LOST SYLLABLES AND TONE CONTOUR IN DZONGKHA (BHUTAN)

Martine Mazaudon and Boyd Michailovsky

1. Introduction

In the present article[1] we will point out a hitherto undescribed phonological opposition in Dzongkha, the national language of Bhutan, and attempt to trace its origin by comparison with the forms of Classical Tibetan.

The contrast between high and low register words in Central Tibetan and its relationship to the voicing opposition of Tibetan orthography has been long established (Jäschke, 1881:xiii). Later authors, among them prominently Dr R. K. Sprigg, have devoted much attention to refining the analysis (Sprigg, 1954, 1955) and extending it to other dialects, for instance in Sprigg (1966), and mainly Sprigg (1972) which underlines the role of initial clusters. For Dzongkha, the same evolution was recently described by Weidert (1986).

The object of our study is a different contrast, between a level and a falling melodic contour, which intersects with the abovementioned register opposition. A contour contrast has also been described for Lhasa Tibetan by Richter (1964:33-36) and Chang and Chang (1978:1.xix-xxxi). But the Dzongkha contrast differs in many respects: in phonetic realisation, lexical distribution, and historical origin. A common feature is the regressive nature of the transphonologisation. As it appears, a major source of the level vs. falling contour opposition in Dzongkha in the reduction of one type of Classical Tibetan disyllables to monosyllables – yet another way of 'reloading the syllable canon' (Matisoff 1986).

1.1 Dzongkha and Ngalong

'Ngalong' is the name given in Bhutan to the inhabitants of the western third of the country and to their language, which linguistically is a Tibetan dialect. Ngalong itself has several regional dialects, with considerable phonological differences between them. Standard Dzongkha,

the official 'court language', is said to be close to the Ngalong of the capital Thimphu and to that of Punakha, although there may be some differences.   Other varieties commonly cited by Bhutanese are the western dialects of Ha (the westernmost) and Paro, and the eastern dialect, Sha (WT *shar* 'east'), spoken between Wangdi Phodrang and the Pele-la, which marks the eastern limit of Ngalong speech.   The speech of Chapcha, about forty kilometers south of Thimphu, is also a distinct dialect.

The languages spoken in central and eastern Bhutan are members of the Tibeto-Burman family, but not Tibetan dialects. The main language of central Bhutan is generally called Bumthang, and that of eastern Bhutan Sharchop (or Tsangla). Dzongkha is taught in schools and used as an official language throughout Bhutan.

It should be noted that Dzongkha (WT *rdzong-kha*, lit. 'fortress-language'), is *not* the same as Den-jong-ke (WT *'bras-ljongs-skad*, lit. 'rice-district-language', variously romanised), which is a related Tibetan dialect spoken in Sikkim.

1.2 The data

The present article is based on short periods of fieldwork by the authors in 1977 and in 1986. In January and February 1977 both authors worked in New Delhi with a native of Chapcha district.   Our understanding of Dzongkha tone is based mainly on this work. In 1986 one of us (B.M.) spent two months in Bhutan, during which he was able to work a number of hours with a young native speaker of Thimphu dialect, from a village within sight of Thimphi Dzong. All of our earlier examples were checked with this speaker, and the notation in this article is based on these notes. The prosodic system appeared to be similar to that of Chapcha. Some notes were also taken with a Paro speaker.

The article is based on the study of Dzongkha monosyllabic nouns and adjectives. We have not been able to work on the phonology of polysyllables as yet, but it is clear, as Sprigg (1954:146-156, 1955) has demonstrated for Lhasa Tibetan, that the phonology of polysyllables is not that of a string of monosyllables. The domain of tone, in particular, is larger than the syllable. Verbs were generally excluded from the present study, because we were uncertain of their morphology, but some of the nouns and adjectives included are probably verbal derivatives.

2. Dzongkha phonology

2.1 Initials

Dzongkha initials are transcribed as in Table 1.

There are four series of initial stops: voiceless, aspirated, voiced, and devoiced, and three of sibilants (the same, less the aspirates). The voiceless and aspirate series are associated with the high register, the voiced and devoiced series with the low register. Bhutanese from the central and eastern parts of the country, who are not native Ngalong speakers, generally confuse the voiced and devoiced series, pronouncing all low-register initials as voiced. (This applies to the majority of Dzongkha language teachers in Bhutan.)

Table 1: Dzongkha initial consonants

stops	*k*	*kh*	*g*	*gh*
	c	*ch*	*j*	*jh*
	ts	*tsh*	*dz*	*dzh*
	t	*th*	*d*	*dh*
	tr	*thr*	*dr*	*dhr*
	p	*ph*	*b*	*bh*
	pɕ	*pɕh*	*bj*	*bjh*
sibilants	*ɕ*	*ʑ*	*ʑh*	
	s	*z*		*zh*
nasals	*ng*	*ny*	*n*	*m*
voiceless nasals	*hn*	*hm*		
liquids	*r*	*l*		
voiceless liquid		*hl*		
glides	*y*	*w*		
aspirate	*h*			

The devoiced series is here transcribed by the voiced initial followed by '*h*'. Note that Dzongkha *zh* is the devoiced partner of *z*, an alveolar sibilant; the Dzongkha palatal fricative corresponding to the WT transliteration **zh** is here transcribed *ʑ* (and its devoiced partner *ʑh*). The transcriptions *tr thr dr dhr* represent retroflex initials; *pɕ pɕh bj bjh* represent bilabials with palatal affrication, e.g. *[pɕ]*, etc. This latter series has merged with the palatals *c ch j jh* in the western dialects (as in Central Tibetan) - thus Thimphu ^L*bjha* 'bird' (WT **bya**) is ^L*jha* in Paro, homophonous with 'tea' (WT **ja**).

Voiced nasals, liquids, and glides may be either high- or low-register, except for *r*, which appears to be only low.

Voiceless nasals *(hn, hm)*, which are high-register, are found in some dialects, but have generally merged with *h* in Thimphu. Thus Chapcha ^1*hnap* 'snot' (WT **snabs**) corresponds to Thimphu ^1*hap* and to Paro ^H*hlap*. Chapcha ^1*hnum* 'oil' (WT **snum**) corresponds to ^1*hum* in Thimphu. The voiceless liquid *hl* is also less frequent in Thimphu than elsewhere - Chapcha and Paro ^1*hlam* 'traditional boot' (WT **hlam**) correspond to Thimphu ^1*ham*.

Voiceless initial *h* is high-register, as are non-breathy vocalic initials. Words here transcribed with initial *h* and low register could equally well be regarded as having low-register (and breathy) vocalic initials.

2.2 Rhymes

The rhymes of Dzongkha monosyllables are summarised in Table 2.

Table 2: Dzongkha rhymes

Rhyme	Associated contour
-V	short open: level (no distinctive contour)
-Ṽ: -Ṽ: -Vp -Vm -Vn	long open and short closed: level vs. falling contour distinction (except with final -n)
-Vu -a:u -V:p -V:m	diphthong and long closed: falling (no distinctive contour) (with a few exceptions)

The inventory of Dzongkha vowel qualities is as follows - *i, e, ε, a, o, oe, u, ue.* The open ε and the front rounded *oe, ue* (IPA [ø], [y]) derive mainly from a kind of umlaut by which *a, o, u* were fronted before dental finals. (Fronted *a* seems to have given *e* in some cases). In short, open monosyllables there is no opposition between *e* and ε (the realisation is rather open), and *oe* and *ue* are rare. Length (:) is phonologically distinctive. Nasalisation (~) is also distinctive, but there is no opposition of length on nasalised vowels, which are realised as long. The diphthongs (found only in open syllables) are *ai* (in [2]*ai* 'mother'), *au, a:u, iu, eo, εu, ou* and perhaps *oeu.*

One feature which the non-standard dialects seem to share is the pronunciation *õ:* (perhaps with an open *ɔ*) corresponding to WT -***ang***, e.g. [H]*lõ:* 'bullock' in Paro, Chapcha and Sha, vs. Thimphu [H]*lã:* (WT ***glang***).

The final consonants found on monosyllabic nouns are *p, m, n*. Before *n* only the short vowels *i, e, ε, oe, ue* are found.

2.3 Tones

Dzongkha has a four-tone system, in which a high vs. low register distinction (found in all syllable types) intersects with a level vs. falling contour opposition (on some syllable types only—see below). We have numbered the tones in the order of their absolute pitch: [1] high-level, [2] high-falling, [3] low level, [4] low falling. On short open syllables, and on monosyllables in final -*n*, which have no distinctive contour, we have noted the registers as [H] and [L]. Where we were uncertain of the contour, we have noted [H] and [L]. (It is not clear that there is a tone contour opposition in the Paro dialect.)

The tonal contours are the most original aspect of Dzongkha phonology and require phonetic description. The melodic aspects of the tones may be seen in the pitch-extraction tracings of

Figure 1 (based on utterances of a male speaker from Chapcha) and Figure 2 (a female speaker from Thimphu). Each tracing contains, from top to bottom, the acoustic signal, the integrated acoustic signal (a measure of intensity), and the fundamental frequency (F0), corresponding to the tone melody.

The contour opposition is clearest on long, open syllables: tones 1 and 3 rise slightly and end with a glottal stop, while tones 2 and 4 tend to fall, and end smoothly. (See the top row of Figure 1 for low-register examples; similar contours are found in the high register.)

1pa:	a cut of meat
2pa:	picture, photograph
3bja:	standing paddy
4bja:	summer
3dho:	a porters load
4dho:	a pair (of oxen)
3dze:	leprosy
4dze:	peg, wedge
1ɕe:	to know
2ɕe:	glass

The contours are realised similarly on nasal vowels:

1kã:	marrow
2kã:	to pour
1kõ:	scabies
1khõ:	they
1sũ:	story

Before the finals -*p* and -*m*, the tone contours were more difficult to record consistently, and there may be some errors in our transcriptions. Before final -*m*, the glottalisation of tones 1 and 3 is still heard; in addition these tones may be somewhat higher than tones 2 and 4. The top row of Figure 2 shows the melodic contour of all four tones with final -*m*. The same contour difference[2] (in the high register) is seen in context in the bottom row of Figure 2.

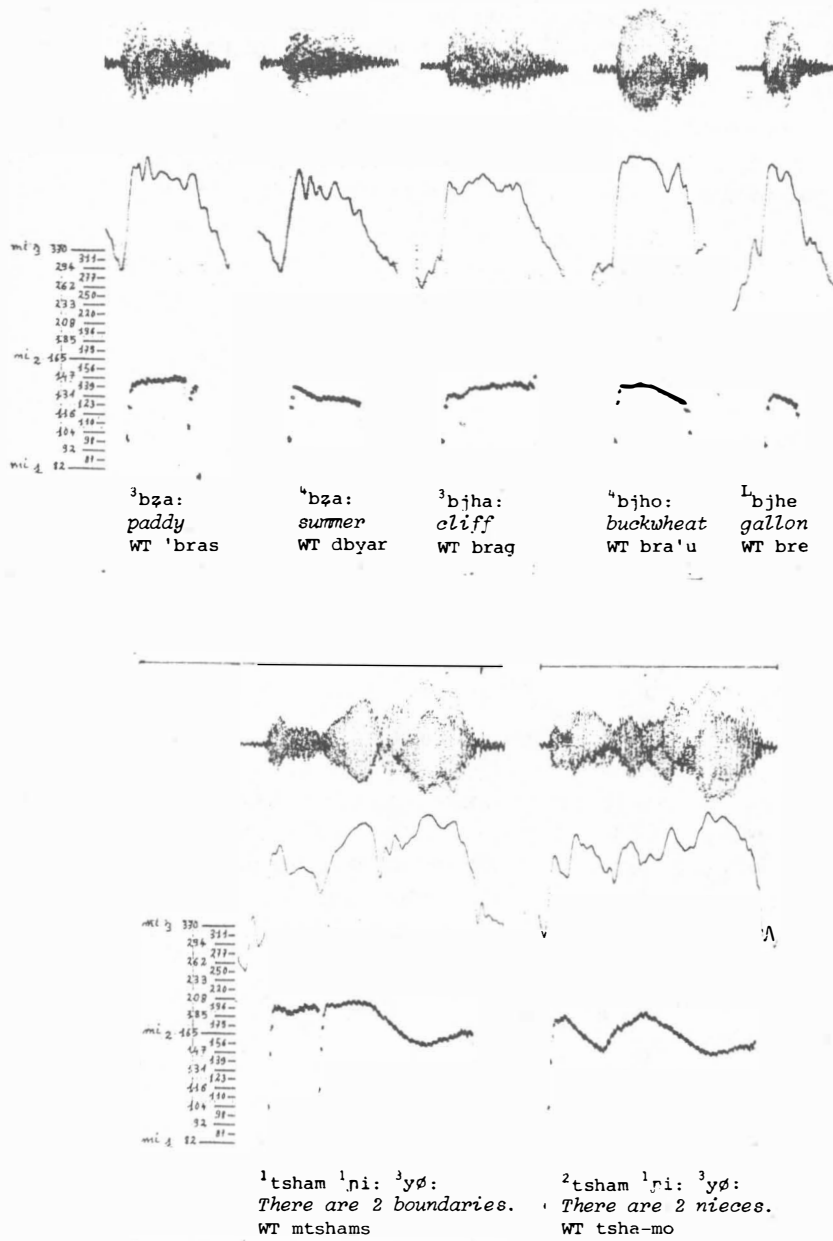|	
1sum	three
2sum	charm, locket
3dzim	tongs
4dzim	eyebrow
1sem	feelings
2sem	bean; syphilis
1chim	liver
2chim	house
1tsham	boundary
2tsham	niece
1ka:m	leg
2ka:m	star

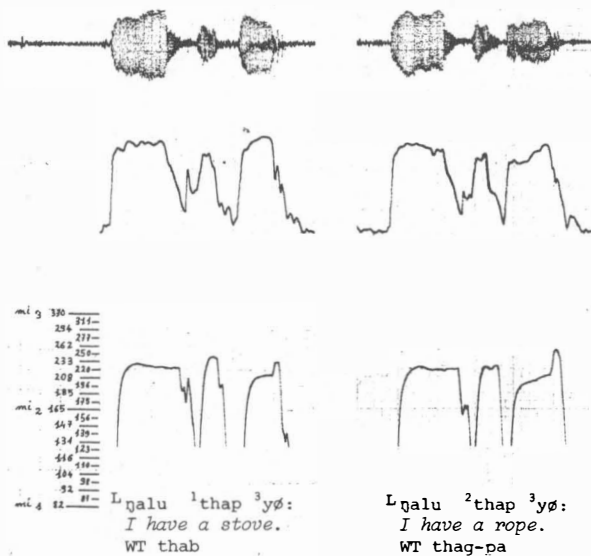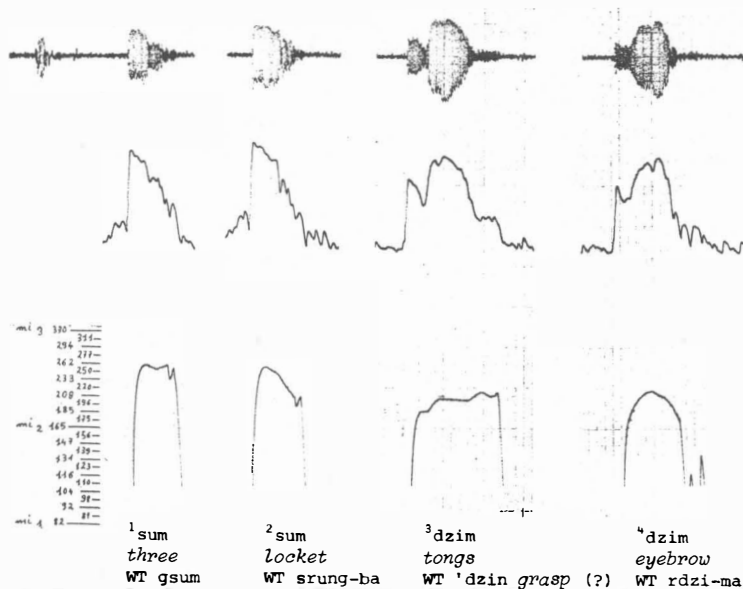Figure 1: Tone melodies (F₀) of a male speaker from Chapcha

Figure 2: Tone melodies (F₀) of a female speaker from Thimphu

Before final -*p*, the main difference noted was one of absolute pitch; this difference was heard more clearly in the high than in the low register. The bottom row of Figure 2 shows the difference in pitch, in context, between short tone 1 and 2 monosyllables in final -*p*. No contour difference is apparent. We do not have clear examples in the low register.

^{1}*thap*	stove
^{2}*thap*	rope
^{1}*ɕo:p*	a lie
^{2}*ɕo:p*	wing
^{1}*sep*	stallion
^{2}*kep*	waist
^{1}*sap*	bit
^{2}*tap*	the back of a blade

3. The history of Dzongkha rhymes

Dzongkha monosyllabic nouns derive historically from both monosyllables and disyllables (as evidenced by Written Tibetan). Table 3 shows the origin of Dzongkha syllable types with respect to two parameters of the ancestral forms: the rhyme (without regard to vowel quality) of the WT first syllable (or only syllable in the case of a WT monosyllable) on the vertical axis, and the nature (essentially the initial) of the WT second syllable (if any) on the horizontal axis. The WT second syllables which have most frequently entered into the formation of Dzongkha monosyllabic nouns are the suffixes -*ba, -bo, -'u, -pa, -po, -ma, - mo*.

3.1 Classical Tibetan monosyllables

The Dzongkha reflexes of classical Tibetan monosyllables are shown in the first column of the table. They are monosyllables, either (1) open (of all prosodic types) or (2) closed, short and level-*toned*.

3.1.1 WT *CV* > Dz **CV** (short)

Old open syllables yield modern open syllables. There is no contour contrast and the pitch is phonetically level (at least for the high tone). The vowel is short, and its quality is generally maintained.

^{H}*kha*	mouth	WT *kha*
^{L}*ga*	saddle	WT *sga*
^{L}*gha*	who? which?	WT *ga*
^{H}*nga*	five	WT *lnga*
^{H}*nga*	drum	WT *rnga*

^{L}*nga* (register varies grammatically) I		WT *nga*
^{H}*ca*	hair	WT *skra*
^{H}*cha*	pair (of shoes)	WT *cha*
^{L}*jha*	tea	WT *ja*
^{L}*nya*	fish	WT *nya*
^{H}*tsa*	grass	WT *rtswa*
^{H}*tsa*	vein, ligament	WT *rtsa*
^{H}*tsa*	twenty (in higher numbers)	WT *rtsa*
^{H}*tsha*	salt	WT *tshwa*
^{H}*ta*	horse	WT *rta*
^{L}*da*	arrow	WT *mda*
^{L}*bha*	cow	WT *ba*
^{H}*pça*	monkey	WT *spra*
^{L}*bjha*	bird	WT *bya*
^{H}*ma*	wound	WT *rma*

Table 3: The development of Dzongka rhymes from Common Tibetan (≈ WT)

WT 1st syllable: \ WT 2nd syllable		WT MONOSYLLABLES -∅	WT DISYLLABLES -ba, -bo, -'u	-pa, -po, ...	-ma, -mo ...
-V		-V ( )	-Vu (FALLING)		
-VC	**-b**	-Vp (LEVEL)		-Vp (FALLING)	-Vm (FALLING)
	-d **-g** **-s**	-V: (LEVEL)			
-VC	**-r** **-l**	-V: (FALLING)	-V(:)u (FALLING)	-V:p (FALLING)	-V:m FALLING
-VN	**-m**	-Vm (LEVEL)			
	-n	-Vn ( )		-Vm (FALLING)	
	-ng	-V̄: (LEVEL) -V̄: (LEVEL)		-V (:)m (FALLING)	

^{L}ya	one of a pair	WT *ya*
^{L}ra	goat	WT *ra*
^{L}la	mountain	WT *la* ('pass')
^{L}wa	wooden tub	WT *wa* ('channel')
^{H}ça	meat, flesh	WT *sha*
^{H}sa	earth	WT *sa*
^{L}ghi	knife	WT *gri*
^{H}chi	dog	WT *khyi*
^{L}ni	this	WT *'di*
^{H}mi	man, person	WT *mi*
^{L}ri	forest, hill	WT *ri*
^{H}lue ~ ^{H}li	pear-apple	WT *sli, gli*
^{L}ʐi	four	WT *bzhi*
^{L}zi	ornament-stone	WT *gzi*
^{L}gu	nine	WT *dgu*
^{H}cu	ten	WT *bcu*
^{H}chu	water, urine	WT *chu*
^{H}tu	vagina	WT *stu*
^{L}dhru	boat	WT *gru*
^{H}pu	body-hair	WT *spu*
^{L}bhu	son	WT *bu*
^{L}bju	grain	WT *'bru*
^{L}ʐu	bow (weapon)	WT *gzhu*
^{H}ue ~ ^{H}yu	turquoise	WT *g.yu*
^{H}khe	a cereal grain	WT *khre* ('millet')
^{H}ce	tongue	WT *lce*
^{L}je	penis	WT *mje*
^{H}pçhi	flour	WT *pḣye*
^{L}bjhe	measure, gallon	WT *bre*
^{L}mi	fire	WT *me*
^{L}zhe	peak, ridge	WT *ze*
^{H}kho	he	WT *kho*
^{L}gu	head	WT *mgo*
^{L}go	door	WT *sgo*
^{H}tsho	lake	WT *mtsho*
^{H}to	cooked rice, dinner	WT *lto*
^{H}tho	span, distance between outstretched thumb and index finger	WT *mtho*

ᴸdo	stone	WT *rdo*
ᴸdho	double measure	WT *do*
ᴴpho	male	WT *pho*
ᴸba	measure of volume, equal to 20 ᴸbjhe	WT *bo*
ᴸmo	she, a female	WT *mo*
ᴴlo	cough	WT *glo*
ᴴlo	heart, mind	WT *blo*
ᴸlo	year	WT *lo*
ᴴɕo	dice	WT *sho*
ᴸʑho	yoghurt	WT *zho*
ᴴso	tooth	WT *so*

Anomalous examples in our data:

¹tsa:	rust	WT *btsa*
⁴rau	horn	WT *rwa*
²u:	head (h)	WT *dbu*
⟨L⟩bup	insect, worm	WT *'bu* (? via *'bu-pa*)
³dze:	leprosy	WT *mdze*
¹nyoe:	edge of a blade	WT *dngo*

3.1.2 WT *CVC* (stop finals *-b -d -g -s*) > Dz. CVp/CV: (level contour)

WT bilabial finals are maintained in monosyllables. Thus, with final **-b**:

⟨L⟩jap	behind	WT *rgyab*
¹thap	hearth	WT *thab*
³yap	stirrup	WT *yob, yab*
³yap	father (h)	WT *yab*
⟨H⟩ɕap	wedge	WT *tsab*
⁴ʔʑhap	leg (h); majesty	WT *zhabs*
¹sap	bit (of horse)	WT *srabs* 'bridle, reins'
¹hap ~¹hnap	snot	WT *snabs*
¹khep	cover (e.g. of cloth)	WT *khebs*
¹sep	stallion	WT *gseb*
¹ɕop	lie, falsehood	WT *shob*

irregular:

¹pho:	yeast	WT *phab*
¹lo:	word, talk	WT *slob*

The other final occlusives are lost, leaving a long, open syllable with level tone.

^{1}*ca:*	iron	WT *lcags*
^{1}*cha:*	hand (h)	WT *phyag*
^{1}*ta:*	tiger	WT *stag*
^{1}*thra:*	blood	WT *khrag*
^{1}*na:*	pus	WT *rnag*
^{1}*pa:*	cut of meat	WT *spags* (food)
^{3}*bjha:*	cliff	WT *brag*
^{1}*ya:*	yak	WT *g.yag*
^{3}*ra:*	brass	WT *rag*
^{3}*la:*	measure of length, hand (i.e. a hands width)	WT *lag*
^{1}*ci:*	one	WT *gcigs*
^{1}*tshi:*	joint	WT *tshigs*
^{1}*tshi:*	sentence, word	WT *tshig*
^{1}*thi:*	line	WT *thig*
^{3}*zi:*	leopard	WT *gzig*
^{3}*dru:*	dragon	WT *'brug*
^{3}*dhru:*	six	WT *drug*
^{3}*lu:*	sheep	WT *lug*
^{3}*zu:*	body	WT *gzugs*
^{3}*zhu:*	pain	WT *zug*
^{1}*u:*	breath (especially the last breath)	WT *dbugs*
^{1}*te:*	shelf	WT *stegs*
^{1}*tsho:*	dinner (h)	WT *tshogs* ('assembly')
^{1}*tho:*	storey	WT *thog*

irregular:

^{3}gip	rubber	WT *'gyig, sgyigs* (÷via *'*gyig-pa*)
^{3}*bũ:*	breath	WT *dbugs*

WT final -*d* has had a fronting effect on old *a*, *o*, and *u*, as in Lhasa Tibetan.

^{1}*ke:*	noise, speech	WT *skad*
^{3}*gɛ:*	eight	WT *brgyad*
^{1}*che:*	a fine	WT *chad*
^{3}*ne:*	illness	WT *nad*
^{3}*gi:*	measure of length: fist and thumb	WT *khyid* 'fist'
^{1}*lue:*	body image for exorcism	WT *blud*

³*lue:*	manure	WT *lud*
¹*pçhe:*	half	WT *phyed*
⁴*ghoe:*	measure, about 2.5 kg. of butter	WT *grod*(-*pa*) 'belly'
¹*choe:*	you (sg.)	WT *khyod*
³*dhroe:*	heat, fever	WT *drod*

irregular:

³*gep*	alms, lama's fee	WT *'gyed*

WT final -*s*, which also has produced umlaut in Central Tibetan, only does so sporadically in Dzongkha, and probably as the result of Central Tibetan influence.

³*dzɛ:*	gunpowder, explosives	WT *rdzas*
³*na:*	barley	WT *nas*
³*bja:*	paddy (in the field)	WT *'bras*
³*re:*	unhusked rice	WT *'bras*
³*rɛ:*	wick	WT *ras*
³*la:*	work	WT *las*
¹*sɛ:*	prince	WT *sras*
¹*hã:*	pillow	WT *sngas*
¹*nyi:*	two	WT *gnyis*
¹*tsi:*	account	WT *rtsis*
³*ʑi:*	estate	WT *gzhis*
³*dhue:*	time	WT *dus*
³*bu:*	centre	WT *dbus*
³*gho:*	mans robe, clothing	WT *gos*
¹*cho:*	religion, scripture	WT *chos*
³*dho:*	load	WT *dos*

3.1.3 WT *CVC* (liquid finals -*r* -*l*) > Dz. CV: (long, falling contour)

The WT final liquids (-*r*, -*l*) are lost, with compensatory lengthening. The tone is falling.

⁴*ga:*	herder's camp	WT *sgar*
²*tsha:*	cane, bamboo strips	WT *tshar*
²*pa:* ~ ²*pã:*	picture, photograph	WT *par*
²*pha:*	there	WT *phar* ('away')
⁴*bja:*	summer	WT *dbyar*
⁴*ma:*	butter	WT *mar*
⁴*ma:*	down	WT *mar*
⁴*ya:*	up	WT *yar*

$^2\varsigma a$:	person from Eastern Wangdi District	WT *shar*
$^4gh\tilde{u}$:	tent	WT *gur*
<L>*ze*:	nail, peg	WT *gzer*
^2se: ~ $^2s\tilde{e}$:	gold	WT *gser*
^4dho:	pair (of bullocks)	WT *dor*
^4no:	cow, cattle	WT *nor* ('wealth')
^2so:	a measure equal to the width of a finger	WT *sor*

WT *-l*, like *-d*, palatalises the vowel (as in Central Tibetan).

$^2kh\varepsilon$:	load (of an animal), twenty	WT *khal*
$^4gh\varepsilon$:	line, row	WT *gral*
$^2thr\varepsilon$:	tax	WT *khral*
$^4bh\varepsilon$:	wool	WT *bal*
$^4\mathbf{z}h\varepsilon$:	face (h)	WT *zhal*
^2si:	cool (weather)	WT *bsil*
^2ngue:	silver, money	WT *dngul*
^4bue:	snake	WT *sbrul*
^2ue:	country, home region of Bhutan	WT *yul*
$^4dhr\tilde{i}$: ~ ^4dhre:	mule	WT *drel*, *dre-mo* ('she-mule')
$^2\varsigma e$:	glass	WT *shel*

3.1.4 WT *CVN* > Dz. CVm level /CVn level/ $C\tilde{V}$: falling (except some -*ng*)

As with the stop finals, the bilabial, -*m*, is preserved, and the vowel remains short. The tone is generally level:

^1cham	mask dance	WT *'cham*
^1tsham	boundary; meditation, retreat	WT *mtshams*
^3dam	mud	WT *'dam*
^2nam	sky	WT *gnam*
^3lam	road	WT *lam*
^1ham ~ ^1hlam	Tibetan-style boot, shoe	WT *lham*
<L>*zim*	sleep (h)	WT *gzim*
^1sum	three	WT *gsum*
^1hum ~ ^1hnum	oil, grease	WT *snum*
^1sem	heart, feelings	WT *sems*
^3drom	box	WT *sgrom*

Irregular (falling):

	^{2}chim	house	WT *khyim*
?	^{2}hɛ:m	shovel	WT *khyem, khem*
	^{4}dhom	bear	WT *dom*

WT -*n* is also preserved in the dialect of Thimphu, leaving a short vowel; the tone is again level and the vowel palatalised. There is apparently no contour opposition before -*n*, probably because almost all examples derive from monosyllables (the exception known to us is ^{1}*soen* 'seed' (WT *sa-bon*)). In the dialect of Chapcha, WT final -*n* has often been lost, leaving a long nasalised vowel with falling contour, e.g. ^{4}*dẽ:* 'carpet', ^{2}*pçhẽ:* 'fart'.

^{H}cen	eye (h)	WT *spyan*
^{H}nyen	ear (h)	WT *snyan*
^{L}nyen	to listen	WT *nyan*
^{L}den	sleeping-carpet	WT *gdan*
^{H}men	medicine	WT *sman*
^{L}len	answer	WT *lan*
^{H}pçin	glue, gum	WT *spyin*
^{L}duen	seven	WT *bdun*
^{H}pçhen	fart	WT *phyen*
^{L}ghoen	cucumber	WT *gon*
^{H}tsoen	prisoner	WT *btson*
^{H}poen	king, lord	WT *dpon*
^{2}õẽ:	left	WT *g.yon*

WT -*ng* is lost, leaving a long nasalised vowel; the tone contour is usually falling, but there are a number of exceptions, with no clear conditioning factor.

^{1}kã:	marrow	WT *rkang*
^{3}gã:	hill, peak of mountain	WT *sgang*
^{3}ghã:	snow-mountain	WT *gangs*
^{4}ghã:	-ful (with measures of volume)	WT *gang*
^{2}chã:	beer	WT *chang*
^{4}jhã:	mud-brick wall	WT *gyang*
^{2}tshã:	nest	WT *tshang*
^{1}pã:	meadow, grassland	WT *spang*
^{4}bjã:	honey	WT *sbrang*
^{4}jhã:	cold	WT *grang(-ba)*
^{2}lã:	bullock, ox	WT *glang*
^{2}wã:	blessing, power	WT *dbang*

<L>zhã:	copper	WT *zangs*
²sã:	measure of weight, balance	WT *srang* ('ounce')
⁴mĩ:	name	WT *ming*
¹çĩ:	wood	WT *shing*
⁴ẓhĩ:	dry field	WT *zhing*
²hĩ:	secret grudge	WT *snying* 'heart'
⁴dũ:	sting (of bee)	WT *mdung*
²lũ: ~ <H>luma	wind	WT *rlung*
⁴lũ:	handle (as of a teacup)	WT *lung*
⁴lũ:	blessing, precept	WT *lung*
⁴zhũ:	pair (of tiles, shingles)	WT *zung*
¹çũ:	tale	WT *gsung*
¹kõ:	scabies, itch	WT *rkong*
²khõ:	they	WT *khong* ('he')
⁴dzõ:	fort	WT *rdzong*
⁴dõ:	face	WT *gdong*
⁴dhõ:	hole, passage	WT *dong* ('deep hole')

3.2 Classical Tibetan disyllables

Dzongkha has collapsed many WT disyllables into (mainly) falling-tone monosyllables with either diphthongs or consonant finals.

3.2.1 WT suffixes *-ba -bo -'u* > Dz. diphthongs in *-u*

The WT noun-suffixes *-ba* and *-bo* appear after open syllables and syllables in *-r* and *-l*; *-'u* follows only open syllables (being written in place of the final). The Dzongkha reflex is a monosyllable whose nucleus is a diphthong in *-u*. When the first syllable vowel is *u*, the result is *u:* (WT *ku-ba* > ²*ku:* 'gourd').

There is no contour contrast on diphthongs; phonetically the contour is falling. Length is not generally distinguished except in the case of *au* vs. *a:u*. Thus WT *-r* and *-l*, which would be expected to lengthen the vowel, fail to do so, except that WT *-ar-ba* > Dz. *-a:u* (while WT *-a-ba* > *au* and WT *-al-ba* > *-eu* or *-ɛu*).

²kau	pillar	WT *ka-ba*
²khau	snow	WT *kha-ba*
⁴jau	beard	WT *rgya-bo*
²tsau	owner	WT *rtsa-ba* 'root'
²tshau	nephew, grandson	WT *tsha-bo*
⁴dau	moon, month	WT *zla-ba*

^{2}pau	shaman, healer	WT *dpa-ba*
^{4}bau	goitre	WT *lba-ba*
^{2}lou ~ ^{2}lau	musk deer	WT *gla-ba*
^{2}ɕau	stag	WT *shwa-ba*
^{4}ʐhau	lame	WT *zha-ba, zha-bo*
^{2}ku:	gourd	WT *ku-ba*
^{2}kiu	birth	WT *skye-ba*
^{2}chiu	tusk	WT *mche-ba*
^{2}ʈiu	navel	WT *lte-ba*
^{2}thiu	seal, imprint	WT *the-bo* ('thumb')
^{4}niu	relative	WT *nye-ba*
^{2}kou	leather	WT *ko-ba*
^{4}dhou	taro; a wild yam with palmate leaves	WT *do-ba*
^{4}dhrou	taste	WT *bro-ba*
? <H>noe:	sharp	WT *rno-ba*
^{2}phou	belly	WT *pho-ba*
^{2}lou	lung	WT *glo-ba*
^{4}zou	carpenter	WT *bzo-ba* ('worker')
^{2}thrau	multi-coloured	WT *khra 'u*
^{4}bjho:	tartary buckwheat	WT *bra 'u*
^{4}diu	bullet	WT *mde 'u*
^{2}kha:u	stick	WT *mkhar-ba*
^{4}ga:u	blacksmith	WT *mgar-ba*
^{4}dha:u	buttermilk	WT *dar-ba*
^{2}pha:u	wolf	WT *'phar-ba*
^{4}ʐha:u	blind	WT *zhar-ba*
^{2}siu	hail	WT *ser-ba*
^{4}zhou	sickle	WT *zor-ba*
^{2}thɛu	dust	WT *thal-ba*
^{2}pɕeu	forehead	WT *dpral-ba*
^{2}ɕeu	leveller; a toothless harrow	WT *shal-ba*
^{2}seu ~ ^{2}soeu	lunch (h), breakfast (h)	WT *gsol-ba*

3.2.2 WT *CV(C)* (non-nasal finals) + *-pa/-po* > Dz. CV(:)p (falling)

When a WT open syllable or syllable with an oral consonant final (*-b, -d, -g, -s*) is followed by a suffix *-pa* or *-po* (or the root *pha* in one case), the Dzongkha reflex is a closed, short monosyllable in *-p,* with falling tone.

The vowel is long if the WT first syllable ended in *-r* or *-l* (and sometimes *-s*), otherwise short (WT *-b -d -g -s*). (Compare the reflexes of WT monosyllables, whose lost stop finals have on the contrary given long vowels). The contour, always falling, does not depend on the identity of this final consonant.

In some examples in the Paro dialect, the suffix *-pa* has had the effect of preserving preceding final *-g* (as a final *-k*), unknown in the standard dialect. In Ha, these words are said to remain disyllabic, with assimilation of the suffix-initial, e.g. *<H>makku* 'husband'.

Ldzep	leper	WT *mdze-pa*	
4gap	headman	WT *'go-pa*	
2ap ~ <H>a-pa	father	WT *a-pha*	
2tap	back of a blade	WT *ltag-pa*	
2thap	rope	WT *thag-pa*	(Paro *<H>thak*)
2?nap	black	WT *nag-po*	(Paro *<H>nak*)
2phap	pig	WT *phag-pa*	(Paro *<H>phak*)
2map	husband, son-in-law	WT *mag-pa*	(Paro *<H>mak*)
4lap	hand	WT *lag-pa*	(Paro *<L>lak*)
2tsip	stone wall	WT *rtsig-pa*	(Paro *<H>tsik*)
<H>mip	hoof	WT *rmig-pa*	
1hlip ~ 1hluep	testicle	WT *rlig-pa*	(Paro *<H>hlik*)
<H>thuep	porridge, soup	WT *thug-pa*	
2pɕhup	rich man	WT *phyug-po*	(Paro *<H>chuk*)
3hu:p	owl	WT *'ug-pa*	
4gop	onion	WT *sgog-pa*	
2tsop	dirty	WT *btsog-pa*	
4bjop	nomad herdsman	WT *'brog-pa*	
2ɕop	wing	WT *shog-pa*	
4zhop	bad	WT *zog-po*	('false')
4gɛp	old (of things)	WT *rgad-pa*	
2chep	one who collects fines	WT *chad-pa* 'punishment'	
2tshɛp	malaria, heat	WT *tshad-pa* 'heat, fever'	
2pep ~ 2poep	leech	WT *pad-pa*	
2lep	brain	WT *glad-pa*	
<H>kuep	brother-in-law	WT *skud-po*	
<H>kuep	thread	WT *skud-pa*	
2kep	waist	WT *rked-pa*	
4bhɛp ~ 4bhoep	Tibetan	WT *bod-pa*	
2e:p	right	WT *g.yas-pa*	
2thrip	bile	WT *mkhris-pa*	

¹*tsi:p*	astrologer, religious practitioner	WT *rtsis-pa*
²*chop*	religious practitioner	WT *chos-pa* ('monk')
⁴*dho:p*	porter	WT *dos-pa*
²*ka:p*	white	WT *dkar-po*
²*cha:p*	rain	WT *char-pa*
²*ma:p*	red	WT *dmar-po*
²*sa:p*	new	WT *gsar-pa*
⁴*a:u*	thief	WT *ar-pa*
²*cup*	sour	WT *skyur-po*
²*se:p*	yellow	WT *ser-po* 'yellow
²*pho:p*	cup	WT *phor-pa*
⁴*gɛ:p*	back (of body)	WT *sgal-pa* 'small of back'
⁴*ge:p*	king	WT *rgyal-po*
⁴*bɛ:p*	frog	WT *sbal-pa*

3.2.3 WT *CVN* (nasal finals) + suffix > Dz. CVm/CV:m (falling)

When the final of the WT first syllable was a nasal before a suffix (with any initial), the Dzongkha reflex is a closed monosyllable ending in *-m*. If the WT final was *-m* or *-n*, the vowel is short; if *-ng*, the vowel is often long. Some of these long vowels we heard as nasal with our Chapcha speaker, but we were unable to confirm this observation with other informants.

Where the old final was *-ng* before *-pa* or *-po*, the tone contour seems to be unpredictable (compare the contour of old monosyllables in *-ng*). With other finals, the tone is generally falling, but with notable exceptions, such as ¹*chim* 'liver' (WT *mchin-pa*), which makes a striking minimal contour-pair with ²*chim* 'house' (WT *khyim*). The latter should of course be level (tone 1) according to our theory.

	¹*ka:m*	leg	WT *rkang-pa*
	²*ca:m*	seedling	WT *ljang-pa*
	⁴*dha:m*	first	WT *dang-po*
?	¹*nyi:p*	old	WT *rnying-pa*
	\<H\>*nye:m*	old	WT *rnying-pa*
	¹*tim*	heel	WT *rting-pa*
	\<L\>*rim*	long	WT *ring-po*
	²*pum*	shoulder (esp. the point)	WT *dpung-pa*
	¹*tho:m*	ploughshare	WT *thong-pa*
	²*sum*	charm, locket	WT *srung-ba*
	²*pçhem*	rosary	WT *'phreng-ba*
	⁴*bjam*	bee	WT *sbrang-ma*

^{2}sim	younger sister (of a male)	WT **sring-mo**
^{2}o:m	Wang-mo \<p.n.\>	WT **dbang-mo**
^{4}za:m	Zang-mo \<p.n.\>	WT **bzang-mo**
$^{\langle L\rangle}$ngem	bad, evil (e.g. of a person)	WT **ngan-po**
^{1}chim	liver	WT **mchin-pa**
^{3}dzim	pincers	WT **'dzin-po** ('to grasp')
^{2}sim	demon	WT **srin-po, srin-mo**
^{4}goem	guest	WT **mgron-po**
^{2}loem	green, wet	WT **rlon-pa**
$^{\langle L\rangle}$ʐoem	young	WT **gzhon-pa**
^{2}hoem	blue, green	WT **sngon-po**
^{2}sem	lentil, dried bean, a small bean	WT **sran-ma**
^{2}tsuem ~ ^{2}tsim	queen, lady	WT **btsun-mo**
^{2}oem	left, left hand	WT **g.yon-ma**
^{1}kam	dry	WT **skam-po**
^{4}zham	bridge	WT **zam-pa**
$^{\langle L\rangle}$bom	big	WT **sbrum-pa** 'pregnant'
^{2}kham	peach	WT **kham-bu**

3.2.4 WT *CV(C)* + *-ma*/*-mo* > Dz. **CVm/CV:m** (falling)

When the WT suffix was **-ma** or **-mo**, the Dzongkha reflex is a closed monosyllable in **-m**, regardless of the WT first-syllable final. (For examples derived from nasal first-syllable finals, see 3.2.3 above). The vowel is short except where the WT final was **-r** (we have no examples of WT **-l** in this context) and, occasionally, **-ng**. The tone contour is falling, except in the case of ^{3}goem 'mare' (WT **rgod-ma**), which forms a minimal pair with ^{4}goem 'guest' (WT **mgron-pa**).

^{2}tsham	niece, granddaughter	WT **tsha-mo**
^{4}dzam	earthen cooking-pot	WT **rdza-ma**
$^{\langle H\rangle}$tham	edge	WT **mtha-ma**
^{2}nam	daughter-in-law	WT **mna-ma**
^{2}pɕham	millet	WT **phra-mo** 'panicum miliaceum'
^{4}bjham	hen	WT **bya-mo**
^{4}yam	a cold, sinus trouble	WT **ya-ma**
^{2}lam	lama	WT **bla-ma**
^{4}ʐham	hat	WT **zha-mo**
^{4}nyim	sun	WT **nyi-ma**
^{4}dzim	brow	WT **rdzi-ma**
^{4}dhrim	odour	WT **dri-ma**

⁴*num*	younger sister (of a female)	WT *nu-mo*
⁴*bhum*	daughter	WT *bu-mo*
⁴*bjhim*	sand	WT *bye-ma*
²*sem*	syphilis	WT *se-mog*
²*om*	breast, milk	WT *o-ma*
²*pɕha:m*	broom	WT *phyag-ma*
⁴*jum* ~ ^{<L>}*ju-ma* tail, sausage		WT *mjug-ma*
²*som*	fontanelle	WT *mtshog-ma*
²*te:m*	show, entertainment	WT *ltad-mo*
²*pɛ:m* ~ ^{<H>}*pe-ma* Pema <p.n.>		WT *pad-ma*
³*goem*	mare	WT *rgod-ma*
²ˀ*tshoe:m*	vegetable dish, greens, curry	WT *tshod-ma*
²*ne:m* ~ ²*nyem*	wife	WT *gnas-mo* 'landlady'
²*sɛ:m*	princess	WT *sras-mo*
²*ka:m*	star	WT *skar-ma*
²*nga:m*	sweet	WT *mngar-mo*
²*thum* ~ ²*thu:m*	spoon	WT *thur-ma*
⁴*dho:m*	trousers	WT *rdor-ma*
? ²*tsã:*	thorn	WT *tsher-ma*

3.2.5 Numeral derivatives in -*pa* or -*po*

When we elicited the following forms from a Chapcha speaker in 1977, we believed them to be ordinal numbers, but this may have been a misunderstanding. Our 1986 informants gave disyllabic forms for the ordinals (e.g. ^H*nyi:ba* 'second'). The monosyllabic forms turned up later as collective nouns, e.g. ⁴*duem* 'the seven, all seven' (WT *bdun-po*).

²*nyi:p*	?second, twosome	WT *gnyis-pa*
²*sum*	?third, trio	WT *gsum-pa*
⁴*Ûip*	?fourth, quartet	WT *bzhi-pa*
²*ngap*	?fifth, quintet	WT *lnga-pa*
⁴*dhrup*	?sixth, sextet	WT *drug-pa*
⁴*duem*	?seventh, septet	WT *bdun-pa*
⁴*gɛp*	?eighth, octet	WT *brgyad-pa*
⁴*gup*	?ninth, the nine	WT *dgu-pa*
^{<H>}*cup*	?tenth, the ten	WT *bcu-pa*

4. Conclusion

Dzongkha monosyllabic nouns derive from both monosyllabic and disyllabic ancestors. This dual origin accounts for the comparative richness of the Dzongkha syllable canon. In particular, length, nasality, pitch contour and certain vowel features (e.g. front rounding), are distinctive on more syllable types (especially stopped syllables) in Dzongkha than in Lhasa Tibetan. The fact that it is almost exclusively WT suffixes that have entered into the formation of Dzongkha monosyllables from disyllables may suggest the existence of an old root-stress.

NOTES

[1] An earlier version of this paper was presented to the 19th International Conference on Sino-Tibetan Languages and Linguistics, Columbus, Ohio, 12-14 September 1986.

We take this opportunity to thank our Bhutanese friends for their generous help. We are indebted to Bernard Gautheron and Annie Rialland for their help in using the pitch-extraction equipment, designed by Gautheron, at the Institut de Phonétique in Paris.

Abbreviations: WT = Written Tibetan; (h) = honorific; p.n. = proper noun. The WT forms cited are not all equally old.

[2] It is interesting to compare the tracing in Chang and Chang (1978:xxii, figure 6), showing a clear fall in Lhasa on the word 'meditation', with the clearly level contour of Dzongkha 'boundary' (Figure 2). These are reflexes of the same WT etymon.