skarma	skarma
45	rain	tʃʰarpa	tʃʰarpa	tʃʰarpa	tʃʰarpa	tʃʰarpa
75	chili	sɲerma	sɲerma	sɲerma (R)	ɲerma	sɲerma
150	red	marpo	marpo	marpo	marpo	marpo
159	nine	rgu	rgu	rgu	zrgu	zrgu
141	far	tʰakriŋ	tʰakriŋ	tʰakriŋs	tʰagriŋ	tʰakriŋs

Intervocalic

*r --> W r, E r, P r, L r

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
35	axe	stare	stare	stare	stari	stare
123	today	diriŋ	diriŋ	diriŋ	diriŋ	diriŋ

Word final

*r --> W r, E r, P r, L r

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
60	gold	xser	ser	ser	ser	xser
82	oil	mar	mar	mar	marnak	mar-
167	where	gar	gar	gar	karu	gar-
194	fly (vb.)	pʰur	pʰur	pʰur	ur	pʰur
199	speak	zer	zer	zer	zer	zer

2.2.2 *l

Proto-WT alveolar lateral *l became voiceless /ɬ/ in W, E, and P, word initial before voiceless consonants. In L it apparently remained /l/ in that environment. Ladakhi does not appear to have a phoneme /ɬ/, although [ɬ] does occur as an allophone of /l/ in voiceless environments.

Word initial before voiceless consonants

*l --> W ɬ, E ɬ, P ɬ, L l

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
10	tongue	ɬtʃe	ɬtʃe	ɬtʃe	ltʃe	ltʃe (R27)
144	heavy	ɬtʃʰo	ɬtʃʰo	ɬtʃintek	ltʃinte	ltʃ-(?) (R27)
184	hunger (vb.)	ɬtok	ɬtok	ɬtok	ltok	ltok (R27)
201	see, look	NC	NC	ɬtas	ltas	ltas (R27)

Proto-WT *l also became /ɬ/ in W, E, and P when it had followed word initial voiceless continuants in Proto-WT. In L it remained /l/.

Following word initial voiceless continuants

*l --> W ɬ, E ɬ, P ɬ, L l

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
49	lightning	ɬok	ɬok	ɬok (B)	skamlak	xlok (R26)
51	wind	xɬuŋ	xɬuŋ	hɬuŋ	hluŋspo	xluŋ (R26)
131	damp	xɬan	NC	NC	lonpa	xlVn- (R26)

Word initial before *ŋ, Proto-WT *l became /ʃ/ in L, while in W, E, and P, the consonant sequence *lŋ became /ʂ/.

Word initial before *ŋ

*l --> L ʃ

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
155	five	ya	ya	ya	ʃŋa	lŋa (T)(R19)

Elsewhere, Proto-WT *l remained /l/.

Word initial

*l --> W l, E l, P l, L l

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
15	palm	lakt^{h}il	lakt^{h}il	lakt^{h}il	lakt^{h}il	lakt^{h}il
42	moon	lzot	lzot	lzormo	lzawa	lzawa- (?)
53	path	lam	lam	lam	lam	lam
62	leaf	loŋa	loŋa	loma	loma	loma
126	month	lza	lza	lza	lda	lza
127	year	lo	lo	lo	lo	lo
222	stand	laŋ	laŋ	laŋ (B)	laŋ	laŋ

Word medial

*l --> W l, E l, P l, L l

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
57	ash, dust	t^{h}altʃit	t^{h}altsir	t^{h}alba	t^{h}alba	t^{h}alba
58	mud	kalak (S)	kalak	kalak	kalak	kalak

Word final

*l --> W l, E l, P l, L l

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
85	fat	ts^{h}il	ts^{h}il	ts^{h}il	ts^{h}il	ts^{h}il
96	snake	gbul	rbul	zbrul	zrul	zbrul
195	walk	drul	drul	ɖul (B)(R)	ɖul	drul
223	swim	rkjal	rkjal	ʃkjalt (K)	skjal	rkjal

2.3 Fricatives and affricates

2.3.1 *s

Proto-WT voiceless dental fricative *s was deleted in L when it occurred word initial before the palatal nasal *ɲ.

Word initial before *ɲ

*s --> W s, E s, P s, L 0

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
75	chili	sɲerma	sɲerma	sɲerma (R)	ɲerma	sɲerma (R10)
128	old	sŋiŋma	sŋiŋpa	sŋiŋba	ŋiŋpa	sŋiŋba (R10)

Proto-WT *s remained /s/ word initial elsewhere in all four varieties.

Word initial before consonants

*s --> W s, E s, P s, L s

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
7	nose	snamsul	snamsul	sna (R)	NC	sna
21	heart	sniŋ	sniŋ	sniŋ (R)(B)	sniŋ	sniŋ
119	morning	NC	NC	sŋamo (B)	sŋamo	sŋamo
235	barley flour	NC	NC	sŋanpe	sŋanpe	sŋanpe
35	axe	stare	stare	stare	stari	stare
37	thread	skutpa	skutpa	skutpa	skutpa	skutpa
44	star	skarma	skarma	skarma	skarma	skarma

Word initial before vowels

*s --> W s, E s, P s, L s

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
9	tooth	so	so	so	so	so
17	fingernail	senmo (finger)	senmero	senmo	senmo	senmo (?)
165	who	su	su	su	su	su
197	go	soŋ	soŋ	soŋ	soŋ	soŋ

Proto-WT *s was deleted in W when it occurred between consonants in a word initial cluster. In P, it became /ʃ/ in that environment.

Following word initial *p

*s --> W 0, E s, P ʃ, L s

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
160	ten	ptʃu	hstʃu	ʃtʃu (RAB)	stʃu	pstʃu (R6)

Elsewhere, Proto-WT *s remained /s/ word medial in all four varieties.

Word medial

*s --> W s, E s, P s, L s

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
19	skin	baxspa	bakspa	pakspa	pakspa	pakspa
20	bone	ruspa	ruspa	ruspa	ruspa	ruspa
60	gold	xser	ser	ser	ser	xser
100	spider	taxskan	takskan	tʰakskan	tʰaksrabu	tʰakskan
124	tomorrow	haske	haske	aske	NC	haske (?)
153	three	xsum	sum	sum	sum	xsum

Proto-WT *s was deleted in syllable final position in W, E, and L following velar and labial consonants.

Syllable final following velar or labial consonants

*s --> W 0, E 0, P s, L 0

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
14	elbow	ʧimok (0)	krioŋ	krimoŋs	temaʒoŋ	krimoŋs (R9)
40	ring	xsurup	surup	serdups	serdup	xsVrdups (R9)
101	name	miŋtax	miŋtax	miŋtaks (K)	miŋ	miŋtaks (R9)
141	far	tʰakriŋ	tʰakriŋ	tʰakriŋs	tʰagriŋ	tʰakriŋs (R9)
216	bark	ʃumpiak	ʃumpak	ʃumbraks (B)	NC	ʃumpraks? (R9)
218	knee	buxmo	buxma	puksmo	pigmo	puksmo (R9)

Elsewhere, Proto-WT *s remained /s/ word final.

Word final

*s --> W s, E s, P s, L s

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
39	cloth	NC	ras	ras	ras	ras
66	fruit	NC	NC	kʰazes	kʰazes	kʰazes (?)
71	rice	blas	bras	bras	das	bras
152	two	ɲis	ɲis	ɲis	ɲis	ɲis
186	thirst (vb.)	skoms	skoms	skoms	skoms	skoms
221	know	ʃes	ʃes	NC	ʃes	ʃes

2.3.2 *z

Proto-WT voiced dental fricative *z was deleted word initial before *r in W, E, and P. In L it remained /z/ in that environment.

Word initial before *r

*z --> W 0, E 0, P 0, L z

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
159	nine	rgu	rgu	rgu	zrgu	zrgu (R11)

Proto-WT voiced alveolar fricative *z behaved somewhat erratically word initial before *br in E and L. In W, it was always deleted, while in P it always remained /z/.

Word initial before *br

*z --> W 0, E z ~ 0, P z, L z ~ 0

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
96	snake	gbul	rbul	zbrul	zrul	zbrul
234	fly (n.)	bjaŋbu	zbjaŋbu	zbjaŋbu (R)	raŋu	zbraŋbu

Elsewhere, Proto-WT *z remained /z/ in all four varieties.

Word initial

*z --> W z, E z, P z, L z

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
1	body	NC	NC	zukspo	zukspo	zukspo
28	door	zgo	zgo	zgo	zgo	zgo
77	garlic	zgokpa	zgokpa	zgokpa	zgokpa	zgokpa
182	eat	zo	zo	zo	zo	zo
199	speak	zer	zer	zer	zer	zer

Word medial

*z --> W z, E z, P z, L z

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
42	moon	lzot	lzot	lzormo	lzawa	lzawa- (?)
50	rainbow	paragza	rza	NC	za ʃutuŋs	-gza rʃutuŋs (?)
66	fruit	NC	NC	kʰazes	kʰazes	kʰazes (?)
126	month	lza	lza	lza	lda[16]	lza

2.3.3 *ʃ

Proto-WT voiceless palato-alveolar fricative *ʃ became /s/ in W, E, and L word initial before consonants. In P, it remained /ʃ/.

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[16]It is not clear why Ladakhi has /d/ here rather than the expected /z/.

Word initial before consonants

*ʃ --› W s, E s, P ʃ, L s

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
6	ear	sna	sna	ʃna (B)	NC	ʃna (R18)
93	tail	NC	sŋama	ʃŋama	sŋama	ʃŋama (R18)

Elsewhere, Proto-WT *ʃ remained /ʃ/ in all four varieties.

Word initial before vowels

*ʃ --› W ʃ, E ʃ, P ʃ, L ʃ

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
29	firewood	ʃiŋ	ʃiŋ	ʃiŋ	ʃiŋ	ʃiŋ
84	meat	ʃa	ʃa	ʃa	ʃa	ʃa
192	die	ʃi	ʃi	ʃi	ʃi	ʃi
214	louse	ʃik	ʃik	ʃik	ʃik	ʃik
216	bark	ʃumplak	ʃumpak	ʃumbraks (B)	NC	ʃumpraks (?)
217	wing	ʃokpa	ʃokpa	ʃokpa	ʃokpa	ʃokpa
221	know	ʃes	ʃes	NC	ʃes	ʃes

Word medial

*ʃ --› W ʃ, E ʃ, P ʃ, L ʃ

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
132	wet	xʃerpa	ʃerpa	ʃerpa	NC	xʃerpa
163	twenty	ɲiʃu	ɲiʃu	ŋiʃu	ɲiʃu	ɲiʃu

2.3.4 *ʒ

Proto-WT voiced palato-alveolar fricative *ʒ remained /ʒ/ in all four varieties, except as noted below for word 154 in Purik.

Word initial

*ʒ --› W ʒ, E ʒ, P ʒ, L ʒ

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
117	day	ʒak	ʒak	ʒak	ʒak	ʒak

Word medial

*ʒ --› W ʒ, E ʒ, P ?, L ʒ

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
61	tree	stakʒi	staʞʒi	NC	NC	staʞʒi
154	four	bʒi	ʒi	rzbi[17]	ʒi	bʒi (R22)

2.3.5 *x

Proto-WT voiceless velar fricative *x was deleted in E, P, and L word initial before sibilants. In W, it remained /x/.

Word initial before sibilants

*x --› W x, E 0, P 0, L 0

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
40	ring	xsurup	surup	serdups	serdup	xsVrdups (R1)
60	gold	xser	ser	ser	ser	xser (R1)
132	wet	xʃerpa	ʃerpa	ʃerpa	NC	xʃerpa (R1)
153	three	xsum	sum	sum	sum	xsum (R1)
227	yellow	xserpo	serpo	serpo	serpo	xserpo (R1)

Proto-WT *x became a lateral word initial before a voiceless affricate in E, P, and L. In W, it remained /x/.

Word initial before a voiceless affricate

*x --› W x, E ɬ, P ɬ, L l

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
23	urine	xtʃin	ɬtʃin	ɬtʃin (B)	ltʃin	xtʃin (R23)

Proto-WT *x was deleted or reduced to /h/ word initial before sonorant consonants in P and L. In W and E, it remained /x/.

[17]Metathesis has occurred here in Purik, whereupon the *ʒ has become /rz/ before the bilabial stop (see rule R22 in chapter 3).

Word initial before sonorant consonants

*x --› W x, E x, P 0 ~ h, L 0 ~ h

No. Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
43 sky	xnam	xnam	nam	nam	xnam (R2)
51 wind	xɬuŋ	xɬuŋ	hɬuŋ	hluŋspo	xluŋ (R2)
131 damp	xlan	NC	NC	lonpa	xlVn- (R2)
139 left	xjun (0)	spen[18]	joma/jun (K)	joma	xjVnma (R2)
231 yak (male)	hjak[19]	xjak	jakpo	jakpo	xjak- (R2)

When preceded by a vowel, Proto-WT *x became /k/ before voiceless stops and /ŋ/ before nasals in P and L. In W and E, it remained /x/ in those environments.

Following a vowel, before stops and nasals

*x --› W x, E x, P k ~ ŋ, L k ~ ŋ

No. Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
113 husband	daxpo	daxpo	makpa	makpa	CaxpV (R33)
137 cold	ʤaxmo	graxmo	daŋmo	taŋmo	graxmo (R33)

Elsewhere, Proto-WT *x remained /x/ in W and E only. No other cognates were found in P or L.

Word medial

*x --› W x, E x, P NC, L NC

No. Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
30 broom	pʰjaxma	pʰjaxma	NC	NC	pʰjaxma (?)
119 morning	ʤoxpa	ʤoxpa	NC	NC	ʤoxpa (?)

2.3.6 *h

There is some doubt about the status of Proto-WT voiceless fricative *h, since it occurs only in word 124, and even there it is questionable. It is included only on the strength of its presence in the Balti forms for this word. It has apparently been deleted in the cognate word in Purik. Ladakhi does not have a cognate for this gloss.[20]

[18]It is not clear why Proto-WT *x has become /s/ here, nor why Proto-WT *j has become /ɲ/.

[19]It is not clear why Proto-WT *x has not remained /x/ here.

[20]Also, Jäschke (1881) does not list any comparable word for Written Tibetan.

Word initial before a vowel

*h --> W h, E h, P 0, L NC

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
124	tomorrow	haske	haske	aske	NC	haske (?)

2.3.7 *ts

Proto-WT voiceless dental affricate *ts remained /ts/ in all four varieties.

Word initial

*ts --> W ts, E ts, P ts, L ts

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
64	thorn	NC	NC	tserma	tserma	tserma (?)
78	onion	tsoŋ	tsoŋ	tsoŋ	tsoŋ	tsoŋ
169	how-many	tsam	tsamtse	tsamʃik	tsamʃik (H)	tsam-
175	same	tsoksatsoks	tsoksatsox	tsoks	tsoks	tsoks

Word medial

*ts --> W ts, E ts, P ts, L ts

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
47	river	rgjamtso	rgjamtso	rgjamtso	gjamso[21]	rgjamtso
143	small	ts^{h}untse	ts^{h}untse	ts^{h}untse	NC	ts^{h}untse
179	few	ɲintse	ɲuntse	ɲuntsek	puntse	ɲVntse

2.3.8 *ts^h

Proto-WT voiceless aspirated dental affricate *ts^h remained /ts^h/ in all four varieties.

Word initial

*ts^h --> W ts^h, E ts^h, P ts^h, L ts^h

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
83	salt	NC	NC	ts^{h}a	ts^{h}a	ts^{h}a
85	fat	ts^{h}il	ts^{h}il	ts^{h}il	ts^{h}il	ts^{h}il
118	night	ts^{h}an	ts^{h}an	ts^{h}an	ts^{h}an	ts^{h}an
143	small	ts^{h}untse	ts^{h}untse	ts^{h}untse	tʃ^{h}un[22]	ts^{h}untse

[21] It is not clear why Proto-WT *ts has become /s/ here.

[22] It is possible that in L, *ts^h becomes /tʃ^h/ before high back vowels.

2.3.9 *dz

Proto-WT voiced dental affricate *dz remained /dz/ word initial in P. In L and E it remained /dz/ or became /z/, while in W it was devoiced. It occurred only word initial in the data.

Word initial

*dz --› W ts, E dz ~ z, P dz, L dz ~ z

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
16	finger	NC	zogu	dzigu	dzugu	dzugu
98	mosquito	tsaŋki	dzaŋgi	dzaŋgi (K)	zaŋgi	dzaŋgi (?)

2.3.10 *tʃ

Proto-WT voiceless palato-alveolar affricate *tʃ remained /tʃ/ in all four varieties.

Word initial

*tʃ --› W tʃ, E tʃ, P tʃ, L tʃ

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
135	bad	tʃaŋmen	tʃaŋmen	NC	NC	tʃaŋmen (?)
151	one	tʃik	tʃik	tʃik	tʃik	tʃik
166	what	tʃi	tʃi	tʃi	tʃi	tʃi

Word medial

*tʃ --› W tʃ, E tʃ, P tʃ, L tʃ

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
10	tongue	ɬtʃe	ɬtʃe	ɬtʃe	ltʃe	ltʃe
23	urine	xtʃin	ɬtʃin	ɬtʃin (B)	ltʃin	xtʃin
61	tree	NC	NC	ɬtʃaŋma	ltʃaŋma	ltʃaŋma
160	ten	ptʃu	hstʃu	ʃtʃu (RAB)	stʃu	pstʃu
161	eleven	tʃustʃik	tʃustʃik	tʃukʃik (B)	dʒukʃik[23]	dʒuktʃik

2.3.11 *tʃʰ

Proto-WT voiceless aspirated palato-alveolar affricate *tʃʰ has become /ʃ/ intervocalically in W and E. In L, it has lost its aspiration in that position, while in P it has remained /tʃʰ/.

[23]It is not clear why *tʃ has become /ʃ/ here in Purik and Ladakhi.

Intervocalic

*tʃʰ --> W ʃ, E ʃ, P tʃʰ, L tʃ

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
109	older sister	aʃe	aʃe	atʃʰe	atʃe	atʃʰe (?)

Elsewhere, Proto-WT *tʃʰ has remained /tʃʰ/ in all four varieties.

Word initial

*tʃʰ --> W tʃʰ, E tʃʰ, P tʃʰ, L tʃʰ

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
45	rain	tʃʰarpa	tʃʰarpa	tʃʰarpa	tʃʰarpa	tʃʰarpa
46	water	tʃʰu	tʃʰu	tʃʰu	tʃʰu	tʃʰu
178	broken	tʃʰak	tʃʰak	tʃʰak	tʃʰak	tʃʰak
220	liver	tʃʰinma	tʃʰinma	tʃʰinba	tʃʰinpa	tʃʰinba

Word medial

*tʃʰ --> W tʃʰ, E tʃʰ, P NC, L NC

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
144	heavy	ɬtʃʰo	ɬtʃʰo	NC	NC	ɬtʃʰo (?)

2.3.12 *dʒ

Proto-WT voiced palato-alveolar affricate *dʒ became /tʃ/ word initial in W, E, and P. In L it remained /dʒ/ in that position.

Word initial

*dʒ --> W tʃ, E tʃ, P tʃ, L dʒ

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
161	eleven	tʃustʃik	tʃustʃik	tʃukʃik (B)	dʒukʃik	dʒuktʃik (R31)
162	twelve	tʃoŋas	tʃoŋas	tʃuŋis	dʒuŋnis	dʒuŋnis (R31)

Proto-WT *dʒ became /ʒ/ in W following a word initial consonant. In E and L it remained /dʒ/ in that environment.

Following a word initial consonant

*dʒ --> W ʒ, E dʒ, P NC, L dʒ

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
219	neck	ʒiŋma	dʒiŋma	NC	rdʒiŋma	rdʒiŋma (R20)

Although the evidence is limited to one example, Proto-WT *dʒ apparently became /j/ in W and E intervocalically. In P, it was sometimes devoiced in that position, while in L it sometimes became /ʒ/.[24]

Intervocalic

*dʒ --› W j, E j, P dʒ ~ tʃ, L dʒ ~ ʒ

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
33	hammer	NC	NC	todʒuŋ	tʰuʒuŋ	tʰVdʒuŋ (?)
92	horns	rwa	rwa	ridʒo	rudʒo	rwadʒo (?)
208	we (excl.)	ŋaja	ŋaja	ŋatʃa	ŋaʒa	ŋadʒa (?)
209	you (plural)	NC	NC	kʰetʃa (K)	kʰjoʒa	kʰjVdʒa (?)

2.4 Nasals

2.4.1 *m

Proto-WT voiced bilabial nasal *m became /ŋ/ in W and E intervocalically when the following vowel was word final and the consonant preceding the preceding vowel was not *ɲ or *ŋ. In P and L, *m remained /m/ intervocalically.

Intervocalic

*m --› W ŋ, E ŋ, P m, L m

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
54	sand	bjaŋa	bjaŋa	bjama	pema	bjema (R24)
59	dirt	triŋa	triŋa	trima (B)	ʈima (H)	trima (R24)
62	leaf	loŋa	loŋa	loma	loma	loma (R24)
87	hen	bjaŋo	bjaŋo	bjamo	NC	bjamo (R24)
91	milk	oŋa	oŋa	NC	oma	oma (R24)
106	mother	aŋo	aŋa	ama	ama	ama (R24)
110	ygr. sister	NC	noŋo	nomo	nomo	nomo (R24)
112	daughter, girl	boŋo	boŋo	bomo	pomo	bomo (R24)
114	wife	naŋa	NC	nama (K)	nama	nama (R24)
129	new	NC	soŋa	soma	soma	soma (R24)

Proto-WT *m was deleted word initial before consonants in all four varieties.

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[24]The reason(s) for this erratic behavior in Purik and Ladakhi is not clear.

Word initial before consonants

*m --> W 0, E 0, P 0, L 0

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
2	head	go	go	go	go	mgo[25]

Elsewhere, Proto-WT *m remained /m/ in all four varieties.

Word initial

*m --> W m, E m, P m, L m

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
5	eye	mik	mik	mik	mik	mik
55	fire	me	me	me	me	me
65	flower	mendok	mendok	mendok	mentok	mendok
82	oil	mar	mar	mar	marnak	mar-

Intervocalic

*m --> W m, E m, P m, L m

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
14	elbow	ʦimok (0)	krioŋ	krimoŋs	temaʒoŋ	krim?oŋs
41	sun	ɲima (0)	ɲima	ɲima	ɲima	ɲima
93	tail	NC	sŋama	ʃŋama	sŋama	ʃŋama
140	near	ɲimor	ɲimor	ɲemo	ɲemo	ɲemo?

Word medial, contiguous with consonants

*m --> W m, E m, P m, L m

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
17	fingernail	senmo (finger)	senmero	senmo	senmo	senmo (?)
44	star	skarma	skarma	skarma	skarma	skarma
47	river	rgjamtso	rgjamtso	rgjamtso	gjamso	rgjamtso
99	ant	ʦimok	kimbok	krimok (K)	temok	krem?ok
133	dry	skambo	skambo	skambo	skampo	skambo
137	cold	ʣaxmo	graxmo	daŋmo	taŋmo	graxmo
186	thirst (vb.)	skoms	skoms	skoms	skoms	skoms
218	knee	buxmo	buxma	puksmo	pigmo	puksmo

[25]Here I have hypothesized that the Written Tibetan ⟨m⟩ was still present in Proto-WT since otherwise it would be expected that Proto-WT *g would have become /k/ in Ladakhi as it normally does in word initial position.

Word final

*m --› W m, E m, P m, L m

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
43	sky	xnam	xnam	nam	nam	xnam
53	path	lam	lam	lam	lam	lam
153	three	xsum	sum	sum	sum	xsum

2.4.2 *n

Proto-WT voiced alveolar nasal *n became /ŋ/ word final following the high back vowel /u/ in L. In W, E, and P, it remained /n/.

Word final following a high back vowel

*n --› W n, E n, P n, L ŋ

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
125	week	ʒa bdun	ʒak rdun	---	duŋ dʒak	ʒak bdun
157	seven	bdun	rdun	rdun	rduŋ	bdun

Elsewhere, Proto-WT *n remained /n/ everywhere in all four varieties.

Word initial

*n --› W n, E n, P n, L n

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
110	ygr. sister	NC	noŋo	nomo	nomo	nomo
114	wife	naŋa	NC	nama (K)	nama	nama
149	black	nakpo	nakpo	nakpo	nakpo	nakpo
168	when	nam	nam	nam	nam	nam

Word medial

*n --› W n, E n, P n, L n

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
6	ear	sna	sna	ʃna (B)	namtʃok	ʃna
7	nose	snamsul	snamsul	sna (R)	nakun	sna
17	fingernail	NC	senmero	senmo	senmo	senmo(?)
21	heart	sniŋ	sniŋ	sniŋ (R,B)	sniŋ	sniŋ
43	sky	xnam	xnam	nam	nam	xnam
65	flower	mendok	mendok	mendok	mentok	mendok
108	ygr. brother	pʰono	nono	nono (K)	no	?-no
122	yesterday	gonde	gonde	gonde	NC	gonde
143	small	tsʰuntse	tsʰuntse	tsʰuntse	tʃʰun	tsʰuntse
179	few	ɲintse	ɲuntse	ɲuntsek	ɲuntse	ɲVntse
220	liver	tʃʰinma	tʃʰinma	tʃʰinba	tʃʰinpa	tʃʰinba
226	green	sŋunpo	sŋunpo	sŋunpo (B)	NC	sŋunpo

Word final

*n --> W n, E n, P n, L n

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
23	urine	xtʃin	ɬtʃin	ɬtʃin (B)	ltʃin	xtʃin
118	night	ts^{h}an	ts^{h}an	ts^{h}an	ts^{h}an	ts^{h}an

2.4.3 *ɲ

With two apparent exceptions, Proto-WT voiced palato-alveolar nasal *ɲ remained /ɲ/ word initially in all four varieties. It is not clear why it became /ŋ/ in E in 187, and in P in 163.

Word initial

*ɲ --> W ɲ, E ɲ, P ɲ, L ɲ

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
41	sun	ɲima (0)	ɲima	ɲima	ɲima	ɲima
86	fish	ɲja	ɲja	ɲja	ɲja	ɲja
140	near	ɲimor	ɲimor	ɲemo	ɲemo	ɲemo?
152	two	ɲis	ɲis	ɲis	ɲis	ɲis
163	twenty	ɲiʃu	ɲiʃu	ŋiʃu	ɲiʃu	ɲiʃu
179	few	ɲintse	ɲuntse	ɲuntsek	ɲuntse	ɲVntse
187	sleep	ɲit	ŋit	ɲit	ɲit	ɲit
188	lie down	ɲalepaŋs	---	ɲal (R)	ɲal	ɲal-
200	hear	NC	NC	ɲun	ɲun	ɲun(?)

Proto-WT *ɲ also remained /ɲ/ in all four varieties when following a word initial *s.

Following a word initial *s

*ɲ --> W ɲ, E ɲ, P ɲ, L ɲ

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
75	chili	sɲerma	sɲerma	sɲerma (R)	ɲerma	sɲerma
128	old	sɲiŋma	sɲiŋpa	sɲiŋba	ɲiŋpa (H)	sɲiŋba

Elsewhere, Proto-WT *ɲ occurs only in 162. There, coalescence has occurred with the following *g in W, E, and P, producing /ŋ/. In L, it has remained /ɲ/.

Word medial, following *g

*ɲ --› W ŋ, E ŋ, P ŋ, L ɲ

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
162	twelve	tʃoŋas	tʃoŋas	tʃuŋis	dʒugnis	dʒugnis (R15)

2.4.4 *ŋ

Proto-WT voiced velar nasal *ŋ remained /ŋ/ in all four varieties in all environments.

Word initial

*ŋ --› W ŋ, E ŋ, P ŋ, L ŋ

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
202	I	ŋa	ŋa	ŋa	ŋa	ŋa
207	we (incl.)	ŋataŋ	ŋataŋ	ŋataŋ	nataŋ[26]	ŋataŋ
208	we (excl.)	ŋaja	ŋaja	ŋatʃa	ŋaʒa	ŋadʒa (?)

Word medial

*ŋ --› W ŋ, E ŋ, P ŋ, L ŋ

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
14	elbow	trimoŋ	krioŋ	krimoŋs	temaʒoŋ	krim?oŋs
26	house	NC	NC	kʰaŋba	kʰaŋpa	kʰaŋba
93	tail	NC	sŋama	ʃŋama	sŋama	ʃŋama
98	mosquito	tsaŋki	dzaŋgi	dzaŋgi (K)	zaŋgi	dzaŋgi (?)
101	name	miŋtax	miŋtax	miŋtaks (K)	miŋ	miŋtaks
128	old	spiŋma	spiŋpa	spiŋba	piŋpa (H)	spiŋba
145	light	jaŋmo	jaŋmo	jaŋmo	jaŋmo	jaŋmo
234	fly (n.)	bjaŋbu	zbjaŋbu	zbjaŋbu (R)	raŋu	zbraŋbu

Word final

*ŋ --› W ŋ, E ŋ, P ŋ, L ŋ

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
4	face	gdoŋ	rdoŋ	rdoŋ (B)	ldoŋ	gdoŋ
11	chest	blaŋ	braŋ	braŋ (B)	taŋ	braŋ
21	heart	sniŋ	sniŋ	sniŋ (R)(B)	sniŋ	sniŋ
51	wind	xłuŋ	xłuŋ	błuŋ	hluŋspo	xluŋ

[26]It is not clear why *ŋ has become /n/ here in Ladakhi.

2.5 Semi-vowels

2.5.1 *w

Proto-WT labial-velar semi-vowel *w occurs only twice in my material. The data is insufficient to determine any consistent patterns in its reflexes. The two occurrences are shown below.

*w --> W o~w, E o~w, P o~i, L w~u

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
42	moon	lzot	lzot	lzormo	lzawa	lzawa- (?)
92	horns	rwa	rwa	ridʒo	rudʒo	rwadʒo

2.5.2 *j

Proto-WT palatal semi-vowel *j occurred only word initial and following initial consonant clusters. It remained /j/ in all four varieties word initial.

Word initial

*j --> W j, E j, P j, L j

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
76	turmeric	juŋ	juŋ	juŋ	juŋpo	juŋ-
145	light	jaŋmo	jaŋmo	jaŋmo	jaŋmo	jaŋmo
147	below	NC	NC	jok	jokmo	jok-

Proto-WT *j generally remained /j/ following labials in W, E, and P. Although the data is very limited, it seems that *j may have coalesced with *a following labials in L to form /e/.

Following labials

*j --> W j, E j, P j~i, L e

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
30	broom	pʰjaxma	pʰjaxma	NC	NC	pʰjaxma
54	sand	bjaŋa	bjaŋa	bjama	pema	bjema
87	hen	bjaŋo	bjaŋo	bjamo	tʃeʃa	bjamo
213	bird	bjabu	bjapʰu	bi	NC	bja-
224	world	mjul	mjul	NC	NC	mjul (?)

Elsewhere, Proto-WT *j generally remained /j/ in all environments, with one apparent exception in each of E (139), P (171), and L (173). The reasons for these exceptions are not clear.

Following other consonants

*j --> W j, E j, P j, L j

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
24	feces	kjakpa	rkjakpa	NC	skjakpa	rkjakpa
47	river	rgjamtso	rgjamtso	rgjamtso	gjamso	rgjamtso
86	fish	ɲja	ɲja	ɲja	ɲja	ɲja
119	morning	gjoxpa	gjoxpa	NC	NC	gjoxpa
130	good	ljaxmo (NC)	ljaxmo (NC)	rgjalba (B)	gjala	rgjalba
139	left	xjun (0)	spen	joma/jun (K)	joma	xjVnma
158	eight	bgjat	rgjat	rgjat	gjat	brgjat
164	one hundred	bgja	rgja	rgja	gja	brgja
171	this (prn.)	dju	dju	du	NC	dju (?)
173	these	djuŋ (0)	djun	djun (B)	di	djun (?)
196	run	bgjuk	rgjuk	NC	gjuk (Z)	brgjuk
203	you (inf.)	kʰjaŋ	kʰjaŋ	kʰjeraŋ	kʰjoraŋ	kʰj??aŋ
223	swim	rkjal	rkjal	ʃkjalt (K)	skjal	rkjal
231	yak (male)	hjak	xjak	jakpo	jakpo	xjak-

3.0 SUMMARY AND EXPLANATION OF RULES

As is the case in most of the other modern Tibetan varieties, the driving force behind most of the sound changes which have occurred in Balti, Purik, and Ladakhi seems to be a tendency to simplify consonant clusters. Two general types of cluster simplification occur. In order of frequency of occurrence, they are: (1) the reduction of the number of segments in a cluster, which is achieved either by simple segment deletion or by the coalescence of two contiguous segments, and (2) the alteration in some way of a (usually initial) segment. The latter may be motivated in some cases by a tendency to strengthen an initial consonant in order to aid audibility, and possibly in others, by a tendency to ease articulatory production.

In addition to the processes involved in cluster simplification, a third major category and cause of the sound changes which have occurred in Western Tibetan varieties is assimilation.

All of the above sound changes affect in some way either the phonemic inventories, or the phonemic distribution patterns, of the daughter languages. For example, the coalescence of two contiguous segments in a cluster sometimes results in the creation of a new consonant phoneme which did not exist in the proto language. Segment deletion generally results in conditional phonemic loss. Assimilation, segment alteration, and some instances of coalescence, result in phonemic split and merger. Each of these processes, together with their effects on the phonemic systems of the daughter languages, will be exemplified in the discussion of the various types of sound change rules which follows Table 3 below.

Table 3 gives the distinctive feature values which I posit for the Proto-WT consonant phonemes listed in Table 1.

Table 3. Distinctive features of Proto-Western Tibetan consonants[27]

	p	t	k	b	d	g	s	ʃ	x	z	ʒ	ts	tʃ	dz	dʒ	m	n	ɲ	ŋ	r	l	w	j
sonorant	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	+	+
consonantal	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-
voice	-	-	-	+	+	+	-	-	-	+	+	-	-	+	+	+	+	+	+			+	+
high	-	-	+	-	-	+	-	+	+	-	+	-	+	-	+	-	-	+	+	-	-	+	+
back	-	-	+	-	-	+	-	-	+	-	-	-	-	-	-	-	-	-	+	-	-	+	-
coronal	-	+	-	-	+	-	+	+	-	+	+	+	+	+	+	-	+	-	-	+	+	-	-
continuant	-	-	-	-	-	-	+	+	+	+	+	-	-	-	-	-	-	-	-	+	+	+	+
obstruent	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	-	-	-	-
nasal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-	-	-
strident	-	-	-	-	-	-	+	+	-	+	+	+	+	+	+	-	-	-	-	-	-	-	-
del. release	-	-	-	-	-	-	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-	-	-
lateral	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	-	-

3.1 Cluster reducing rules

3.1.1 Deletion

The least complex way in which the consonant clusters of the Western Tibetan varieties have been simplified is by the deletion of one or more of the constituent segments. In word initial clusters, it is generally the first consonant that undergoes deletion, except in a few three-segment clusters in which the second segment is deleted in some varieties. In non-initial clusters, the deleted segment is generally the syllable-final one.

The following deletion rules all result in conditional phonemic loss in the daughter language. In the case of the Proto-WT phoneme /x/, two deletion rules and one assimilation rule, each applying in a different environment, combine to achieve complete loss of the phoneme /x/ in Purik and Ladakhi. The two deletion

[27]This listing does not include the aspirates. They may be considered to have the same values for these features as their non-aspirated counterparts.

rules (R1 and R2) are shown below. All of the sound change rules displayed in this chapter will be laid out in accordance with the following template.

R# (examples affected by the rule)
Language variety(s) affected: Summary of rule's effect

Formalization of rule

R1 (40, 60, 132, 153, 227)
E,P,L: *x --> 0

$$\begin{bmatrix} +\text{back} \\ +\text{cons} \end{bmatrix} \text{ --> } 0 / \#\_\_ \text{ [+strident]}$$

R2 (43, 51, 131, 139, 231)
P,L: *x --> 0

$$\begin{bmatrix} +\text{back} \\ +\text{cons} \end{bmatrix} \text{ --> } 0 / \#\_\_ \begin{bmatrix} \text{C} \\ +\text{son} \end{bmatrix}$$

The next three deletion rules all have the effect of deleting labials from consonant clusters. Of the three, R3 is the most widespread, both in terms of the number of language varieties, and in terms of the number of words, it affects. Note that it has one minor inconsistency, however. While the *voiced* labial has been completely deleted in all three language varieties in the environment specified, the *voiceless* labial has apparently left a trace in the form of an initial /h/ in Eastern Balti. Also, it may be that the /ʃ/ which occurs in Purik in 160 /ʃtʃu/ 'ten' in place of the original *s may also be a result of its coalescence with some remnant of the deleted voiceless labial.

R3 (158, 160, 164, 196)
E,P,L: *b --> 0,0,0; *p --> h,0,0

[+labial] --> 0/ #__ C C

R4 (154)
E,L: *b --> 0

$$\begin{bmatrix} +\text{labial} \\ +\text{voice} \end{bmatrix} \text{ --> 0/ \#\_\_ } \begin{bmatrix} +\text{cont} \\ -\text{son} \end{bmatrix}$$

R5 (48,96,234)
L: *p --> 0; *b --> 0

[+labial] --> 0 / C__ C

It should be noted that R6 affects in W exactly the same group of words that R3 affects in E, P, and L. This is because they both affect the same type of consonant cluster: namely, clusters of at least three consonants, the first of which is a labial, the second of which is a continuant, and the third of which is a non-continuant. Whereas in Eastern Balti, Purik and Ladakhi, the labial has been deleted, Western Balti has preserved the labial while deleting the medial continuant.[28] This has led to a somewhat confusing situation for a comparative analyst, particularly with regard to the voiced clusters represented in 158, 164, and 196, in which the deletion on both sides has been complete. Without knowledge of Written Tibetan, and using only the data from the 236 words presented here, it would have been possible to reconstruct an initial *bgj for these three words, since the data includes other examples (4, 23, 157, and possibly earlier, 159) of initial coronal continuants developing from similar sources in similar environments. However, /tʃubgjat/ 'eighteen' in W, E, and P, preserves evidence that the Proto-WT *b has not been replaced by /r/ in E and P. Rather it has simply been lost in the word initial environment, resurfacing in the medial environment in /tʃubgjat/, where the /r/ has been lost by another rule.[29]

[28]It is a matter of Balti phonology that the preserved labials, which now immediately precede either a stop or an affricate, are pronounced as fricatives.

[29]Such a rule might look like the following: *r --> 0/ VC__CC

R6 (158,160,164,196)
W: *r --> 0; *s --> 0

$$\begin{bmatrix} C \\ +\text{cont} \end{bmatrix} \rightarrow 0 \;/\; \#C\_\_\; C$$

The effect of R7 is to delete /r/, in L only, whenever it occurs word initially before /g/. This rule is not restricted to words in which *r was word initial in Proto-WT. It applies whenever its conditions are met, including after the operation of R3. So, in L we have 158 *brgjat first becoming /rgjat/ by R3, then becoming /gjat/ by R7.

R7 (47, 130, 158, 164, 196)
L: *r --> 0

$$r \rightarrow 0 / \#\_\_ \begin{bmatrix} +\text{voice} \\ +\text{back} \end{bmatrix}$$

The conditions specified in R8 are met only in 219 *rdʒiŋma 'neck', and there is some doubt as to whether the proto form really had *r there, or something else. Written Tibetan has no ‹r› there. Rather it has the so-called 'a-chung', a symbol thought to have indicated a vowel-like sound, prefixed to the initial voiced affricate. It is not known how this may have been pronounced in classical Tibetan.

It is peculiar that only Leh Ladakhi has an /r/ sound at the beginning of this word, since it is usually Balti and Purik that are more conservative of such features. However, another variety of Eastern Balti, that of Kharmang, on the Indus river in southeastern Baltistan, provides additional evidence that *something* really was there at the beginning of this word. In Kharmang, this word is pronounced [ɣʒima].

R8 (219)
W,E: *r --> 0

$$r \rightarrow 0 \; / \; \#\_\_ \begin{bmatrix} +\text{voice} \\ +\text{del rel} \end{bmatrix}$$

R9 states that morpheme final *s has been deleted, in all of the varieties except Purik, following any non-coronal consonant.

R9 (14, 40, 101, 141, 216, 218)
W,E,L: *s --> 0

$$s \rightarrow 0 / \begin{bmatrix} C \\ -cor \end{bmatrix} \_\_ \begin{Bmatrix} + \\ \# \end{Bmatrix}$$

The last three deletion rules are of limited application, and should be self-explanatory. R11 is based upon a reconstruction of Proto-WT *zrgu for 159, where Written Tibetan has ‹dgu›. It seems preferrable to assume that Written Tibetan ‹d› became *zr here rather than simply *r, since the latter assumption would necessitate an abrogation of R7, which is otherwise well attested in L.

R10 (75, 128)
L: *s --> 0

$$s \rightarrow 0 / \#\_\_ \begin{bmatrix} +\text{high} \\ -\text{back} \\ +\text{nasal} \end{bmatrix}$$

R11 (159)
W,E,P: *z --> 0

$$\begin{bmatrix} +\text{cont} \\ +\text{cons} \end{bmatrix} \rightarrow 0 / \#\_\_ \; r$$

R12 (40)
W,E: *d --> 0

d--> 0 / V r __ V

3.1.2 Coalescence

Although I have labeled R13 as a coalescence rule, it may also be viewed as a sequence of an assimilation rule and a deletion rule. Together, the rules produce a single new segment which possesses qualities of each of the two original segments which it displaces. In Ladakhi, the deletion rule follows the assimilation rule, almost without exception. In Purik, however, its application is somewhat inconsistent. This inconsistency may be due in part to regional variations in Purik, caused by the tension between its own conservative tendencies, together with those of its western neighbor Balti, and the innovative influence exerted by Ladakhi on the east. It is likely that Purik is moving in the direction already taken by Ladakhi.

R13 describes a process which, with some variation, is very widespread in modern spoken Tibetan varieties. It shows how the many Proto-WT initial clusters, consisting of an initial stop of any description whatsoever, followed by *r, have all been reduced to unaccompanied retroflexed stops: /ʈ/, /ʈʰ/, or /ɖ/. These retroflexed stops represent new phonemes in L and P.[30]

The assimilation part of R13 is laid out below in three parallel horizontal lines. The first line (R13) represents the general process, which is essentially the assimilation of the stop to a coronal articulation.[31] Naturally, it affects only those stops which are not already coronals, namely the labials and velars. R13a represents a corollary process by which all velar stops in the same environment,

[30]While /ʈ/, /ʈʰ/, and /ɖ/ may now also be present in Balti, they have come in through loan words and did not gain phonemic status through sound change in native words, as they have in Ladakhi and Purik.

[31]Sprigg considers the coronal stops to have been originally a junction feature, caused by the following /r/ and assuming its place of articulation (1968:310). Thus, the coronal stop may have actually appeared *before* the disappearance of the original initial stop.

regardless of their original voicing value, have become voiceless in L. R13b depicts the fact that all stops which were already coronal in Proto-WT have become retroflexed in L. In addition to these Proto-WT coronals, R13b may or may not also apply to stops made coronal by R13, depending on the variety of Ladakhi. In Zangskar at least, R13b apparently applies whenever its conditions are met, since *all* stops which in Proto-WT were word initial before *r have become retroflexed[32] (Hoshi 1978).

R13c, representing the deletion part of the process, apparently happens simultaneously with the retroflexion, since no retroflexed stops occur with a following /r/. In effect, the /r/ imparts retroflexion to the stop, as a trace of its former presence, before being itself deleted.

R13 (11, 12, 14, 22, 25, 34, 59, 69, 71, 88, 99, 104, 136, 137, 138, 156, 195, 232)
L: *p --> ʈ; *b --> ɖ; *k --> ʈ; *g --> ʈ; *t --> ʈ; *d --> ɖ

R13: [-cont] --> [+cor] / # ___ r
R13a: [+back] --> [-voice]
R13b: [+cor] --> [+retro]

R13c (as above)
L: *r --> 0

$$r \rightarrow 0 / \# \begin{bmatrix} +\text{cor} \\ -\text{cont} \end{bmatrix} \_\_$$

Unlike Ladakhi and Purik, Balti has preserved most of the consonant clusters affected by R13 relatively intact. Eastern Balti in particular, maintains both

[32] I am not prepared to say whether this is the case in Leh. The researcher who provided my Leh Ladakhi material confessed some doubt as to whether he always properly distinguished and recorded the retroflexed stops. However, it is interesting that the modern Leh stops which derived from Proto-WT dentals were recorded by him as retroflexed, whereas nearly all of those derived from either labials or velars he had marked as non-retroflexed. Nonetheless, my observation based on published material from both Zangskar Ladakhi and Purik is that all Proto-WT initial stops occurring before *r are moving towards retroflexion and simultaneous loss of the /r/.

the original points of articulation of the stops, and the articulation of the /r/. Interestingly, Western Balti has recently begun undergoing a change similar, but not identical, to the more advanced one in Ladakhi. So far, the change has only affected clusters which began with proto velar stops, not the labials or dentals. Furthermore, instead of producing retroflexed *stops*, the change in Western Balti is producing retroflexed *affricates*. Whether this is only a stage toward stop production, or a more permanent arrangement, only time will tell. Areal linguistic features, however, seem to lend strength to the idea that this development may indeed be different, not only in its stage of advancement, but also in kind, from that seen in Ladakhi. Baltistan, especially western Baltistan, is partially surrounded and, to a considerable extent, infiltrated by speakers of Shina, a Dardic (Indo-Aryan) language which, like several other languages of northern Pakistan, have an abundance of retroflexed sibilants and affricates. This areal feature could well have provided the pressure which is currently influencing the development of similar affricates in Western Balti. It is very likely that this trend will continue, and probably spread to Eastern Balti eventually. The current state of development is represented in R14.

R14 (14, 22, 25, 34, 69, 137)
W: *kr --> ʧ; *gr --> ʤ

$$\begin{bmatrix} +\text{back} \\ -\text{cont} \end{bmatrix} \text{ r } \rightarrow \begin{bmatrix} +\text{retro} \\ +\text{del rel} \end{bmatrix} \; / \; \#\_\_$$

Some uncertainty exists about the last two coalescence rules, R15 and R16, since the sequences *gɲ and *lŋ occur only once each in the data. These rules are interesting in that they are both examples of cases where Ladakhi has been more conservative than either Purik or Balti, the reverse of the usual situation. In the

case of R16, the coalescence has worked to create a new phoneme in both Balti varieties as well as in Purik. R15 on tbe other hand, has simply produced phonemic merger.

R15 (162)
W,E,P: *gɲ --> ŋ

$$\begin{bmatrix} -\text{cont} \\ +\text{back} \end{bmatrix} \begin{bmatrix} +\text{nasal} \\ +\text{high} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{nasal} \\ +\text{back} \end{bmatrix}$$

R16 (155)
W,E,P: *lŋ --> ɣ

$$\begin{bmatrix} +\text{cons} \\ +\text{cont} \\ +\text{voice} \end{bmatrix} \begin{bmatrix} +\text{nasal} \\ +\text{back} \end{bmatrix} \rightarrow \begin{bmatrix} -\text{nasal} \\ +\text{cons} \\ +\text{cont} \\ +\text{back} \end{bmatrix} \quad / \quad \#\_\_$$

3.2 Segment altering rules

The motivation behind R17 seems to be a tendency to strengthen a relatively weak word initial /r/, which is voiceless in this environment, by making it a sibilant, which is easier to hear. Once again phonemic merger is the result, as new instances of /ʃ/ are created.

R17 (18, 24, 223, 236)
P,L: *r --> ʃ

$$\begin{bmatrix} +\text{cor} \\ +\text{cont} \end{bmatrix} \rightarrow \begin{bmatrix} +\text{strident} \\ +\text{high} \end{bmatrix} / \#\_\_ \begin{bmatrix} -\text{cont} \\ -\text{voice} \end{bmatrix}$$

It is unclear whether R18 is a case of segment strengthening, or rather is motivated by a tendency to ease articulatory production of certain clusters. In any case, R18 should be grouped with R17 since it feeds on the latter's output. In fact,

it is probable that R17 and R18 are closely linked. It seems that a rule very similar to R17 may have applied earlier to Proto-Tibetan, by which Proto-Tibetan *r became Proto-WT *ʃ before nasals, as seen in words 6 and 93. These two words, along with those affected by R17 as formalized above, form the entire input into R18.

R18 (6, 18, 24, 93, 223, 236)
W,E,L: ʃ --> s

[+strident] --> [-high] / #__ C

R19 is also very similar to R17. Here it is word initial Proto-WT *l, rather than *r, that became /ʃ/ before a consonant. R19 applied only to word 155, since that is the only place where *l occurred word initially before a nasal. Unlike R17, R19 must have taken place after R18, since the /ʃ/ in 155 in Ladakhi has not become /s/.

R19 (155)
L: *l --> ʃ

$$[+\text{lateral}] \dashrightarrow \begin{bmatrix} +\text{strident} \\ +\text{high} \end{bmatrix} \quad / \quad \#\_\_ \quad [+\text{nasal}]$$

R20 may have been motivated by a tendency to ease production, or by a need to provide greater distinction between the reflexes of the proto phoneme *dʒ and the new phoneme /ʤ/, created by R14, or both. In any case, R20, together with R31, have caused the loss of the phoneme /dʒ/ in Western Balti. R20 must have taken place before R8, since otherwise the *r in 219 would have been deleted before it had a chance to cause R20.

R20 (219)
W: *dʒ --› ʒ

$$\begin{bmatrix} +\text{del rel} \\ +\text{voice} \end{bmatrix} \text{ --› [+cont]/ \# C \_\_}$$

R21 and R22 are exceptional rules that do not fit neatly into any category. I have included them with the segment altering rules, since that most closely fits their descriptions, even though these alterations do not appear to simplify the consonant clusters that they affect.

R21 is unique among the segment altering rules since it affects a segment which is not word initial, either in Proto-WT or in the daughter language. In Western Balti, Proto-WT *r has become /l/ following word initial labial stops. The motivation for this sound change is not clear. However, alternations between /r/ and /l/ are quite common in Tibetan varieties (cf. Sprigg 1968:305,6,9).

R21 (11, 13, 71, 104, 225)
W: *r --› l

*r --› [+lateral] / # [+labial] __

R22 affects only 154 *bʒi 'four'. In Purik, the *b and the *ʒ have apparently undergone metathesis. After metathesis, R22 changes the /ʒ/ into the sequence /rz/,[33] possibly due to constraints which disallow /ʒ/ from occupying a word initial position before another obstruent.

R22 (154)
P: *ʒ --› rz

*ʒ --› rz / #__ [+obs]

[33]Since neither *bʒ nor *ʒb occur anywhere else in the data, we have no way of knowing whether this change is erratic, or actually represents a consistent sound change.

3.3 Assimilation rules

3.3.1 Point of articulation assimilation

R23, shown on the following page, is basically a coronalization rule. It has four parts, the first of which is general, applying to all cases, while the next three are more restricted and specific. The latter define more precisely what has occurred in specific environments which are subsets of the general environment specified in the first, or general, part of the rule.

The general part of the rule notes that whenever there is any word initial consonant occurring immediately before a stop or an affricate in E, P, or L, the first consonant has become [+coronal] and [+continuant]. The secondary parts of the rule then further specify the first consonant, depending upon the nature of the second consonant. If the second consonant is a voiceless affricate, the initial consonant will become a lateral. If the second consonant is voiced, and neither a labial nor an affricate, the initial consonant will become /r/ in E and P, but usually /l/ in L. The only exception is found in 157, where it becomes /r/ in L as well as in E and P. Since 157 is a numeral, its pronunciation may be affected by areal pressures which hinder the change to /l/.

R23 (4, 23, 52, 157)
E,P,L: *x --> ɬ,ɬ,l; *g --> r,r,l; *r --> r,r,l; *b --> r,r,r

$$C \rightarrow \begin{bmatrix} +\text{cor} \\ +\text{cont} \end{bmatrix} / \#\_\_ \begin{bmatrix} -\text{cont} \\ -\text{nasal} \end{bmatrix}$$

$$\rightarrow [+\text{lateral}] / \#\_\_ \begin{bmatrix} -\text{voice} \\ +\text{del rel} \end{bmatrix}$$

EP only: $\rightarrow /\text{r}/ \quad / \#\_\_ \begin{bmatrix} +\text{voice} \\ -\text{labial} \end{bmatrix}$

L only: $\rightarrow [+\text{lateral}] / \#\_\_ \begin{bmatrix} +\text{voice} \\ -\text{del rel} \\ -\text{labial} \end{bmatrix}$

R24 is almost unique in that it represents a consistent sound change affecting a consonant which occurs intervocalically, rather than initially, or as part of a cluster. Specifically, it has changed Proto-WT *m to /ŋ/ in both Western and Eastern Balti.[34] A plausible motivation for this rule is assimilation to a lingual articulation between vowels, rather than a labial articulation. Besides being intervocalic, there are two other environmental constraints on this rule. First, it has occurred only in word-final open syllables, and second, the preceding vowel must not be preceded by a nasal which is [+high], i.e. either /ɲ/ or /ŋ/. This last constraint may be motivated by dissimilation, in order to keep two similar-sounding nasals from occurring in contiguous syllables.

It may be useful to note that a reconstruction of Proto-WT *ŋ, rather than *m, for all the words affected by R24 would actually have been easier, but would have required us to disregard the valuable evidence we have gained from Written Tibetan. Written Tibetan has ‹m› for every one of the words affected by R24.

[34]Except in the area of Kharmang in southeastern Baltistan, where the intervocalic nasals agree in place of articulation with those of Purik.

However, if we assumed instead that Proto-WT *ŋ was correct, all that would be required would be a rule stating that intervocalic *ŋ became /m/ in P and L, without any other constraints being necessary.

R24 (54, 59, 62, 87, 91, 106, 110, 112, 114, 129)
W,E: *m --> ŋ

$$\begin{bmatrix} +\text{nasal} \\ +\text{labial} \end{bmatrix} \text{ --> [+back] / C V \_\_ V\# (C is not } \begin{bmatrix} +\text{high} \\ +\text{nasal} \end{bmatrix} \text{)}$$

R25 finds application only in word 161. In W and E, the *k has apparently assimilated, both in point and manner of articulation to /s/ before the voiceless africate /tʃ/ in the middle of this word. Although the *k was historically associated with the second syllable of this word, the /s/ seems now to be more associated with the first syllable. It is not pronounced at all in 150 /tʃik/ 'one', which is the same morpheme as the second syllable of 161.

R25 (161)
W,E: *k --> s

$$\begin{bmatrix} +\text{back} \\ -\text{cont} \end{bmatrix} \text{ --> } \begin{bmatrix} +\text{cor} \\ +\text{cont} \end{bmatrix} \text{ / \_\_ } \begin{bmatrix} +\text{cor} \\ +\text{del rel} \end{bmatrix}$$

3.3.2 Voicing assimilation

A feature of Western Tibetan initial consonant clusters, excluding those with nasals in them, is that they always agree internally for voicing. The whole cluster assumes the voicing value of the most consonantal (least sonorant) member.[35] This has led to a case where voicing assimilation has contributed to the production of a new phoneme in W, E, and P. In 49, W, E, and P have /ʎok/ 'lightning'. This /ʎ/

[35]The most consonantal member happens to correspond with the head or radical consonant in Written Tibetan. In the case of words like /bdun/ 'seven', /d/ is the radical, and also the most consonantal since /b/ will automatically be given a fricative pronunciation in this environment.

has apparently developed from a word initial *xl (Jäschke 1881:82), the *x having since been deleted,[36] apparently within the last century.

R26 (49, 51, 131)
W,E,P: *l --> ɬ

$$[+\text{lateral}] \rightarrow [\text{-voice}] \; / \; \# \begin{bmatrix} \text{-voice} \\ \text{+cont} \end{bmatrix} \_\_$$

Although neutralization of contrast makes assignment of phonemic status less meaningful here, voicing assimilation also appears to have produced several instances of /ɬ/ word initially before voiceless consonants, as shown in R27.

R27 (10, 61, 144, 184, 201)
W,E,P: *l --> ɬ

[+lateral] --> [-voice] / #__ [-voice]

The next two rules seem to indicate that Ladakhi may be in the process of losing a voicing distinction in its stops. The phoneme /b/, for example, is very rare, occurring only in highly sonorant environments. /p/ on the other hand, occurs frequently, and is usually, but not always, in complementary distribution with /b/.

Similarly, /g/ and /k/ are *almost* in complementary distribution. For example, 2 /go/ 'head' is the only example in the data in which Proto-WT *g has not become /k/ word initially before a vowel. The probable explanation is that *g was not word initial in Proto-WT, rather Written Tibetan ‹m›, or some vestige of it, was probably still in existence. Therefore, it is important to note that for R28, *b and *g have become /p/ and /k/ *only* if they were word initial in Proto-WT, regardless of their present word position.

---

[36]It is not clear why the *x has been deleted here, but not in 51 /xɬuŋ/ 'wind', although the /x/ in the latter case has apparently come from Written Tibetan ‹r›, whereas that in *xlok comes from Written Tibetan ‹g›.

R28 (54, 89, 111, 112, 167, 170)
L: *b --> p; *g --> k

$$\begin{bmatrix} \text{-cor} \\ \text{-cont} \\ \text{-nasal} \end{bmatrix} \text{ --> [-voice] / *\#\_\_ V}$$

R29 (26, 65, 128, 133, 180, 220)
L: *b --> p; *d -->t

$$\begin{bmatrix} \text{-cont} \\ \text{-back} \\ \text{-nasal} \end{bmatrix} \text{ --> [-voice] / [-cont]\_\_}$$

As in Ladakhi, the labial stops contrast only rarely in Balti. The change seems to be moving in the opposite direction in Balti, however. In Balti, they are moving towards more voicing, rather than less. R30 represents the fact that *p has become /b/ in Balti, when occurring word initially before a vowel.

R30 (19, 218)
W,E: *p --> b

[+labial] --> [+voice] / #__ V

R31 is like R28 in that it applies only where *dʒ is word initial in Proto-WT, i.e. not after the loss of any initial consonant. Otherwise we would expect to see /tʃ/ rather than /ʒ/ and /dʒ/ in 219 in W and E respectively. R31 and R20 have combined to cause the loss of the phoneme /dʒ/ in W. This loss, combined with the loss of /dz/, also in W (see §2.3.8), is made more understandable by two facts. First, both of these voiced affricates were fairly low frequency phonemes, and second, R14 has produced the voiced retroflexed affricate /dẓ/ in W. A three-way contrast between fairly similar, low-frequency phonemes would have been hard to maintain.

R31 (161, 162)
W,E,P: *dʒ --> tʃ

$$\begin{bmatrix} +\text{del rel} \\ +\text{high} \end{bmatrix} \text{ --> [-voice] / } *\#\_\_$$

R32 affects only words 141 and 218. It may perhaps be seen as the converse of R28 and R29, where a preceding [-sonorant] environment has caused the devoicing of phonemes in Ladakhi. Here, a following [+sonorant] environment has caused voicing.

R32 (141, 218)
L: *k --> g

$$\begin{bmatrix} +\text{back} \\ -\text{cont} \end{bmatrix} \text{ --> [+voice] / } \_\_ \begin{bmatrix} +\text{son} \\ +\text{cons} \end{bmatrix}$$

3.3.3 Nasalization and manner of articulation assimilation

R33, together with R1 and R2, have brought about the demise of Proto-WT *x in P and L. Unlike the latter rules, which result in *x deletion, R33 results in *x assimilating to the manner of articulation ([-cont]), as well as the nasalization value, of the following consonant. The result is that some reflexes of *x merge with the phoneme /k/, and some with /ŋ/.

R33 (113, 137)
P,L: *x --> k; *x --> ŋ

$$[+\text{back}] \text{ --> } \begin{bmatrix} -\text{cont} \\ \alpha\ \text{nasal} \end{bmatrix} \text{ / V } \_\_ \begin{bmatrix} -\text{cont} \\ \alpha\ \text{nasal} \end{bmatrix}$$

R34 and R35 describe conditions under which *k has become /x/ in Western and Eastern Balti respectively. The rules are identical except that in Western Balti, the conditions are a bit less restrictive. In both, *k has become /x/ before an /s/

which is either word final, or is followed by a consonant,[37] provided that the /s/ is not a separate morpheme (as in the case of some verb endings). In Eastern Balti, the additional restriction provides that the consonant following the /s/, if any, must be a nasal in order for the rule to apply.

Areal linguistic features may help explain why Balti has the phoneme /x/ while Purik and Ladakhi apparently do not. Velar fricatives are a common feature of the Dardic, and even more so, of the Iranian languages of northern Pakistan. In northern India they are much less common.

R34 (19, 100, 101, 218)
W: *k --> x

$$[+\text{back}] \rightarrow [+\text{cont}] / \_\_ \; s \begin{Bmatrix} C \\ \# \end{Bmatrix}$$ (if s is not a separate morpheme)

R35 (101, 218)
E: *k --> x

$$[+\text{back}] \rightarrow [+\text{cont}] / \_\_ \; s \begin{Bmatrix} [+\text{nasal}] \\ \# \end{Bmatrix}$$ (if s is not a separate morpheme)

R36 describes the nasalization assimilation of *b to /m/ in W and E, following any non-labial nasal.

R36 (128, 220)
W,E: *b --> m

$$\begin{bmatrix} +\text{labial} \\ +\text{voice} \end{bmatrix} \rightarrow [+\text{nasal}] / \begin{bmatrix} +\text{nasal} \\ -\text{labial} \end{bmatrix} \_\_ \; V \#$$

[37]An exception is found in word 175 in W. It is probable that the reduplication which occurs there has interfered with the application of the rule to the final /ks/.

4.0 CONCLUSIONS

4.1 Phonemic inventories

The comparative analysis of the four Western Tibetan varieties represented in this study has produced the reconstructed phonological system of Proto-Western Tibetan which is seen in Tables 1 and 2 at the beginning of Section 2.0. The consonant systems of the daughter languages, as represented in the material available for this study, are displayed in the tables found in Appendix B. The differences between the phonological system of the proto language and those of its daughter languages, expressed as phonemes that have been lost and gained in each of the four daughter languages, is summarized below in Figure 1.

Figure 1: Phonemes lost and gained in four Western Tibetan varieties

	Phonemes lost	Phonemes gained
Western Balti	*dz, *dʒ	ʈʂ, ɖʐ, ɣ, ɬ
Eastern Balti		ɣ, ɬ
Purik	*x, *w	ʈ, ʈʰ, ɖ, ɣ, ɬ
Ladakhi	*x	ʈ, ʈʰ, ɖ, ʂ

Figure 1 seems to suggest that Eastern Balti is the most conservative of the four modern varieties, while Purik is the most innovative. While the first suggestion is probably accurate, the second is open to question.[38] The loss of the phoneme *w in Purik has not been proven beyond doubt, since there were only two instances of it in the proto language, neither of which were indisputable. Also, the

[38]There is, in fact, some evidence to the contrary. Of the sound change rules listed in §3.0, fewer apply to Purik than to any of the other three language varieties.

proto phoneme *x may not have been lost in all Purik varieties (Rangan 1979:6). If, however, Purik is indeed to be considered the most innovative of the modern Western Tibetan varieties, it is only by virtue of its position between Ladakhi and Balti. It has apparently accepted the innovations of both of its neighbors, receiving the new phonemes /ɣ/ and /ʎ/ along with Balti, and /ʈ/, /ʈʰ/, and /ɖ/ along with (and probably historically later than) Ladakhi.

4.2 Types of sound changes and their motivating factors

In §3.0 we saw that the majority of the sound changes observed in the modern Western Tibetan varieties occurred in the context of consonant clusters, especially word initial clusters. The changes were caused either by a tendency of languages to simplify complex consonant clusters, or by the assimilation of a consonant to some feature of its environment, usually a feature of a contiguous consonant. The cluster-simplifying sound changes were achieved by one of three methods: (1) the deletion of a segment, (2) the coalescence of two contiguous segments into one, or (3) the alteration of a segment. Those in the latter category are included with the other cluster-simplifying sound changes because, like them, they were probably induced either to ease the articulatory production of the sequence, or to aid auditory distinctness.

In all of these types of sound changes, the segment or segments most likely to be deleted or altered were those at the beginning of the cluster, that is, those consonants that in Written Tibetan are written above or before the primary consonant of any given syllable onset.[39]

Proto-Western Tibetan *r had a prominent role in all of the major categories of sound change rules. With the exception of the very limited rules R15

[39]Thus, the Tibetan writing system seems to have captured an important feature of the language that endures to this day, in spite of all the sound changes, even in those areas, like Baltistan, where the script has not been in general use for several centuries.

and R16, the coalescence rules did not affect words with prefixed or superscribed consonants, but rather those with an initial stop followed by *r.[40] The *r had the effect of coronalizing and eventually retroflexing the preceding stop in the affected varieties. When occurring word initial before voiceless or nasal consonants, Proto-WT *r tended to become a voiceless sibilant, especially in Purik and Ladakhi. Conversely, when *other* consonants occurred word initially before *voiced* obstruents in Proto-WT, /r/ was the phoneme most likely to appear in the place of the original consonant in the daughter language. In Western Balti, *r also figured in R21, by which it became a lateral following labial stops.

4.3 Problems encountered in comparative analysis of Tibetan varieties

This study has brought to light certain problems that a comparative analyst faces in attempting to do reconstruction in the Tibeto-Burman language family. For example, without a knowledge of Written Tibetan, or of some of the central and eastern Tibetan varieties, it would have been very difficult to explain why the Proto-WT *g has not become /k/ in Ladakhi in 2 /go/ 'head' as it has elsewhere when word initial before a vowel. Also, the reconstruction of words with initial *brg (158, 164, and 196) may instead have been reconstructed as beginning simply with *bg, since /b/ and /r/ never occur together in any of the forms in any of the modern varieties, and since similar phoneme correspondences occur between the four varieties in other words in similar environments. Matters are further complicated by the substantial number of seemingly erratic correspondences and by occasional inconsistencies in the application of certain rules. These have combined

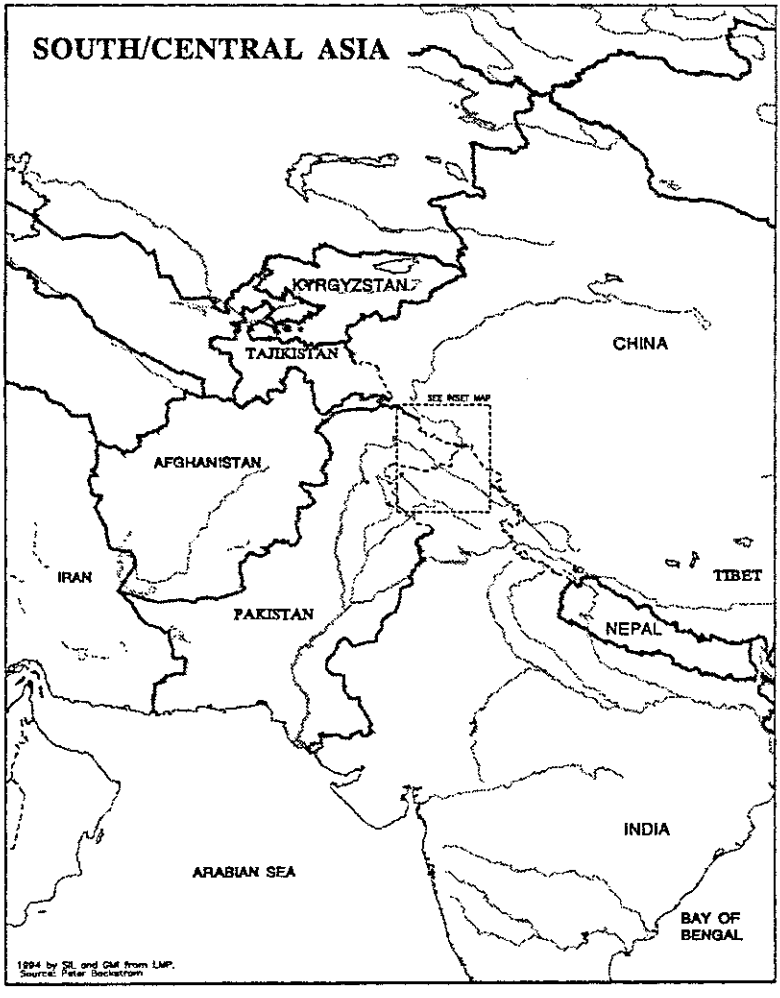
[40]In Written Tibetan the ‹r› was written *under* the letter for the stop, which was the head consonant in these syllables.

to render difficult or impossible the reconstruction of certain parts of several of the Proto-Western Tibetan words found in the list in Appendix A.[41]

Nonetheless, the reconstruction provided by this study should prove useful to those interested in the history and development of the modern Tibetan varieties. In particular, it may be helpful, although not in itself sufficient, for determining the relationship between Proto-Western Tibetan and Proto-Tibetan. This study suggests that Proto-WT may represent an intermediate stage of development, between the classical Tibetan of the seventh century, as preserved in the Tibetan writing system, and the forms found in modern Balti, Purik, and Ladakhi. These results cannot yet be considered conclusive, however. This question merits further research and analysis.

[41]Other uncertainties in the reconstructed words are due to a lack of cognates in all four varieties, or only partial cognates, for several of the glosses.

MAPS


SOUTH/CENTRAL ASIA
KYRGYZSTAN
TAJIKISTAN
CHINA
SEE INSET MAP
AFGHANISTAN
IRAN
PAKISTAN
TIBET
NEPAL
INDIA
ARABIAN SEA
BAY OF BENGAL
1994 by SIL and GM from LMP.
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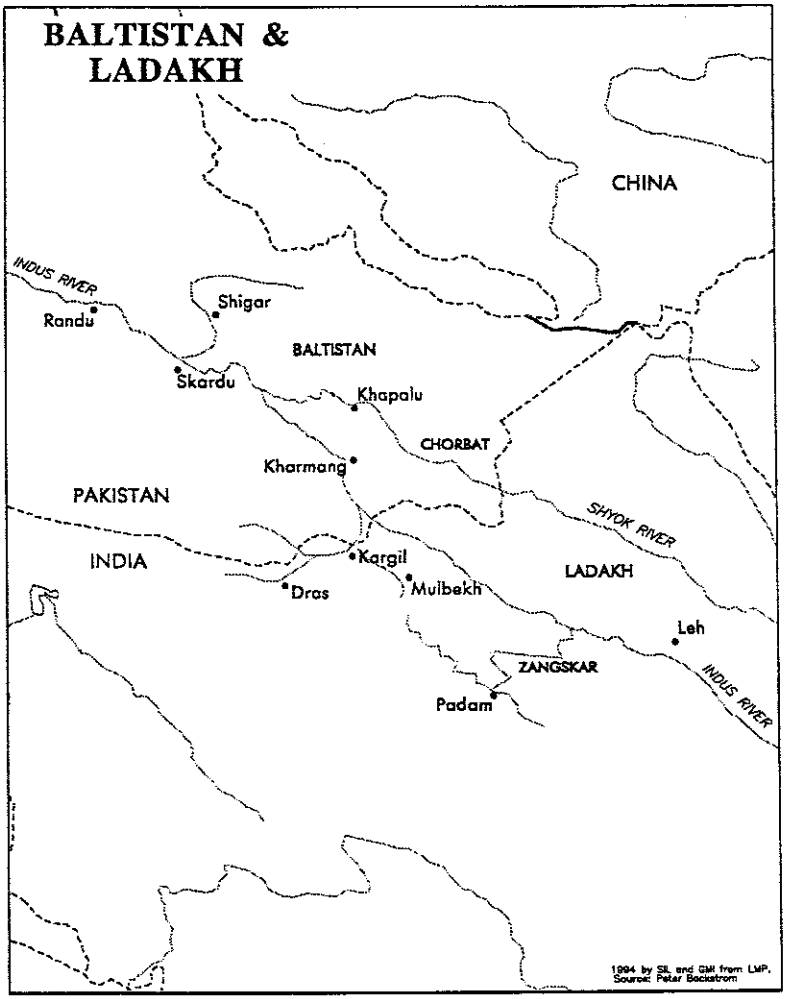
BALTISTAN &
LADAKH
CHINA
INDUS RIVER
Shigar
Randu
BALTISTAN
Skardu
Khapalu
CHORBAT
Kharmang
PAKISTAN
SHYOK RIVER
INDIA
Kargil
LADAKH
Dras
Mulbekh
Leh
ZANGSKAR
INDUS RIVER
Padam
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APPENDIX A

WORD LISTS WITH RECONSTRUCTIONS

Appendix A

Word lists with reconstructions

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
1	body	rgo	rgo	zukspo	zukspo	rgo/zukspo
2	head	go	go	go	go	mgo (T)
3	hair	ral	ral	rjal	ṣa	skra- (?)(T)
4	face	gdoŋ	rdoŋ	rdoŋ (B)	ldoŋ	gdoŋ (R23)
5	eye	mik	mik	mik	mik	mik
6	ear	sna	sna	ʃna (B)	namtʃok	ʃna (R18)
7	nose	snamsul	snamsul	sna (R)	nakun (NC?)	sna
8	mouth	kʰabak	kʰa	kʰa	kʰa	kʰa-
9	tooth	so	so	so	so	so
10	tongue	ɬtʃe	ɬtʃe	ɬtʃe	ltʃe	ltʃe (R27)
11	chest	blaŋ	braŋ	braŋ (B)	taŋ	braŋ (R21,R13)
12	belly	ɬtoa	ɬtoa	totpa	totpa	krotpa (T)(R13)
13	arm	plakpa (0)	prakpa	lakpa (K)	lakpa	prakpa (R21)/lakpa
14	elbow	trimoŋ/ ʦimok (0)	krioŋ	krimoŋs	temaʒoŋ	krim?oŋs (R13-R14,R9)
15	palm	lakt^{h}il	lakt^{h}il	lakt^{h}il	lakt^{h}il	lakt^{h}il
16	finger	senmo (NC)	zogu	dzigu	dzugu	dzugu
17	fingernail	zermoŋ (NC)	senmero	senmo	senmo	senmo (?)
18	leg	kaŋma	kaŋma	ʃkaŋ	skaŋ	rkaŋ- (R17,R18)
19	skin	baxspa	bakspa	pakspa	pakspa	pakspa (R30,R34)
20	bone	ruspa	ruspa	zuspa	ruspa	ruspa
21	heart	sniŋ	sniŋ	sniŋ (R,B)	sniŋ	sniŋ
22	blood	ʦak	kʰrak	tʰak	tʰak	kʰrak (R13,R14)
23	urine	xtʃin	ɬtʃin	ɬtʃin (B)	ltʃin	xtʃin (R23)
24	feces	kjakpa	rkjakpa	NC	skjakpa	rkjakpa (R17,R18)
25	village	ʤoŋ	groŋ	jul	ʈoŋpa (H)	groŋ- (R13,R14)/jul
26	house	naŋ	naŋ	kʰaŋba	kʰaŋpa	kʰaŋba (R29)
27	roof	tʰok (0)	tʰoksa	katʰok	katʰok	-tʰok-
28	door	zgo	zgo	zgo	zgo	zgo
29	firewood	ʃiŋ	ʃiŋ	ʃiŋ	ʃiŋ	ʃiŋ
30	broom	pʰjaxma	pʰjaxma	bumo (NC)	olmo (NC)	pʰjaxma (?)
31	mortar	ɬtanus	ɬʈanus	NC	stunni	?tVn- (?)
32	pestle	ɬtanusi bu	ɬʈanusi bu	---	stunʃiŋ	---
33	hammer	NC	martol	todʒuŋ	tʰuʒuŋ	tʰVdʒuŋ (?)
34	knife	ʤi	gri	gri	ti	gri (R13,R14)
35	axe	stare	stare	stare	stari	stare
36	rope	tʰakpa	tʰakba	tʰakpa	tʰakpa	tʰakpa
37	thread	skutpa	skutpa	skutpa	skutpa	skutpa
38	needle	kʰap	kʰap	kʰap	kʰap	kʰap
39	cloth	snambu	ras	ras	ras	ras
40	ring	xsurup	surup	serdups	serdup	xsVrdups (R1,R9,R12
41	sun	ɲima (0)	ɲima	ɲima	ɲima	ɲima
42	moon	lzot	lzot	lzormo	lzawa	lzawa- (?)
43	sky	xnam	xnam	nam	nam	xnam (R2)
44	star	skarma	skarma	skarma	skarma	skarma
45	rain	ʧ^{h}arpa	ʧ^{h}arpa	ʧ^{h}arpa	ʧ^{h}arpa	ʧ^{h}arpa
46	water	ʧ^{h}u	ʧ^{h}u	ʧ^{h}u	ʧ^{h}u	ʧ^{h}u

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
47	river	rgjamtso	rgjamtso	rgjamtso	gjamso	rgjamtso (R7)
48	cloud	psil (NC)	psil (NC)	sprin	rsin	sprin (R5)
49	lightning	ɬok	ɬok	ɬok (B)	skamlak	xlok (R26)
50	rainbow	paragza	rza	tʃutuŋs	za ʃutuŋs	?gza/?ʃutuŋs (?)
51	wind	xɬuŋ	xɬuŋ	hɬuŋ	hɬuŋspo	xluŋ (R2,R26)
52	stone	rdoa	rdoa	rdoa	ldoa	rdoa (R23)
53	path	lam	lam	lam	lam	lam
54	sand	bjaŋa	bjaŋa	bjama	pema	bjema (R28,R24)
55	fire	me	me	me	me	me
56	smoke	tutpa	tutpa	tutpa	tutpa	tutpa
57	ash, dust	tʰaltʃit	tʰaltsir	tʰalba	tʰalba	tʰalba
58	mud	kalak (S)	kalak	kalak	kalak	kalak
59	dirt	triŋa	triŋa	trima (B)/ ʧima (K)	ʧima (H)	trima (R13b,R24)
60	gold	xser	ser	ser	ser	xser (R1)
61	tree	stakʒi	stakʒi	ɬtʃaŋma	ltʃaŋma	ltʃaŋma (R27)/stakʒi
62	leaf	loŋa	loŋa	loma	loma	loma (R24)
63	root	rampa	rampa	paʈak	paʈak	rampa/pa?ak
64	thorn	tsʰok	riŋa	tserma	tserma	tserma (?)
65	flower	mendok	mendok	mendok	mentok	mendok (R29)
66	fruit	pʰlaxmul	mewa	kʰazes	kʰazes	kʰazes (?)
67	mango	---	---	---	---	---
68	banana	---	---	---	---	---
69	wheat	ʧo	kro	tro	tro	kro (R13,R14)
70	millet	tʃʰa	tʃʰa	---	---	tʃʰa (?)
71	rice	blas	bras	bras	das	bras (R21,R13)
72	potato	alu	alu	alu	alu	alu
73	eggplant	---	---	---	---	---
74	groundnut	---	---	---	---	---
75	chili	ɲerma	ɲerma	ɲerma (R)	ɲerma	ɲerma (R10)
76	turmeric	juŋ	juŋ	juŋ	juŋpo	juŋ-
77	garlic	zgokpa	zgokpa	zgokpa	zgokpa	zgokpa
78	onion	tsoŋ	tsoŋ	tsoŋ	tsoŋ	tsoŋ
79	cauliflower	---	---	---	---	---
80	tomato	paɣan	paɣan	---	tamatar	---
81	cabbage	karam	karam	---	NC	karam (?)
82	oil	mar	mar	mar	marnak	mar-
83	salt	paju	paju	tsʰa	tsʰa	tsʰa
84	meat	ʃa	ʃa	ʃa	ʃa	ʃa
85	fat	tsʰil	tsʰil	tsʰil	tsʰil	tsʰil
86	fish	ɲja	ɲja	ɲja	ɲja	ɲja
87	hen	bjaŋo	bjaŋo	bjamo	tʃeʃa	bjamo (R24)
88	egg	bjapʒun	bjapʒun	trul/tʰul (B)	tʰul	trul (R13b)
89	cow	ba	ba	ba	paʃi (H)	ba
90	buffalo	---	---	---	---	---
91	milk	oŋa	oŋa	ordʒen	oma	oma (R24)
92	horns	rwa	rwa	ridʒo	rudʒo	rwadʒo
93	tail	ʒindo	sŋama	ʃŋama	sŋama	ʃŋama (R18)
94	goat	rabak	ra	rama	rama	ra-
95	dog	kʰi	kʰi	kʰi	kʰi	kʰi
96	snake	gbul	rbul	zbrul	zrul	zbrul (R5)

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
97	monkey	ʃedi	ʃedi	ʃaʤi	manu	---
98	mosquito	tsaŋki	dzaŋgi	dzaŋgi (K)	zaŋgi	dzaŋgi (?)
99	ant	ʧimok	kimbok	krimok (K)	temok	krem?ok (R13)
100	spider	taxskan	takskan	tʰakskan	tʰaksrabu	tʰakskan (R34)
101	name	miŋtax	miŋtax	miŋtaks (K)	miŋ	miŋtaks (R34,R35,R9)
102	man	mi	mi	mi	mi	mi
103	woman	bustriŋ	brustiŋ	ane	pomo	---
104	child	pʰʮu	pʰru	tʰru	tʰugu	pʰru (R21,R13)
105	father	ata	ata	ata	aba (NC)	ata
106	mother	aŋo	aŋa	ama	ama	ama (R24)
107	older brother	kaka	kaka	kaka	atʃo	kaka/atʃo
108	ygr. brother	pʰono	nono	nono (K)	no	?-no
109	older sister	aʃe	aʃe	atʃʰe	atʃe	atʃʰe (?)
110	ygr. sister	striŋmo (NC)	noŋo	nomo	nomo	nomo (R24)
111	son, boy	bu	bu	butsa	putsa	bu (R28)
112	daughter, girl	boŋo	boŋo	bomo	pomo	bomo (R28,R24)
113	husband	daxpo	daxpo	makpa	makpa	CaxpV (R33)
114	wife	naŋa	zanzus	nama (K)	nama	nama (R24)
115	boy	(same as 104 or 111)				
116	girl	(same as 112)				
117	day	ʒak	ʒak	ʒak	ʒak	ʒak
118	night	tsʰan	tsʰan	tsʰan	tsʰan	tsʰan
119	morning	gjoxpa	gjoxpa	sŋamo (B)	sŋamo	sŋamo/gjoxpa
120	noon	trobar	trobar	totʃu	dzara	---
121	evening	pʰiro	pʰiro	pʰitok	pʰitok	pʰiro/pʰitok
122	yesterday	gonde	gonde	gonde	daŋ	gonde
123	today	diriŋ	diriŋ	diriŋ	diriŋ	diriŋ
124	tomorrow	haske	haske	aske	tʰore (NC)	haske (?)
125	week	ʒa bdun	ʒak rdun	---	duŋ dʒak	ʒakbdun
126	month	lza	lza	lza	lda	lza (?)
127	year	lo	lo	lo	lo	lo
128	old	spiŋma	spiŋpa	spiŋba	piŋpa (H)	spiŋba (R10,R29,R36)
129	new	sarpa	soŋa	soma	soma	soma (R24)
130	good	ljaxmo	ʧjaxmo	rgjalba (B)	gjala	rgjalba (R7)
131	damp	xʟan	NC	NC	lonpa	xlVn- (R2,R26)
132	wet	xʃerpa	ʃerpa	ʃerpa	NC	xʃerpa (R1)
133	dry	skambo	skambo	skambo	skampo	skambo (R29)
134	long	riŋmo	riŋbo	riŋmo	riŋmo	riŋmo
135	bad	tʃaŋmen	tʃaŋmen	tsokpo	tsokpo	tʃaŋmen?/tsokpo?
136	hot	tsʰo	tronmo	ʈonmo (K)	ʈotmo (H)	tro?mo (R13b)
137	cold	ʤaxmo	graxmo	daŋmo/ graŋmo	taŋmo	graxmo (R13-R14,R33)
138	right	traŋ	traŋ	ʈaŋ (R)	ʈaŋ (H)	traŋ (R13b)
139	left	xjun (0)	spen	joma/ʃun (K)	joma	xjVnma (R2)
140	near	ɲimor	ɲimor	ɲemo	ɲemo	ɲemo?
141	far	tʰakriŋ	tʰakriŋ	tʰakriŋs	tʰagriŋ	tʰakriŋs (R32,R9)
142	big	tʃoɣo	tʃoɣo	tʃʰe	tʃʰenmo	tʃʰe- (?)
143	small	tsʰuntse	tsʰuntse	tsʰuntse	tʃʰun	tsʰuntse
144	heavy	ɬtʃʰo	ɬtʃʰo	ɬtʃintek	ltʃinte	ltʃ- (R27)
145	light	jaŋmo	jaŋmo	jaŋmo	jaŋmo	jaŋmo
146	above	jar	gjen	katotpo	kʰjetok	---

No. Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
147 below	tʰuru	tʰur	jok	tʰuglo/jokmo	tʰu-/jok-
148 white	karpo	karpo	karpo	karpo	karpo
149 black	nakpo	nakpo	nakpo	nakpo	nakpo
150 red	marpo	marpo	marpo	marpo	marpo
151 one	tʃik	tʃik	tʃik	tʃik	tʃik
152 two	ɲis	ɲis	ɲis	ɲis	ɲis
153 three	xsum	sum	sum	sum	xsum (R1)
154 four	bʒi	ʒi	rzbi	ʒi	bʒi (R4,R22)
155 five	ŋa	ŋa	ŋa	ʃŋa	lŋa (T)(R16,R19)
156 six	truk	truk	truk/ʈuk (R)	ʈuk	truk (R13b)
157 seven	bdun	rdun	rdun	rduŋ	bdun (R23)
158 eight	bgjat	rgjat	rgjat	gjat	brgjat (R6,R3,R7)
159 nine	rgu	rgu	rgu	zrgu	zrgu (R11)
160 ten	ptʃu	hstʃu	ʃtʃu (R,A,B)	stʃu	pstʃu (R3,R6)
161 eleven	tʃustʃik	tʃustʃik	tʃukʃik (B)	dʒukʃik	dʒuktʃik (R31,R25)
162 twelve	tʃoŋas	tʃoŋas	tʃuŋis	dʒugɲis	dʒugɲis (R31,R15)
163 twenty	ɲiʃu	ɲiʃu	ŋiʃu	ɲiʃu	ɲiʃu
164 one hundred	bgja	rgja	rgja	gja	brgja (R6,R3,R7)
165 who	su	su	su	su	su
166 what	tʃi	tʃi	tʃi	tʃi	tʃi
167 where	gar	gar	gar	karu	gar- (R28)
168 when	nam	nam	nam	nam	nam
169 how-many	tsam	tsamtse	tsamʃik	tsamʃik (H)	tsam-
170 which	go	go	gadzuk	kazuk	ga- (R28)
171 this (prn.)	dju	dju	du	NC	dju (?)
172 that (prn.)	do	do	NC	NC	do (?)
173 these	djuŋ (0)	djun	djun (B)	di	djun (?)
174 those	doŋ	don	NC	NC	don (?)
175 same	tsoksatsoks	tsoksatsox	tsoks	tsoks	tsoks
176 different	loxso	loxso	soso	soso	---
177 whole	NC	NC	NC	NC	---
178 broken	tʃʰak	tʃʰak	tʃʰak	tʃʰak	tʃʰak
179 few	ɲintse	ɲuntse	ɲuntsek	ɲuntse	ɲVntse
180 many	iʃin	ɬtim	maŋbo	maŋpo	maŋbo (R29)
181 all	gaŋma	gaŋma	gaŋma	tsʰaŋma	gaŋma
182 eat	zo	zo	zo	zo	zo
183 bite	tʃat	tʃat	tʰam (K)	tʰam	tʃat (?)/tʰam (?)
184 hunger (vb.)	ɬtok	ɬtok	ɬtok	ltok	ltok (R27)
185 drink	tʰuŋ	tʰuŋ	tʰuŋ	tʰuŋ	tʰuŋ
186 thirst (vb.)	skoms	skoms	skoms	skoms	skoms
187 sleep	ɲit	ɲit	ɲit	ɲit	ɲit
188 lie down	palepaŋs	---	ɲal (R)	ɲal	ɲal-
189 sit	duk	duk	duk	duk	duk
190 give	min	min	toŋ	toŋ	min (?)/toŋ (?)
191 burn (tr.)	tuk	potuk	tuk	tuk	-tuk
192 die	ʃi	ʃi	ʃi	ʃi	ʃi
193 kill	rdaps	rdaps	sot	sot	rdaps/sot
194 fly (vb.)	pʰur	pʰur	pʰur	ur	pʰur
195 walk	drul	drul	ɖul (B,R)	ɖul	drul (R13b)
196 run	bgjuk	rgjuk	baŋtaŋ	gjuk (Z)	brgjuk (R6,R3,R7)
197 go	soŋ	soŋ	soŋ	soŋ	soŋ

No.	Gloss	Western Balti	Eastern Balti	Purik	Ladakhi	Proto-WT
198	come	oŋ	oŋ	joŋ	joŋ	?-oŋ
199	speak	zer	zer	zer	zer	zer
200	hear	kos	kos	ɲun	ɲun	kos (?)/ɲun (?)
201	see, look	tʰoŋ	tʰoŋ	ɨtas	ltas	tʰoŋ, ltas (R27)
202	I	ŋa	ŋa	ŋa	ŋa	ŋa
203	you (inf.)	kʰjaŋ	kʰjaŋ	kʰjeraŋ	kʰjoraŋ	kʰj??aŋ
204	you (formal)	jaŋ	jaŋ	jeraŋ (B)	ɲeraŋ	?-eraŋ (?)
205	he	kʰo	kʰo	kʰo (B)	kʰo	kʰo
206	she	NC	NC	kʰo (B)	kʰo	kʰo
207	we (incl.)	ŋataŋ	ŋataŋ	ŋataŋ	nataŋ	ŋataŋ
208	we (excl.)	ŋaja	ŋaja	ŋatʃa	ŋaʒa	ŋadʒa (?)
209	you (plural)	kʰitaŋ	kʰitaŋ	kʰetʃa (K)	kʰjoʒa	kʰjVdʒa (?)
210	they	kʰoŋ	kʰoŋ	kʰoŋ (B)	kʰoguŋ	kʰo??ŋ
211	not	met	met	minduk	miduk	—
212	person	(same as 102)				
213	bird	bjabu	bjapʰu	bi	tʃipa (NC)	bja-
214	louse	ʃik	ʃik	ʃik	ʃik	ʃik
215	seed	son	son	sa	sa	sa-?
216	bark	ʃumplak	ʃumpak	ʃumbraks (B)	tʃaŋmo bakspa	ʃumpraks (?)(R9)
217	wing	ʃokpa	ʃokpa	ʃokpa	ʃokpa	ʃokpa
218	knee	buxmo	buxma	puksmo	piqmo	puksmo (R30-R35,R9,R32)
219	neck	ʒiŋma	dʒiŋma	ske (NC)	rdʒiŋma	rdʒiŋma (R8,R20)
220	liver	tʃʰinma	tʃʰinma	tʃʰinba	tʃʰinpa	tʃʰinba (R29,R36)
221	know	ʃes	ʃes	---	ʃes	ʃes
222	stand	laŋ	laŋ	laŋ (B)	laŋ	laŋ
223	swim	rkjal	rkjal	ʃkjalt (K)	skjal	rkjal (R17,R18)
224	world	mjul	mjul	sa	sa	sa (?)/mjul (?)
225	mountain	blak	brak	brak	ri	brak (R21)
226	green	sŋunpo	sŋunpo	sŋunpo (B)	ldʒaŋku	sŋunpo
227	yellow	xserpo	serpo	serpo	serpo	xserpo (R1)
228	full	gaŋse	gaŋse	skaŋse	skaŋste	gaŋse (?)
229	round	ribu	rilbu	kirkir	kirkir	—
230	turquoise	---	---	hju	ju	---
231	yak (male)	hjak	xjak	jakpo	jakpo	xjak- (R2)
232	yak (female)	hjakmo	xjakmo	dimo	dimo	dimo/brimo (T)(R13)
233	carpet	---	—	—	—	---
234	fly (n.)	bjaŋbu	zbjaŋbu	zbjaŋbu (R)	raŋu	zbraŋbu (R5)
235	barley flour	traskur	naskur	sŋanpe	sŋanpe	sŋanpe
236	horse	rta	rta	ʃta	sta	rta (R17,R18)

APPENDIX B

CONSONANT SYSTEMS OF WESTERN BALTI, EASTERN BALTI, PURIK, AND LADAKHI

Appendix B

Consonant systems of Western Balti, Eastern Balti, Purik, and Ladakhi

Consonant system of Western Balti

	Labial	Dent./Alv.	Palato-alv.	Retro.	Velar	Glottal
vl. stops	p	t			k[1]	
vl. asp. stops	p^h	t^h			k^h	
vd. stops	b	d			g	
vl. fric.		s	ʃ		x	h
vd. fric.		z	ʒ		ɣ	
vl. affr.		ts	tʃ	ʈʂ		
vl. asp. affr.		ts^h	$tʃ^h$			
vd. affr.				ɖʐ		
nasals	m	n	ɲ		ŋ	
flap		r				
vd. lateral		l				
vl. lateral		ɬ				
semi-vowels	w		j			

Consonant system of Eastern Balti

	Labial	Dent./Alv.	Palato-alv.	Velar	Glottal
vl. stops	p	t		k	
vl. asp. stops	p^h	t^h		k^h	
vd. stops	b	d		g	
vl. fric.		s	ʃ	x	h
vd. fric.		z	ʒ	ɣ	
vl. affr.		ts	tʃ		
vl. asp. affr.		ts^h	$tʃ^h$		
vd. affr.		dz	dʒ		
nasals	m	n	ɲ	ŋ	
flap		r			
vd. lateral		l			
vl. lateral		ɬ			
semi-vowels	w		j		

[1]I have not distinguished between /k/ and /q/, a uvular stop, which may now be a separate phoneme in Balti and Purik. According to Bielmeier, [q] originally occurred as a variant of /k/ after /a/ and /o/, word finally and before voiceless stops (1985:54). He contends that it should now be considered a separate phoneme due to its frequent occurrence in loan words.

Consonant system of Purik

	Labial	Dent./Alv.	Palato-alv.	Retro.	Velar	Glottal
vl. stops	p	t		ʈ	k	
vl. asp. stops	pʰ	tʰ		ʈʰ	kʰ	
vd. stops	b	d		ɖ	g	
vl. fric.		s	ʃ			h
vd. fric.		z	ʒ		ɣ	
vl. affr.		ts	tʃ			
vl. asp. affr.		tsʰ	tʃʰ			
vd. affr.		dz	dʒ			
nasals	m	n	ɲ		ŋ	
flap		ɾ				
vd. lateral		l				
vl. lateral		ɬ				
semi-vowel			j			

Consonant system of Ladakhi

	Labial	Dent./Alv.	Palato-alv.	Retro.	Velar	Glottal
vl. stops	p	t		ʈ	k	
vl. asp. stops	pʰ	tʰ		ʈʰ	kʰ	
vd. stops	b[2]	d		ɖ	g	
vl. fric.		s	ʃ	ʂ		h
vd. fric.		z	ʒ			
vl. affr.		ts	tʃ			
vl. asp. affr.		tsʰ	tʃʰ			
vd. affr.		dz	dʒ			
nasals	m	n	ɲ		ŋ	
flap		ɾ				
lateral		l				
semi-vowels	w		j			

[2]It is questionable whether /b/ is really still a separate phoneme in Ladakhi. [b] occurs only four times in my data, three times intervocalically and once between [l] and a vowel. [p] occurs much more frequently than [b] and, with one exception, their distribution is complementary. The exception is found in 213 /tʃipa/ 'bird' where [p] occurs intervocalically. Although this word is probably not cognate with the forms for this gloss from Balti and Purik, I have retained it in the data as my only justification for keeping /p/ and /b/ as separate phonemes in Ladakhi. /tʃipa/ probably comes from Written Tibetan ‹mtʃʰil-pa›, rather than from ‹bja›, the etymon of the Purik and Balti forms for that gloss.

REFERENCES

Afridi, Banat Gul. 1988. Baltistan in history. Peshawar, Pakistan: Emjay Books International.

Austen, H.H.G. 1866. A vocabulary of English, Balti and Kashmiri. Journal of the Asiatic Society of Bengal, vol. XXXV.

Backstrom, Peter C. 1992. Balti. Sociolinguistic survey of northern Pakistan, vol. 2: Languages of northern areas, by Peter C. Backstrom and Carla F. Radloff. Islamabad: National Institute of Pakistan Studies and Summer Institute of Linguistics.

Bailey, T.G. 1915. Purik. Linguistic studies from the Himalayas, 1-45. (Royal Asiatic Society monograph no. 18.) London: The Royal Asiatic Society.

Bielmeier, Roland. 1985. Das Märchen vom Prinzen Cobzan: Eine tibetische Erzählung aus Baltistan. Text, Übersetzung, Grammatik und westtibetisch vergleichendes Glossar. Sankt Augustin: VGH Wissenschaftsverlag.

Chang, Kun. 1992. Tibetan. International encyclopedia of linguistics, ed. by William Bright, 156-60. New York: Oxford University Press.

Francke, A.H. 1986. Baltistan and Ladakh -- A History. Islamabad: Lok Virsa Publishing House. First published as "History of Western Tibet", London, 1907.

Grierson, G.A. 1908. Linguistic survey of India, vol. III, part I. Calcutta: Government of India, Central Publishing Branch.

Grimes, Barbara F. (ed.) 1992. Ethnologue: languages of the world. 12th edn. Dallas, Texas: Summer Institute of Linguistics.

Hale, Austin. 1982. Research on Tibeto-Burman languages. Trends in linguistics: State-of-the-Art Report 14. New York: Mouton Publishers.

Hoshi, Michiyo and Tondup Tsering. 1978. Zangskar vocabulary: A Tibetan dialect spoken in Kashmir. Monumenta Serindica no. 5. Tokyo: Institute for the Study of Languages and Cultures of Asia and Africa.

Jäschke, H.A. 1881. A Tibetan-English dictionary. London.

Jäschke, H.A. 1954. Tibetan Grammar. Reprint. Supplement of readings with vocabulary by John L. Mish. New York: Frederick Ungar Publishing Co.

Matisoff, James A. 1986. The languages and dialects of Tibeto-Burman: An alphabetic/genetic listing, with some prefactory remarks on ethnonymic and glossonymic complications. McCoy and Light 1986: 3-75.

Ossorio, Janet R.W. 1982. Tsang Tibetan Phonology. Doctoral thesis. University of Colorado at Boulder.

Rangan, K. 1975. Balti phonetic reader. Mysore: Central Institute of Indian Languages.

Rangan, K. 1979. Purki grammar. Mysore: Central Institute of Indian Languages.

Read, A.F.C. 1934. Balti grammar. London: The Royal Asiatic Society.

Sprigg, R.K. 1966. Lepcha and Balti Tibetan: tonal or non-tonal languages? Asia Major. New series 12.185-201.

Sprigg, R.K. 1968. The role of r in the development of the modern spoken Tibetan dialects. Acta Orientalia Academiae Scientiarum Hungaricae, Budapest 21.3:301-11.

Sprigg, R.K. 1972. A polysystemic approach, in Proto-Tibetan reconstruction, to tone and syllable-initial consonant clusters. Bulletin of the School of Oriental and African Studies, University of London, 35.3:546-87.

Sun, Jackson T.-S. 1986. Aspects of the phonology of Amdo Tibetan: Ndzorge śæme Xora dialect. Monumenta Serindica no. 16. Tokyo: Institute for the study of languages and cultures of Asia and Africa.