

QHALAXARZI PHONOLOGY

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### ABSTRACT

The first part of this study is a description of both the segmental and tonal aspects of synchronic Qhalaxarzi phonology. This description is theoretically eclectic, with different linguistic theories being drawn on so as best to explicate different aspects of the data.

The second part is an attempt to reconstruct the segmental phonology of Proto-Sotho by means of the comparative-historical method. Seven Sotho languages spoken over a wide area of South Africa and Botswana have been used for this purpose. Because tonal data on these languages, except Qhalaxarzi and Northern Sotho, were not available, no Proto-reconstruction was possible for tone. A comparison between the tones of Northern Sotho and Qhalaxarzi is given however.

The data used for this study (Qhalaxarzi and other) were collected by the writer at different times between 1975 and 1984 from native speakers. The auditory-impressionistic method of collection was used, with forms being transcribed phonetically as they were uttered.

DECLARATION

I declare that this dissertation is my own, unaided work. It is being submitted for the degree of Master of Arts in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in any other university.

W. SICKENS

this 3<sup>rd</sup> day of January, 1986.

## PREFACE

Qhalaxarzi is probably the least well-known Sotho language. It has no official status in Botswana, where it is spoken over a wide area in the central and southern regions, and it has never been written. At the time this research was undertaken, only Tswana and English were being taught to Qhalaxarzi speakers in their schools. Since Qhalaxarzi lacks a written medium, it is likely that if this educational trend continues, the language will eventually disappear. Apart therefore from my irrational interest in any language, the spirit behind this research is that of preserving a moment, which may prove to be of interest to linguists at some future date.

I wish to thank the University of the Witwatersrand for funding some of this research, and I also wish to thank the following people: my supervisor, To Traill, who was always interested and helpful, and who, in the first place, made it possible for me to go to Botswana; my informants, especially Khumoetsile Gakeobotse, Lekwerekwere Molosiwa and Philip Phokojwe, who showed *great kindness during our data-gathering sessions*; Bolo//xao, Peti, Guhmsa and //ahniki, who looked after me during *my research trip in April 1984*; Timothy Cursons, who encouraged me when it seemed that the light at the end of the tunnel was fading; Mark Ingle, for helping to proof-read this manuscript.

Parts of this dissertation have been published before. These are parts of Chapters 2 and 6 in 'A Prelimi-



nary Report on Kgalagadi Vowels' in African Studies, 1977, Vol. 37, and parts of Chapters 2 and 13 in 'Qhalaxari Verb Tone Classes' in African Studies, 1984, Vol. 43. A summary of Chapter 8 is due to appear in African Languages under the title 'Tone in Qhalaxarzi Main Verb Constructions'.

## ABBREVIATIONS

What abbreviations stand for is presented in the text. For reference however, a complete list is provided here.

1pp	first person plural
2pp	second person plural
!psOP	first person singular, object prefix
AbsP	absolute pronoun
AdfulR	adjunctful raising
AdlessL	adjunctless lowering
Alt	alternation
AMP	aspect/mood prefix
A?	adjective prefix
ASP	ASPIRATED
C	(non-nasal) consonant
CB	Common Bantu
CD	compensatory doubling
C1	class
CONS	CONSONANTAL
DESYLL	desyllabification
DS	diminutive suffix
E	extra-low
EXRPR	exceptional right prefix raising
ext	extension
FRIC	FRICATIVE
G	glide
H	high

IHR	inter-high raising
IMP	imperative
i-v/w-1	intervocalic/word-initial
KG	Khumoetsile Gakeobotse
K43	Van der Merwe and Schapera (1943)
K68	Du Plessis and Krüger (1968)
L	low
LM	Lekwerekwere Molosiwa
LAT	LATERAL
LocP	Locative prefix
LSR	left suffix raising
Lo	Lobedu
MVC	main verb construction
N	syllabic nasal OR homorganic nasal
NAS	NASAL
NegP	negative prefix
NP	noun prefix
NS	Northern Sotho
OP	object prefix
OPlessL	OP-less lowering
PA	PLACE OF ARTICULATION
PartPos	participial positive
PASS	passive
PosP	possessive prefix
PosS	possessive stem
PP	preprefix
PPL	prepausal penultimate lengthening
PS	postsuffix OR Proto-Sotho
Pu	PuTana

PxoL	pre-x <sub>0</sub> lowering
Qh	Qhalaxarzi
R	radical
RelP	relative pronoun
ROP	reflexive object prefix
RP	relative pronoun
RPR	right prefix raising
S	surface
s	language-specific redundancy
SP	subject prefix
SPLA	SPx low assimilation
SPLow	SP-lowering
SS	Southern Sotho
SYLL	SYLLABIC
T1	Tlokwa
TMS	tense/mood suffix
Ts	Tswana
U	underlying
u	universal redundancy
UTA	unassociated tone attachment
V	vowel
VH	vowel harmony
v.i.	verb intransitive
VO	voice onset
VOI	VOICED
v.t.	verb trans <sup>2</sup>

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## CHAPTER 1

### INTRODUCTION

This study is divided into two parts: Part I, which deals with the synchronic analysis of Qhalaxarzi phonology (Chapters 2 to 9), and Part II, which is an attempt to reconstruct Proto-Sotho by the comparative-historical method from our Qhalaxarzi and other Sotho data (Chapters 10 to 13).

PART I: THE SYNCHRONIC ANALYSIS represents a systematization of Qhalaxarzi (Qh) phonology as presented to us particularly by Khumoetsile Gakeobotse (KG) and Lekwerekwere Molosiwa (LM) at Kacgae, Botswana, in April 1984, and by Philip Phokojwe at Lone Tree, Botswana, at different times throughout 1975. They were then aged 28, 25 and 30 respectively.

Between 1975 and 1984 data were collected again at Sekoma and Letihakeng, also in Botswana. These informants, a family group of four children and two women, and two men and women respectively, were seen for a shorter time, and the data from them was found to corroborate the other data, rather than bring in new facts.

On a casual basis we sometimes asked other people to pronounce something to check on what we had heard previously in a data-gathering session.

Few recordings were made on tape. Data were gathered for the most part by the auditory-impressionistic method,

the words being transcribed as they were said.

The analysis done on tone in 1984 represented a great expansion from the work done on tone in 1975, when tonemes and allotones had been analysed, and all vocabulary transcribed tonemically, but the tone alternations had not been worked out at all. From the point of view of segmental data, the 1984 data was not new, except that both KG and LM pronounced the vowels e and o as [ɪ] and [ʊ] whereas Philip Phokojwe and all the other informants pronounced them as [e] and [o].

The two previous works on Qhalaxarzi (referred to therein and in Dickens (1978) as 'Kgalagadi', which represents the Tswana pronunciation of the word) were consulted during the course of this study. They are Van der Merwe and Schapera (1943) and Du Plessis and Krüger (1968). The latter proved to be an invaluable guide to eliciting morphological structures in the field, and the former provided the stimulus for the comparative study between Qh and the other Sotho languages. the subject of Part II.

In Chapter 3 a brief summary of the differences in phonological and phonetic structure is given between the findings of these studies and our own. In our view, there are serious shortcomings in their descriptions - for example they do not mention the existence of uvulars at all, and do not discuss tone, though Du Plessis and Krüger acknowledge its presence with a tone mark here and there. It should be remembered however, that these were pioneering works, especially Van der Merwe and Schapera's, and

that much of the foundation of the present study was laid by them. The data in Van der Merwe and Schapera were recorded and transcribed by Schapera in mostly Tswana orthography, and then analysed later by Van der Merwe - certainly difficult circumstances for a linguist to operate in with phonetic and phonological efficiency. The Du Plessis and Krüger data it seems were collected directly by both authors, but clearly their main emphasis was the collection of morphological construction types, and to that extent their phonological description suffers. A similar kind of bias can be found in this study: Our tonal analysis is heavily weighted to finding out what happens in main verb construction (Chapter 8), but we have very little *in comparison to offer on* the tonal analysis of substantive constructions (Chapter 9).

We have drawn on several descriptive frameworks in order to explicate the data most clearly. To give the reader a quick overall grasp of the phonetics and phonology in Chapter 2, the sounds are presented in a structuralist taxonomy of phonemes with short informal descriptions of how these phonemes are pronounced in *different contexts*. In general, the concrete principle of Natural Generative Phonology (Hooper, 1978) that an underlying form or phoneme be the same as one of its phonetic realizations, was used as a guideline in determining phonemes. However, where this guideline led to what we considered counter-intuitive solutions, it was abandoned, and a more abstract, but in our opinion, more commonsensical, analysis was adopted. For example, at an underlying

level h is analysed as a consonant, even though phonetically it is only ever realized as a breathy vowel. The reason for this analysis is that h always fills a consonant slot in a syllable, and in an allomorph-selection process, behaves in line with other 'true' consonants.

In Chapters 4, 5 and 6 the segmental alternations found in the language are given. As a convenience to the reader, these alternations are formalized in generative notation following a brief informal description in words. In these chapters also, the underlying representations of the sounds are presented in terms of feature decomposition. The features used are those of Ladefoged (1971), though here and there we have found it necessary to modify his definitions to suit the data. For example, in addition to his definition of +STOP as 'complete articulatory closure' (page 93), we have added 'without nasal airflow or (oral) vibration' in order to exclude nasals and trills from a certain natural class. Such modifications however, are always made without destroying the phonetic reality of the phonological feature concerned. Naturally, not all of the features a language can possibly make use of are to be found in Qh, and we have tried to show, particularly in Chapter 5, for consonants, and Chapter 6, for vowels, why we think the features we have chosen best describe the language.

Tonally, in Chapters 8 and 9, we have treated the language as having two tonemes, HIGH and LOW (for convenience these labels are used instead of +HIGH and -HIGH). Underlyingly, all syllables bear one toneme or the other,



but in a few instances a toneme has no underlying syllabic base, and must in a lexicon-to-surface derivation, be assigned a syllable by autosegmental rule in order to be manifested phonetically.

There are at least two other analytical possibilities: The language could have a pitch-accent (*our HIGH tone*) on some syllables, and no tone on other syllables. Tonal fluctuation would then be in terms of the spreading of the pitch-accent on to surrounding empty syllables, or of the deletion of the pitch accent. In our analysis on the other hand, the spreading of a HIGH tone always incorporates the replacement of an (or some) adjacent LOW(s). The main reason that we feel the LOW tone is an underlying entity, rather than *tonelessness*, is that it appears to trigger certain rules (for example SP-Low Assimilation - see Chapter 8), and sometimes its presence in a particular environment restricts the operation of some rules (for example Right Prefix Raising - see Chapter 8).

Another possibility would be to have some syllables underlyingly HIGH, some underlyingly LOW, and others toneless. Khumalo (1981) has treated Zulu in this way, regarding verbal extensions, for example, as toneless underlyingly. We have not found it necessary to assume this, though we recognise the validity of such an analysis for explicitly separating the tonal behaviour of extensions from that of other morphemes. We found however, that our description would in no way have been simplified by this assumption, and that the rules applying to extensions were of the same kind as those applying to what in a Khumalo-type analysis would

be *u* tones.

The chapter we have not yet mentioned is Chapter 7. This is a guide to familiarize the reader with the complex morphology of main verb constructions prior to dealing with the tone alternations found in these constructions. More comprehensive summaries of Qh morphology are to be found in Van der Merwe and Schapera, and Du Plessis and Krüger.

In the first three chapters of PART II: THE HISTORICAL ANALYSIS, we attempt to reconstruct the segmental phonological system of Proto-Sotho. Most of the data for comparison have been obtained by original research into the languages concerned. (In some cases these are Sotho dialects, rather than languages, but since no investigation into mutual intelligibility has been undertaken, we shall refer to the Sotho speech-forms as 'languages' throughout.) On occasion, where there were gaps in our own data, we have referred to such authoritative writers as Ziervogel and Mokgokong (1975) for Northern Sotho, Tlokwa, Lobedu and Pulana, Cole (1955) for Tswana, and Paroz (1961) for Southern Sotho. The data for the various languages were collected on field trips between 1974 and 1984 to the specific areas (see below), or from informants from those areas who were resident in Johannesburg at the time.

The languages used were the following:

Southern Sotho (SS), of the Leribe district of Lesotho and of the Southern Transvaal;

Northern Sotho (i.), of Warmbaths;

Tswana (Ts), of Hammanskraal and Ventersdorp;

Lobedu (Lo), of Tzaneen;

Puġana (Pu), of Bushbuckridge;  
Tlokwa (Tl), of Pietersburg;  
Qhalaxarzi (Qh), as collected for Part I.

Three languages used in a previous less comprehensive study of Sotho (Dickens, 1977) were not used here. These are Tawana and Ngwato of Maun and Palapye respectively in Botswana, and Lozi, spoken in Zambia.

Lozi was not included here because we felt that it had little to offer for comparative-historical reconstruction. It has been so greatly influenced by non-Sotho languages that phonologically very little resemblance between it and other Sotho languages remains (though lexically and syntactically its Sotho origin is still quite apparent).

Tawana and Ngwato, and for that matter all other Sotho languages not included here were not used because we found that there were too many gaps in our data, and to our knowledge there is no literature available on these languages from which we could fill in these gaps.

The purpose of Chapters 10, 11 and 12 is not merely to reconstruct Proto-Sotho, but also, once that is established, to give a step-by-step account of the phonological changes which must have taken place between Proto-Sotho and the modern languages. These step-by-step accounts of the changes are essentially 'natural' explanations of the kind compatible with the 'Natural Phonology' of Stampe (1969), but, as the reader will see, there is a considerable number of changes which do not seem 'natural', in the sense that they do not occur very frequently in the world's languages.

By tracing the sound changes for the different languages, it is possible to gain a picture of how they are related phonologically to each other. It must be stressed however, that genetic links should not be attributed from phonological links, for it can and does happen that the same phonological changes occur independently in languages whose speakers have long been geographically apart. To emphasize this point, it can be observed that in the development of one sound, one language may represent an older stage of Sotho, and another a younger stage, yet with a different sound, precisely the opposite picture emerges. For example Proto-Sotho (PS) \*ph develops into Lo ɸ (earlier) and Ts f (later), but PS \*kh develops into Lo h (later) but Ts x (earlier). We believe that genetic relationships can be identified linguistically only through lexical, and perhaps morphological, comparisons, which are beyond the scope of this study.

In our comparisons we have used Guthrie's (1967-1971) segmental inventory of Common Bantu as a reference point for each comparative series. This enables us to show not only the relationship between modern Sotho and Proto-Sotho, but also to some extent between Proto-Bantu and Proto-Sotho. The use of Guthrie's forms also serves to focus the discussions more tightly, particularly for those readers who are not familiar with the Sotho languages.

The last Chapter, 13, is a comparison between the tones of Qh and Northern Sotho (as given by Lombard (1976) and Ziervogel and Mokgokong (1976)). Unfortunately, what we consider adequate tonal descriptions, for our purposes at least, have not yet been undertaken for the other

languages, though starting points have been made by Krüger (1973) for Tswana, and Letele (1955) for Southern Sotho. Since only two languages are compared, it is obviously not advisable at this stage to attempt a tonal reconstruction of Proto-Sotho, though in some respects Qh and NS are so similar tonally, that we feel tentative suggestions can be made in this direction.

Using again Guthrie's Common Bantu forms, this time for tone, we attempt to trace the changes that must have occurred between Proto-Bantu and Qh and NS. There are also occasions where, because the Proto-Bantu to Sotho changes appear implausible, or unlikely, we question the correctness of Guthrie's tonal (and in one instance, segmental) reconstructions, and postulate others which would appear to explain better the Sotho reflexes. This discussion comprises the first part of Chapter 13, in which we concentrate on the underlying tonal forms of noun stems and verbal radicals. The second part is a straightforward comparison between the rules in the main verb constructions (as given in Chapter B) of Qh, and those of NS, with finally some tentative proposals about the existence of these rules in Proto-Sotho.

PART I : THE SYNCHRONIC ANALYSIS

## CHAPTER 2

PHONEMES AND THEIR PHONETIC REALIZATIONS

Qh phonemes fall into six categories:

1. Nonsyllabic consonants (C)
2. The syllabic nasal (N)
3. Vowels (V)
4. Glides (G)
5. Stress
6. *Tones*

These categories are dealt with separately below. In each section the sounds are given in their suggested orthography (see Appendix A) in a phonemic taxonomy. The features used to label them are phonetic, not phonological, and describe the pronunciation of the unconditioned allophone of each phoneme (except for h), or, in cases where there is free variation, the pronunciation of the more commonly occurring variant.

Once the phonemes have thus been named, allophonic conditioning and free variation are discussed, and at the end of each section a list of words is given illustrating the phonemes of each category.

2.1.0 Nonsyllabic consonants (henceforth simply 'consonants')

These are classified in table (1) overleaf:

(1)

	BIL	DEN	ALV	ALPAL	PAL	VEL	UVU	GLOT
STOP VCLS UNASP	p	t			c	k	q	
STOP VCLS ASP	ph	th			ch	kh	qh	
STOP VOICED	b	d			j	g		
AFFR VCLS UNASP			ts	tj				
AFFR VCLS ASP			tsh	tjh				
FRIC VCLS			s	sj			x	h(breathy)
FRIC VOICED			z	zj				
TRILL VCLS			r					
TRILL VOICED			rʒ					
RESON ORAL LAT			l					
RESON NASAL	m	n			ny	ng		
CLICK		/n	in(breathy)					

KEY TO ABBREVIATIONS: VCLS=VOICELESS; UNASP=UNASPIRATED; ASP=ASPIRATED;  
 AFFR=AFFRICATE; FRIC=FRICATIVE; RESON=RESONANT; LAT=LATERAL; BIL=BILABIAL;  
 DEN=DENTAL; ALV=ALVEOLAR; ALPAL=ALVEOPALATAL; PAL=PALATAL; VEL=VELAR;  
 UVU=UVULAR; GLOT=GLOTTAL.



Palatographic and direct visual observation of the places of articulation revealed the following phonetic detail, supplementing that in the table (unfortunately it was not possible at the time the research was carried out to photograph the information recorded here):

- (i) Dentals: The tongue-tip makes contact with the upper teeth, or may protrude between the teeth. The front of the tongue is in contact with the alveolar ridge as far back as the rugae.
- (ii) Alveolars: Only the very tip of the tongue is used, articulating against the alveolar ridge. The trills and l are articulated slightly further back than the other sounds, but still well within the limits of the term 'alveolar'. For the fricatives a groove-shaped gap is formed between the tongue and the alveolar ridge.
- (iii) Alveopalatals: The front of the tongue articulates against the palate from just in front of the rugae until just behind them. For the fricatives a slit-shaped gap is made between the tongue and the palate.
- (iv) Palatals: The centre of the tongue contacts the hard palate from just behind the rugae.
- (v) Velars: The back of the tongue contacts the velum just beyond the point where the hard palate ends and the velum begins.
- (vi) UVulars: The back of the tongue articulates

against the uvula. In the sequence axa (phonetic [axa]) the uvula can be seen folded forward and resting on the tongue for [χ].

### 2.1.1 Allophonic alternation

The voiceless trill r ([r]) is frequently pronounced breathily (as [r̥]) in intervocalic position. This could be seen as a partial assimilation to the voicing of the surrounding vowels.

The breathy 'fricative' h ([ɦ]) assimilates in quality to the vowel following it. This means that unlike other phonemes, h has no unconditioned allophone, since it is always conditioned by its vocalic environment. The justification for regarding h as a consonant (since phonetically it is always a breathy vowel) is that it behaves as other consonants in its distribution, occurring as the onset and never as the nucleus of a syllable. Apart from this, it also parallels the phonological behaviour of voiceless fricatives in an allomorph-selection process known as Postnasal Stopping (see 5.4).

### 2.1.2 Free variation

We use the term 'free' in 'free variation' advisedly, bearing in mind that the variation we have found may be related to sociolinguistic factors such as style, age, status etc. It is however beyond the scope of this study to determine whether there is such a relation, and the most we can offer here are statements concerning the frequency of the variants in our data.

The voiceless aspirated uvular stop qh was sometimes, but less frequently pronounced as the affricate [qʰh].

The voiced fricatives z and zj were sometimes, but less frequently pronounced as affricates, [dz] and [dʒ] respectively.

### 2.1.3 Examples of consonants in words

#### Bilabials

pizjá	[pʰǎǎ]	'pot'
phata	[pʰǎtǎ]	'forehead'
xobábá	[xòbábá]	'to be itchy'
sjimúmú	[šimúmú]	'mute person'

#### Dentals

taté	[tǎté]	'father'
sjethatha	[šétʰǎtʰǎ]	'nest'
dá	[dǎ]	'come!'
xongna	[xòŋnǎ]	'to become fat'
-n/nú	[ŋ/ŋú]	'small'

#### Alveolars

xotsá	[xòtsǎ]	'to cut (meat) into strips'
ʎetsʰqtshq	[ʎétʰtʰtʰ]	'tongue'
xosǎla	[xòsǎlá]	'to stay behind'
xozóma	[xòzómǎ]	'to hunt'
xoróma	[xòrómǎ]	'to send'
xorzuma	[xòrúmǎ]	'to roar'
xolóma	[xòlómǎ]	'to bite'
mon!nú	[mùŋ!nú]	'big intestine'

#### Alveopalatals

ntjwǎla	[ŋtʰwǎ:lǎ]	'tell me!'
---------	------------	------------

tetjhá	[tètʃhá]	'pan(geographical)'
sjesjá	[ʃèsjá]	'tree stump'
zjwɛla	[ʒwɛ:là]	'tell!'

Palatals

cicá	[cìcá]	'tree trunk'
chelerzɪ	[chèlérá]	'knee'
já	[já]	'eat!'
nyaa	[nã:]	'no'

Velars

kákɛ	[káké]	'yellow cobra'
khákhá	[khákhá]	'pangolin'
magáú	[mágáú]	'womb (of an animal)'
mangéna	[mãŋɛná]	'earrings'

Uvulars

qa'la	[qàl'à]	'branch'
qhamá	[qhàimá]	'throttle!'
xoxɔxá	[xòxɔxá]	'to pull/smoke!'

Glottal

hohá	[hòhá]	'fly!'
------	--------	--------

2.2.0 The syllabic nasal

There is only one syllabic nasal in Qh, which, at a phonological level is unspecified for place of articulation. Phonetically, N is realized as dental n preceding a vowel or semivowel, bilabial m preceding h, and velar ŋ word-finally, and in all other instances it takes on the same place of articulation as the consonant following it (orthographically m indicates a bilabial and n any other place of articulation).

As with h, there is no particular allophone of N which we can say is basic or unconditioned, and from which we might thus abstract a phoneme with specified place of articulation. Although the dental, bilabial and velar allophones are distributed according to nonassimilatory phonetic factors, and might therefore be considered as candidates for the phonemic representation of N, there is no principled synchronic way in which a choice among them can be made.

The essential difference between a syllabic and non-syllabic nasal is that the former is longer and bears a tone.

#### 2.2.1 Examples of the syllabic nasal in words

It will be seen from the examples below that the syllabic nasal in two cases constitutes an independent lexical item, namely, (i) first person singular, object prefix (1psOP) and (ii) the locative suffix. It may also function as a phonemic element of no particular morphological significance (but note that in the forms for 'head of cattle' and 'nose' it originally functioned as the Class 9 noun prefix, but synchronically is reckoned as part of the noun stem itself).

##### (i) N as 1psOP

nárába	[nárá:ba]	'answer me!'
mpóha	[mpó:na]	'see me!'
nthabá	[ntsé:xá]	'slaughter me!'
ntshebá	[nts'e:iba]	'slander me!'
ntjhexa	[ntsé:xá]	'cut me!'

nchúca	[ɲh'ú:ca]	'teach me!'
nkhúmisa	[ɲk'húm'í:sà]	'enrich me!'
nqháca	[ɲq'h'á:ca]	'trample me!'

(ii) N as locative suffix

mpizjéng	[mp'iz'ž'éŋ]	'in the pot'
mɔsjexóng	[mɔ'sj'èx'óŋ]	'in the dish'

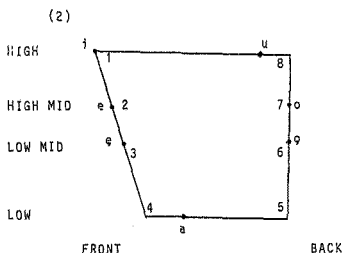
(iii) N with no particular significance

mhó	[m'hó]	'head of cattle'
ntjé	[ɲ'tjé]	'nose'
séŋka	[sé'ŋka]	'look!'
lebɛŋtɛlɛ	[l'èb'ɛŋ'k'è'l'è]	'shop'
bozjwáŋ	[b'òz'w'áŋ]	'grass'

### 2.3.D Vowels

No acoustic or instrumental investigation of vowels was undertaken. The phonetic vowel symbols used here thus represent nothing more than qualities judged subjectively against the qualities of the I.P.A. cardinal vowels. In similar vein, although articulatory terms are used to label the vowels, these should not be understood as necessarily representing exact articulatory configurations.

The vowel phonemes of Qh are given below in table (2). Their positions relative to the numbered cardinal vowels are marked by the dots on the traditional vowel diagram.



From the diagram it can be seen that the Qh vowels differ from the cardinal vowels in that (i) the low mid vowels are slightly higher than their cardinal equivalents. Phonetically  $\underline{e}$  and  $\underline{ə}$  are  $[\epsilon^{\wedge}]$  and  $[\text{ə}^{\wedge}]$  respectively; (ii) the low vowel is between cardinal vowels 4 and 5, but closer to 4, that is slightly fronted; (iii) the high back vowel is centralized from cardinal vowel 8, that is phonetically  $[u^{\wedge}]$ .

### 2.3.1 Allophonic alternation

Adjacent to uvulars there is a slow vocalic transition between the uvular and a high or high mid front vowel, which we transcribe here phonetically as  $[\text{ɛ}^{\wedge}]$ , for example in réqisa 'sell':  $[\text{r}^{\text{h}}\text{éq}^{\text{h}}\text{ɛ}^{\text{h}}\text{ɪ}^{\text{h}}\text{s}^{\text{h}}\text{à}]$ .

Postnasally vowels and glides are heavily nasalized, for example in monq  $[\text{m}^{\text{h}}\text{ò}^{\text{h}}\text{ŋ}^{\text{h}}\text{ç}^{\text{h}}]$  'finger' and xonwá  $[\text{x}^{\text{h}}\text{ò}^{\text{h}}\text{ŋ}^{\text{h}}\text{w}^{\text{h}}\text{á}]$  'to drink'. This nasalization spreads into subsequent syllables if they commence on a vowel or glide, for example in nawá  $[\text{n}^{\text{h}}\text{à}^{\text{h}}\text{w}^{\text{h}}\text{á}]$  'bean'.

Prenasally vowels are also nasalized, but less noticeably so, and this nasalization has not been marked in phonetic transcriptions.

Word-finally, in *prepausal neutral* (see 2.5) position, vowels preceded by a voiceless consonant are often pronounced voicelessly, for example mocho [mɔ̃ːchɔ̃ː] 'person'. Following a voiced consonant, partial devoicing to breathiness may occur, for example in mabú [máːbú̃] 'sand'. This devoicing (partial or complete) did not occur consistently in citation forms, and it was beyond the scope of this investigation to determine its exact distribution in connected speech.

### 2.3.2 Free variation

Our two main informants, KG and LM, often pronounced the high mid phonemes e and o as the lowered high vowels [ɪ] and [ʊ] respectively, whereas all other informants pronounced them in all cases as high mid [e] and [o] respectively. It would appear that in using these higher vowels, KG and LM have been influenced by Tswana, in which lowered high vowels regularly correspond to the Qh high mid vowels.

In our transcriptions we have consistently used the symbols e and o.

### 2.3.3 Examples of vowels in words

High front	rziphrif	[rɪpʰɪʃɪ]	'hyaenas'
High mid front	chelerzf	[chʰelɛrɪ]	'knee'



Low mid front	-cɛlɛlɛ	[cɛlɛlɛ]	'tall/long'
Low central	razjána	[rãžá'ná]	'flirt!'
Low mid back	cɔqɔlɔlɔ	[cɔqɔlɔlɔ]	'joint of body'
High mid back	mocho	[mɔchò]	'person'
High back	khúrú	[k'úrú]	'tortoise'

#### 2.4 Glides

There are two glide phonemes, y and w, which are realized as phonetic [ɣ] and [ɔ] respectively. Apart from nasalization, dealt with above under vowels, there is no other allophonic alternation affecting glides.

Examples of glides in words are given below:

Front	yáya	[ɣáɣà]	'it(9) went'
Back	wawa	[ɔàɔà]	'you(sg) fell'

#### 2.5 Stress

Unlike the segmental elements and tone, stress in Qh is predictable always by rule, and never serves to differentiate lexical meanings or categories. It is assigned at the utterance level, and is manifested phonetically as the lengthening of the penultimate syllable of the utterance.

The presence of a penultimately lengthened syllable at the end of an utterance indicates that the speaker is about to pause or stop speaking altogether. It also generally signals the neutral attitude (for example, non-surprised, non-angry etc.) of the speaker, and that the sentence-type is a statement, or possibly a non-urgent imperative (that is, one for whose fulfilment the speaker does not require urgent action). Citation forms are also neutral utterances

and they too are assigned penultimate length.

In other utterance-types (for example, urgent imperatives and questions), or where no break occurs in the utterance, stress does not occur, and all syllables are of the same, short, duration.

The description of stressing given above has been put in fairly categorical terms, but it should be borne in mind that no detailed analysis of stressing was carried out in running speech. For this reason we consider it premature to attempt a formalization of the stress assignment rule, although for convenience we will refer to this rule as Prepausal Penultimate Lengthening (PPL). Examples of prepausally penultimately lengthened syllables can be found in the list of non-urgent imperatives in 2.2.1(i) on pages 17 and 18.

We do not consider it necessary to show the effect of PPL orthographically.

### 2.6.0 Tones

There are two phonemic tones in Qh, high (H) and low (L). Orthographically H tones are marked by an acute accent, and L tones left unmarked (except on L syllabic nasals preceding a vowel or glide, to distinguish them from nonsyllabic nasals - see the first example in 2.2.1(i) on page 17). (For further remarks on the orthography of tones see Appendix A.)

These tones are realized phonetically as (i) long level tones; (ii) long falling tones or (iii) short level tones. The distribution is as follows:

- (i) Long level tones occur on prepausally lengthened penultimate syllables if the final syllable bears the opposite tone. Thus the prepausal sequences HL and LH are realized phonetically as H:L (``) and L:H (``) respectively, for example in xobózja [χóbó:zá] 'to ask', and mabú [má:bú] 'sand'.
- (ii) Long falling tones occur on a prepausally lengthened penultimate syllable if the final syllable following it bears the same tone underlyingly. In this case however, the final tone assimilates to the endpoint of the penultimate fall. The prepausal sequence HH is realized phonetically as HLL (``) (a fall from H to L followed by a L), and LL is realized phonetically as LEE (``) (a fall from L to extra-L followed by an extra-L), for example respectively in xobóná [χóbó:ná] 'to see' and xobála [χóbá:lá] 'to count'.
- (iii) Short level tones occur in all other cases, that is, on all syllables which have not been prepausally lengthened. Thus the examples given above in (i) and (ii) would be in non-prepausal position [χóbózá], [mábú], [χóbóná] and [χóbálá] respectively.

It is clear from the above that PPL affects not only the length of vowels, but also tones. The falls associated with sequences of like tones in (ii) however, cannot be

attributed to the effect of PPL alone, and must be considered as a co-occurring, but independent intonational phenomenon.

### 2.6.1 Examples of tones in words

The following minimal pairs clearly show the contrastive function of H and L tones (these examples are all in the non-prepausal context):

ratsá	'wash!'
rátsá	'vomit!'
zjwéǎ	'get out!'
zjwéǎ	'tell!'
xochfǎ	'to close'
xochiba	'to return'

### 2.6.2 Downdrifting

Another tonal phenomenon associated with neutral utterances is downdrifting. This is the gradual sinking of overall pitch from the beginning of the utterance to the end. Its presence is much more noticeable in utterances containing like tones, for example in the all-L obala bacho 'he(1) counts the people', or in the all-H óbóná khǎrzǎ 'you(sg) see the tortoise'. The falls described above in 2.6.0(ii) on prepausal like-tone sequences, could be seen as exaggerations, or phonologizations, of downdrifting over the last two prepausal syllables of an utterance.

### 2.7 Syllable structure

There are only four types of syllable in Qh. These are as follows:

- (i)  $\begin{Bmatrix} C \\ G \end{Bmatrix}V$  (a consonant or glide followed by a vowel)  
 (ii) CWV (a consonant followed by a back glide,  
 followed by a vowel)  
 (iii) V (a vowel)  
 (iv) N (a syllabic nasal)

Within these syllable-types there are the following intramorphemic restrictions:

- (i) in GV and CWV, the glide may not be followed by a vowel of the same backness which is higher than low mid;  
 (ii) in CV, dental, velar and uvular stops may not be followed by front vowels (six exceptions were found however, namely -tiba 'play in water', -kɛlé 'left(side)', káké 'yellow cobra', -khɛlé 'play', qhetsf 'bag' and -qhɛcha 'pay tax');  
 (iii) in CWV, C may not be bilabial.

In Chapters 4 and 5 it can be seen that some of the phonological rules of Qh have the effect of preventing the intermorphemic creation of syllable structures other than these four kinds, or of preventing the violation of the restrictions on these syllable-types.

## CHAPTER 3

A COMPARISON OF FINDINGS BY VAN DER MERWE AND SCHAPERA (1943),  
DU PLESSIS AND KRUGER (1968) AND THIS STUDY

For convenience we shall refer to the Van der Merwe and Schapera (1943) study as 'K43', and to Du Plessis and Krüger's (1968) study as 'K68'.

3.1.0 Nonsyllabic consonants3.1.1 Ejection

K68:2 (page 2) records all of the sounds which we have labelled 'voiceless unaspirated stops' or 'voiceless unaspirated affricates' in table (1) of the previous chapter, as ejectives. In our data these sounds were always produced pulmonically, except on a few occasions when ejectives were used metalinguistically as follows:

- (i) An informant might use an ejective to indicate that we had incorrectly imitated a voiceless unaspirated stop as aspirated;
- (ii) Once we were asked how we intended to represent the sound  $q$  graphically. The speaker on this occasion pronounced  $q$  as  $[q\chi^p]$ , instead of the  $[q]$  which he otherwise used.

A speculation regarding this is that voiceless unaspirated stops and affricates may actually be stored mentally

as ejectives, but that this ejection is realized only when attention is being paid to the sounds themselves.

K43:9 records only one ejective, namely k', which corresponds to our q. This will be discussed in 3.1.7 below.

### 3.1.2 h

K68:2 records the phoneme h as phonetic [h], that is, voiceless. In our data h only ever occurred as breathy [h̤]. The state of the glottis for h is not mentioned in K43.

### 3.1.3 Aspiration versus voicing in the trills

K68:2 claims that the difference between our voiced rz ([r]), and voiceless (or breathy, see 2.1.1) r ([r̥] or [r̥̤]) is one of aspiration, and transcribes these sounds [r] and [r̥] respectively. The fact however that K68 uses the symbol [h̤] instead of [h] suggests that their term 'geaspireerd' is best interpreted here as breathy, which, as we have shown, is one of the phonetic realizations of our voiceless r.

K43:13 records only voiced 'r'. In our own investigation of Bolaongwe (which is the only dialect studied in K43) one of our Letlhakeng informants also had only voiced [r] corresponding both to voiced and voiceless rz and r in the Sjaxa dialect at Lone Tree and Kacgae. It is probable that Bolaongwe, situated as it is adjacent to the Tswana area, has been influenced by Tswana in which the voiced sound regularly corresponds to the voiceless Qh equivalent.

### 3.1.4 Voiced sibilant fricatives versus affricates

K68:3 claims that our phonemes z and zj occur as the affricates [dz] and [dʒ] respectively in Bolaongwe only. This tallies with our Bolaongwe data, but as shown in 2.1.2, [z] and [dz], and [ʒ] and [dʒ] are in free variation in Sjaxa (although it is true that the fricative variants occurred more often). It would appear therefore that the affricate variants in Sjaxa could be the result of dialect influence by Bolaongwe.

K43:9 and 11 records two 'voiced palatal' sounds which are transcribed 'dy' in one word 'dyuēla' (skin at) and 'j' in all other words, for example 'ja' (eat) and 'bija' (call). In our own data these words are zjuēla ([ʒuēla] or [dʒuēla]), ja ([ʒa]) and bfzja ([bfʒa] or [bfdʒa]) respectively. It would appear from this that there could be some confusion in K43 between alveopalatals and palatals. But it should be remembered that K43 is based on only one informant.

### 3.1.5 Allophonic versus phonological alternation between l and rz

Both K43:13 and K68:3 note that the phoneme l is realized as rz ([r]) before the high vowels i and u, but as l elsewhere, for example compare balā (from underlying bal+a) 'count!' with mbarzi (from underlying mo+bal+i) 'counter'.

As our example shows, this alternation is found in this study as well. However, we treat it not as an allophonic alternation, but as a phonological one (which in addition is somewhat morphologized). The reason is that when i or u



are derived from the high mid vowels e and o respectively by Vowel Harmony (see Chapter 6) preceding the phoneme l, this l is not converted to rz, but remains l. In effect this means that l and rz may be in contrast, as the following example shows: lɛ+phúny+a+xɔ becomes by Vowel Harmony lɪphúnyaxɔ 'he(5) stabs', and makes a minimal pair with rzɪphúnyaxɔ 'they(10) stab'. Apart from this, there are adoptive words in which rz now occurs preceding vowels other than i and u, for example -bɛrzéka 'work' from Afrikaans 'werk', and karza 'cart' from Afrikaans 'kar'.

The l/rz alternation will be dealt with in 5.3 as a phonological alternation called 'Trilling'.

### 3.1.6 Rare sounds

Only two clicks have been recorded in this study, and both of them occur in only one lexical item each: /n ( [ɲ̥] ) in the adjective stem -n/nɔ 'small' (and its derived diminutive -n/nwána), and ln ( [l̥ɲ̥] ) in the noun monlnú 'big intestine'.

The diminutive -n/nwána is recorded in both K43:13 (as -ncuana) and K68:38 (as -ncwana). K43:8 however also records the word for 'big intestine', but as a clickless form, monhu. It is probable that this word is the Bolaongwe reflex of the form containing the click ln which in Sjaxa has been preserved.

In our data we came across only one word containing the voiced velar stop g, namely magáú 'womb of animal'. K68:3 records two others in addition: /gukhɛla/ 'wegjaag'

and /gaba/ 'op skouers dra'.

Whereas the two clicks are poorly integrated into the overall phonological system of Qh, g is not: it fits into both the velar and the voiced stop series, and is affected as part of the natural class of voiced segments in the allomorph selection process we have called Postnasal Devoicing (see 5.4).

It is likely that all three of these sounds are borrowings. We have not however been able to discover the source items of the words in the surrounding Khoisan languages. (Henceforth no further mention of the clicks will be made. Their phonetic definitions will serve as their underlying representations and they will be regarded as standing outside the phonological system per se of Qh.)

### 3.1.7 Velars versus uvulars

The discrepancies mentioned above between K43 and K68 and this study have hitherto been relatively minor. A major point of difference however lies in the fact that uvulars have not been recorded at all in K43 or K68.

As table (1) below shows (omitting rare g), K43 and K68 record only velars where we have found both velars and uvulars:

(1)	<u>K43:7ff</u>	<u>K68:2</u>	<u>This study</u>
	'k'	[k]	[k]
	'kh'	[kh]	[kh]
	'ng'	[ŋ]	[ŋ] or [ŋ̥]
	'kʰ'	[kx]	[q]

'kg'	[kxh]	[qh] or [q̄xh]
'g'	[x]	[χ]
'ng'	[ŋ]	[ŋ]

Note firstly that although no uvulars are recorded in the two earlier studies, the phonemic distinctions between what we have recorded as velars and uvulars respectively, have been made.

A possible interpretation of the above comparison would be that a very recent (that is, post-1968) sound change had occurred. However a remark in K43 suggests that this has not been the case and that uvulars already existed at the time that the K43 study was undertaken. The remark concerns the K43 sound k' (our [q]) where it is said that 'This sound was usually, but not consistently, employed by the informant before a, o and o in the final syllable of a word; and occasionally in other positions and before other vowels...'. Bearing in mind that K43 k' and k (our [q] and [k] respectively) both derive from the same older velar \*k (see 11.3.2) it seems phonetically implausible that Qh should have developed an ejected variant just before the low and/or back vowels 'a, o and o' (our a, o and o respectively). On the other hand it is perfectly reasonable that the language should develop uvular variants before such vowels, since the consonantal place of articulation closest to these vowels would have been uvular (which is both back and low), and the historical change would simply have been one of vowel/consonant place-assimilation. We suspect therefore, that K43 and K68, although they succeeded

in identifying the correct number of phonemes, failed to record their phonetic realizations correctly.

### 3.2 Syllabic consonants

The only difference here is that K43:13 records not only syllabic nasals, but also a syllabic trill as in the word 'irró' (your father) and a syllabic lateral as in the reduplicated applied extension 'élla'. In our data these syllabic elements did not occur. The forms above were recorded as iró and -élela respectively.

### 3.3 Vowels

In K43:7 the Qh vowels are merely listed without phonetic labelling at all, and are recorded as corresponding exactly with Tswana vowels. Tswana orthography is used for the Qh. The treatment of vowels is *phonemic* rather than *phonetic*, giving only an idea of the actual pronunciation.

K68:1 treats vowels phonemically as well, although a chart showing the relationship between Qh and the cardinal vowels is given. There are certain minor points of disagreement here between their findings and ours, namely

- (i) there are no high mid vowels (the symbols /e/ and /o/ are used, but on the chart they are placed in a lowered high position);
- (ii) the low mid vowels are given as corresponding exactly to their cardinal equivalents, instead of being slightly higher as we have found them to be;
- (iii) the low vowel is shown as being precisely

central, instead of somewhat fronted;  
(iv) the high back vowel is not shown as somewhat centralized.

The only other point made about the phonetics of vowels in K68:1 is that all vowels of the Sekoma dialect are reported to be nasalized, apparently irrespective of phonetic environment. Our own findings in Sekoma are in disagreement with this. We found that our six Sekoma informants nasalized their vowels in the same environments (see 2.3.1) as the other informants. K68:1 notes however that 'Genasaleerde vokale word egter merendeels by ouer persone aangetref'. Since none of our informants was an old person, this could be the reason we did not find this general nasalization.

#### 3.4 Stress and Tone

These phenomena are not dealt with at all in the earlier studies.

## CHAPTER 4

PHONOLOGICAL ALTERNATIONS IN CONSONANTS CAUSED BY A FOLLOWING GLIDE

In this and the following two chapters we account for segmental phoneme alternations by phonological rules or by lexical allomorph selection processes.

No formal distinction is drawn between phonological rules which require some morphological specification and those which do not. We also draw no distinction between natural and unnatural rules. The fact that an alternation may be (partly) phonologically conditioned to occur in a particular environment does not imply therefore that it is phonetically motivated by that environment. Unnatural rules are the result of the telescoping of historical changes, and these are dealt with in later chapters.

Allomorph selection processes are used to handle exceptional alternations which are not formulable systematically as rules. In such cases one allomorph of an alternating morpheme is marked lexically as occurring in this or that environment. For example the noun meaning 'skin' has two allomorphs ledaig and ledajw in which the alternation l/j is irregular. The latter allomorph occurs only when followed by the diminutive suffix (DS) -ana. The lexical representation of this morpheme would thus be

ledajɔ ~ ledajw / \_\_\_+DS.

As the description of the phoneme alternations proceeds, it will become clear that some of the traditional phonetic labels given in table (1) of Chapter 1 are unnecessary from a phonological point of view. Where this is so they will be discarded or replaced by more suitable phonological features, which, except for SYLLABIC and CONSONANTAL (see 4.2) are nevertheless based on phonetic properties.

#### 4.1 Vowel desyllabification

Before discussing the consonant changes themselves, we deal here first with the sources of the glides which cause them.

w exists lexically as the passive morpheme, occurring as a suffix to verb radicals, for example

- (1) o+bal+w+a+yɔ → obalwayɔ 'he(1) is counted'  
(cf. obalayɔ 'he(1) counts')

All other instances of w are created by desyllabification of back vowels, for example in

- (2) caú+ana → cawána 'little lion'  
(cf. caú 'lion')

All instances of conditioning y are created by the desyllabification of front vowels. y differs from w however, in that if it is preceded by a consonant it is always deleted (usually after causing the preceding consonant to change). Compare the derivations of the diminutive of sjeléǵé 'axe' with that of khái 'cloth'

below:

(3) <u>Underlying (U)</u>	sjeləpə+ana	khái+ana
Desyllabification	y	y
(see 4.4)	ts	-
y-deletion	∅	-
<u>Surface (S)</u>	sjelətsána	kháyana
	'little axe'	'little cloth'

In the same environment in which back and front vowels are desyllabified (that is, preceding the DS) the low vowel a is simply deleted without causing a change to the preceding consonant, for example

(4) pəba+ana → pəbana 'little mouse'

This deletion may be incorporated into the general desyllabification rule (see below) if the feature bundle -SYLLABIC, -FRONT, -BACK, -CONSONANTAL is interpreted by the phonetic realization rules as zero.

In terms of backness/frontness we classify the vowels underlyingly as follows:

(5)	<u>FRONT</u>	<u>BACK</u>
i	+	-
e	+	-
ə	+	-
a	-	-
ɔ	-	+
o	-	+
u	-	+

(These features, together with those used for vowel height



are discussed again in Chapter 6.)

Since all vowels are +SYLLABIC (SYLL) and -CONSONANTAL (CONS), and all glides are -SYLL and -CONS (for a full classification of the major segmental classes, see the following section), we may formulate the rule of Desyllabification (DESYLL) as follows:

$$\begin{bmatrix} +SYLL \\ -CONS \end{bmatrix} \rightarrow [-SYLL] \quad / \text{ \_\_\_\_ } +DS$$

and y-deletion may be formalized as

$$\begin{bmatrix} -SYLL \\ -CONS \\ -BACK \\ +FRONT \end{bmatrix} \rightarrow \emptyset \quad / [+CONS] \text{ \_\_\_\_ }$$

The interpretative rule for the desyllabification of a as zero, may be stated simply as

$$\begin{bmatrix} -SYLL \\ -CONS \\ -BACK \\ -FRONT \end{bmatrix} \rightarrow \emptyset$$

Observe that when a high-toned vowel is desyllabified (examples (2) and (3) above) the high tone is not lost, but replaces the immediately following low tone on the first syllable of the diminutive prefix. This is a case of tonal stability, and more instances of this phenomenon will be seen in Chapter 8 when tone is discussed. (No further comments on tone will be made in this and the following two chapters.)

For ease of exposition, in the examples of consonant changes caused by glides, the full derivations will not be shown. For instance in 4.4 our example (3) above is given

simply as sjelɛpɛ+ana → sjelɛtsána 'little axe'.

The sound changes caused to consonants by a following glide are now presented below.

#### 4.2 Non-nasal bilabial alveopalatalization

Non-nasal bilabials become alveopalatals when followed by w. Examples are:

- (5) bɔp+w+a → bɔtjwá 'be moulded'  
 tshɔpɔh+w+a → tshɔtjhwá 'be rolled'  
 rab+w+a → razjwa 'be slaughtered'

The examples in (6) are with the lexical, passive w. The same changes occur if w has been derived by desyllabification, for example

- (7) lexupo → lexutjwana 'little rib'  
 qobɔ → qozjwana 'little blanket'

The rule may be formalized as

$$\left[ \begin{array}{l} \text{BILABIAL} \\ \text{-NASAL} \end{array} \right] \rightarrow \left[ \text{ALVEOPALATAL} \right] / \text{_____} \left[ \begin{array}{l} \text{-SYLL} \\ \text{-CONS} \\ \text{+BACK} \\ \text{-FRONT} \end{array} \right]$$

This rule, and all others following, incorporate the following rule-writing conventions:

- (i) Features which do not change, unless, like -NASAL above, they are required for the structural index, are not mentioned. So, for example, for the instance of this rule, p → tj the feature STOP (where +STOP = complete articulatory closure) is not mentioned.
- (ii) Feature changes which are redundant in terms of

other independently required features are not mentioned. So for example in the instance,  $b \rightarrow zj$ , the change +STOP to -STOP is not mentioned since the only ALVEOPALATAL, +VOICED segment is  $zj$ , that is -STOP. (That ALVEOPALATAL and VOICED are independently required can be seen from the minimal pairs  $sjá$  'roast!' versus  $xá$  'draw water!' (ALVEOPALATAL versus UVULAR) and  $sjwá$  'die!' versus  $zjwá$  'get out!' (+VOICED versus -VOICED). Similarly, the change -FRICATIVE to +FRICATIVE (FRICATIVE = with fricative turbulence) is not mentioned, since all BILABIALS are -FRICATIVE and all ALVEOPALATALS are +FRICATIVE.

- (iii) This rule also embodies the assumption that phonological features, except those for place of articulation, are binary. This will be further discussed in 5.5.0.

The feature SYLLABIC (+SYLL = occurs as syllabic nucleus) and the feature CONSONANTAL (-CONS = has vowel-like formant structure) are used to distinguish the four classes of segments listed at the beginning of Chapter 1:

(8)	C	N	V	G
SYLLABIC	-	+	+	-
CONSONANTAL	+	+	-	-

Unlike the rest of the features to be used, SYLL and CONS are not based on absolute phonetic ground. As Ladefoged (1971:81) points out, no neurophysiological correlates to

SYLL have yet been discovered. The definition of CONS, though somewhat vague, does have phonetic correlates, but to the definition of -CONS of 'has vowel-like formant structure' we must add, 'at an underlying or phonological level'. The reason for adding this non-phonetic information is to exclude h from the -CONS category, even though at the surface level h (being breathy - see 2.1.1) has vowel-like formant structure.

#### 4.3 Bilabial nasal velarization

In the same environment in which non-nasal bilabials become alveopalatal, the bilabial nasal becomes velar, for example

(9) lem+w+a → lengwa 'be ploughed'  
 molomq+ana → molongwana 'little mouth'

We state the rule formally as

$$\left[ \begin{array}{l} \text{BILABIAL} \\ +\text{NASAL} \end{array} \right] \rightarrow \left[ \text{VELAR} \right] / \left[ \begin{array}{l} -\text{SYLL} \\ -\text{CONS} \\ +\text{BACK} \\ -\text{FRONT} \end{array} \right]$$

It is probable that m in this position originally became palatal ny (as it still does for example in Nguni, where for instance 'be ploughed' in Zulu is linywa from underlying lim+w+a). As we shall show in 12.11 and 12.12 there are other cases of ny becoming ng in the history of Sotho languages.

#### 4.4 Non-nasal bilabial alveolarization

A non-nasal bilabial becomes a +FRICATIVE ALVEOLAR

when followed by a front glide (which, thereafter, is deleted), for example

- (10) sjeleppé+ana → sjeleptsána 'little axe'  
 maróphi+ana → marótshana 'little blisters'  
 tjebé+ana → tjezána 'little ear'

The rule is

$$\left[ \begin{array}{l} \text{BILABIAL} \\ -\text{NASAL} \end{array} \right] \rightarrow \left[ \begin{array}{l} \text{ALVEOLAR} \\ +\text{FRICATIVE} \end{array} \right] / \text{---} \left[ \begin{array}{l} -\text{SYLL} \\ -\text{CONS} \\ -\text{BACK} \\ +\text{FRONT} \end{array} \right]$$

The feature +FRICATIVE here excludes as possible outputs of this rule the non-fricative ALVEOLARS r, rz and l. These -FRICATIVES are further distinguished from each other by the feature TRILL (+TRILL = one articulator vibrates against the other): r and rz are +TRILL and l is -TRILL. l is further distinguished as +LATERAL, with the trills as -LATERAL. Since in this group αLATERAL implies -αTRILL, and αTRILL implies -αLATERAL, there is the question of redundancy. This will be discussed in 5.5.0.

The feature TRILL presents a slight problem for our feature STOP, the positive value of which was defined above as 'complete articulatory closure'. Trills involve rapidly recurring complete articulatory closures, but in Qh generally behave phonologically as -STOPS. In order thus to classify trills as -STOP we modify our earlier definition of +STOP segments as being those involving complete articulatory closure, but without vibration.

To return to the alveolarization of bilabials, note that the nasal bilabial undergoes no change in the context

of following y, for example

(11) sjemé+ana → sjemána 'little whip'

#### 4.5 Dental nasal palatalization

A dental nasal becomes palatal preceding a front glide (which thereafter is deleted), for example,

(12) chwáné+ane → chwányáne 'little lynx'

(Note that the suffix -ane is a lexically determined variant of the usual DS -ana). We may state the rule as

$$[DENTAL] \rightarrow [PALATAL] \quad / \quad \left[ \begin{array}{l} -SYLL \\ -CONS \\ +FRONT \\ -BACK \end{array} \right]$$

No examples of non-nasal dentals were found in which the same or a similar rule might have been expected to operate.

#### 4.6 Alveolar alveopalatalization

The -FRICATIVE alveolars become alveopalatal when followed by a front glide (which thereafter is deleted), for example,

(13) sjethare+ana → sjethatjhana 'little tree'

marzf+ana            mazjána            'little money'

mabé1é+ana        mabéjzjána        'little breasts'

As the examples show, voiceless r becomes +STOP tjh, whereas for rz → zj and l → zj the value of the feature STOP does not change, and is -STOP for both input and output.

This sub-regularity may be incorporated in the rule by including the feature -VOICED in the input and +STOP in the output, in angled brackets. The rule would then read

as 'input becomes output, but if input is -VOICED then output is +STOP, otherwise there is no change to these features'. (This is the only case in which a trill does appear to behave as a +STOP rather than as a -STOP segment - see the remarks in 4.4 and in 5.5.0.)

The rule is formalized as follows:

$$\left[ \begin{array}{l} \text{ALVEOLAR} \\ \text{-FRICATIVE} \\ \text{<VOICED>} \end{array} \right] \rightarrow \left[ \begin{array}{l} \text{ALVEOPALATAL} \\ \text{<+STOP>} \end{array} \right] / \text{---} \left[ \begin{array}{l} \text{-SYLL} \\ \text{-CONS} \\ \text{-BACK} \\ \text{+FRONT} \end{array} \right]$$

#### 4.7 rz-Alveopalatalization by w

rz becomes zj when followed by w (caused by the desyllabification of u), for example

(14) khdrzú+ana → khúzjwána 'little tortoise'

The rule is formulated as

$$\left[ \begin{array}{l} \text{ALVEOLAR} \\ \text{+VOICE} \\ \text{+TRILL} \end{array} \right] \rightarrow \left[ \text{ALVEOPALATAL} \right] / \text{---} \left[ \begin{array}{l} \text{-SYLL} \\ \text{-CONS} \\ \text{+BACK} \\ \text{-FRONT} \end{array} \right]$$

#### 4.8 h-Alveolarization

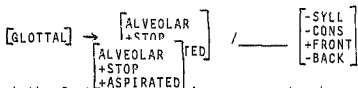
Preceding a front glide, h becomes the alveolar aspirated affricate (the glide of course is subsequently deleted), for example

(15) lehihi+ana → lehitshana 'little darkness/  
twilight'

As we shall show in 11.4.0, Qh h derives historically from a voiceless bilabial fricative, and historically speaking, the synchronically unusual h-alveolarization is

merely another instance of Non-nasal bilabial alveolarization, as dealt with in 4.4.

The rule may be stated as .



Just the feature ALVEOLAR is necessary to characterize h in this rule, since h is the only GLOTTAL segment. A slight problem concerning VOICED arises here however, since h is phonetically breathy, though in this alternation (as well as in Postnasal Stopping - see Chapter 5) behaves as though it were -VOICED. We suggest that at a phonological level -VOICED be interpreted as voicelessness or partial voicelessness (that is, fully or partially abducted vocal folds) and +VOICED strictly as completely adducted and vibrating folds. The breathiness of h is thereby reduced to a phonetic detail.

Note also that +FRICATIVE is not necessary in the structural change, since both ALVEOLAR, +STOP segments (ts and tsh) are also +FRICATIVE.

#### 4.9 Historical digression (1): Alveolarization/alveopalatalization in concords and pronouns

It is clear that historically, alveolarization and alveopalatalization of the types discussed above occurred in the formation of the concordial and pronominal elements in Qh. In table (16) below some of these are displayed. Historically each concord or pronoun has been derived from its corresponding noun prefix (NP) plus some other element:



the possessive prefix (PosP) from \*NP+a; the relative prefix (RelP) from \*NP+V<sub>2</sub> (where V<sub>2</sub> stands for e, a or o if the vowel contained by the NP is i/e, a or o respectively); and the absolute pronoun (AbsP) from \*NP+ona.

(16) Class	NP	PosP	RelP	AbsP
1	mo-	wá-	yó-	ená
2	ba-	bá-	mbá-	bóná
3	mo-	wá-	wó-	wóná
4	me-	yá-	yé-	yóná
5	le-	lá-	lé-	lóná
6	ma-	á-	óá-	wóná
7	sje-	sjá-	sjé-	sjóná
8	bi-	zá-	zé-	zóná
9	e-/ø	yá-	yé-	yóná
10	rzi-	zjá-	zjé-	zjóná
14	bo-	zjwá-	zjwé-	zjwóná
15	xo-	xá-	xó-	xóná

Examples of Non-nasal bilabial alveolarization (see 4.4), Alveolar alveopalatalization (see 4.6) and Non-nasal bilabial alveopalatalization (see 4.2) can be seen in Class (Cl) 8, Cl 10 and Cl 14 respectively. However the patterns of place of articulation changes we have observed in 4.3 to 4.7 are broken in practically all the other classes: In Cls 1 and 3, where Bilabial nasal velarization might have been expected the nasal instead has been deleted (this has also happened in Cls 4 and 6). In addition, in the RelP of Cl 1, the back vowel of the NP corresponds to a front, instead of back, glide, and the AbsP of this class is quite irregular.

Two other irregularities in the ReIP are the initial elements m in Cl 2 and o in Cl 6, which are not synchronically derivable from the NPs. In Cl 5 the l of the NP has failed to undergo expected Alveolar Alveopalatalization (though in dialects other than Sjaxa apparently still does - see K68:26). Finally note that in Cl 15, the o of the NP has been deleted rather than desyllabified (cf. this with the o → w in diminutives such as phoxówána → phoxwána 'little eland').

Because of these irregularities it is thought best that these concords and pronouns be represented as already existing in the lexicon, rather than as derived synchronically from the NP followed by some formative. For the sake of uniformity, even those forms which are regularly accountable by the rules above will be considered as already existing in the lexicon.

It is appropriate here to mention the findings of K43 and K68 with respect to what we have called Alveolar alveopalatalization, especially in the change l to zj. K68:21 records not l → zj, but l → j ( [ɟ] ) in diminutives, for example 'mbale:mbejana liggaampie'; in the Cl 5 concords, for example ja 'PosP', je 'ReIP', and in the absolute pronoun, jona. K43:14 also records these changes, but since K43 uses the same symbol 'j' for our j and zj, it is impossible to interpret it phonetically.

It is probable that the differences between K68 and our study in this regard are a matter of dialectal variation. A very likely further factor in the disappearance of Alveolar alveopalatalization in Cl 5 in Sjaxa is the

conflation in that dialect of C1 11 and C1 5. Both K68:24 and K43:26 record the existence of a C1 11 NP lq- with PosP lwa-, ReIP lq- and AbsP lqna. In our data only two cases with the C1 11 NP were found, namely losjff 'eyebrow' and loba 'small hut'. These take our C1 5 concords as do all le-commencing nouns (whether etymologically C1 5 or C1 11). It can be seen that our C1 5 concords in table (16) resemble K43's and K68's C1 11 concords more closely than their palatalized C1 5 concords. What seems to have happened in Sjaxa then is that the C1 11 NP has been replaced by the C1 5 NP (barring the two exceptions just mentioned), but that the C1 5 concords have been replaced by those of C1 11 - though some restructuring has taken place, with w falling out of the PosP and AbsP, and the back vowel of the ReIP being replaced by a front vowel.

As an aside, we might note that the conflation of C1s 11 and 5 has an interesting effect on the formation of plurals in Sjaxa. Previously C1 5 nouns would have made their plural in C1 6 only, for example lesjorzu/masjorzu 'thief/thieves'. Now however, some C1 5 nouns take a plural in C1 10 (the usual plural correlate of old C1 11), for example lesjéa/rzitjhéa 'baby/babies'. This represents added complexity to the morphology of the language.

#### 4.10 Historical digression (2): Alveolarization/alveopalatalization in causatives

Pairs of noncausative/causative (or intransitive/transitive) verbs exist in which, historically, various alveolarization and alveopalatalization processes occurred,

for example,

(17) rapa	'wash (oneself)'
ratsa	'wash (something)'
tjhwána	'be alike'
tjhwána	'make alike'
dála	'become full'
dázja	'fill'
aqoha	'hurry (v.i.)'
aqotsha	'hurry (v.t.)'
tjhóxa	'be frightened'
tjhosja	'frighten'

It seems clear that historically a front glide was once present between the verb radical and the -a suffix, thus for example \*dál+y+a → dázja 'fill'. Since however there is no synchronic phonological evidence of such a conditioning causative morpheme in the surface structure, we regard both members of each pair as existing independently of each other in the lexicon.

#### 4.11 Exceptions in diminutives

A few exceptions to the rules involving the diminutive suffix were found. Interestingly in these cases it was not that a rule failed to apply, but rather that some sort of change was made where ordinarily none would have been expected. Two such cases are khóba/khózana 'owl/little owl' and ledalq/ledajwana 'skin/little skin'. In the first case the bilabial would not have been expected to undergo alveolari-

zation since the next sound is a, which generally deletes without causing a preceding consonant to change (see example (4) which is typical). In the second case, though the desyllabification of g to w is usual, the palatalization of l preceding w is not (cf. with molelq+ana → molelwana 'little fire'). It is possible that alveolarization and alveopalatalization have come to be closely associated with diminutive formation, and that this is why these processes are applied even where they are not phonologically motivated.

As we have already stated (see the beginning of this chapter), these exceptions and others like them would be dealt with by allomorph selection processes. Thus the form for 'owl' would be represented lexically as

khóba ~ khóz / \_\_\_\_\_+DS.

(For the lexical representation of the form for 'skin' see page 35).

#### 4.12 Rule ordering

The only explicitly required ordering relationship among the rules discussed in this chapter is that Desyllabification should precede the alternations caused by the glides, and that y-Deletion should follow these. Since the glide-conditioned changes themselves occur in mutually exclusive environments, they need not be ordered amongst themselves.

## CHAPTER 5

OTHER PHONOLOGICAL ALTERNATIONS IN CONSONANTS AND THE UNDERLYING REPRESENTATION OF CONSONANTS

Alternations of consonants which are not specifically conditioned by a following glide are dealt with below.

5.1 Uvular alveopalatalization

Before the two front-vowel-commencing suffixes, the applied extension -e] and the perfect/stative suffix -f]e, uvulars become alveopalatals, for example

- (1) r<sup>h</sup>q+e]a → r<sup>h</sup>tj<sup>h</sup>e]a 'buy for'  
 r<sup>h</sup>q+f]e → r<sup>h</sup>tj<sup>h</sup>f]e 'have bought'  
 dox+e]a → dosj<sup>h</sup>e]a 'leave alone'  
 dox+f]e → dusj<sup>h</sup>f]e 'have left'

The rule is formulated as

$$\begin{array}{l} [UVULAR] \rightarrow [ALVEOPALATAL] \\ [UVULAR] \rightarrow [ALVEOPALATAL] \end{array} / \text{---} + \left[ \begin{array}{l} +SYLL \\ -CONS \\ +FRONT \\ -BACK \end{array} \right] \left. \begin{array}{l} \\ \\ \\ \end{array} \right\} \begin{array}{l} \text{applied,} \\ \text{perfect/stative} \end{array}$$

K68:21 also notes one case of alveopalatalization before the agentive noun suffix -j in 'humangxa: mohumaneši arm person'. This, and other similar cases would have to be handled by allomorph selection process, since preceding this suffix the rule does not (in our data) usually apply, for

example compare with the K68 form above, réqá : moréqf 'buy : buyer' and rəxa : morexi 'kick : kicker' where alveopalatalization does not occur.

### 5.2 l-Nasalization

The alveolar l becomes n in the perfect/stative -flé when this is preceded by a verb radical ending in n, for example

- (2) nən+fi' → nonfné 'have become fat'  
tjən+flé → tjénfné 'have entered'

This rule is formalized as

$$\left[ \dots [+LATERAL] \dots \right] \xrightarrow{\text{perfect/stative}} \left[ \begin{array}{c} \text{DENTAL} \\ +\text{NASAL} \end{array} \right] / \left[ \begin{array}{c} \text{DENTAL} \\ +\text{NASAL} \end{array} \right] + \underline{\quad}$$

K43:52 also reports the change l → n in the applied extension, but only in one case, namely 'tjhwanəna (ought, must)' (from tjhwan+əl+a). l-Nasalization with this extension did not occur at all in our data.

There are also sporadic cases of historical l-nasalization in the reduplicated reversive extension. These must be regarded as synchronically lexicalized however, since there is no way of coherently specifying under what circumstances l-nasalization occurs. An example of l-nasalization in this morpheme can be found in bəhónona 'untie' (cf. bəhá 'tie up') and the lack of this process can be seen in rəpólola 'lift up (from lying down position)' (cf. rəpáma 'lie down').

### 5.3 Trilling

When l is followed by the i-commencing morphemes, -i

'agentive suffix', -is- 'causative extension' and -fɬ 'perfect/stative suffix', it becomes the trill, voiced rz, for example

- (3) ba+baɫ+i → babarzi 'counters'  
 beɫ+is+a → birzisa 'boil (v.t.)'  
 bɔxɔɫ+ɫɬ → bɔxɔrzɫɬ 'have barked'

We may state this rule as

$$[+LATERAL] \rightarrow [r] \quad / \text{---} + \left[ \begin{array}{l} +SYLL \\ -CONS \\ 3HIGH \\ -BACK \\ +FRONT \end{array} \right] \left. \begin{array}{l} \text{agent suffix} \\ \text{causative ext.} \\ \text{perfect/stative} \end{array} \right\}$$

(For an explanation of the feature '3HIGH', see Chapter 6.)

As we have explained in 3.1.5, this rule is related to the historical allophony between rz (occurring before 3HIGH vowels, i and u) and ɫ (occurring before all other vowels). The reason that no back vowel is mentioned in the rule is simply because Qh happens to have no derivational or inflectional morphemes commencing in u.

#### 5.4 Postnasal Stopping and Devoicing

For ease of reference, we name the alternations to be shown below according to the historical rules (Postnasal Stopping and Postnasal Devoicing) which originally gave rise to them. As will be seen, neither the environments conditioning the alternations, nor the alternations themselves can be characterized synchronically in a phonologically coherent way, and therefore must be accounted for by allomorph selection process.



The alternations shown below in (4) in plain imperatives (IMP) versus imperatives incorporating the first person singular object prefix (1psOP), N, illustrate Postnasal Stopping (the heading 'Alt' abbreviates 'alternation'):

(4)	Alt	Plain IMP		1psOP+IMP ('...me!')
	h/ph	há	'give!'	mphá
	r/th	rábá	'slaughter!'	nthabá
	s/tsh	sebá	'slander!'	ntshqbá
	sj/tjh	sjéxa	'cut!'	ntjhéxa
	r/ch	ráca	'love!'	ncháca
	x/kh	xúmísa	'enrich!'	nkhúmísa
	x/qh	xáca	'trample!'	nqháca

In this alternation, -VOICED, -STOP segments become +ASPIRATED, +STOP, but there are irregularities with respect to place of articulation changes: GLOTTAL h becomes BILABIAL ph, and ALVEOLAR r becomes DENTAL th in some words, but PALATAL ch in others. The change from UVULAR x to VELAR kh however is not a true irregularity, since this occurs only when the high back u follows.

Postnasal Devoicing is illustrated below using the same kind of examples:

(5)	Alt	Plain IMP		1psOP+IMP ('...me!')
	b/p	bóna	'see!'	mpóna
	d/t	dázja	'fill!'	ntázja
	z/ts	zóma	'hunt!'	ntsóma
	zj/tj	zjwéla	'tell!'	ntjwéla
	l/c	lóma	'bite!'	ncóma
	rz/c	rzumézja	'greet!'	ncumézja

j/c	já	'eat!'	ncá
g/k	gukhēla	'chase!'	nkukhēla
(Ø/q)	árába	'answer!'	qárábq 'answer (noun)'

(The g/k example is taken from K68:19, and its tones are unknown. The Ø/q alternation will be discussed later.)

In Postnasal Devoicing, +VOICED, -NASAL segments alternate with +STOP, -VOICED, -ASPIRATED segments. The irregularities in place of articulation changes are that ALVEOLAR rz and l (historically a single phoneme) both become PALATAL c, and that q (zero) becomes UVULAR q (see below for further explanation of this).

Now even though the conditioned alternants are all +STOP, -VOICED, +ASPIRATED in Postnasal Stopping, and all +STOP, -VOICED, -ASPIRATED in Postnasal Devoicing (an important set of facts to which we will return), the alternations cannot be reduced to rules because of the irregularities in the place of articulation changes just mentioned. Furthermore, when it comes to the environments in which the alternations occur (so far only one, namely following the 1psOP has been given), there is no vestige of phonological coherence at all.

These environments are as follows:

- (1) Following the 1psOP: (examples given in (4) and (5) above) Note that the alternation Ø/q does not occur in this environment. With vowel-commencing radicals h is simply prefixed without any change, for example árába/hárába 'answer/answer me!'.

j/c	já	'eat!'	ncá
g/k	gukhɛ́ɛ	'chase!'	nkukhɛ́ɛ
β/q	árába	'answer!'	qáráβq 'answer (noun)'

(The g/k example is taken from K68:19, and its tones are unknown. The β/q alternation will be discussed later.)

In Postnasal Devoicing, +VOICED, -NASAL segments alternate with +STOP, -VOICED, -ASPIRATED segments. The irregularities in place of articulation changes are that ALVEOLAR rz and l (historically a single phoneme) both become PALATAL c, and that β (zero) becomes UVULAR q (see below for further explanation of this).

Now even though the conditioned alternants are all +STOP, -VOICED, +ASPIRATED in Postnasal Stopping, and all +STOP, -VOICED, -ASPIRATED in Postnasal Devoicing (an important set of facts to which we will return), the alternations cannot be reduced to rules because of the irregularities in the place of articulation changes just mentioned. Furthermore, when it comes to the environments in which the alternations occur (so far only one, namely following the 1psOP has been given), there is no vestige of phonological coherence at all.

These environments are as follows:

- (i) Following the 1psOP: (examples given in (4) and (5) above) Note that the alternation β/q does not occur in this environment. With vowel-commencing radicals N is simply prefixed without any change, for example árába/hárába 'answer/answer me!'

(ii) Following the reflexive object prefix (ROP) f:

Examples of these are given below in (6) and (7) in plain imperatives and those preceded by the ROP.

(6) Postnasal Stopping following ROP

Alt	Plain IMP		ROP+IMP ('...yourself!')
h/ph	há	'give!'	fphé
r/th	rabá	'slaughter!'	fthabé
s/tsh	səbá	'slander!'	ftshəbé
sj/tjh	sjéxa	'cut!'	ftjhéxé
r/ch	ráca	'love!'	fcháce
x/kh	xúfisa	'enrich!'	fkhúfisé
x/qh	xáca	'trample!'	fqháce

(7) Postnasal Devoicing following ROP

Alt	Plain IMP		ROP+IMP ('...yourself!')
b/p	bóna	'seel!'	fpóné
d/t	dázja	'fill!'	ftázjé
z/ts	zóma	'hunt!'	ftsómé
zj/tj	zjwéla	'tell!'	ftjwéle
l/c	lóma	'bite!'	fcómé
rz/c	rzumézja	'greet!'	fcúmézjé
j/c	já	'eat!'	fcé
g/k	gukhəla	'chase!'	fkukhəle

As with the 1psOP, the θ/q alternation does not occur with the ROP. Before vowel-commencing radicals, the other allomorph of ROP, namely fn, is simply prefixed, for example frába/fnárábé 'answer!/answer yourself!'

- (iii) Following the C1 9 and C1 10 NPs in deverbative derivations: The C1 9 NP is e ~ ę (e before monosyllabic noun stems, and ę otherwise) and the C1 10 NP is rzi. Examples of nouns derived from verbs are given below (examples at all places of articulation could not always be found in our data, so tables (8) and (9) are not as comprehensive as the preceding four):

(8) Postnasal Stopping following (singular) C1 9 NP and (plural) C1 10 NP

Alt	Verb		C1 9	C1 10	
h/ph	há	'give'	ephq	rziphq	'gift/s'
r/th	raba	'slaughter'	thabq	rzithabq	'slaughter- ing/s'
s/tsh	sęba	'slander'	tshębq	-	'slander'
r/ch	rúca	'teach'	chúcq	rzichúcq	'lesson/s'
x/kh	xúma	'be rich'	khúmq	-	'wealth'
x/qh	xáca	'trample'	qhácq	rziqhácq	'footstep/s'

(9) Postnasal Devoicing following C1 9 and 10 NPs

Alt	Verb		C1 9	C1 10	
b/p	bóna	'see'	pónq	rzipónq	'sight/s'
l/c	lwa	'fight'	ecwa	rzicwa	'fight/s'
ę/q	áraba	'answer'	qárábq	rziqárábq	'answer/s'

- (iv) Following the C1 9 and 10 adjective prefixes (AP): These are yęę and zjęrzi respectively. Only a few instances of the alternations could be found in adjective stems. These follow overleaf:

(10) Postnasal Stopping and Devoicing (last example only) following the C1 9 and 10 APs

Alt	Adjective stem	C1 9	C1 10
s/tsh	sá 'new'	yéetshá	zjérzitshá
r/ch	ráro 'three'	-	zjérzicháro
x/qh	xó16 'big/old'	yéeqhó16	zjérziqhó16
b/p	berzf 'two'	-	zjérziperzf

From these examples it can be seen that there is obviously no way of characterizing the environments N (1psOP), f (ROP), e ~ ø (C1 9 NP), rzi (C1 10 NP), yé (C1 9 AP), and zjérzi (C1 10 AP) in a phonologically coherent way.

Since no phonological rule can be devised for these alternations, we must treat them by lexical allomorph selection process, and this is done as follows.

Each verbal radical or adjective stem subject to Postnasal Stopping or Devoicing has two lexically listed allomorphs, one containing one phoneme and the other its alternant. Thus for example, 'see', 'answer' and 'big' would be listed lexically as

- (11) 'see' : bŏn ~ pŏn  
 'answer' : árab ~ qáráb  
 'big' : xó16 ~ qhó16

Since the conditioned allomorphs in such cases will always commence with a +STOP, -VOICED segment, it is possible to use that remnant of phonologically coherent information as a selection feature on the morphemes which originally created the +STOP-commencing allomorphs (historically all of the morphemes listed above as environments for the alternations terminated in a nasal which was originally the

conditioning factor for the alternations - see Chapter 11).

So for example, the 1psOP could be lexically specified as

$$(12) \text{ '1psOP' : N } \left[ \text{ / } \_\_\_ + \left. \begin{array}{l} [+STOP] \\ [-VOICE] \end{array} \right\} \right]_{\text{verb}}$$

In this way, when 1psOP is prefixed to a form such as that meaning 'see' it will automatically select p<sup>h</sup>ŋ rather than b<sup>h</sup>ŋ (see (11) above). In fact however, this particular allomorph selection feature will be somewhat more complicated for 1psOP, since in items such as 'answer' (see (11) above), the uvular-commencing allomorph must be excluded, and the vowel-commencing allomorph selected. Other possibilities are that a verb radical may commence in a nasal or a glide (these have not been mentioned previously since no alternation is associated with them). Thus the allomorph selection feature for 1psOP must include a possible following voiceless stop (except q), a vowel or glide, or a nasal. This can be achieved as follows:

$$(13) \text{ N } \left[ \text{ / } \_\_\_ + \left. \begin{array}{l} \left\{ \begin{array}{l} [+STOP] \\ [-VOICED] \\ [-UVULAR] \end{array} \right\} \\ [-CONS] \\ [+NASAL] \end{array} \right\} \right]_{\text{verb}}$$

(Note that the feature -UVULAR is simply an abbreviation for the disjunctive set of places of articulation other than UVULAR.)

The ROP can be marked by selection feature in a similar way. Here though, there are two allomorphs (see (ii) above on page 55). These are given overleaf:

(14) 'ROP':

$$\text{fn } [ \_ + [-\text{CONS}] ]_{\text{verb}} \sim \text{f } [ \_ + \left\{ \begin{array}{l} +\text{STOP} \\ -\text{VOICED} \\ -\text{UVULAR} \\ [+NASAL] \end{array} \right\} ]_{\text{verb}}$$

Similarly, the C1 9 and 10 NPs and APs would be marked with the selection feature

$$(15) \left[ \_ + \left\{ \begin{array}{l} +\text{STOP} \\ -\text{VOICED} \\ [+NASAL] \end{array} \right\} \right]_{\{\text{verb, adjective}\}}$$

Here the -UVULAR restriction is not necessary, since these morphemes do select the g-commencing allomorph of otherwise vowel-commencing stems (see in (9) above on page 56). Also, because to our knowledge no vowel-commencing adjective stems exist in the language, no -CONS necessarily need be included. Other information not strictly relevant here regarding the distribution of the C1 9 NP allomorphs e and g (see (iii) above on page 56) would also have to be included in the lexical representation of this morpheme. (For an historical review of this allomorphy see Chapter 11.)

The reason behind using these phonological distribution features to mark these six prefixal morphemes, rather than marking the conditioned allomorph of each and every alternating verb radical and adjective stem as occurring in the morphological environments

$$(16) \left\{ \begin{array}{l} \text{1psOP} \\ \text{ROP} \\ \text{C1 9 NP} \\ \text{C1 10 NP} \\ \text{C1 9 AP} \\ \text{C1 10 AP} \end{array} \right\} + \_$$

is merely one of simplicity in the lexicon.



### 5.5.0 The underlying system of nonsyllabic consonants

Having reviewed all of the phoneme alternations affecting the consonants, we are now in a position to determine the underlying system they form in a feature classification. The features of this system must be able to distinguish all contrastive units (phonemes) from each other, as well as provide natural class characterizations for use in the phonological rules. In the preceding chapter, and the preceding sections of this chapter we have to some extent anticipated what this system will be like in both respects.

### 5.5.1 Place of articulation

A brief perusal of Appendix C (Short Qhalaxarzi Vocabulary) will be enough to show that all of the places of articulation listed in table (1) of Chapter 1 (page 12) are contrastive. In addition, all of these places are required by the phonological rules.

Place of articulation features, as mentioned previously, are not broken down further into binary features. The reasons for this are firstly because as they stand they are sufficient to distinguish contrasts, and secondly because groups of different places of articulation do not function as natural classes in the rules, so that Jakobson and Halle's (1971) tonality features (such as GRAVE), or Chomsky and Halle's (1968) articulatory features (such as CORONAL) are not necessary as a part of the phonological apparatus of Qh.

Amongst our rules we have found three occasions where rules could, it might seem at first, be conflated by the use of such features, because different places of articulation

behave similarly. These are

- (i) Alveopalatalization before w of non-nasal bilabials and the alveolar voiced trill (see 4.2 and 4.7);
- (ii) Alveopalatalization before a front vowel/glide of -FRICATIVE alveolars, and of uvulars (see 4.6 and 5.1);
- (iii) Alveolarization before a front glide of non-nasal bilabials and of h (see 4.4 and 4.8).

From this listing it is obvious that even if places of articulation were subclassified into binary features, and at the same time were phonetically real, it would still not be possible to characterize these inputs as natural classes. For example, for (i), there is nothing that the non-nasal bilabials and the voiced trill rz have in common, whereby they could be put into the same group.

For these reasons then, PLACE OF ARTICULATION (PA) is regarded as a feature with eight possible values, which we shall continue to call BILABIAL, DENTAL, ALVEOLAR, ALVEOPALATAL, PALATAL, VELAR, UVULAR and GLOTTAL.

#### 5.5.2 Nasality

The feature NASAL clearly has a contrastive function as in minimal pairs such as árába 'answer!' versus áráma 'yawnl'. Furthermore, it is an important feature in many of the rules. NASAL must therefore be considered an underlying feature in Qh, which distinguishes m, n, ny, and ng from all other segments.

### 5.5.3 Complete articulatory closure (STOP)

In 4.4 we modified our definition of STOP, given as the heading above, to include the phrase 'without vibration'. This was to exclude the trills from the category +STOP, since, as the examples for the rules show, the trills behave parallel to other -STOP segments (except in the one instance noted in 4.6)

A further refinement of this definition should be 'during which there is no nasal airflow'. This would explicitly exclude nasals from the +STOP category, for although they share with +STOPS a complete articulatory closure, they do not behave phonologically in any parallel way.

The feature STOP is required in the phonological rules, and it is clear from such minimal pairs as kérəqaxó/kérəxaxó 'I buy/I kick' and sjwá/tjhwá 'die!/spit!' that it is necessary as a contrastive feature.

### 5.5.4 Voice and aspiration

Both of these features are necessary at a contrastive level to distinguish minimal pairs such as kélápaxó/kélábaxó 'I am getting tired/I watch' and ntjwéla/ntjhwéla 'tell me!/die for me!'. Both features are also used in the phonological rules. It will be recalled that VOICED has been defined (see 4.8) so that the breathy segment h is classified underlyingly as -VOICED.

### 5.5.5 Fricatives, laterals and trills

It has been shown in the rules that these features

are necessary for a simple and elegant description of the alternations.

From a viewpoint of contrastiveness however, only two of these features are necessary, as the breakdown of the ALVEOLAR segments in table (17) shows:

(17)	rz	l	z	r	ts	tsh
VOICED	+	+	+	-	-	-
STOP	-	-	-	-	+	+
ASPIRATED	-	-	-	-	-	+
FRICATIVE	-	-	+	-	+	+
TRILL	+	-	-	+	-	-
LATERAL	-	+	-	-	-	-

The reason that only FRICATIVE and TRILL, FRICATIVE and LATERAL, or TRILL and LATERAL are needed is that there are between the features, bilateral implications of redundancy as follows:

+FRICATIVE	↔	-TRILL, -LATERAL
+LATERAL	↔	-FRICATIVE, -TRILL
+TRILL	↔	-FRICATIVE, -LATERAL

Since we have no way of telling which two features are psychologically more real than the other one (this could be used as a measure for better description, but the only way of getting an answer here would involve sophisticated experimental testing, which is clearly beyond the scope of this study) we will use all three in our feature classification, but bearing in mind that one of them could be scrapped in favour of the other two.

### 5.5.6 Other features

The eight features, PA, NASAL, STOP, VOICED, ASPIRATED, FRICATIVE, TRILL and LATERAL are sufficient, and, we have attempted to show, necessary, for distinguishing the contrasts among the -SYLLABIC, +CONSONANTAL segments, and for neatly capturing the alternations holding among them.

Other features commonly used in phonological expositions of this kind are not used here, because either they do not represent the contrasts (or do not represent them as simply), or because the phonology, in terms of its rules, is not 'tuned in' to them, or for both reasons. Below we give some examples of this.

We have already shown above why the multivalued feature of PA is preferred to the binary features such as GRAVE, CORONAL etc. On the other hand, we have used the binary features VOICED and ASPIRATED instead of a multivalued one such as VOICE ONSET (VO) to distinguish between the triplets b/p/ph, d/t/th etc. Although the features VOICED and ASPIRATED do not play a particularly prominent role in the rules per se, in Postnasal Stopping and Devoicing, the voiceless (aspirated or unaspirated) +STOPS come together as a natural class. With the three-valued VO feature, this could only be clumsily represented as a disjunction {0 VO, +1 VO}, where in our analysis it is directly represented as -VOICED.

In many cases, a feature we have used can be considered a composite of two potentially distinctive features. Such, for example are our ASPIRATED and LATERAL. ASPIRATED is essentially intended as a binary voice onset feature

(+ASPIRATED = voicing starts considerably after the articulation, and -ASPIRATED = voicing starts immediately afterwards), but it must also include the feature FORTIS (+FORTIS = 'heightened subglottal pressure' and -FORTIS = 'normal respiratory activity' - see Ladefoged (1971:92)). The reason that this inclusion is necessary is obvious when we consider phonetic-level final devoicing (see 2.3.1). If aspiration were only a matter of the delay of voicing after the release of a consonant, then if the vowel were devoiced after an aspirated +STOP, it would no longer be possible to perceive the aspiration, since everything after the +STOP would be voiceless. That one can in fact perceive the aspiration in this position (for example the contrast in the 1<sup>st</sup> consonants of [ʔá:cá] 'trample!' and [qhè:chá] 'pay tax!') shows that aspiration is more than simply a matter of voice onset timing. FORTIS does not however have to be abstracted as a separate feature, since it does not have an existence apart from aspiration.

Our feature LATERAL includes the feature +SONORANT (= 'greater acoustic energy in the formants' - Ladefoged (1971:93)). The reason that SONORANT is not used in our analysis is that it is not selected by the phonological rules. The consonantal sonorants of the language (the nasals, l and possibly rz) do not function as a natural class - the most commonly occurring natural class to which l belongs is l, rz and r, which includes the voiceless and therefore -SONORANT r. It would appear then that the sonorance of l is irrelevant to the phonological system.

Arguments similar to those above may be given for the

exclusion of APICAL (included by ALVEOLAR) and SIBILANT (included by ALVEOLAR, +FRICATIVE and by ALVEOPALATAL).

5.5.7 Contrastive feature breakdown of nonsyllabic consonants

Table (18) overleaf gives the full contrastive feature classification of Qh consonants. The abbreviations used in it are as follows:

B = BILABIAL  
D = DENTAL  
A = ALVEOLAR  
AP = ALVEOPALATAL  
P = PALATAL  
V = VELAR  
U = UVULAR  
G = GLOTTAL  
NAS = NASAL  
VOI = VOICED  
ASP = ASPIRATED  
FRIC = FRICATIVE  
LAT = LATERAL

(18)	PA	NAS	STOP	VOI	ASP	FRIC	TRILL	LAT
p	B	-	+	-	-	-	-	-
ph	B	-	+	-	+	-	-	-
b	B	-	+	-	-	-	-	-
m	B	+	-	+	-	-	-	-
t	D	-	+	-	-	-	-	-
th	D	-	+	-	+	-	-	-
d	D	-	+	+	-	-	-	-
n	D	+	-	+	-	-	-	-
ts	A	-	+	-	-	+	-	-
tsh	A	-	+	-	+	+	-	-
s	A	-	-	-	-	+	-	-
z	A	-	-	+	-	+	-	-
r	A	-	-	-	-	-	+	-
rz	A	-	-	+	-	-	+	-
l	A	-	-	+	-	-	-	+
tj	AP	-	+	-	-	+	-	-
tjh	AP	-	+	-	+	+	-	-
sj	AP	-	-	-	-	+	-	-
zj	AP	-	-	+	-	+	-	-
c	P	-	+	-	-	-	-	-
ch	P	-	+	-	+	-	-	-
j	P	-	+	+	-	-	-	-
ny	P	+	-	+	-	-	-	-
k	V	-	+	-	-	-	-	-
kh	V	-	+	-	+	-	-	-
g	V	-	+	+	-	-	-	-
ng	V	+	-	+	-	-	-	-
q	U	-	+	-	-	-	-	-
qh	U	-	+	-	+	-	-	-
x	U	-	-	-	-	+	-	-
h	G	-	-	-	-	+	-	-



Although these features are necessary to characterize the contrasts of the system, there is nevertheless considerable redundancy amongst them. It is possible however (indeed in a strictly generative analysis, unlike this one, necessary) to regard *lexical representations* as being redundancy-free. That is, features predictable in terms of other features are left unmarked lexically, and are filled in by redundancy rules before an item is processed by the phonological rules, and interpreted phonetically.

We can distinguish between two sorts of redundancy, which we term here 'universal' and 'language-specific'. By universal redundancy we leave blank those features whose values will be determined according to physiological constraints on the vocal tract, for example, a nasal cannot be lateral, so LATERAL need not be specified for +NASAL segments; or according to the way the features have been defined phonetically, for example, nasals have airflow during their complete articulatory closure, and therefore are predictably -STOP. This feature may thus be left blank for +NASAL segments.

By language-specific redundancies we mean those where features are *predictable not for physiological or definitional reasons*, but simply because the language in question happens to be that way. So, for example, it is not physiologically necessary for nasals to be voiced, but in Qh they happen only to be voiced. Thus VOICED for +NASAL segments can be left unspecified lexically.

Often a feature is multiply redundant, for example the feature LATERAL may be left unmarked whenever a segment is

+TRILL (a universal redundancy) or +FRICATIVE (a language-specific redundancy, since lateral fricatives are possible, but happen not to exist in Qh).

We shall not list the universal redundancies found in Qh, since these should be obvious from a knowledge of phonetics or from the definitions of our features given above. The Qh-specific redundancies however are listed below:

(i) Features predicted by PA

- BILABIAL ⊃ -FRICATIVE, -TRILL
- DENTAL ⊃ -FRICATIVE, -TRILL, -LATERAL
- ALVEOLAR ⊃ -NASAL
- ALVEOPALATAL ⊃ -NASAL, +FRICATIVE, -TRILL, -LATERAL
- PALATAL ⊃ -FRICATIVE, -LATERAL
- VELAR ⊃ -FRICATIVE
- UVULAR ⊃ -NASAL, -VOICED
- GLOTTAL ⊃ -STOP, -VOICED, -ASPIRATED, +FRICATIVE

(ii) Feature predicted by NASAL

- +NASAL ⊃ +VOICED

(iii) Features predicted by STOP

- +STOP ⊃ -LATERAL
- STOP ⊃ -ASPIRATED

(iv) Features predicted by VOICED

- VOICED ⊃ -LATERAL, -NASAL

(v) Features predicted by ASPIRATED

- +ASPIRATED ⊃ +STOP, -TRILL, -LATERAL

(vi) Feature predicted by FRICATIVE

- +FRICATIVE ⊃ -TRILL, -LATERAL

(vii) Features predicted by TRILL

+TRILL ⊃ ALVEOLAR, -ASPIRATED, -FRICATIVE,  
-LATERAL

(viii) Features predicted by LATERAL

+LATERAL ⊃ ALVEOLAR, -STOP, +VOICE, -ASPI-  
RATED, -FRICATIVE

In table (19) overleaf, a distinctive non-redundant classificatory matrix of the consonants is given. Redundantly specifiable cells are marked 'u' if filled in by universal redundancy, and 's' if filled in by language-specific redundancy.

(19)	PA	NAS	STOP	VOI	ASP	FRIC	TRILL	LAT
p	B	s	+	~	-	s	s	u
ph	B	s	s	s	+	s	s	u
b	B	u	+	+	u	s	s	u
m	B	+	u	s	u	s	s	u
t	D	s	+	~	-	s	s	s
th	D	s	s	s	+	s	s	s
d	D	u	+	+	u	s	s	s
n	D	+	u	s	u	s	s	s
ts	A	s	+	~	-	+	s	s
tsh	A	s	s	s	+	+	s	s
s	A	s	-	~	s	+	s	s
z	A	s	~	+	u	+	s	s
r	s	s	u	~	s	s	+	u
rz	s	s	u	+	u	s	+	u
l	s	s	s	s	u	s	u	+
tj	AP	s	+	~	-	s	s	s
tjh	AP	s	s	s	+	s	s	s
sj	AP	s	-	~	s	s	s	s
zj	AP	s	-	+	u	s	s	s
c	P	s	+	~	-	s	u	s
ch	P	s	s	s	+	s	u	s
j	P	u	+	+	u	s	u	s
ny	P	+	u	s	u	s	u	s
k	V	s	+	~	-	s	u	u
kh	V	s	s	s	+	s	u	u
g	V	u	+	+	u	s	u	u
ny	V	+	u	s	u	s	u	u
q	U	s	+	s	~	-	u	u
qh	U	s	s	s	+	-	u	u
x	U	s	-	s	s	+	u	u
h	G	u	s	s	s	s	u	u

## CHAPTER 6

PHONOLOGICAL ALTERNATIONS IN VOWELS AND GLIDES

There are several rules affecting vowels and glides in Qh. These are detailed in this chapter.

6.1.0 Vowel harmony (VH)

Vowel harmony, which was mentioned in 3.1.5 with respect to the decision to regard ɪ and rz as underlyingly distinct, affects the mid vowels, front e and ɛ, and back o and ɔ.

When these vowels are followed in the next syllable by a high vowel, ɪ or u, they are then raised by one degree of height. VH in Qh is thus a rule of regressive height assimilation. Examples are as follows:

(1) Low mid becomes high mid

ba+r<sup>ɛ</sup>q+i → baréqf 'buyers'

(cf. baréqa 'they(2) buy')

ba+b<sup>ɔ</sup>n+i → babónf 'seers'

(cf. babóná 'they(2) see')

(2) High mid becomes high

lé+phúny+a → lfphúnyá 'he(5) stabs'

(cf. lérdqá 'he(5) sews')

xo+phúny+a → xuphúnyá 'to stab'

(cf. xordqá 'to sew')

The assimilation is not necessarily confined to only the immediately preceding vowel. In less monitored speech mid vowels to the left of that syllable may also be affected, for example

(3)  $h\acute{e}+l\acute{e}+ph\ddot{u}ny+a+x\phi \rightarrow h\acute{e}l\acute{e}ph\ddot{u}nyax\phi$  'we stab him(5)'

Using a multivalued feature HIGH, where the correspondences to our earlier traditional labels are

0HIGH = Low, that is a

1HIGH = Low mid, that is e and o

2HIGH = High mid, that is ɛ and ɔ

3HIGH = High, that is i and u

the rule may be formalized as

$$\left[ \begin{array}{l} +\text{SYLL} \\ -\text{CONS} \\ n\text{HIGH} \end{array} \right] \rightarrow [n+1\text{HIGH}] / \dots (\text{C}) \_ (\text{C}) \left[ \begin{array}{l} +\text{SYLL} \\ -\text{CONS} \\ 3\text{HIGH} \end{array} \right]$$

Condition: The rule does not apply to -FRONT, -BACK a.

The '...' immediately after the environment slash is intended to show that the rule may be repeated in more than just the syllable immediately preceding the 3HIGH vowel.

#### 6.1.1 Multivalued HIGH versus binary height features for vowels

There appears to be no way of characterizing the Qh vowel heights in terms of binary features without unnecessarily distorting the phonetics of the vowels, or creating ambiguity in the interpretation of the features, or de-unifying the VH rule. The following binary classificatory possibilities have been considered

and rejected in favour of the multivalued feature HIGH:

- (i) Using just the binary features HIGH and LOW, the vowels could be classified as follows:

	<u>HIGH</u>	<u>LOW</u>
i/u	+	-
e/o	-	-
ɛ/ɔ/a	-	+

Here ɛ and ɔ are treated as being on the same level of height as a. This is an unnecessary distortion of the phonetic reality.

- (ii) Using three binary features, HIGH, MID and LOW, the vowels could be classified as

	<u>HIGH</u>	<u>MID</u>	<u>LOW</u>
i/u	+	-	-
e/o	+	+	-
ɛ/ɔ	-	+	+
a	-	-	+

The problem here is that HIGH and LOW mean different things according to whether the segment is simultaneously +MID or not. If the segment is +MID, +HIGH, then +HIGH means 'raised from some basic +MID position', but if it is -MID, +HIGH, then +HIGH means 'highest position'. The same double meaning would have to hold, mutatis mutandis, for LOW.

- (iii) A third possibility would be to use in conjunction with binary HIGH and LOW, a non-

height feature such as TENSE, thus:

	<u>HIGH</u>	<u>LOW</u>	<u>TENSE</u>
i/u	+	-	
e/o	-	-	+
ɛ/ɔ	-	-	-
a	-	+	

Apart from the fact that without experimental testing for tension in the vocal tract, such a feature assignment is strictly speaking arbitrary, this classification destroys the unity of the VH rule. It seems reasonable to assume in this rule, that a following high vowel has the same effect on a preceding low mid or high mid vowel. Using the feature TENSE in this way however, means that the change from traditional low mid to high mid is a change in tension, but that the change from high mid to high is a change in height. Thus two rules would be required to capture what intuitively appears to be one generalization.

For these reasons we prefer to classify the vowels using the single multivalued feature HIGH, as shown above. Below we give a full classification of vowels using HIGH, and binary BACK and FRONT:

(4)	<u>i</u>	<u>e</u>	<u>ɛ</u>	<u>a</u>	<u>ɔ</u>	<u>o</u>	<u>u</u>
HIGH	3	2	1	0	1	2	3
FRONT	+	+	+	-	-	-	-
BACK	-	-	-	-	+	+	+



### 6.1.2 Fossilized vowel harmony

The effect of VH can be seen in cases where historically a high VH-triggering vowel has been deleted. An example of this is in the allomorph ezj of the applied extension, which can be traced back to original \*ɛl+i, which, via desyllabification of the i, became \*ɛl+y, and by Alveolar alveopalatalization and VH eventually became ezj. In this case, since there is no surface evidence of the triggering vowel, ezj must be treated synchronically as a lexical item whose vowel happens to have been historically vowel-harmonized.

VH must also have originally been caused by the older form of the locative suffix ng, which was originally \*ini (for further details about this suffix see 6.7 and 10.4). In modern Qh, preceding locative ng, mid vowels are still raised, for example:

- (5) mɔ+mo+lɛlɔ+ng → mmɔlɛlɔng 'in the fire'  
bɑ+cho+ng → bɑchɔng 'among the people'  
lɛ+ngɔlɛ+ng → lɛngɔlɛng 'on the knee'  
mɔ+sɔlɛ+ng → mɔsɔlɛng 'in the saddle'

Such alternations may be accounted for by the VH rule given earlier if the rule is denaturalized by expanding the environment to include the locative suffix as a possibility.

### 6.2 Vowel assimilation

This refers to the complete vowel assimilation that occurs in the past progressive between the final ɛ of the auxiliary verb lɛ and a vowel subject prefix in the following

participial complement, for example

- (6) o1é#óábá1a → o1éóábá1a 'you(sg) were counting'  
 e1é#éábá1a → e1ééábá1a 'they(4) were counting'

The only possible assimilations are between those vowels shown, that is, é, and ó or é, since in the participial, the other vowel subject prefixes (C1 1 and 6) are in any case é (see 6.7), for example alé éábá1a 'they(6) were counting'.

The rule may be formalized as

$$\begin{array}{c}
 \left[ \begin{array}{l}
 +\text{SYLL} \\
 -\text{CONS} \\
 1\text{HIGH} \\
 +\text{FRONT} \\
 -\text{BACK} \\
 \dots
 \end{array} \right]_{\text{aux}} \# \left[ \begin{array}{l}
 +\text{SYLL} \\
 -\text{CONS} \\
 2\text{HIGH} \\
 \alpha\text{FRONT} \\
 -\alpha\text{BACK}
 \end{array} \right] \rightarrow \left[ \begin{array}{l}
 \alpha\text{FRONT} \\
 \alpha\text{BACK}
 \end{array} \right] \left[ \begin{array}{l}
 1\text{HIGH} \\
 2
 \end{array} \right]
 \end{array}$$

This rule is optional like several others presented below. Its application appears to characterize less formal speech. (It should be borne in mind, that since we have not investigated very deeply the effects of syncope, there could exist other rules characterizing 'less formal speech' over and above the ones we have found.)

### 6.3 Vowel desyllabification with compensatory doubling (DESYLL/CD)

In the first section of Chapter 4 it was shown that noun-stem-final vowels are desyllabified before the diminutive suffix ana. Desyllabification also occurs in object prefixes (OP) when they are followed by a vowel-commencing radical, and in subject prefixes (SP) in the same circumstances, or when followed by an OP consisting of only a vowel. Whereas back vowels are simply desyl-

labified, front vowels are in addition deleted if preceded by a consonant. To this extent, the desyllabification here and in 4.1 are the same. In other respects however, there are considerable differences. These are as follows:

- (i) a is not subject to desyllabification (interpreted as deletion in 4.1) at all;
- (ii) The consonants preceding the desyllabified vowel never undergo any change;
- (iii) The vowel following the desyllabified vowel is doubled segmentally, and the clone vowel created by this doubling bears the tone of the desyllabified vowel. This is another case of tonal stability (mentioned previously in 4.1). We assume that this doubling occurs so that the tone of the desyllabified vowel is not lost - hence our term Compensatory Doubling.
- (iv) The process is optional, and like Vowel Assimilation above, characterizes less formal speech.

Examples of DESYLL/CD follow:

(7) Between SP and following OP

- lɛ+á+bal+a+xɔ́ → lɛábáɪaxɔ́ 'you(pl) count them(6)'  
 e+ó+bal+a+yɔ́ → yódbáɪayɔ́ 'he(9) counts it(3)'  
 xó+á+bal+a+xɔ́ → xwɛábáɪaxɔ́ 'it(15) counts them(6)'  
 o+é+bal+a+yɔ́ → weébáɪayɔ́ 'he(1) counts him(9)'

(8) Between SP and following vowel-commencing radical

- hɛ+á+ráb+a+xɔ́ → háárábaxɔ́ 'we count'  
 e+óm+a+yɔ́ → yóqmáayɔ́ 'it(9) gets dry'

xó+q̄m+a+xq̄ → xwq̄maxq̄ 'it(15) gets dry'  
 ó+áráb+a+xq̄ → wárábaxq̄ 'you(sg) answer'

(9) Between OP and vowel-commencing radical

hé+lé+áráb+a+xq̄ → héliárábaxq̄ 'we answer him(5)'  
 hé+é+áráb+a+xq̄ → héyárábaxq̄ 'we answer him(9)'  
 hé+xó+ep+el+a+xq̄ → héxwéq̄p̄elaxq̄ 'we dig for it(15)'  
 hé+ó+í̄b+a+xq̄ → héwíf̄baxq̄ 'we steal it(3)'

Examples showing that a does not undergo DESYLL here:

(10) á+é+bal+a+xq̄ → áébálaxq̄ (not ~~áébálaxq̄~~)  
 'they(6) count it(9)'  
 bá+ó+bal+a+xq̄ → báóbálaxq̄ (not ~~báóbálaxq̄~~)  
 'they(2) count it(3)'

Apart from the fact that a does not undergo this process, there are two further restrictions on the rule: Firstly DESYLL/CD does not operate if the two vowels in sequence are of the same backness and the second is higher than 1HIGH (low mid). From the examples given below it can be seen that the application in such cases of DESYLL/CD would yield violations of the restriction on GV-sequences, given in 2.7:

(11) ó+ó+bal+a+xq̄ → óóbálaxq̄ (not ~~wóóbálaxq̄~~)  
 'you(sg) count it(3)'  
 e+í̄b+a+yq̄ → efbáyq̄ (not ~~yifbáyq̄~~)  
 'he(9) steals'

Secondly, DESYLL/CD does not operate on prefixes containing a bilabial consonant, these being C1 1 OP mo, C1 2 SP/OP bá (already excluded since it contains a), C1 8 SP/OP bf and C1 14 SP/OP bó. In the case of mo and bó, if they were to undergo DESYLL/CD the result (since in this process the

preceding consonant is not changed) would be a violation of the restriction preventing BILABIAL+w sequences (see 2.7) from occurring, for example

(12) xo+mo+áráb+a → xomódrába (not xomwaárába)  
'to answer him(1)'

It is not so clear why bí does not undergo desyllabification here, but it could be because if it did, it would overlap with C1 2 bá when preceding an a, for example

(13) bí+áráb+a+xó → bídrábaxó (not báárábaxó)  
'they(8) answer'  
(cf. báárábaxó 'they(2) answer')

The differences noted here between DESYLL preceding the diminutive suffix ana and DESYLL/CD in OPs and SPs suggests that the former rule is historically distinct from the latter, and became part of the language at an earlier date. In particular the fact that DESYLL/CD is optional, supports this conclusion.

We thus regard these rules as different. DESYLL/CD must be ordered after the consonant alternations caused by DESYLL preceding ana, since these do not occur in OPs and SPs. y-Deletion, as given in 4.1 would be the last rule of this group, since it applies here in the same way as preceding ana by deleting y if it is preceded by a consonant. The ordering of these rules would thus be:

- First     Desyllabification preceding the DS, ana;
- Second   Consonant alternations caused by a following glide;
- Third     Desyllabification in OPs and SPs with compensatory doubling;

Fourth y-Deletion.

Desyllabification in OPs and SPs, and Compensatory Doubling are formalized below respectively as

$$\left[ \begin{array}{c} \left[ \begin{array}{c} -\text{CONS} \\ +\text{SYLL} \\ \left\{ \begin{array}{c} -\text{FRONT} \\ -\text{BACK} \end{array} \right\} \end{array} \right] \\ \left\{ \dots \right\} \end{array} \right]_{\substack{\text{OP} \\ \text{SP}}} \rightarrow \left[ -\text{SYLL} \right] / \_ + \left[ \begin{array}{c} -\text{CONS} \\ +\text{SYLL} \end{array} \right]$$

Unless: (i) input and context are of the same backness, and context is as high or higher than input;

(ii) input is preceded by +CONS, BILABIAL.

and

$$\left[ \begin{array}{c} -\text{CONS} \\ +\text{SYLL} \end{array} \right] \rightarrow \_ \_ / \left\{ \dots \right\} \left[ \begin{array}{c} -\text{CONS} \\ -\text{SYLL} \end{array} \right]_{\substack{\text{OP} \\ \text{SP}}} + \_$$

## 6.4 SP-e Replacement

In SPs comprising a consonant and the vowel e, this e may optionally in more informal speech be replaced by the vowel of a following CV-shaped OP, for example

- (14) k $\acute{e}$ +xo+b $\acute{o}$ zj+a+x $\acute{o}$  → k $\acute{o}$ x $\acute{o}$ b $\acute{o}$ zjax $\acute{o}$  'I ask you(sg)'  
 sj $\acute{e}$ +b $\acute{a}$ +bal+a+x $\acute{o}$  → sj $\acute{a}$ b $\acute{a}$ b $\acute{a}$ lax $\acute{o}$  'he(7) counts them(2)'  
 l $\acute{e}$ +b $\acute{o}$ +j+a+x $\acute{o}$  → l $\acute{o}$ b $\acute{o}$ jax $\acute{o}$  'he(5) eats it(14)'  
 h $\acute{e}$ +mo+k+a+x $\acute{o}$  → h $\acute{o}$ m $\acute{o}$ kax $\acute{o}$  'we mention him(1)'

The SPs affected by this rule are 1ps k $\acute{e}$ , 1pp h $\acute{e}$ , 2s l $\acute{e}$  and Cl 5 sj $\acute{e}$ . The rule is formalized as

$$\left[ \begin{array}{c} +\text{SYLL} \\ -\text{CONS} \\ +\text{FRONT} \\ -\text{BACK} \\ \text{2HIGH} \end{array} \right]_{\text{SP}} \rightarrow \left[ \begin{array}{c} \alpha\text{FRONT} \\ \beta\text{BACK} \\ \gamma\text{HIGH} \end{array} \right] / \_ + \left[ \begin{array}{c} +\text{CONS} \\ -\text{SYLL} \end{array} \right] \left[ \begin{array}{c} -\text{CONS} \\ +\text{SYLL} \\ \alpha\text{FRONT} \\ \beta\text{BACK} \\ \gamma\text{HIGH} \end{array} \right]_{\text{OP}}$$

Note that in cases where the following OP contains a 3HIGH vowel, for example in`

(15) kɛ+rzi+k+a+xɔ → kɪrzi+kaxɔ 'I.mention them(10)'

we assume that the vowel alternation is caused by Vowel Harmony, not SP-e Replacement. VH, being obligatory, would apply prior to the optional application of Sp-e Replacement.

#### 6.5 Back Vowel Absorption

Preceding a bilabial, the vowel in the prefixes mo (C1 1 NP/OP, C1 3 NP) and mo (Locative Prefix (LocP)) is deleted, but its syllabicity and tone are transferred to the preceding m, for example

(16) In C1 1 NP, OP and C1 3 NP respectively

mo+baɪ+i → mbarzi 'counter'

(cf. moloji 'speaker')

o+mo+baɪ+a+yɔ → ombaɪayɔ 'he(1) counts him(1)'

(cf. omongácáyɔ 'he(1) hits him(1)')

mo+melo → mmelo 'throat'

(cf. monwana 'finger')

(17) In LocP

mɔ+pizjɛ́+ng → mpizjéng 'in the pot'

(cf. montjéng 'in the nose')

This process also occurs preceding a non-verbal stem commencing in h (the reason for this is that h derives historically from a bilabial - see Chapter 11. Presumably Back Vowel Absorption applied in the past before the bilabial had become h), for example

(18) mo+háftjána → mháftjána 'boy(1)'

mo+haxɔ → mhaxɔ 'padkos(3)'

Preceding a h-commencing verb however, the C1 1 OP is not changed, for example

(19) bá+mo+hfr+a+xɔ → bá mó hfraxɔ 'they(2) hide him(1)'

The rule is

$$\begin{array}{c}
 \left[ \begin{array}{l} +\text{CONS} \\ -\text{SYLL} \\ +\text{NASAL} \\ \text{[BILABIAL]} \end{array} \right] \left[ \begin{array}{l} -\text{CONS} \\ +\text{SYLL} \\ +\text{BACK} \\ -\text{FRONT} \end{array} \right] \rightarrow \left[ +\text{SYLL} \right] \emptyset / \text{---} \left\{ \begin{array}{l} \left[ \text{[BILABIAL]} \dots \right] \\ \left[ \text{[GLOTTAL]} \dots \right] \\ \text{non-verb} \end{array} \right\} \\
 \left. \begin{array}{l} -( \text{C1 1 NP} \\ \text{C1 1 OP} \\ \text{C1 3 NP} \\ \text{LocP} ) \end{array} \right\} \\
 \begin{array}{cccc} 1 & 2 & 1 & 2 \end{array}
 \end{array}$$

#### 6.6 Locative Doubling

Before NPs commencing in m, the LocP mɔ, having become h by Back Vowel Absorption (see preceding section), may undergo further change. It may optionally be deleted, but in compensation the vowel of the prefix is doubled, for example

(20) mɔ+mo+ze+ng → mmozing → moozing 'in the village'  
 mɔ+ma+zɪ+ng → mmazing → maazing 'in the water'

The rule is formulated as

$$\begin{array}{c}
 \left[ \begin{array}{l} +\text{SYLL} \\ +\text{CONS} \\ \text{[BILABIAL]} \\ +\text{NASAL} \end{array} \right] + \left[ \begin{array}{l} -\text{SYLL} \\ +\text{CONS} \\ \text{[BILABIAL]} \\ +\text{NASAL} \end{array} \right] \left[ \begin{array}{l} +\text{SYLL} \\ -\text{CONS} \end{array} \right] \rightarrow \emptyset \quad 2 \quad 3 \quad 3 \\
 \text{LocP} \qquad \qquad \qquad \text{NP} \\
 \begin{array}{cccc} 1 & 2 & 3 & 3 \end{array}
 \end{array}$$

One informant (KG) also applied this rule in the context of a following C1 14 NP, bo, for example



(21) mɔ+bo+sɔ̄+ng → mbosɔ̄ng → boosɔ̄ng 'in the face'

This would appear to be the beginning of a broadening of the rule to include non-nasal bilabial-commencing prefixes as well, as its environment.

### 6.7 Old Coalescence

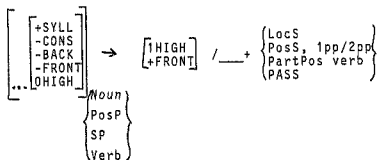
This refers to the change from a to ɛ preceding certain forms. These forms are

- (i) Noun-stem-final a preceding the locative suffix (LocS) ng (here the change is from a to ɛ rather than ɛ as the result of Fossilized VH - see 6.1.2);
- (ii) Possessive prefixes (PosPs) (all of which end in a) preceding the possessive stems (PosSs) tjho 'our' and no 'your(pl)';
- (iii) SPs in a, preceding participial positive (PartPos) verb stems;
- (iv) verb-radical-final a preceding the passive extension (PASS) w.

Examples are

- (22) mmokhá+ng → mmokhéng 'in the acacia'  
 bá+no → bɛno 'yours(pl)(2)'  
 bá+tjho → bɛtjho 'ours(2)'  
 á+bɔ̄ná → ɛbɔ̄ná 'he(1) seeing'  
 bóá+w+a → bóɛwa 'be killed'

The rule is formalized overleaf as:



Historically, Old Coalescence was caused by an initial \*i or \*I (see Chapter 10) of the LocS and the possessive stems, and a participial positive prefix \*i before verb stems of that mood. An allomorph iw of the usual passive extension w still exists in the language (occurring after certain nonsyllabic verb radicals, for example as in lw+iw+a → lwiwa 'be fought') and this is probably the source of coalescence in forms like bolgwa 'be killed' (see (22) above). Since however, this is the only case in which the coalescence-triggering vowel can be found on the surface synchronically, it was thought best to include this case in this morphologized rule, rather than to postulate another rule of coalescence.

One isolated instance of Old Coalescence was found in the case where the usual C1 2 NP ba is replaced by be before the noun stem nyi, as in benyi 'owners'. Since this is the only case in our data of coalescence in NPs, it is treated as a case of lexical allomorphy, that is

(23) C1 2 NP: ba ~ be / \_\_\_+nyi

#### 6.8 Optional y-Addition

The right-hand boundary of verb radicals otherwise terminating in a vowel may optionally be indicated by the

presence of final y, for example

- (24) ná or náy 'give'  
bólá or bóláy 'kill'  
bó or bóy 'return'

More commonly these and other such radicals were recorded without the y, hence our lexical representation without it. The rule is

$$\emptyset \rightarrow \begin{bmatrix} \text{-SYLL} \\ \text{-CONS} \\ \text{+FRONT} \\ \text{-BACK} \end{bmatrix} / \begin{bmatrix} \text{+SYLL} \\ \text{-CONS} \end{bmatrix} \text{---} \text{Radical}$$

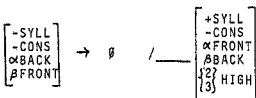
### 6.9 Glide Deletion

In 6.3 it was observed that desyllabification in SPs and OPs did not occur if in the sequence of vowels the second was of the same backness and as high or higher than the first. This, it may be recalled, prevented the violation of the syllable-structure condition on GV-sequences as given in 2.7.

Glide Deletion is a rule preventing the violation of this restriction as well. In a derivation, when a glide is followed by a vowel of the same backness, which is higher than low mid (HIGH), then the glide is deleted. (The rule below is stated in general terms although in our data only instances of back glide deletion were found.) Example follow:

- (25)  $n\acute{w}+os+a \rightarrow n\acute{o}sa$  'cause to drink'  
 $n\acute{w}+ow+a \rightarrow n\acute{o}wa$  'be drunk (of liquid)'

The rule is



### 6.10 Rule ordering

Apart from the rule ordering given in 6.3, integrating DESYLL preceding the diminutive suffix, the glide-triggered consonant alternations and  $\gamma$ -Deletion with DESYLL/CD, and apart also from the fact that obligatory rules must precede optional ones, the only other ordering relation among the vowel alternations is that Back Vowel Absorption (6.4) must precede Locative Doubling (6.5).

For the sake of consistency, we will assume that all segmental alternations precede the tone rules, although we can show that only DESYLL and DESYLL/CD must necessarily precede them. It will become clear why in the tonal analysis in Chapter 8.

## CHAPTER 7

MORPHOLOGICAL PRELIMINARIES TO THE TONAL ANALYSIS OF MAIN VERB CONSTRUCTIONS

As indicated in 2.6.0, Qh has two tonemes, H and L. There are a considerable number of alternations between these two tonemes, and most of them occur in main verb constructions. Accordingly, the bulk of the tonal analysis of this study is concerned with this morphological subsystem of the language.

The tone rules governing these alternations are dealt with in the following chapter, and the main point of this chapter is to allow the reader to familiarize him/herself with the way main verb constructions (MVCs) are put together in the language. In addition to this however, the underlying tones of all morpheme-types, except verb radicals (see Chapter 8) will be given here.

By MVC, we mean a verbal construction which contains a radical which refers in some way to the 'real world', as opposed to one which aids temporal, aspectual or modal expression of a verb. For example in the sentence kelé kébóná 'I was seeing', kébóná 'I seeing' is the MVC, and kelé 'I was ...-ing' the auxiliary verb giving the main verb a past progressive significance. Tone alternations in some auxiliary forms are given in Chapter 9.

The following morpheme-types may be found in

MVCs:

1. Preprefixes (PP)
2. Relative prefixes (RP)
3. Subject prefixes (SP)
4. Negative prefixes (NegP)
5. Aspect/mood prefixes (AMP)
6. Object prefixes (OP)
7. Verb radicals (R)
8. Extensions (Ext)
9. Tense/mood suffixes (TMS)
10. Postsuffixes (PS)

These are given here in the order from left to right in which they occur in MVCs, but not all types ever occur in the same MVC. Below each type is discussed.

### 7.1 Preprefixes (PP)

There are two PPs, negative ha, occurring only in the indicative present and perfect/stative, and hortative á, occurring optionally in the positive subjunctive.

Examples of their use are:

- (1)  $ha + bá + ba1 + é$   
 PP SP R TMS  
 →  $habábalé$  'they(2) don't count'
- $á + h á + ba1 + é$   
 PP SP R TMS  
 →  $áhébalé$  'let us count'

### 7.2 Relative prefixes (RP)

The RPs were given in 4.9, and are repeated here

for convenience:

(2)	C1	RP
	1	yǫ
	2	mǫǫ
	3	wǫ
	4	yǫ
	5	lǫ
	6	ǫǫ
	7	sǫǫ
	8	zǫ
	9	yǫ
	10	zǫǫ
	14	zǫwǫ
	15	xǫ

Example of their use:

(3) yǫ + ǫ + nǫn + lǫǫ + yǫ  
 RP SP R TMS PS

→ yǫnǫnǫǫ 'he(i) who is fat'

zǫǫ + rzǫ + xǫǫ + a + xǫ  
 RP SP R TMS PS

→ zǫǫrzǫǫǫ 'they(10) which growl'

### 7.3 Subject prefixes

Like RPs (see 4.9), SPs are historically derivable from their corresponding noun prefixes (and in some cases in the 1st and 2nd persons, from the absolute pronouns). Synchronically however, such derivations would require many exceptional statements, and thus it is thought best to view SPs as underlying lexical items. There are two sets of SPs

(but these sets overlap in the case of C1 2 and C1 6 - see below), which for convenience we designate SPx and SPy. These are given below, together with their corresponding noun prefixes, or for 1st and 2nd persons, their corresponding absolute pronouns.

(4)	C1/Person	NP/AbsP	SPx	SPy
	1ps	nna	ke	qa
	1	tjhona	he	ha
	2ps	wene	o	wa
	2pp	loná/nyená	ie	ia
	1	mo	áwo	a
	2	ba	bá	bá (overlap)
	3	mo	o	wá
	4	me	éwe	yá
	5	le	lé	lá
	6	ma	á	á (overlap)
	7	sje	sjé	sjá
	8	bi	bf	zá
	9	e~ø	éwe	yá
	10	rzi	rzi	zjá
	14	bo	bó	zjwá
	15	xo	xó	xá

SPy occurs only in the past positive, for example

- (5) a + bai + a  
 SPy R 'MS  
 → abala 'he(1) counted'
- qa + nw + a  
 SPy R TMS  
 → qanwá 'I drank'



SPx occurs in all other MVCs. The low-toned allomorphs of CIs 1, 4 and 9 occur only in the positive present indicative. It may be recalled (see 6.7) that SPxs in é become é preceding a positive participial verb. Examples of SPx are:

- (6) o + bōñ + a + yq  
 SPx R TMS PS  
 → obōñāyq 'he(1) sees'
- sjé + bōzj + é  
 SPx R TMS  
 → sjébōzjé 'he(7) should ask'
- á + bal + a  
 SPx R TMS  
 → ébála 'they(6) counting'
- ha + bá + j + é  
 PP SPx R TMS  
 → habáje 'they(2) don't eat'

#### 7.4 Negative prefixes (NegP)

There are three of these: sjaa occurring in the negative participial, sjáá in the negative infinitive, and sje in the negative imperative and negative subjunctive. Examples are:

- (7) ké + sjaa + rqbál + é  
 SPx NegP R TMS  
 → késjaarqbálé 'I not sleeping'
- xo + sjáá + bal + a  
 NP NegP R TMS  
 → xosjáábala 'not to count'

(Note here that verb infinitives are actually nominal constructions, and the first morpheme here is the C1 15 noun prefix.)

hé + sje + bal + é  
 SPx NegP R TMS

→ hēsjebalé 'we shouldn't count'

#### 7.5 Aspect/mood prefixes

There are two of these: qé indicating potentiality, and sjá indicating the progressive. Examples:

(8) á + qé + rzih + a  
 SPx AMP R TMS

→ aqárzyha 'he(1) can work'

ha + á + sjá + rác + flé  
 PP SPx AMP R TMS

→ haásjárácflé 'he(1) is not still in love'

#### 7.6 Object prefixes (OP)

The OPs are as follows:

(9)	<u>Cl/Person</u>	<u>OP</u>
	1ps	N
	1pp	hé
	2ps	xo
	2pp	lé
	1	mo
	2	bá
	3	ó
	4	é
	5	lé
	6	á
	7	sjé
	8	bf
	9	é

10	rzf
14	b6
15	x6
ROP	i ~ in (see 5.4 for distribution)

Examples follow:

(10) ké + bá + b6n + a + x6  
 SPx OP R TMS PS

→ kébáb6nax6 'I see them(2)'

a + N + bal + a  
 SPy OP R TMS

→ ampala 'he(1) counted me'

bá + rzf + rab + 6  
 SPx OP R TMS

→ bárfzrb6 'they(2) should slaughter  
 them(10)'

Two object prefixes may occur in the same MVC. In such a case the direct object precedes the indirect, for example

(11) ké + x6 + bá + N + a + x6  
 SPx OP<sub>d</sub> OP<sub>i</sub> R TMS PS

→ kéx6báhx6 'I give it(15) to them(2)'

### 7.7 Verb radicals (R)

Radicals form the nucleus of MVCs in that they give the construction a 'real-world', as opposed to linguistic significance. As such, they form an open-ended morpheme class, whereas all other morphemes in MVCs can be comprehensively listed.

The underlying tones of radicals can be seen in the left-hand side of the preceding and following examples, but discussion of these tones will be left until Chapter 8.

### 7.8.0 Extensions (Ext)

Extensions are suffixes immediately following verb radicals, and they modify the meaning of the radicals in some specific way, or in the case of the passive extension, change the focus of the MVC. Although more than the seven extensions exemplified here occur in Qh (K43:32-35 for instance lists fourteen), these seven appear to be the most productive.

#### 7.8.1 The Passive Ext w

This extension shifts the focus to the object of the verb, causing it to be subjectivalized, for example:

- (12) qa + chwfs + w + a  
 SPy R Ext TMS  
 → qachwíswa 'I was helped'

#### 7.8.2 The Applied Ext e1

e1 indicates that an action is done 'for', 'on behalf of', 'to the detriment of', 'into' or 'out of', for example:

- (13) hē + mo + rēq + e1 + a + xq  
 SPx OP R Ext TMS PS  
 → hémórēqqé1axq 'we buy for him(!)'
- há + j + e1 + a (mpizjéng)  
 SPy R Ext TMS  
 → hájé1a 'we ate out of (the pot)'

#### 7.8.3 The Causative Ext is

This Ext makes a radical causative and/or transitive,

for example,

(14) bá + rēq + is + a (eto)  
 SPy R Ext TMS

→ bārēqīsa 'they(2) sold (the house)' (where  
 'sell' = 'cause to buy')

bá + beI + is + a (mazf)  
 SPy R Ext TMS

→ bábfrzisa 'they(2) boiled (the water)'  
 ('caused the water to boil')

#### 7.8.4 The Extensive Ext aq

aq indicates that the action signified by the radical is carried out repeatedly, extensively or violently, for example:

(15) (etjwá) yá + N + lóm + aq + a  
 SPy OP R Ext TMS

→ yáncómáqa '(the dog) bit me savagely'

#### 7.8.5 The Reciprocal Ext an

an indicates that the action of the radical is carried out reciprocally, for example,

(16) bá + rab + an + a + xq  
 SPx R Ext TMS PS

→ bárábanaxq 'they(2) are slaughtering  
 each other'

#### 7.8.6 The Reversive Ext, transitive olo/onon, intransitive olox/onox

The Reversive Ext indicates the opposite of the action of the radical, for example

- (17) yá + é + bǫh + unon + a  
 SPy OP R Ext TMS  
 → yáébǫhónona 'he(9) untied him(9)'
- yá + bǫh + onox + a  
 SPy R Ext TMS  
 → yábǫhónoxa 'he(9) got untied'

#### 7.8.7 The Neuter Ext ex

ex makes a transitive radical intransitive, for example:

- (18) á + bǫt + ex + a + xǫ  
 SPx R Ext TMS PS  
 → ábǫtǫxǫ 'they(6) are getting broken'

The forms of the extensions given above are those which occur most commonly. Some extensions however have a number of lexical allomorphs (this has been seen above in the case of the Reversive Ext), which are selected in an unsystematic way by certain radicals. For a detailed listing of such allomorphs see K43:32-35, in which their distribution is given.

#### 7.8.8 Radical-extension fusion

Many old radicals do not occur in isolation in the modern lexicon, as they have been morphologically fused to certain extensions. An example of this is the radical rázjan 'flirt', which presumably arose first as rázj+an, that is R+Ext. Such forms must be regarded as *underived* synchronically, that is, they exist as lexical items.

It is still necessary however to represent the morpheme boundary between the old R and the Ext lexically, because

this boundary plays a part in some tone rules (see Chapter 8). The special symbol \* will be used rather than + to indicate such lexically 'frozen' boundaries, thus the underlying form of rǎzjan would be rǎzj\*an. Henceforth the term 'radical' will be used to refer in these cases only to the historical radical, that is, the first element in the fusion. If it is necessary to refer to forms like rǎzj\*an as a unit, the phrase 'fused extended radical' will be used.

The example of fusion above involves an extension (Reciprocal) which is otherwise fully productive. There are many other fusion however with old extensions, which today have independent significance, for example ar in ap\*ar 'get dressed' which is traceable back to a proto-contactive Ext \*at. In modern Qh this is no longer a productive Ext at all, and only occurs fused to a few radicals. Another such example would be am in ar\*ám 'yawn', which traces back to the proto-positional Ext \*am.

In addition to these etymologically traceable forms, all other bisyllabic radicals must be represented lexically as containing a \*-boundary between the first and second syllables. The necessity of this boundary in these forms is that with respect to the tone rules, they behave as though they were true monosyllabic radicals followed by a fused Ext. In some cases these 'Exts' might have existed as such, but there is little evidence for them, for example the áb in áráb 'answer'. In other cases there is obviously no etymological link, for example ák in bérzék 'work' (from Afrikaans 'werk'). In these etymologically dubious or false cases, one must assume that these forms have been reanalysed

underlyingly as containing a \* by analogy with the true forms.

The left-hand side of the examples preceding show that the tones of Exts are low underlyingly. However, some examples of fused Exts have high tones, for example ár\*ám 'yawn', ár\*áb 'answer' and bérz\*ék 'work'. This apparent discrepancy will be explained in the following chapter.

### 7.9.0 Tense/mood suffixes (TMS)

We divide these morphemes into two types (1) the perfect/stative suffix, and (2) the general suffixes. The latter are termed 'general' simply because one such suffix may occur in a number of different MVCs.

#### 7.9.1 The perfect/stative suffix flé

This suffix marks the stative with inchoative radicals in the present indicative or the perfect or stative with action or inchoative radicals respectively in the present participial, for example

(19) o + sjw + flé + yo  
 SPX R TMS PS  
 → osjwfléyo 'he(1) is dead'

ké + nqn + flé  
 SPX R TMS  
 → kéndnflé 'I being fat'

š + rēq + flé  
 SPX R TMS  
 → šréqflé 'he(1) having bought'

There are many cases of phonological 'fusion' between extensions and flé (or some other no longer existing allo-



morph of flé) which are synchronically no longer systematizable. Such forms must therefore be given lexical status as stative/perfect counterparts to their 'plain' forms. Examples of the diverse kinds of fusion which occur are shown below:

(20) Plain		Stative/perfect
rqb*al	'go to sleep'	rqb*éé 'be asleep'
rzih+g]	'do for'	rzih+éé 'have done for'
ap*ar	'get dressed'	ap*éré 'be dressed'
páx*am	'mount'	pax*ámé 'be mounted'
kop*an	'congregate'	kop*áné 'be congregated'

It appears that historically, flé, particularly with respect to its tones, has 'infiltrated' the extension (whether this is fused to the radical or not). This infiltration is not amenable to systematization.

#### 7.9.2 The general suffixes

These occur as TMSs in all other cases other than where flé occurs. Together with other morpheme-types, they indicate the tense, mood, and negativity or positivity of the MVC.

Three general suffixes can be identified. They are

- (i) a, which occurs in Present Indicative Positive, Present Participial Positive, Past Indicative Positive, and Infinitive, Positive or Negative, for example:

(21) ké + bǒzj + a + xǫ  
 SPx R TMS PS

→ kébǒzjaxǫ 'I ask'

ké + bǒzj + a  
 SPx R TMS

→ kébǒzja 'I asking'

qa + bǒzj + a  
 SPy R TMS

→ qabǒzja 'I asked'

xo + bǒzj + a  
 NP R TMS

→ xobǒzja 'to ask'

xo + sjǎá + bǒzj + a  
 NP NegP R TMS

→ xosǎábǒzja 'not to ask'

(ii) ǫ, which occurs only in the Past Indicative Negative, which occurs as the complement of hasé, for example:

(22) hasé ké + bǒzj + ǫ  
 SPx R TMS

→ hasé kébǒzjé 'I didn't ask'

(iii) ǫ, which occurs in Present Indicative Negative, Present Participial Negative, Imperative Positive (but see below) and Negative, and Subjunctive Positive and Negative, for example:

(23) ha + ké + bal + ǫ  
 PP SPx R TMS

→ hakébalǫ 'I don't count'

ké + sjaa + bal + é  
SPx NegP R TMS

→ kəsjaabalé 'I not counting'

rzf + bal + é  
OP R TMS

→ rzfbalé 'count them(10)!'

sje + bal + é  
NegP R TMS

→ sjebalé 'don't count!'

hé + sje + bal + é  
SPx NegP R TMS

→ həsjebalé 'we shouldnt count'

é has the lexical allomorph á which occurs just in the Imperative Positive if there is no OP, or if the OP is 1ps, for example:

(24) bal + á  
R TMS

→ balá 'count!'

N + bal + á  
OP R TMS

→ mpaá 'count me!'

#### 7.10 Postsuffixes (PS)

There are two of these, xé and yé, which occur only in the Present Indicative Positive if no adjunct (object or adverb) follows, and in the Present Relative Positive or Negative, if no adjunct follows. xé occurs with the high SPs, and yé with the three low SPs of Cls 1, 4 and 9. Examples follow overleaf:

(25) hé + hóm\*ol + a + xǵ  
 SPx R TMS PS

→ héhómolaxǵ 'we rest'

o + hóm\*ol + a + yǵ  
 SPx R TMS PS

→ ohómolayǵ 'he(1) rests'

m̄bá + bá + hóm\*ol + a + xǵ  
 RP SPx R TMS PS

→ m̄bábádhómolaxǵ 'they(2) who rest'

yé + e + sjaa + hóm\*ol + e + yǵ  
 RP SPx NegP R TMS PS

→ yéesjaahómóléyǵ 'he(9) who doesn't rest'

## CHAPTER 8

tone alternations in main verb constructions

Before considering the alternations themselves, we first consider the underlying tones of verb radicals, and an autosegmental rule which ensures a well-formed relation between syllables and tones.

In certain constructions, among others (see below) the Positive Infinitive, three tone classes of monosyllabic radicals may be found. These are

- (i) LOW, in which the radical is L, for example xobala 'to count', radical bal;
- (ii) HIGH-1, in which the radical is H, for example xobózja 'to ask', radical bózj;
- (iii) HIGH-2, in which the radical is H, and the tone of the TMS or Ext immediately following it is also H, for example xobóná, 'to see', radical bón.

In this analysis, it is assumed that the H on the Ext or TMS immediately following a H-2 radical belongs underlyingly to the radical, rather than to the Ext or TMS. The radical is thus assigned two Hs, the first associated with its syllabic element (the vowel), but the second unassociated (since there is only one vowel). In the course of a derivation, the second, unassociated tone becomes associated to the following syllable, replacing the L there,

by means of the rule we call Unassociated Tone Attachment (UTA). Thus the derivation of xobóná 'to see' would be

(1) Underlying (U): xo + bón + a

UTA:       bón á

Surface (S): xobóná

One reason behind this analysis concerns the complication to the underlying representations of the Exts and TMSs if the second H were assigned underlyingly to these morphemes, rather than to the radical. If this were done, then the TMS would have to have two lexical allomorphs, one H and the other L. The H one would have to be marked by lexical allomorph selection feature as occurring only immediately after what we have termed the H-2 radicals. In the same way, all Exts would each have two allomorphs, H and L, with the H marked in this way.

The argument above rests essentially on considerations of lexical economy. Perhaps more compelling grounds for this abstract analysis is the fact that UTA is necessary elsewhere in the tonology of the language.

In the formation of diminutives (see Chapter 4) it was observed that after DESYLL the first a of the DS ana became H if the preceding tone of the desyllabified vowel had been H, for example

(2) khúrzú+ana → khúzjwána 'little tortoise'

On the other hand, if the tone of the desyllabified vowel had been L, the first a of ana was also L, for example

(3) qobq+ana → qozjwana 'little blanket'

A reasonable interpretation of the data here would be

that the H of ana in (2) derives from the underlying H of the final desyllabified vowel of the noun stem. In the case of (3) we assume that the rule operates *vacuously* (L replaces L). The derivations of these forms would thus be (ignoring the alveopalatalization):

(4)	U:	khúrú+ana	qobq+ana
	DESYLL:	w	w
	UTA:	w á	(vacuous)
	S:	khúzjwána	qozjwana

Another case of the need for UTA can be seen in DESYLL/CD (see Chapter 6). Here the tone of the desyllabified SP or OP is transferred to the clone vowel created by Compensatory Doubling (in this case UTA does not involve the replacement of a L, since the clone vowel is toneless). Examples of such forms in derivations are shown below:

(5)	U:	ð + ár*áb + à + yq	lé + ár*áb + à + xq
	DESYLL:	w	ø
	CD:	a	a
	UTA:	w à	ø á
	S:	wàárábàýq	láárábàxq
		'he(1) answers'	'he(5) answers'

(The Ls are marked in this example to distinguish them from toneless clone vowels.)

A fourth case in which UTA is needed is with H non-syllabic radicals, such as f 'eat', and h 'give'. These are reconstructed (see 10.3.3) as coming originally from H-toned CV forms, in the case of f, from \*lf. The disappearance of the V from the original CV forms can be explained historically in much the same way as vowel desyllabification (or

deletion) in synchronic diminutive formation. Like the monosyllabic HIGH-2 radicals, when these H nonsyllabic radicals are followed by an Ext or TMS, these morphemes become H. On the other hand, when Ext or TMS follow L, or toneless (see below) nonsyllabic radicals, they remain L. Sample derivations are

(6)	U:	xo + j + a	'to eat'	xo + k + a	'to mention'
	UTA:	j	á		(vacuous if <u>k</u> is L, inapplicable if toneless)
	S:	xojá		xoka	

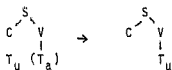
In the last three instances of the application of UTA (in diminutive formation, in desyllabified OPs and SPs, and in H nonsyllabic radicals) the motivation for the existence of an unassociated tone has been an originally tone-bearing syllable which has become desyllabified or deleted, either synchronically (the first two cases) or historically (the third case). This suggests that the second H of HIGH-2 monosyllabic radicals, such as b<sup>h</sup>q̄n 'see' came to have an unassociated tone in the same way. This is precisely our contention, and in Chapter 13 we put forward evidence for reconstructing these radicals as originally bisyllabic forms, in the case of b<sup>h</sup>q̄n, perhaps b<sup>h</sup>q̄n<sup>h</sup>.

To return to nonsyllabic radicals, it is undoubtedly the case that historically L-toned CV radicals existed, which gave rise to modern Qh radicals like k 'mention' and ny 'defecate'. Synchronically however, there is no reason to treat these radicals as L-toned (as say f < \*lf is treated as H-toned) rather than simply as toneless radicals. This is because if these radicals are followed by a L, then UTA



is vacuous, and if they are followed by a H, then UTA would not apply, and the unassociated L tone would have to be deleted anyway. In other words, an underlying L on these radicals would never have any surface effect, and for this reason we regard them as *underlyingly toneless*.

UTA is the only rule in the language which is autosegmental in the sense that it brings about a well-formed relation between tones and syllables, rather than simply changes tones. We formalize the rule as follows:



That is, an unassociated tone ( $T_u$ ) becomes associated with an immediately following syllabic base (V), and in doing so replaces the associated tone ( $T_a$ ) of that syllabic base, if there is one (this will be the case in all instances of UTA except after *Compensatory Doubling*, where the clone vowel following the unassociated tone is toneless). Note that in the cases where  $T_u$  does replace  $T_a$ , although the rule is stated in general terms (either tone replaces either tone), there are in fact no cases in which an unassociated L tone replaces a following H. An unassociated L followed by the DS ana represents a case of L replacing L (*vacuous*), and of course there are no unassociated Ls on radicals, since historically L CV-radicals are analysed synchronically as toneless, thus if these are followed by a H TMS, there would be no application of UTA at all, for example  $k+a \rightarrow k\acute{a}$  'mention!'.<sup>1</sup>

Apart from the radical-types given so far (nonsyllabic H and toneless radicals, and monosyllabic L, H-1 and H-2

radicals) there are also fused extended radicals (see previous chapter). Here the tone of the immediately following extension is L with L or H-1 radicals, and H with H-2 radicals, for example L rgb\*al 'go to sleep', H-1 hóm\*ol 'rest' and H-2 xóp\*ól 'remember'. In the last case, we regard the underlying H of the extension as the result of the lexical fossilization of the application of UTA, so that this form would be derived historically from \*xóp+ol in the same way as, say, bónán 'see each other' is derived synchronically from bón+an.

In addition to these radical-types, there are also the perfect/stative radicals (see Chapter 7 (20), page 100) which always end on two Hs, for example rgb\*éé 'be asleep'. Finally there are three radicals with the tone sequence LH. Historically we cannot be certain how these radicals arose, but it is possible that they (like rgb\*éé etc.) resulted from the fusion of a stative morpheme to the radical, but that the stative significance was subsequently lost. The three radicals are rwelé 'spend the day', khelé 'play' and metshé 'stand up'.

As we mentioned at the outset of this chapter, the tone classes of the radicals (L, H-1 and H-2) were obtained from the radical tones of the infinitive positive. We regard the tones in this MVC as representing most directly the tones of the underlying forms. The only tone rule which has operated between the lexicon and this surface construction is UTA, and this rule, though partly replacive, is essentially one which ensures a well-formed relation between tones and syllables. The reason for regarding the tones of this MVC in the first place as most closely approximating the lexical

tones, is simply that it is from them that tone alternations may best be predicted by general rules for the other MVCs.

Because of its close association with the lexical tones, we shall call the Positive Infinitive a 'tonally basic construction'. Apart from this MVC however, there are three other tonally basic constructions. These are the Infinitive Negative without OP, the Past Positive without OP and the Present Indicative Positive with L SPx and without OP. Examples are:

(8) Infinitive Negative

LOW	<u>ba</u> l	xosjáábala	'not to count'
HIGH-1	<u>bó</u> zj	xosjáábózja	'not to ask'
HIGH-2	<u>bón</u>	xosjáábóná	'not to see'

Past positive

LOW	<u>ba</u> l	abala	'he(1) counted'
HIGH-1	<u>bó</u> zj	abózja	'he(1) asked'
HIGH-2	<u>bón</u>	abóná	'he(1) saw'

Present Indicative Positive

LOW	<u>ba</u> l	obalayo	'he(1) counts'
HIGH-1	<u>bó</u> zj	obózjayo	'he(1) asks'
HIGH-2	<u>bón</u>	obónáyoy	'he(1) sees'

We are now in a position to investigate the tone rules applying to MVCs.

8.1 Pre-xó Lowering (PxOL)

By the application of PxOL, a H is converted to a L preceding the PS xó, for example

(9) U: ké + rác + flé + xó  
 UTA: rác (vacuous, H replaces H)  
 PxoL: flé  
 S: kérécflexó 'I am in love'

U: ké + rác + a + xó  
 UTA: rác á  
 PxoL: a  
 S: kérécaxó 'I love'

U: zé + bí + sjaa + k + é + xó  
 PxoL: é  
 S: zébsjaakéxó 'those(B) who do not mention'

Observe that *no change occurs* with these forms when preceding the L PS yo, for example orácfléyo 'he(1) is in love', orácáyo 'he(1) loves' and yóosjaakéyo 'he(1) who does not mention'.

This rule is formalized as

$$[H] \rightarrow [L] / \_\_\_\_\_\_ + [é]$$

PS

### 8.2 Right Prefix Raising (RPR)

This rule has two parts. Firstly, the H of an SPx or an OP will spread to an immediately following L radical, replacing the L there, for example

(10) ké + bal + a + xó  
 → kébálaxó  
 o + hé + bal + a + xó  
 → ohébálaxó 'he(1) counts us'

The second part of the rule states that a H SPx, SPy or AMP will cause a following L OP to become H, for example

(11) hé + xo + bal + a + xó  
 → héxóbalaxó 'we count you(sg)'

há + xo + bal + a  
 → háxóbala 'we counted you(sg)'

hé + qá + xo + bal + a  
 → heqáxóbala 'we can count you(sg)'

(The change from hé to he in the last example will be dealt with in 8.8.)

The following examples show that a H of SPy or AMP does not spread to a following L radical:

(12) hábala (not hábála) 'we counted'  
 heqábala (not heqábála) 'we can count'

It is necessary to order the first part of the rule before the second to prevent a derivedly H OP from raising the L of a following radical. If this ordering were not the case, then our first example in (11) would be incorrectly derived as héxóbálaxó.

Both parts of the rule are blocked if the susceptible L is penultimate and followed by a final H, for example

(13) hé + bal + é  
 → hébalé (not hébálé) 'we should count'

hé + xo + j + a  
 → héxojá (not héxójá) 'we eating you'

The rule is formalized as

$$(i) [L]_R \rightarrow [H] / [H] \left. \begin{array}{l} \{OP\} \\ \{SPX\} \end{array} \right\}^+ \text{---}$$

$$(ii) [L]_{OP} \rightarrow [H] / [H] \left. \begin{array}{l} \{SPX\} \\ \{SPY\} \\ \{AMP\} \end{array} \right\}^+ \text{---}$$

unless input is penultimate and followed by H.

It will have been observed that both PxOL and RPR are concerned in some way with a penultimate L followed by a H. RPR is blocked from applying to such a L, and PxOL creates a penultimate L from a penultimate H followed by H xó. A third rule, Adjunctless Lowering, which is discussed below, also takes account of a penultimate L followed by a H.

### 8.3 Adjunctless Lowering (AdlessL)

In the Negative Indicative and in the Imperative Negative or Positive, the H TMS ( $\underline{\xi}$  in the former, and  $\underline{\xi}$  or  $\underline{\xi}$  in the latter) is lowered if no adjunct (object or adverb) follows, for example (where '...' indicates 'with following adjunct' and '#' indicates 'without following adjunct'):

- (14) ha + ké + bözj +  $\underline{\xi}\#$   
 → hakebözj $\underline{\xi}\#$  'I don't ask'  
 (cf. hakebözj $\underline{\xi}$ ...)
- bón +  $\underline{\xi}\#$  → bóná $\underline{\xi}\#$  (by vacuous UTA)  
 → bóna $\underline{\xi}\#$  'see!'  
 (cf. bóná...)

sje + ár\*áb + ǂ#  
 → sjeárábǂ# 'don't answer!'  
 (cf. sjeárábǂ...)

The rule does not apply if the tone preceding the H TMS is L (this L being of course penultimate), for example

(15) ha + hé + bal + ǂ#  
 → hahebalǂ# 'we don't count'  
 bá + bal + ǂ#  
 → bábalǂ 'count them(2)!'

A further restriction on the rule is that it does not apply if the TMS is the only syllabic element in the word. This is the case with Imperatives without OPs, of non-syllabic radicals, for example

(16) k + á# → kǂ# 'mention!'  
 j + á# → jǂ# (with vacuous UTA) 'eat!'

We formalize the rule as follows:

$$[H]_{TMS} \rightarrow [L] / [H] + \text{_____} \#$$

$\left. \begin{array}{l} \text{Indicative negative} \\ \text{Imperative, positive or} \\ \text{negative} \end{array} \right\}$

The preceding H in the environment of this rule ensures that it does not apply if TMS is preceded by a L, and also prevents it from applying in imperative nonsyllabic radicals (in the case of H nonsyllabic radicals UTA would have applied first, so here too there would be no preceding H by the time AdressL were to apply - for details on rule ordering, see 8.12).

#### 8.4 Left Suffix Raising (LSR)

Where, in RPR, a H is spread from the left to the right, in LSR the spread is in the opposite direction. The trigger for LSR is a H TMS, and its effect is to raise all extensions between a H TMS and the radical, for example:

- (17) rqb\*al + á...  
 → rqbálá... 'go to sleep!'
- bel + is + ezj + a...  
 → birzisézjá... 'boil (something for someone)!'
- sje + hóm\*ol + é...  
 → sjehómólé... 'don't rest!'

With extended H nonsyllabic or H-2 radicals, the raising of the first extension is caused by prior application of UTA, but subsequent extensions are raised by LSR, for example:

- (18) U: hé + sjaa + r<sup>é</sup>q + el + an + é  
 ÚTA:                    r<sup>é</sup>q él  
 LSR:                                    éh  
 S: hésjaar<sup>é</sup>q<sup>é</sup>l<sup>é</sup>    'we not buying for each other'

LSR is ordered to apply before AdlessL. If these rules were not so ordered then AdlessL in negative indicatives and all imperatives would be blocked from applying because the extension preceding the TMS would still be L. The derivations overleaf in (19) illustrate the correct and incorrect ordering of these rules:



(19)

Incorrect

U: rqb\*al + á

AdressL: (blocked by preceding L)

LSR: rqbáld

Correct

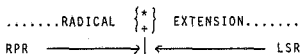
U: rqb\*al + á

LSR: ál

AdressL: a

S: rqbála 'go to sleep!'

RPR and LSR can be seen almost as mirror images of each other with respect to their domains of application. The boundary between radical and extension is common to both, with RPR applying up to it from the left, and LSR up to it from the right. The diagram illustrates this:



The formalization of LSR is

$$\begin{array}{c} [L] \rightarrow [H] / [R] + \underline{\quad} + [H]_{\text{TMS}} \\ \text{Ext.} \end{array}$$

8.5 Adjunctful Raising (AdfUR)

This rule applies only in the Positive Indicative, and causes the L TMS a to become H when an adjunct follows (that is, when the MVC is not prepausal), for example

(20) hé + bózj + a...

→ hébózjá,... 'we ask'

In the case of the H nonsyllabic radicals and

monosyllabic H-2 radicals, UTA causes the TMS to become H prior to the application of AdfuR. This is illustrated in the derivations given below, together with the derivation of a H-2 fused extended radical, for comparison:

(21) U: hé + j + a...  
 UTA: j á  
 AdfuR: (vacuous)  
 S: héjá... 'we eat'

and U: hé + b<sup>h</sup>ón + a...  
 UTA: b<sup>h</sup>ón á  
 AdfuR: (vacuous)  
 S: héb<sup>h</sup>óná... 'we see'

cf. U: hé + xóp<sup>h</sup>ól + a...  
 AdfuR: á  
 S: héxóp<sup>h</sup>ólá... 'we remember'

This rule does not apply if the SPx in the construction is L, for example obózja... 'he(1) asks'. Formally the rule is

$$\begin{array}{c} [L] \\ \text{TMS} \end{array} \rightarrow \begin{array}{c} [H] \\ \text{SPx} \end{array} / \begin{array}{c} [H] \\ \text{SPx} \end{array} (+X) + \underline{\hspace{1cm}} \dots$$

Indicative Positive

(The 'X' here stand for anything that might appear between SPx and the TMS, and '...' indicates that an adjunct must follow the MVC for the rule to apply.)

AdfuR must precede LSR, because sometimes this rule creates a H TMS which acts as the trigger for LSR. The derivations overleaf illustrate the incorrect and correct orderings:

(22)

Incorrect

U: ké + rgb\*al + a...

RPR: rgb

LSR: (blocked - no H TMS)

Adfu1R: á

S: kérébalá...

Correct

U: ké + rgb\*al + a...

RPR: rgb

Adfu1R: á

LSR: ál

S: kérébalá... 'I go to sleep'

Adfu1R must also follow RPR. The reason for this is that the final H created by Adfu1R would otherwise prevent RPR from applying to a penultimate L. The derivations below show the incorrect and correct ordering:

(23)

Incorrect

U: bá + bal + a...

Adfu1R: á

RPR: (blocked by final H)

S: bábalá...

Correct

U: bá + bal + a...

RPR: bá1

Adfu1R: á

S: bábalá... 'they(2) count'

### 8.6 OP-less Lowering (OPlessL)

This rule occurs only in the Positive Subjunctive if the construction contains no OP. Its effect is to lower the H TMS  $\xi$ , for example:

(24)  $h\acute{e} + k + \xi$

→  $h\acute{e}k\acute{e}$  'let us mention'

(cf. with OP,  $h\acute{e}b\acute{a}k\acute{e}$  'let us mention them(2)')

$b\acute{a} + b\acute{o}zj + \xi$

→  $b\acute{a}b\acute{o}zj\acute{e}$  'let them(2) ask'

(cf. with OP,  $b\acute{a}l\acute{e}b\acute{o}zj\acute{e}$  'let them(2) ask him(5)')

In H-2 extended radicals (whether the extension is historically fused or not) OPlessL causes a H extension immediately preceding the TMS to become  $\xi$  with the TMS, for example:

(25) U:  $h\acute{e} + x\acute{o}p*o\acute{l} + \xi$

OPlessL:  $o\acute{l} \quad \xi$

S:  $h\acute{e}x\acute{o}p\acute{o}l\acute{e}$  'we should remember'

U:  $h\acute{e} + b\acute{o}n + an + \xi$

UTA:  $b\acute{o}n \quad \acute{a}n$

OPlessL:  $an \quad \xi$

S:  $h\acute{e}b\acute{o}n\acute{a}n\acute{e}$  'let us see each other'

Observe that when the H extension does not immediately precede the TMS then it is not affected, for example

(26)  $h\acute{e} + kh\acute{u}rz*\acute{u}m + o\acute{l} + \xi$

→  $h\acute{e}kh\acute{u}rz\acute{u}m\acute{o}l\acute{e}$  'let us uncover'

OPlessL must precede RPR. When there is a L radical in the construction, OPlessL feeds RPR by lowering the H tone

following the penultimate L of the radical. If the ordering were the opposite, RPR would be blocked from applying, by the final H. The derivations illustrate the incorrect and correct ordering:

(27)

Incorrect

U: hɛ + baɪ + ɛ

RPR: (blocked by final H)

OPlessL: ɛ

S: hɛbaɪɛ

Correct

U: hɛ + baɪ + ɛ

OPlessL: ɛ

RPR: baɪ

S: hɛbaɪɛ 'let us count'

OPlessL must also precede LSR. If it did not, then LSR would incorrectly raise the extensions between the radical and the still H TMS. The derivations illustrate the orderings:

(28)

Incorrect

U: hɛ + hɔm\*oɪ + ɛɪ + ɛ

LSR: ɔɪ ɪɪ

OPlessL ɔɪ ɛ

S: hɛhɔmɔɪɛɪɛ

Correct

U: hɛ + hɔm\*oɪ + ɛɪ + ɛ

OPlessL: ɛ

LSR: (blocked: no H TMS)

S: hɛhɔmɔɪɛɪɛ 'let us rest for'

OPlessL is formalized as

$$\begin{array}{ccc} ([H]) & + & [H] & \rightarrow & ([L]) & + & [L] \\ \text{Ext} & & \text{TMS} & & & & \\ 1 & & 2 & & 1 & & 2 \end{array}$$

/SP + R (+ X) (+\_\_\_\_) +\_\_\_\_  
Subjunctive Positive

By including 'SP + R' in the rule, it is prevented from applying if there is an OP in the construction. '(+ X)' indicates possible extensions between the radical and the following environment. Input 1 (and its environment) are parenthesized because they may not be present.

#### 8.7 SP-Low Assimilation (SPLA)

This rule applies only in one verbal construction, namely the Past Negative, complement of hasé. By this rule a H SPx becomes L if followed by a L OP or L radical, for example:

(29) hasé hé + bal + é  
→ hasé hebalé 'we didn't count'

hasé hé + xo + bójz + é  
→ hasé hexobójzé 'we didn't ask you'

If the tone following the SPx is H, then there is no change, for example hasé hé(bá)bójzé 'we didn't ask (them (2))'.

The H SPx becomes L also when preceding a nonsyllabic radical, whether this is H or toneless underlyingly, for example with H j, hasé hejé 'we didn't eat', and with toneless k, hasé heké 'we didn't mention'.

SPLA must precede RPR. If it did not, then a L OP or radical would be incorrectly raised by RPR, and SPLA would be blocked. The derivations below illustrate the orderings:

(30)

Incorrect

U: hasé hé + xo + bózj + é

RPR: xó

SPLA: (inapplicable)

S: hasé héxóbózzé

Correct

U: hasé hé + xo + bózj + é

SPLA: he

RPR: (inapplicable)

S: hasé hexóbózzé 'we didn't ask you(sg)'

The rule is formalized as

$$[H]_{SPx} \rightarrow [L] / \text{---} + \left\{ \begin{array}{l} [L] \\ \{OP\} \\ \{R\} \\ [-SYLL]_R \end{array} \right\}$$

Past Negative

8.8 SP-Lowering (SPLow)

In the Positive Indicative Potential, all H SPxs are lowered before the AMP qá, for example

(31) ké + qá + rzih + a

→ keqárzyha 'I can make'

bá + qá + chwfs + a

→ baqáchwfsa 'they(2) can help'

(Note that in the first example, the form qárzyha, with 1ps

SP N, is also possible.)

The rule is

$$\begin{array}{c} [H] \\ \text{SPX} \end{array} \rightarrow [L] / \text{_____} + [q\acute{a}] \\ \text{AMP}$$

### 8.9 Downstep

Downstep differs from all previous rules. It is neither a 'well-formedness' rule like UTA, nor a 'manipulatory' rule like the rest, but instead causes a change to a lower key of a *H-commencing tone sequence* which is preceded by a H. MVCs in our data were found to be downstepped in the following circumstances:

(1) following the negative auxiliaries ha + SPX + l\acute{e} '...was not...ing'; ha + SPX + l\acute{a} '...had not...-en', and ha\acute{f}y\acute{e}/ha\acute{f}y\acute{e} '...did not...long ago', for example (downstep indicated by a '↓'):

- (32)  $\text{h\acute{a}k\acute{e}l\acute{e} \downarrow k\acute{e}b\acute{o}n\acute{a}$  'I was not seeing'  
 $\text{h\acute{a}b\acute{a}l\acute{a} \downarrow b\acute{a}b\acute{o}n\acute{a}$  'they(2) had not seen'  
 $\text{h\acute{a}f\acute{y}\acute{e} \downarrow b\acute{a}b\acute{o}n\acute{a}$  'they(2) did not see (long ago)'

(ii) following a relative prefix, for example

- (33)  $\text{m\acute{b}\acute{a} \downarrow b\acute{a}b\acute{o}n\acute{a}x\acute{e}$  'they(2) who see'  
 $\text{l\acute{e} \downarrow l\acute{e}b\acute{o}n\acute{a}x\acute{e}$  'he(5) who sees'

There are probably other syntactic environments in which downstep occurs, but which did not form part of our data. For this reason we feel that it would be premature to attempt a formalization before more research has been done on this tonal aspect of the language.



### 8.10 Inter-HIGH Raising (IHR)

Most of the tones of MVCs in our data can be explained by the rules given up till now. There are however a few tones which are not predicted by our rules. These are all Hs, and they are exemplified below (the relevant Hs being circled):

- (34) bá (sje) bózjé 'they(2) shouldn't ask'  
 kéxó (rqb) ázjé 'I should put you to sleep'  
 xosjáá (xó) bózja 'not to ask you(sg)'

At first glance it might appear that the tones of these underlyingly L morphemes, rqb 'radical', sje 'NegP' and xó '2psOP' are raised by RPR, but observe that when these morphemes are followed by a L, then they remain L, for example

- (35) bá (sje) balé 'they(2) shouldn't count'  
 kéxó (rqb) azjaxé 'I put you to sleep'  
 xosjáá (xó) bala 'not to count you'

As we saw in 8.2, RPR does not require the context 'y\_\_H' in order to apply, and for this reason we consider the raising of such L syllables to be caused by a different rule, which we call IHR. The structural description of IHR (see below) is met in the Indicative Present, the Imperative, the Subjunctive and the Infinitive Negative.

Like RPR, IHR is blocked from applying if the susceptible L is penultimate and followed by a H. However, this restriction in the Present Indicative and Imperative is weakened somewhat in that the penultimate L must be prepausally lengthened (there must be no following adjunct) in order to block the rule, for example

(36) ha + ké + bal + €#  
 → hakeba1€# 'I don't count'  
 (cf. hakebá1€... where ba1 → bá1 by IHR)

bá + bal + €#  
 → bába1€# 'count them(2)!'  
 (cf. bábá1€... where ba1 → bá1 by IHR)

A further weakening of the restriction in Subjunctives, is that L OPs, irrespective of whether they are penultimate or not, are raised by IHR. Compare the examples in (37) below, in which L penultimate OP xo is raised, but L penultimate radical ba1 is not:

(37) ké + xo + k + €  
 → kéxdké 'I should mention you(sg)'  
 ké + ba1 + €  
 → kéba1é 'I should count'

This rule and its complicated set of restrictions may be formalized

$$\left[ \begin{array}{c} [L] \\ \left\{ \begin{array}{l} \text{OP} \\ \text{NegP} \\ \text{R} \end{array} \right\} \end{array} \right] \rightarrow [H] \quad / [H] + \underline{\quad} + [H]$$

$$\left\{ \begin{array}{l} \text{Indicative Present} \\ \text{Imperative} \\ \text{Subjunctive} \\ \text{Infinitive Negative} \end{array} \right\}$$

- unless: (i) input is penultimate and pre-pausally lengthened in Indicative Present or Imperative;  
 (ii) input is penultimate in Infinitive Negative  
 (iii) input is penultimate and constitutes R or NegP (but not OP) in Subjunctive.

IHR must be ordered after RPR and LSR since these two rules sometimes provide the /H+\_\_\_+H context in which it applies, for example

- (38) U: hé + :o + rqb\*azj + é  
 RPR: xó  
 LSR: ázj  
 IHR: rqb  
 S: héxórqbázjé 'we should put you(sg)  
 to sleep'

#### 8.11 Exceptional Right Prefix Raising

With the tone rules presented above we are able to account for all tones on MVCs collected in our data (see Appendix B) except three. These tones are:

- (39) obák <sup>á</sup> 'he(1) mentions them(2)'  
 xobák <sup>á</sup> 'to mention them(2)'  
 xosjáábák <sup>á</sup> 'not to mention them(2)'

The examples show that the TMS a in the Indicative Present Positive (with adjunct) and the Infinitive Positive or Negative, is raised if preceded by a toneless non-syllabic radical (such as k 'mention') if that in turn is preceded by a H OP (such as bá 'them(2)').

This looks like RPR except that it has operated beyond the right radical-boundary (for the right-most domain of this rule, see 8.4). We regard this as an exceptional application of RPR, and it is possible that these three environments represent a broadening of the context of the RPR rule. We formalize Exceptional RPR (EXRPR) as

$$[L] \xrightarrow{\text{TMS}} [H] \quad / [H]_{OP} + [-\text{SYLL}]_R + \underline{\quad}$$

{ Indicative Present Positive  
 { Infinitive, Positive/Negative }

### 8.12 Rule Ordering

Because the function of UTA is to ensure that each syllable bears a tone, and that all unassociated tones are assigned a syllable, we regard it as applying before all other tone rules. Insofar as prior application of this rule, to 'set the stage' so to speak, is necessary however, we can show that it must precede only one other rule, namely AdlessL. Below we illustrate the incorrect and correct ordering:

(40)

IncorrectU: ha + hé + b<sup>h</sup>on + é

AdlessL:                   é

UTA:                    b<sup>h</sup>on éS: hahé**h**onéCorrectU: ha + hé + b<sup>h</sup>on + éUTA:                    b<sup>h</sup>on é (vacuous, H replaces H)

AdlessL:                   é

S: hahé**h**oné    'we don't see'

The list below illustrates the ordering of the rules other than UTA. Note however, that four of these rules (Pxol, SPLOW, DOWNSTEP and EXRPR) do not interact with any of the other rules, and are arbitrarily listed as applying last. The ordering between other non-interacting

rule-pairs is also arbitrary. For example SPLA and OPlessL apply in mutually exclusive contexts (Past Negatives and OP-less Positive Subjunctives respectively), and are ordered (1) SPLA (2) OPlessL, which is arbitrary. The fact that they both precede RPR however, is a necessary ordering.

1	SPLA
2	OPlessL
3	RPR
4	Adfu!R
5	LSR
6	AdlessL
7	IHR
8	PxoL
9	SPLow
10	DOWNSTEP
11	EXRPR

### 8.13 Surface Tone Melodies

In some MVCs which are not tonally basic, the combined effect of some of the rules we have postulated is to give the MVC in question a particular tonal melody on the surface, irrespective of the underlying tone class of the radical involved. For example in the Present Indicative Negative with following Adjunct, RPR, LSR and IHR combine to give the melody which we might abbreviate LH<sub>x</sub> (first syllable is L, and all the rest are H). This effect is shown with the radicals LOW rgb\*azj 'put to sleep', HIGH-1 hdm\*ozj 'cause to rest' and HIGH-2 xop\*o1 'remember':

(41) U: ha + ké + xo + rǝb\*azj + é...

RPR: xǝ

LSR: ázj

IHR: rǝb

S: hakéxǝrǝbázjé... 'I don't put you(sg) to sleep'

U: ha + ké + xo + hǝm\*ozj + é...

RPR: xǝ

LSR: ózj

S: hakéxǝhǝmózzjé... 'I don't make you(sg) rest'

U: ha + ké + xo + xǝp\*ǝl + é...

RPR: xǝ

S: hakéxǝxǝpǝlé... 'I don't remember you(sg)'

This treatment of tone melodies is different from some recent analyses of Bantu tone, for example Laughren (1984) for Zulu nouns or Odden (1984) for Shona verb stems, where it is claimed that the tone melodies are underlying and mapped directly onto (for Shona) MVCs.

It would be quite possible to handle tone melodies in Qh in this way, but in our view to do so would mean the unnecessary proliferation of theoretical apparatus for handling tone, since the very rules which we have shown create the tone melodies are independently required to account for alternations in what we might term non-melodic MVCs.

One such non-melodic MVC is the tonally basic Past Positive, on which the following tonal sequences (on

bisyllabic fused extended radicals with underlyingly L OP) may occur: LLLLL (axorqbazja 'he(1) put you to sleep'), LLHLL (axohómozja 'he(1) made you rest'), LLHHL (axoxópdia 'he(1) remembered you'), HLLLL (báxórqbazja 'they(2) put you to sleep'), HHLLL (báxóhómozja 'they(2) made you rest'), and HHHLL (báxóxópdia 'they(2) remembered you'). It is also possible with HIGH-2 monosyllabic radicals for only Hs to occur in this MVC, for example báxóqbóná 'they(2) saw you', so clearly this is a non-melodic construction. The point here however is that RPR, one of the melody-creating rules in other MVCs (see (41) above) is required in any case to raise the L OP xo '2ps' when it is preceded by a H SPy.

For this reason then, that melody-creating rules are independently required to account for alternations in non-melodic constructions, we consider tone melodies in Qh to be surface tone melodies, created accidentally, so to speak, by the combined effect of a number of 'local' rules operating on underlying structures.

It is possible that in those languages where all MVCs are *melodic* (we know of no examples however), the melodies have been created historically in the way we have suggested Qh melodies are created. By gradual lexicalization of the outputs of the rules (and levelling of any exceptions to the melodies, if there were any), underlying tone melodies would come into existence, and they would then be directly mapped onto MVCs.

## CHAPTER 9

tone alternations in other constructions

As we mentioned in Chapter 1, the Introduction, most attention was given in our tonal analysis to main verb constructions. To the extent that we did not divide our time more equally between these and other constructions, it is probable that some, possibly many, tone alternations in these other constructions were missed.

What we have found however, suggests that there is far less alternation in non-main verb constructions, and that tone is relatively simpler here.

What follows represents all of the non-main verb tone alternations we found in our corpus.

9.1 SPx-Auxiliary Lowering

In the Indicative Positive, SPx is lowered before the auxiliary verbs lé 'past progressive' and lá 'pluperfect (progressive)', for example:

(1) ke + lé (kébála)  
 → ke1é 'I was counting'

ké + lá (qabála)  
 → ke1á 'I had been counting'

Observe that the L-toned allomorphs of SPx C1 1, 4 and 9 are selected here, so the rule operates vacuously in these



cases, for example olé ábá 'he(1) was counting'.

By adding to the SLOW rule (see 8.8) the possible environments /\_\_\_+lḗ and /\_\_\_+lḗ, this alternation can be captured.

### 9.2 Noun, adjective and relative stems

With the exception of UTA in diminutive formation, these stems do not appear to be subject to tone rules at all.

The tones on these stems may thus be regarded as the underlying tones. These tones do not form underlying classes as those on verb radicals do. In other words, given that there are two tones in the language, the number of tone permutations on a stem  $n$  syllables long, would be  $n^2$ . Below, we illustrate all the possible tone sequences on stems of up to three syllables (the noun prefix, if there is one, is parenthesized):

(2)	H	(e)tjwá	'dog'
	HH	púlá	'rain'
	HHH	khúzáná	'orphan'
	HL	khái	'cloth'
	HHL	nyélérzi	'star'
	HLH	námané	'calf (animal)'
	HLL	phómolo	'rest'
	L	(i)tji	'fly'
	LL	tshero	'thorn'
	LLL	tabua	'(kind of) beetle'
	LH	thaqó	'hoof'
	LLH	chelerzi	'knee'

LHL	(1e)rochórzi	'drop'
LHH	(1e)xurzfmó	'roof'

### 9.3.0 Noun Prefix (NP) Raising Rules

The noun prefixes are listed below. Observe that they are all L except that of C1 2b:

(3)	<u>C1</u>	<u>NP</u>
	1	mo
	2	ba
	1a	ǝ
	2b	bǝ
	3	mo
	4	me
	5	le
	6	ma
	7	sje
	8	bí
	9	e ~ ǝ
	10	rzi
	14	bo
	15	xo

### 9.3.1 Copulative NP-Raising

In Present Participial Identificatives and Descriptive Copulatives, the L NP is raised when directly preceded by a H SPx, for example:

(4) ké + mo + cho  
 → kémócho                    'I am a person'

- lé. + ba + cho  
→ lébácho 'you are people'
- (5) bá + ba + cǎlǎlé  
→ bábáǎlǎlé 'they(2) are tall'
- sjé + sje + cǎna  
→ sjésjécǎna 'it(7) is big'
- (6) lé + sje + tábana  
→ lésjétábana 'he(5) is short'
- xó + mo + náce  
→ xómónáce 'it(15) is nice'

Examples (4) illustrate the Identificative Copulative, (5) the Descriptive Copulative with adjective stems, and (6) the Descriptive Copulative with relative stems.

A short note on the morphology of the Identificative Copulative is necessary here because this construction in Qh differs sharply from what is generally found in the rest of Sotho. As can be seen, NP-Raising occurs with the H 1st and 2nd person SPs. The 3rd person of this construction however is expressed by using the noun alone, without any kind of verbal prefix - so for example móndná may mean just 'man' or 'it/he is a man' and banóna 'men' or 'it is/they are men'.

K68:49 records other third person copulative prefixes, too/koo and te but our two main informants LM and KG were not familiar with these forms. K68:49 also records the form ke, which sometimes replaced the forms above, but claims that this form is 'onder die invloed van Tswana'. Our informants knew this ke form, and confirmed K68's claim, saying

that it was not Qh, but Tswana. When using it, they consistently did not spread its tone to the NP (presumably because this would have caused homophony with the 1st person form - see the first example in (4) above), thus 'he is a person' was kémocho (cf. kémócho 'I am a person'). In Tswana, Northern Sotho and Southern Sotho, the expected forms would be almost opposite to this, namely kémótho 'he is a person' and kemotho 'I am a person'.

Copulative NP-Raising is blocked, like RPR, if the L NP is penultimate and followed by a H, for example

- (7) lé + rzi + tjwá  
 → léritzjwá 'you are dogs'
- hé + xo + jd  
 → héxojá 'we are food'
- bá + ba + sá  
 → bábasá 'they(2) are young'

Note that no change occurs if there is no NP, for example

- (8) ó + tabua  
 → ótabua 'you are a beetle'

The rule can be formalized as

$$\begin{array}{c} [L] \\ \text{NP} \end{array} \rightarrow \begin{array}{c} [H] \\ \text{SPx} \end{array} / \begin{array}{c} [H] \\ \text{SPx} \end{array} + \underline{\quad}$$

unless input is penultimate and followed by H.

### 9.3.2 Associative NP-Raising

After the Associative Prefix lé, a L NP is raised, but only if the following tone is L, for example,

(9) lé + mo + tho  
 → lémotho 'with the person'

lé + xo + bala  
 → léxóbala 'and to count'

but lé + e + tǰwá  
 → léetǰwá 'with the dog'

lé + sje + múmú  
 → lésjemúmú 'and the deaf person'

The rule may be formalized as

$$[L]_{NP} \rightarrow [H] / [ǰ] + \text{_____} + L_{AssP}$$

### 9.3.3 Possessive NP-Raising and Possessive Prefix (PosP) Dissimilation

The PosPs are listed below. Note that they are all H-toned.

(10)	Cl	PosP
	1	wá
	2	bá
	3	wá
	4	yá
	5	lá
	6	á
	7	sǰá
	8	zá
	9	yá
	10	zǰá
	14	zǰwá
	15	xá

A L NP following a PosP becomes H unless it is penultimate and followed by a H, for example

(11) (sjerziba) sǰ + mo + cho

→ sǰmócho 'a person's well'

(mabǰlǰ) ǰ + ba + sézana

→ ǰbásézana 'a girl's breasts'

but (mosǰéǰ) wá + e + tjwá

→ wáetjwá 'a dog's tail'

This alternation may be incorporated into Copulative NP-Raising by including a possible PosP in its environment.

When a PosP is affixed directly to a stem (an NP-less noun, or a possessive pronominal stem) then it becomes L if the stem commences on a H, for example

(12) (thǰxǰ) yá + khǰrzú

→ yakhǰrzú 'a tortoise's head'

(thǰxǰ) yá + mé

→ yamé 'my head'

Compare (12) with (13) in which the stems commence on a L, and there is no change to the PosP:

(13) thǰxǰ yákwǰ 'his(f) head'

thǰxǰ yáphuchi 'the duiker's head'

The formalization of this rule is

$$[H]_{\text{PosP}} \rightarrow [L] / \text{---} + [H] \dots \begin{matrix} \text{Noun stem} \\ \text{Poss Pronominal stem} \end{matrix}$$

### 9.3.4 Locative Prefix Raising

In the Present Indicative Positive Descriptive Copulative when the LocP mɔ is preceded by a SPx, it is raised. This is not a true 'right prefix raising' rule however, since this morpheme is raised irrespective of the tone of the SPx, for example

- (14) hé + mɔ + etung  
       → hémgetung       'we are in the house'
- o + mɔ + etung  
       → omgetung       'he(1) is in the house'

Observe that this rule does not apply in the negative:

- (15) hahémgetung       'we aren't in the house'  
       haámgetung       'he(1) isn't in the house'

The rule is formalized as

$$\begin{array}{c} [L] \\ \text{LocP} \end{array} \rightarrow \begin{array}{c} [H] \\ \text{Present Indicative Positive} \end{array} / \text{SPx} + \underline{\hspace{2cm}}$$

This concludes our synchronic analysis of Qh phonology. In the limited time and space available, we have tried to be as comprehensive as possible in covering this field, but clearly there remains considerable research to be done on this topic.

PART II : THE HISTORICAL ANALYSIS



## CHAPTER 10

THE DEVELOPMENT OF SOTHO VOWELS

In this and the following two chapters, the Qh and all other Sotho forms are not given orthographically, but phonetically, in order to facilitate comparisons. Tones are not given here also, since they are irrelevant to the discussion.

There is no rationale behind our order of presentation (vowels in this chapter, and consonants in the following two), except perhaps that since there is less divergence among the Sotho languages vocally, it is easier to gain an overall picture by dealing with vowels first.

10.1 The Proto-Sotho (PS) Vowel Inventory

The Common Bantu (CB) vowel inventory is given by Guthrie as (labels extrapolated from his vowel chart on page 11, volume 1):

(i)	FRONT	CENTRAL	BACK	
	*i		*y	HIGH
	*ɨ		*u	LOWERED HIGH
	*e		*o	MID
		*a		LOW

The Sotho reflexes of these vowels are given overleaf in (2) and (3):

(2)	'sing/dance'	'cry'	'stand'	'count'
CB	*-bin-	*-did-	*-yem-	*-bad-
Qh	-bin-	-lel-	-em-	-bal-
Ts	-bin-	-lil-	-em-	-bal-
SS	-bin-	-lil-	-em-	-bal-
NS	-βin-	-lil-	-em-	-βal-
Pu	-βin-	-lil-	-em-	-βal-
Tl	-βin-	-lil-	-em-	-βal-
Lo	-βin-	-lil-	-em-	-βal-

a in reflexes of \*-bad- should be taken phonetically as low central (between cardinal vowels 4 and 5) but slightly fronted in Qh (see 2.3.0). The other symbols have their usual phonetic values.

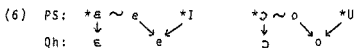
(3)	'roar'	'bite'	'get fat'
CB	*-dum-	*-dum-	*-non-
Qh	-ru <sup>◌</sup> m-	-lom-	-hɔ <sup>◌</sup> n-
Ts	-du <sup>◌</sup> m-	-lUm-	-nɔn-
SS	-du <sup>◌</sup> m-	-lUm-	-nɔn-
NS	-l <sup>◌</sup> u <sup>◌</sup> m-	-lUm-	-nɔn-
Pu	-l <sup>◌</sup> u <sup>◌</sup> m-	-lUm-	-nɔn-
Tl	-l <sup>◌</sup> u <sup>◌</sup> m-	-lUm-	-nɔn-
Lo	-l <sup>◌</sup> u <sup>◌</sup> m-	-lUm-	-nɔn-

u in the reflexes of \*-dum- is a high back but somewhat centralized vowel between [u] and [ɯ]. (The consonant symbol l represents an alveolar lateral flap.)

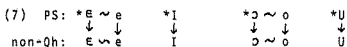
The reflexes of the mid CB vowels \*o and \*e appear in all Sotho as lowered mid ɔ and ɛ respectively. However, in all languages, these vowels have raised allophones if



allophones of  $*\underline{E} \sim e$  and  $*\underline{O} \sim o$  respectively, that is



This development has as its synchronic reflex in Qh, the rule of Vowel Harmony (VH), whereby lowered mid phonemes, by morphophonemic rule, become raised mid phonemes (see 6.1.0). In the other languages, VH, performing the same conversion phonetically, also occurs, but there it is not a morphophonemic rule, since the conversion is between allophones, not phonemes; that is, historically the development for non-Qhalaxarzi was



For the reflexes of CB  $*\underline{i}$ , we reconstruct PS  $*\underline{i}$ . There appears to be nothing controversial about this vowel.

For CB  $*\underline{u}$  we reconstruct in PS a high back centralized vowel,  $*\underline{u}^{\leftarrow}$ . It is important to assume the centralization of this vowel because (apart from the fact that it occurs as a reflex in all Sotho) we show in Chapter 11, that  $*\underline{u}^{\leftarrow}$  does not form part of the natural class of back (nor, for that matter, front) vowels.

Although all Sotho has central low (but fronted in Qh)  $\underline{a}$  as the reflex of CB  $*\underline{a}$ , we must assume that at PS, this vowel was in fact closer to the back position. This is because, as we show again in Chapter 11, PS  $*\underline{a}^{\leftarrow}$  (as we shall symbolize this backed central vowel) does form part of the natural class of back vowels, together with  $*\underline{U}$  and  $*\underline{O} \sim o$ .

The vowels of PS were thus:

(8) HIGH FRONT	*i	
LOWERED HIGH FRONT	*I	
RAISED MID FRONT	*e	} one phoneme
LOWERED MID FRONT	*E	
LOW CENTRAL BACKED	*a>	
LOWERED MID BACK	*ɔ	} one phoneme
RAISED MID BACK	*o	
LOWERED HIGH BACK	*U	
HIGH BACK CENTRALIZED	*u<	

To summarize our findings, the following table shows all the reflexes of PS vowels:

(9) CB	*i	*I	*e	*a	*o	*U	*u
PS	*i	*I	*E~e	*a>	*ɔ~o	*U	*u<
Qh	i	e	E e	a<	ɔ o	o	u<
Ts	i	I	E~e	a	ɔ~o	U	u<
SS	i	I	E~e	a	ɔ~o	U	u<
NS	i	I	E~e	a	ɔ~o	U	u<
Pu	i	I	E~e	a	ɔ~o	U	u<
Tl	i	I	E~e	a	ɔ~o	U	u<
Lo	i	I	E~e	a	ɔ~o	U	u<

Given that these were the vowel qualities found in PS, we now turn to other aspects of the development of vowels.

### 10.2 Double Vowels in CB

Guthrie reconstructs long syllables containing two like vowels in CB, for example in forms like *\*-daad-* 'sleep', *\*-beede* 'breast' and *\*-doot-* 'dream'. In all Sotho these double vowels have become single, and therefore there is

no reason to assume that they existed as double in PS. Examples of reflexes are given below in (10) (differences between CB and PS consonants in this and following tables are explained in Chapters 11 and 12):

(10)	CB	*-daad-	'sleep'	*-doot-	'dream'
	PS	*-laɫ-		*-lotʃh-	
	Qh	-laɫ-		-lɔg-	
	Ts	-laɫ-		-lɔr-	
	SS	-laɫ-		-lɔr-	
	NS	-laɫ-		-lɔr-	
	Pu	-laɫ-		-lɔr-	
	Tl	-laɫ-		-lɔʃ-	
	Lo	-laɫ-		-lɔr-	

(The symbols ʃ and tʃh represent a voiceless alveolar slit fricative, and a voiceless aspirated alveolar slit affricate respectively.)

It is surmised that the merger between double- and single-vowel syllables arose through the introduction of Prepausal Penultimate Lengthening (PPL) (see 2.5). This rule occurs in all Sotho (indeed in all South-eastern Bantu) and may be presumed to have been part of PS (though it does not appear to have existed in CB).

By the application of this rule, all original single-vowel syllables which were penultimate, would have come to have long (or double) alloforms. For example, pre-PS \*-non- 'get fat' would have been \*-no:n- (or \*-nonn-) in penultimate position, but \*-non- elsewhere. We suggest that by analogy, original double-vowel syllables came to have single-vowel alloforms which occurred just in non-penultimate position. Thus for example, pre-PS \*-laal- 'sleep'

would not have been lengthened by PPL because it was already long, but it came instead to have the single-vowel alloform *\*-laɪ-* which occurred non-prepausally. Such a form would ultimately have been reinterpreted as single-vowelled underlyingly. The derivation below summarizes this tentative solution:

(11) Pre-PS:	*-laaɪ-	*-noɪn-	
PPL:	-	~	-noɪn-
Analogy:	-laɪ- ~	-	
PS:	*-laɪ-	*-noɪn-	
	(by PPL -la:l-)	(by PPL -no:n-)	

### 10.3.0 Other vowel sequences

Apart from sequences of two like vowels in CB occurring within a morpheme, two like vowels could occur with a morpheme-boundary intervening, or two different vowels could occur either *within* or *across morphemes*. To some extent the development of such sequences was morphologically determined, as we show below.

#### 10.3.1 \*Ca-shaped monosyllabic radicals

All \*Ca-shaped radicals, for example *\*-pa-* 'give', lost the a when a suffix, inevitably vowel-commencing, was added to it. Since in all Sotho, such originally monosyllabic radicals now contain no vowel, we assume that this deletion of \*a had occurred by PS. Examples of reflexes are:

(12)	CB	*-pa+a	'give'	*-pa+o	'gift'
	PS	*-ph+a		*-ph+o	
	Qh	-fa		-pho	
	Ts	-fa		-pho	
	SS	-fa		-pho	
	NS	-fa		-pho	
	Pu	-fa		-pho	
	Tl	-fa		-pho	
	Lo	-fa		-pho	

10.3.2 Coalescence or deletion with certain CB \*i- or \*i-commencing elements

Coalescence resulted between morpheme-final \*a and morpheme-initial \*i or \*i, giving \*e, if the \*i or \*i belonged to

- (i) the locative suffix \*-ini;
- (ii) the noun stem \*-yini 'owner';
- (iii) the possessive pronominal stems \*-yitu 'our' and \*-yinu 'your(pl)'.

(In the case of (ii) and (iii) the initial \*y had been lost by the time of PS - see below in 10.6, and these forms must have been PS \*-ini, \*-itʔhU and \*-inu respectively.)

If any vowel other than a preceded these forms, then the initial \*i or \*i was simply deleted. Below, examples using the locative suffix are given:



(13) CB \*-dɪba+ini 'in the well' \*-yico+ini 'in the eye'

PS *-ɭiβa+ini	*-ɪcho+ini
Qh -riβeŋ	-iɽoŋ
Ts -diβeŋ	-itʰoŋ
SS -diβeŋ	-iɽoŋ
NS -ɭiβeŋ	-iɽoŋ
Pu -dʰiβeŋ	-itʰoŋ
Tl -ɭiβeŋɪ	-itʰoŋɪ
Lo -ɭiβeŋɪ	-itʰoŋɪ

In addition, coalescence resulted between \*a-terminating subject prefixes and an original \*ɪ indicating the participial in verbs in Qh, but in all other Sotho this participial \*ɪ must have been lost, irrespective of the preceding vowel. For example, compare Qh bebina 'they(2) singing' (from \*ba+ɪ+bin+a) with other Sotho babina (Ts, SS) or βaβina (all other).

The alternations left over from historical coalescence in Qh have been dealt with under the heading 'Old Coalescence' in 6.7.

### 10.3.3 Yet other sequences - desyllabification

In other cases only high or lowered high vowels could occur as the first vowel in two-vowel sequences.

If the first vowel was PS \*u or \*ɯ, this desyllabified to w, but subsequently, if preceded by a proto-bilabial, was deleted in some languages, and converted to y in others (there are also some cases of irregular w-deletion in what are otherwise 'w-retaining' languages). The table below illustrates these possibilities:

(14)	'fight'	'dog'	'be slaughtered'
CB	*-du+a	*-b $\dot{y}$ a	*-cab+u+a
PS	*-l $\dot{w}$ +a	*-b $\dot{w}$ a	*-cha $\beta$ +w+a
Qh	-lwa	-t $\dot{s}$ wa	- $\dot{y}$ a $\dot{z}$ wa
Ts	-lwa	-t $\dot{s}$ a	-t $\dot{h}$ ad $\dot{z}$ wa
SS	-lwa	-t $\dot{s}$ a	- $\dot{h}$ ad $\dot{z}$ wa
NS	-lwa	-p $\dot{s}$ a	- $\dot{h}$ a $\beta$ $\dot{z}$ a
Pu	-lwa	-p $\dot{s}$ a	-c $\lambda$ a $\beta$ $\dot{z}$ a
Tl	-lwa	-p $\dot{y}$ a	- $\dot{t}$ $\dot{h}$ a $\beta$ $\dot{y}$ a
Lo	-lwa	-b $\dot{y}$ a	- $\dot{t}$ $\dot{h}$ a $\beta$ $\dot{y}$ a

As can be seen from this table, the desyllabification of \*u and \*u is considered to have been complete by PS. The subsequent deletion of PS \*w, or its conversion to y, is discussed in Chapter 12, together with the changes caused to a preceding bilabial by this consonant.

If the first vowel in an unlike two-vowel sequence was a front vowel, this desyllabified to \*y. There is no direct evidence of this \*y however, since in all languages, after causing a change to the preceding consonant, this sound was deleted (only occasionally converted to w). The changes caused by this sound at all places of articulation however, are consistent with the sorts of changes which are commonly associated with a following front glide, and on this basis we assume \*y, as desyllabified CB \*i or \*i, existed in PS. Examples are:

(15)	'new'	'ask/tell'	'tree stump'
CB	*-pia	*-buudi+a	*-kia
PS	*-phya	*-βUly+a	*-khya
Qh	-sa	-boža	-ša
Ts	-ša	-bUtsa	-sa
SS	-tšha	-bUtsa	-sa
NS	-φsa	-βUtša	-sa
Pu	-tshwa	-βUtša	-sa
Tl	-swa	-βUtša	-sa
Lo	-swa	-βUdža	-sa

Details of the changes caused by a following \*y to a preceding consonant will be discussed in Chapter 12, together with the subsequent deletion of \*y or its conversion to w.

Desyllabification as a synchronic process in Qh has been dealt with in 4.1.

#### 10.4 Vowel Absorption

Vowel Absorption refers to the transference of the syllabicity and tone of a vowel to a preceding sonorant (l or a nasal) consonant with the simultaneous deletion of the vowel itself. This development has affected particularly the sequences CB \*ni and \*ni in preconsonantal or word-final positions, for example

(16)	CB	*ni- 'me'	*-ini 'LocS'	*yanj 'grass'
PS	*N-		*-InI	*-anI
Qh	N-		-(e)ŋ	-aŋ
Ts	N-		-(I)ŋ	-aŋ
ʃ	N-		-(I)ŋ	-aŋ
NS	N-		-(I)ŋ	-aŋ
Pu	N-		-(I)ŋ	-aŋ
T'	ʃ-		-(I)pI	-apI
Lo	N-		-(I)pI	-apI

In all cases the 1psOP, CB \*ni-, has become a syllabic nasal, which is homorganic with the initial consonant of the radical which would follow it. Because of this general Sotho agreement we assume that vowel absorption had already applied by PS. (Note that Guthrie (volume 4) actually gives non-syllabic \*n as his CB form for this morpheme, but the fact that it is everywhere syllabic in Sotho suggests an NV-shaped ancestor, something like ni, which occurs fairly widely for 1psOP and 1ps SP in modern central and eastern languages, for example Zambian Tonga and Swahili.)

In word-final position vowel absorption has failed to apply in Tl and Lo, so for morphemes in these cases, PS must be reconstructed as not yet having undergone this process. (The changes in place of articulation in these word-final forms will be handled in Chapter 12.)

Vowel absorption has sporadically affected other sequences containing alveolar nasal plus some other vowel than PS \*i or \*I, and in some languages all CB sequences \*did, \*ded and \*dud (PS \*IiI, \*IeI and IUI respectively) have undergone vowel absorption, for example

(17)	'man'	'smell'	'fire'	'Applied Ext (x2)'
CB	*-nuna	*-nunk-	*-dido	*-eded-
PS	*-nUna	*-ŋkh-	*-lIlɔ	*-eIeI-
Qh	-nɔna	-ŋtʂh-	-leIɔ	-eIeI-
Ts	-ŋna	-ŋkxh-	-lIlɔ	-eIeI-
SS	-ŋna	-ŋkxh-	-lIɔ	-eIi-
NS	-ŋna	-ŋkxh-	-lIɔ	-eIi-
Pu	-ŋna	-ŋkxh-	-lIɔ	-eIi-
Ti	-ŋna	-ŋkh-	-lIɔ	-eIi-
Lo	-ŋna	-ŋkh-	-lIɔ	-eIi-

The CB sequence \*mu, if representing the C1 1 or 3 NP, or the C1 2 OP, also underwent vowel absorption, but this only occurred if \*mu preceded a bilabial (\*b, \*p \*m) in Qh, NS, Pu, Ti and Lo, and only a voiced bilabial (\*b or \*m) in Ts and SS, for example:

(18)	'seer(1)'	'body(3)'	'padkos(3)'
CB	*mu+bonj	*mu+midj	*mu+pako
PS	*m+boni	*m+mIlI	*mu+phakɔ
Qh	mboni	mwele	mɣaxɔ
Ts	mmonj	mmIlI	mUfaxɔ
SS	mmonj	mmIlI	mUfaxɔ
NS	mmonj	mmIlI	mɣaxɔ
Pu	mmonj	mmIlI	mɣaxɔ
Ti	mmonj	mmIlI	mɣahɔ
Lo	mmonj	mmIlI	mɣahɔ

This development, leading to the alternation between mu and m (Qh mu and m) has been dealt with synchronically for Qh in Back Vowel Absorption in 6.5 (Observe that the

conversion of b to m does not take place in Qh.) As was shown in 6.5, vowel absorption has been extended in Qh to apply also to the locative prefix mo, but this has not happened elsewhere, for example compare Qh m+mozIng 'in the village' with Ts mo+mUtsIng. (In some languages this morpheme does not occur at all of course, for example SS g+mU+tsIng.)

Note finally that in Qh forms such as phaXɔ 'padkos', we assume that absorption had taken place before the PS \*ph became fi (see Chapter 11), that is, while the proto-sequence \*mU was still followed by a bilabial.

#### 10.5 Exceptional vowel developments

In a few cases Sotho vowels do not correspond as given in table (9) on page 144. Occasionally a proto-vowel develops into a phonetically adjacent (on the vowel chart) vowel, instead of its regular reflex. Examples of some exceptions (marked in the table with 'X') where \*a has become e instead of a, and \*I, i instead of I, are given below:

(19) CB \*mpaka 'wild cat'      \*ncimbi 'iron'

PS	*mphakha	*ntšhImbI
Qh	phaXɛ X	tšhepe
Ts	phaxe X	tšhipi X
SS	phaha	tšhIpI
NS	phaɣa	tšhipi X
Pu	phaɣa	tšhipi X
Tl	phaha	tšhipi X
Lo	phaha	tšhibi X

### 10.6 Glides

Apart from the vowels, Guthrie reconstructs one glide for CB, namely \*y. This sound is everywhere deleted in Sotho, and it is therefore not necessary to reconstruct it in PS. (A glide \*y however, from CB \*g or in some circumstances from a front vowel - see 10.3.3 - must be reconstructed for PS. The \*y from CB \*g is dealt with in the following chapter.)

Examples showing these zero reflexes are:

(20) CB	*-yem-	'stand'	*-yino	'tooth'
PS	*-em-		*-ino	
Qh	-em-		-ino	
Ts	-em-		-ino	
SS	-em-		-ino	
NS	-em-		-ino	
Pu	-em-		-ino	
TI	-em-		-ino	
Lo	-em-		-ino	

## CHAPTER 11

THE DEVELOPMENT OF SOTHO CONSONANTS IN NON-SIBILANTIZING ENVIRONMENTS

For ease of exposition we discuss the development of Sotho consonants in two chapters, according to whether they stood originally in sibilantizing environments or not. By 'sibilantizing environment' we mean preceding a vowel or glide which caused the consonant to become an alveolar or alveopalatal sibilant (that is, s, tsh, z, ts, ʒ, tʃh, ʒ or tʃ in Qh or the cognates of these in the other languages).

In this chapter we deal only with non-sibilantizing environments, and exclude the sibilantizing ones. The latter are

- (i) for bilabials, following glides w or y;
- (ii) for alveolars, following glide y;
- (iii) for palatals, following glide y, or a following front vowel;
- (iv) for velars, following glide y, or a following front vowel.

In addition to these environments, we exclude also the analogous changes undergone by

- (v) bilabial nasals, preceding w;
- (vi) alveolar nasals, preceding the glide y, or high front vowels.



(i) to (vi) are dealt with fully in Chapter 12.

### 11.1 Common Bantu Consonant Inventory

Guthrie reconstructs the CB inventory of consonants as follows:

(1)	*b	*mb	*p	*mp	*m
	*d	*nd	*t	*nt	*n
	*j	*ɲj	*c	*ɲc	*ɲ
	*g	*ŋg	*k	*ŋk	*ŋ

The forms with nasals preceding are regarded by Guthrie as units, but since these forms occurred not only lexically, for example in the radical \*-damb- 'get hungry/tired', but could also be derived, for example \*ŋg in the noun \*ŋgy 'sheep', where \*ŋ is the Cl 9 NP and \*-gy the noun stem, we shall treat these forms all as clusters of HOMORGANIC NASAL + CONSONANT. With the restriction that this was the only type of clustering allowed in CB, we can thus simplify the CB consonant inventory to

(2)	*b	*p	*m
	*d	*t	*n
	*j	*c	*ɲ
	*g	*k	*ŋ

We shall use system (2) above as the reference point in attempting to reconstruct PS from the Sotho correspondences given below.

### 11.2.0 The Development of Nasals

This section is divided into the development of nasals

in (1) prevocalic position and (2) preconsonantal position.

### 11.2.1 Nasals in Prevocalic Position

Firstly, we can find no Sotho reflexes of Guthrie's \*ŋ prevocalically. He himself expresses doubt as to whether this sound was distinct from the cluster \*ŋg. We will assume that prevocalic \*ŋ did not exist in PS.

The reflexes of prevocalic CB \*m, \*n and \*ŋ are relatively straightforward:

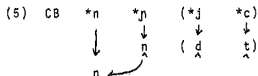
(3)	'Cl 6 NP'	'get fat'	'meat'
CB	*ma-	*-non-	*n+ama
Qh	ma-	-nɔn-	nama
Ts	ma-	-non-	nama
SS	ma-	-non-	nama
NS	ma-	-non-	nama
Pu	ma-	-non-	nama
Tl	ma-	-non-	nama
lɔ	ma-	-non-	nama

In all languages \*m has the reflex m, and this needs no further discussion.

In Qh, \*n and \*ŋ merged to dental n. This must have occurred after the palatal series as a whole (see below) had become dentals, thus the historical derivation of these nasals for Qh would have been:

(4)	CB	*n	*ŋ	(*j)	(*c)
		(	↓	↓	↓
			n	( d	t)
			↓	↓	↓
			n	↓	↓
			↓		
			n		

In T1 and Lo, the non-nasal palatals also became dental, as probably did the nasal, but here the merger of nasals was in the opposite direction, thus



In all other languages except Pu, the palatals became alveolar (the non-nasals laterally released), so for the nasals this represents a one-step merger:



In Pu the non-nasals palatals remained palatal (but became laterally released), but the nasal merged with the alveolar nasal:



In order to explain the different directions of merger in Qh, and in T1 and Lo respectively, it is necessary to assume that the alveolar and palatal nasals were distinct at the time of PS.

Thus the prevocalic nasals of PS were: \*m, \*n and \*ɲ.

#### 11.2.2 Nasals in Preconsonantal Position

We will assume that lexical preconsonantal nasals were not specified for place of articulation in CB, since only homorganic clusters could occur. The place of articulation of the preceding nasal would thus be copied

from the following consonant by rule. Using the symbol 'N' to represent 'nasal unspecified for place', proto-forms such as *\*-damb-* 'get hungry/tired', *\*-dand-* 'follow' and *\*-teng-* 'buy' would have been derived by a Nasal Assimilation (NA) rule as follows:

(8)	U:	<i>*-daNb-</i>	<i>*-daNd-</i>	<i>*-teNg-</i>
	NA:	m	n	ŋ
	S:	<i>*-damb-</i>	<i>*-dand-</i>	<i>*-teng-</i>

Of the derived prenasal nasals, C1 9 NP, ROP and ipsOP, the C1 9 NP was specified underlyingly for place, because when it appeared preceding a vowel-commencing stem, it had a surface place of articulation which was not predictable from the following vowel segment. Preceding a vowel-commencing stem, the C1 9 NP nasal was palatal, for example in *\*n+ama* 'meat'. (Guthrie in fact reconstructs this and similar words as *\*n+yama*, but if this was the case, then it seems that at an early stage of CB the *\*y* of the stem fused with the C1 9 alveolar prefix *\*n*, to give a palatal C1 9 NP preceding the (now) vowel-commencing stem.) Preceding a consonant-commencing stem, the underlying *\*n*, by Nasal Assimilation, became homorganic with the following consonant, for example

(9)	'sheep'	'dog'	but: 'meat'
U:	<i>*n+gʷ</i>	<i>*n+bʷa</i>	<i>*n+ama</i>
NA:	ŋ	m	-
S:	<i>*ngʷ</i>	<i>*mbʷa</i>	<i>*nama</i>

The other derived prenasal nasals were the unspecified N in *\*-viN-* 'ROP' and the syllabic *\*-N-* 'ipsOP'

from the following consonant by rule. Using the symbol 'N' to represent 'nasal unspecified for place', proto-forms such as *\*-damb-* 'get hungry/tired', *\*-dand-* 'follow' and *\*-teng-* 'buy' would have been derived by a Nasal Assimilation (NA) rule as follows:

(8) U: *\*-daNb-*    *\*-daNd-*    *\*-teNg-*  
 NA:        m            n            ŋ  
 S: *\*-damb-*    *\*-dand-*    *\*-tegg-*

Of the derived preconsonantal nasals, C1 9 NP, ROP and IpsOP, the C1 9 NP was specified underlyingly for place, because when it appeared preceding a vowel-commencing stem, it had a surface place of articulation which was not predictable from the following vowel segment. Preceding a vowel-commencing stem, the C1 9 NP nasal was palatal, for example in *\*n+ama* 'meat'. (Guthrie in fact reconstructs this and similar words as *\*n+yama*, but if this was the case, then it seems that at an early stage of CB the *\*y* of the stem fused with the C1 9 alveolar prefix *\*n*, to give a palatal C1 9 NP preceding the (now) vowel-commencing stem.) Preceding a consonant-commencing stem, the underlying *\*n*, by Nasal Assimilation, became homorganic with the following consonant, for example

(9) 'sheep'    'dog'            but: 'meat'  
 U: *\*n+gu*    *\*n+bɣa*            *\*n+ama*  
 NA:    ŋ            m                    -  
 S: *\*ŋgu*        *\*mbɣa*            *\*nama*

The other derived preconsonantal nasals were the unspecified N in *\*-yiN-* 'ROP' and the syllabic *\*-N-* 'IpsOP'



the lengthening, and hence the syllabicity, of nasals, was reanalysed as underlying. From this point on then, two types of underlying syllabic nasals existed: *\*-N-*, the 1psOP, and *\*-ŋ-*, the Cl 9 NP, occurring before monosyllabic noun stems (and allomorph of nonsyllabic *\*-n-*, occurring only before polysyllabic noun stems).

We are now in a position to investigate the reflexes of the different kinds of prenasal nasals, these being:

- (i) syllabic *\*-N-* '1psDP';
- (ii) syllabic *\*-ŋ-* 'Cl 9 NP' preceding monosyllabic stems;
- (iii) nonsyllabic nasals.

The table below illustrates:

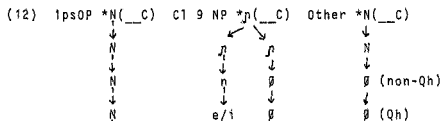
(11)	<u>SYLLABIC</u>		<u>NONSYLLABIC</u>		
	'count me' 'sheep'		'buy'	'impala'	'count oneself'
CB	<i>*-N+bad-</i>	<i>*ŋ+gu</i>	<i>*-teŋg-</i>	<i>*ŋ+pada</i>	<i>*-yŋ+bad-</i>
Qh	-mpal-	iku	-reŋ-	phala	-ipal-
Ts	-mpal-	ŋku	-rek-	phala	-ipal-
SS	-mpal-	ŋku	-rek-	phala	-ipal-
NS	-mpal-	ŋku	-rek-	phala	-ipal-
Pu	-mpal-	ŋku	-ʔek-	phala	-ipal-
Tl	-mpal-	ŋku	-rek-	phala	-ipal-
Lo	-mbal-	ŋgu	-reg-	phala	-

(Note that Lo does not use a reflex of *\*-yŋ-* for ROP.)

From this table it can be seen that in all cases the nonsyllabic prenasal nasals have been deleted. The syllabic nasals have been retained, except that in Qh

a further development has occurred, that of vocalization of the (l 9 NP nasal to e (or with lexicalized Vowel Harmony -see 6.1.0- as in the case of iku, to i). (There are a few cases where vocalization did not happen however, for example \*n+ca → ntha 'edge/point'. In such cases the nasa? is reckoned synchronically as part of the noun stem, since in forming the plural the Cl 10 NP does not replace it, as it does e- or i-). Cf. ikú/rzikú 'sheep(sg)'-sheep(pl)' with nthá/rzi! thá 'point/points'.)

The diagram below summarizes the developments of preconsonantal nasals:



We will assume that at PS the situation was as given in the second line of this development, that is

(13) \*N- '1psOP' \*n- ~ n- 'Cl 9 NP' \*N (other)

### 11.3.0 The Development of Voiced Consonants

We divide this section into the development of voiced consonants (1) in intervocalic or word-initial position (abbreviated henceforth as 'i-v/w-i') and (2) in pos'nasal position.

#### 11.3.1 Voiced consonants in i-v/w-i position

The reflexes of CB bilabials and palatals are relatively

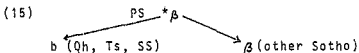


straightforward:

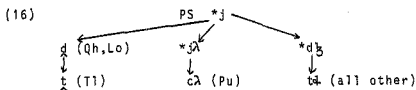
(14)	CB	*ba-	'C1 2 NP'	*-jam-	'bind'
	Qh	ba-		-ɖam-	
	Ts	ba-		-tɬam-	
	SS	ba-		-tɬam-	
	NS	βa-		-tɬam-	
	Pu	βa-		-cɬem-	(exceptional vowel)
	Tl	βa-		-ɬam-	
	Lo	βa-		-ɖam-	

On weak grounds we regard the PS ancestor of the reflexes of CB \*b as the -STOP segment \*β, rather than Guthrie's \*b. In support of this we note that a -STOP reflex is generally more widely found in Bantu than a +STOP one.

This assumption for Sotho implies the historical derivation



For the CB palatal \*j there seems to be no principled way of deciding whether the PS segment was dental (as in Qh, Tl and Lo), alveolar laterally released (as in Ts, SS and NS), palatal laterally released (as in Pu), or anything else, and for this reason we shall simply regard palatal \*j (the same as Guthrie's CR sound) as the PS ancestor. This assumption entails the historical changes to these three places of articulation, as well as the devoicing in all but Qh and Lo, as follows:



Note that intermediate voiced laterally released reflexes are not attested.

The reflexes of CB \*d differ according to whether \*d was followed by one of the high vowels, CB \*i or \*y, or by some other vowel. These reflexes are given below (lowered high \*i and \*y here representing any vowels other than the highest vowels):

(17)

	'Cl 10 NP'	'roar'	'Cl 5 NP'	'bite'
CB	*dj-	*-dym-	*di-	*-dum-
Qh	ri-	-rum-	le-	-lom-
Ts	di-	-dum-	ʔi-	-ʔum-
SS	di-	-dum-	ʔi-	-ʔum-
NS	ʔi-	-ʔum-	ʔi-	-ʔum-
Pu	dʃi-	-dʃum-	ʔi-	-ʔum-
Tl	ʔi-	-ʔum-	ʔi-	-ʔum-
Lo	ʔi-	-ʔum-	ʔi-	-ʔum-

Given the differences between the reflexes preceding CB \*i and \*y versus their complete agreement before the other vowels, we will assume that the ancestor of all of these reflexes was simply PS \*j, and that Qh r, Ts and SS d, Pu dʃ and NS, Tl and Lo ʔ developed after PS out of \*j preceding the highest vowels. Of these latter sounds, ʔ probably developed first, giving way later to d, dʃ or r in the respective languages.

The reflex of CB \*g is most commonly  $\emptyset$  (zero), but in most languages \*g has the reflex  $\underline{y}$  if it occurred as the final consonant of a verb radical. Examples are:

## (18) 'divide' 'elephant' 'return'

CB	*gab-	*njogu	*bug-
Qh	-ab-	$\lambda$ ou	-bo- or -boy-
Ts	-ab-	t $\lambda$ ou	-bu-
SS	-ab-	t $\lambda$ ou	-bu $\underline{y}$ -
NS	-a $\beta$ -	t $\lambda$ ou	- $\beta$ u $\underline{y}$ -
Pu	-a $\beta$ -	c $\lambda$ ou	- $\beta$ u $\underline{y}$ -
Tl	-a $\beta$ -	$\lambda$ ou	- $\beta$ u $\underline{y}$ -
Lo	-a $\beta$ -	gou	- $\beta$ u $\underline{y}$ -

Note that in Qh the deletion of radical-final CB \*g was optional (see 6.8 where we have analysed these possibilities as optional  $\underline{y}$ -Addition, considering the forms without  $\underline{y}$  to be underlying since they occur more frequently).

From table (18) above it would appear that there is no need to reconstruct a voiced velar consonant at all in PS, but only the proto-segment \* $\underline{y}$ , which was lost in Ts, and optionally deleted in Qh. However, in the following section we shall show that radical-initially a proto voiced velar must have been retained underlyingly, since when otherwise vowel-commencing radicals such as -ab-/-a $\beta$ - 'divide' follow a nasal in derivation, the velar element surfaces (except in Qh - see below). Consider for example the Lo forms: a $\beta$ a 'divide!', but g $\beta$ a $\beta$ e 'divide me!'. This suggests that underlyingly this form contained the initial  $\underline{g}$  which was deleted except when occurring postnasally. On

the other hand, in reflexes of CB \*njogy 'elephant' and \*-bug- 'return', the \*g was deleted or converted to y once and for all, since in these positions it could never in a derivation come to occur postnasally.

The following is a summary of the PS position regarding voiced consonants in i-v/w-i position:

- (i) \*β became b in Qh, Ts and SS, and remained β elsewhere;
- (ii) \*j became ɟ in Qh and Lo, ʒ in Tl, cɰ in Pu, and tʃ in Ts, SS and NS;
- (iii) \*l remained l in all languages preceding all but the highest vowels, preceding which it became ɭ in NS, Tl and Lo, d in SS and Ts, ɖ in Pu, and r in Qh;
- (iv) \*g occurred underlyingly in radical-initial position, and remained g in this position in all languages except Qh (see following section). Probably even at the PS stage, this \*g was deleted by rule unless in a derivation it came to follow a nasal. This rule has been retained by non-Qh Sotho. Radical-final \*g of CB did not exist in PS., but had already been converted to \*y, which was deleted in Ts, optionally deleted in Qh, and retained in the other languages. All other instances of CB \*g had already been lost by PS, and thus have  $\emptyset$  reflexes in all Sotho.

### 11.3.2 Voiced consonants in postnasal position

The reflexes of the PS voiced consonants in postnasal position are always +STOP segments, so for those segments reconstructed in i-v/w-i position as -STOP, that is bilabial \*β and alveolar \*ɺ, we must postulate +STOP allophones which occurred just postnasally. These +STOP allophones occurred in lexical nasal clusters, or were converted from the -STOP allophones in derived nasal clusters. Exemplifying for instance from the bilabial position, +STOP \*b would have occurred lexically in \*-[amb- 'get hungry/tired' or would have been converted from \*β in a derivation such as \*-[βal- → \*-[mbal- 'count me'. The rule converting -STOP to +STOP postnasally we shall call Postnasal Stopping. This is the ancestor of part of the allomorph selection process in modern Qh (and other Sotho too) which was dealt with in 5.4 also under the heading 'Postnasal Stopping'.

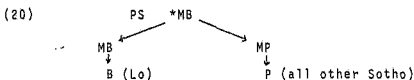
Palatal \*j and velar \*g, for which there is no evidence of their being -STOP, we must assume occurred as +STOP both in i-v/w-i and postnasal positions.

The modern reflexes of voiced consonants in postnasal position are shown below in (19). All examples cited here involve cases in which nasal deletion (see 11.2.2) subsequently took place.

(19) 'get tired' 'urinate' 'hand' 'instrumental P'

CB	*-damb-	*-tund-	*-ganja	*oga-
Qh	-lap-	- <sup>o</sup> oc-	-a <sub>A</sub> ja	qa-
Ts	-lap-	-rUt-	-at <sub>A</sub> ja	ka-
SS	-lap-	-rUt-	-at <sub>A</sub> ja	ka-
NS	-lap-	-rUt-	-at <sub>A</sub> ja	ka-
Pu	-lap-	-rUt <sub>F</sub> -	-ac <sub>A</sub> ja	ka-
Tl	-lap-	-rUt <sub>F</sub> -	-a <sub>A</sub> ja	ka-
Lo	-lab-	-rUd <sub>F</sub> -	-a <sub>A</sub> ja	ga-

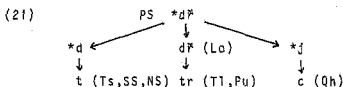
Observe firstly that except in Lo the reflexes are voiceless. To account for the Lo data however, we must assume that in PS these forms were voiced, and that Postnasal Devoicing (see 5.4 for the synchronic version of this rule in Qh) occurred, prior to nasal deletion, in all languages except Lo. This gives us the following historical development (using the upper case symbols 'M', 'B' and 'P' to represent nasals, voiced stops and voiceless stops respectively at any place of articulation):



Note that the intermediate forms still with a nasal are found only when that nasal was syllabic (and thus not subject to nasal deletion).

Concerning changes in place of articulation, the bilabials are the least controversial, since all languages have a bilabial stop in this position. We assume therefore that the PS was \*b, becoming p by development (20) except in Lo, where it remained b.

For the alveolars, the simplest derivation to the modern reflexes can be given if we assume that the alveolar slit affricate  $*dʃ$  was the ancestor. This implies for Qh, the change in lingual articulation from APICAL to LAMINAL, with some tongue-backing to a more palatal position, and the loss of affrication. For Ts, SS and NS the change involves simply the straightforward loss of affrication. For the other languages (Lo, Tl and Pu) there has been no change in place of articulation. The development of our PS  $*dʃ$  is shown below:



Note that the intermediate voiced forms  $*d$  and  $*j$  are not attested.

We regard  $*dʃ$  as being the most likely ancestor here, because, by the loss of affrication in the modern reflexes, the changes can be thought of as simplificatory as opposed to complicating changes, which would be the case if the affrication were to have been added to the proto-form.

For the palatals, we assume that  $*j$  was the PS form postnasally, and that its development into dentals, laterally released alveolars and palatals arose as given in (16) on page 164. Note that the Qh change in (21), that is  $*dʃ \rightarrow *j$  ( $\rightarrow c$ ) must have occurred after that in (16), that is  $*j \rightarrow d$ , otherwise there would have been a merger between reflexes of PS palatals and alveolars. Note also, that in all languages other than Qh and Lo, the reflexes of  $*j$  became devoiced whether preceded by a nasal or not - compare the reflexes of  $*njogw$  'elephant' in (18) with those of  $*-jam-$  'bind'

in (14). (In Lo there is of course no devoicing at all, and in Qh, devoicing of the \*j reflex occurred only postnasally, as for other places of articulation.)

PS \*g was devoiced postnasally except in Lo (see reflexes of \*nga- 'Instrumental Prefix' in (19) on page 168). In Qh, preceding the back vowels \*a>, \*ɔ and \*u, this velar became uvular, as also shown in (19). Preceding centralized \*u< however, the velar remained velar, as exemplified in the word iku, 'sheep', from \*ngu<, by Postnasal Devoicing and Nasal Vocalization (cf. with Lo ngu, and all other Sotho nku).

As mentioned in the preceding section, radical-initial \*g must be considered to have been underlyingly present in PS, since, except in Qh, when a nasal precedes such a modern-day radical, the velar actually surfaces. Examples of this are given below:

(22) 'divide me'		'portion(9)'
CB	*-N+gab-	*n+gab+o
Qh	-ŋab-	qabɔ
Ts	-ŋkab-	kabɔ
SS	-ŋkab-	kabɔ
NS	-ŋkaβ-	kaβɔ
Pu	-ŋkaβ-	kaβɔ
Tl	-ŋkaβ-	kaβɔ
Lo	-ŋgaβ-	gaβɔ

We assume the PS articulation of these forms to have been \*-N+gag- and \*n+gagɔ respectively, with the development of the voiced velar (except in Qh) as given in (20), page 168, showing devoicing (except in Lo) and nasal deletion



in the C1 9 noun, except where the nasal was syllabic.

In Qh the velar has been deleted underlyingly in the verb, but where the verb has been converted to a C1 9 noun, the velar (or uvular, in the case of qabɔ 'portion' in (22)) is retained. A reasonable explanation of this change would be that originally deverbatively derived nouns such as \*n+gaβɔ came to have independent lexical representation (in this case presumably \*nggaβɔ) and so the velar in such forms were always preceded by a nasal. On the other hand, in a radical stored originally as lexical \*-gaβ- 'divide', the \*g would only be preceded by a nasal in two morphological settings (followed by 1psOP \*-N- or ROP \*-iN-) and the deletion of \*g here would have represented the levelling of irregular allomorphy (which levelling however did not happen in the rest of Sotho). Observe also that the levelling of this exception in Qh resulted in this language's having two allomorphs of the ROP (for the synchronic treatment of this allomorphy see 5.4 (14), page 59). Compare Qh and Ts in this respect:

(23)	'see oneself'	'divide oneself'
PS	*-iN+βan-	*-iN+gaβ-
Qh	-ipɔn- (i+pɔn)	-inab- (in+ab)
Ts	-ipɔn- (i+pɔn)	-ikab- (i+kab)

In Qh, where the radical-initial \*g has fallen out, as in 'divide oneself', the original nasal of the ROP \*-iN- was retained, since it had come to be no longer preconsonantal. However, where a radical-initial consonant does occur, as in 'see oneself', the nasal, being preconsonantal (and

nonsyllabic) is deleted. In all other languages on the other hand, because all of their radicals are underlyingly consonant-commencing, the n of \*-iN- has been deleted in all cases.

We summarize the PS situation regarding voiced consonants in postnasal position as follows:

- (i) \*b existed as allophone of \*g postnasally. \*b occurred in lexical nasal clusters, or was converted from \*g in derived nasal clusters. \*b was devoiced to p everywhere, except in Lo.
- (ii) \*dʃ existed as allophone of \*ʃ postnasally. \*dʃ occurred in lexical clusters or was converted from \*ʃ in derived nasal clusters. \*dʃ became unaffricated alveolar \*d, devoicing to t in Ts, SS and NS. It became palatal \*j, devoicing to \*c in Qh (this occurring after the changes given below in (iii)). \*dʃ was devoiced without change in place of articulation to tʃ in Pu and Tl, and remained as voiced dʃ only in Lo.
- (iii) \*j became dental \*d in Qh, Tl and Lo, devoicing to t in the former two. It became alveolar laterally released \*dʎ, devoicing to tʎ in Ts, SS and NS. It became palatal laterally released \*cʎ in Pu. (In all languages except Qh and Lo, these reflexes are the same as those for \*j in i-v/w-i position.)
- (iv) \*ŋ became uvular in Qh preceding the back vowels, \*a>, \*o and \*u, but not preceding the centralized

back vowel \*u<. (Preceding other vowels constituted sibilantizing environments - see following chapter.) Devoicing occurred in all languages except Lo. In Qh \*g became k or g, in Lo it remained g, and in all other languages it became k.

- (v) We assume that *Postnasal Devoicing and Postnasal Stopping* occurred prior to *Nasal Deletion*, since it seems reasonable that the preceding nasal was in fact the *conditioning factor* for these changes. Note however, that in Qh the loss of underlying radical-initial \*g must have preceded *Nasal Deletion*, since otherwise the nasal in the ROP in forms such as inaba 'divide oneself' would not have been retained.

#### 11.4.0 The Development of Voiceless Consonants

We divide this section into the development of voiceless consonants in (1) postnasal position and (2) i-v/w-i position.

##### 11.4.1 Voiceless consonants in postnasal position

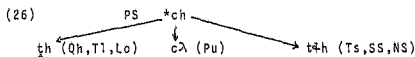
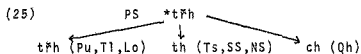
As table (24) below shows, the reflexes of all of these CB segments, \*p, \*t, \*c and \*k (except that of \*c in Pu) are aspirated:

(24)	'gift'	'person'	'edge'	'guinea fowl'
CB	*n+pa+o	*mu+ntu	*n+ca	*n+kanga
Qh	apho	mocho	ṅ <sub>h</sub> tha	qhaqa
Ts	ṅpho	mUthU	ṅt <sub>h</sub> ha	kxhaka
SS	ṅpho	mUthU	ṅt <sub>h</sub> ha	kxhaka
NS	ṅpho	mUthU.	ṅt <sub>h</sub> ha	kxhaka
Pu	ṅpho	mUt <sub>h</sub> hU	ɲc <sub>h</sub> la	kxhaka
Tl	ṅpho	mUt <sub>h</sub> hU	ṅ <sub>h</sub> tha	khaka
Lo	ṅpho	mUt <sub>h</sub> hU	ṅ <sub>h</sub> tha	khaga

Given this basic agreement, we assume that PS voiceless segments were aspirated.

In the case of the bilabials we reconstruct \*ph which is common to all languaegs.

For the alveolars and palatals, given that they underwent the same place of articulation changes as their voiced equivalents, we reconstruct \*tʃh (equivalent of voiced \*dʃ) and \*ch (equivalent of voiced \*j). These latter two reconstructions imply the following historical derivations:



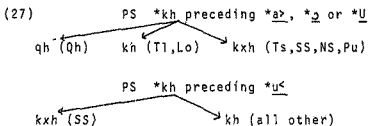
It can be seen that in Pu, the reflex of the voiced palatal \*j (see (16), page 164) and that of the voiceless palatal \*ch have merged. The aspiration of \*ch has been lost, and so has the voicing of \*j, giving c<sub>h</sub> for both. This is exceptional, since at the other places of articulation the

voiced/voiceless aspirated distinction is retained.

As in the voiced series in Qh, PS \*kh becomes uvular qh, preceding the back vowels, but not the centralized \*u<, for example \*p+khucmo 'wealth' gives khumo, not qhumo. In some of the other languages as well, a difference in the reflex of \*kh occurs, depending on the vowel following, though unlike the Qh case, this is not a difference in place of articulation, but in affrication.

In Ts, NS and Pu, \*kh becomes affricated kxh preceding back \*a>, \*ɔ and \*U (as shown above for 'guinea fowl' in (24)), but preceding \*u< it remains a stop, for example khumo 'wealth'. In SS, \*kh becomes affricated irrespective of the vowel following, thus kxhaka 'guinea fowl' and kxhumo 'wealth', and in Tl and Lo \*kh remains unaffricated no matter what vowel follows, thus khaka (Tl), khaga (Lo) and khumo (both).

The development of \*kh is given below:



A summary of the development of voiceless aspirated PS consonants in postnasal position follows:

- (i) \*ph remains ph in all languages;
- (ii) \*tʰh becomes Qh ch (this occurs after the change given below in (iii)), th in Ts, SS and NS, and remains tʰh in Pu, Tl and Lo;

- (iii) \*ch becomes th in Qh, Tl, and Lo, tʰh in Ts, SS and NS, and cɿ in Pu;
- (iv) \*kh preceding back vowels becomes qh in Qh, kxh in Ts, SS, NS and Pu, but remains kh in Tl and Lo. Preceding \*u, \*kh remains kh in all languages except SS, in which it becomes kxh.

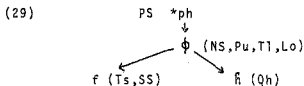
#### 11.4.2 Voiceless consonants in i-v/y-i position

In these positions PS \*ph, \*tʰh, \*ch and \*kh developed most often into -STDP, generally fricative, segments. This change, which we shall call 'Fricativization' failed occasionally, and exceptionally, to occur, leaving the original aspirated +STOP segments intact (apart of course from place of articulation changes mentioned in the previous section). These exceptional failures of the rule to apply are mentioned again in 11.6, and will not be further discussed here.

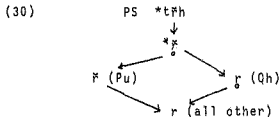
The fricativized reflexes of these aspirated stops are given below:

(28)	'end'	'buy'	'sort out'	'milk'
CB	*-ped-	*-teŋg-	*-caagud-	*-kam-
PS	*-phe -	*-tʰhɛŋg-	*-chaU -	*-kham-
Qh	-fɛ -	-rɛq-	-ɣaol-	-xam-
Ts	-fɛ -	-rɛk-	-tʰhaU -	-xam-
SS	-fɛ -	-rɛk-	-ɬaU -	-ham-
NS	-fɛ -	-rɛk-	-ɬaU -	-xam-
Pu	-fɛ -	-ɸɛk-	-cɿa' -	-xam-
Tl	-fɛ -	-rɛk-	-tʰhaU -	-ham-
Lo	-fɛ -	-rɛq-	-tʰhaU -	-ham-

The fricativization of \*ph is straightforward. It most likely first became  $\phi$ , then  $f$  in Ts and SS, or, by loss of the bilabial articulation and partial assimilation to the surrounding vowels, breathy glottal  $h$  in Qh, that is



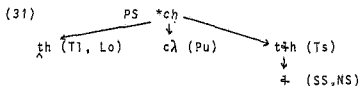
For the alveolars, we assume that \*tʃh first fricativized to the slit fricative \*ʃ̥. In all languages this \*ʃ̥ then became a trill (except in Pu in which it remained a fricative), and in all languages other than Qh became voiced as well. The reason for choosing \*ʃ̥ as the first development from \*tʃh, even though it occurs in no modern language, is that its fricative nature can be reconstructed from Pu, and its voicelessness from Qh. Combining these two features, plus ALVEOLAR, the result is \*ʃ̥. The development of this sound can be seen as follows:



From the diagram it can be seen that we cannot be sure whether for Ts, SS, NS, Tl and Lo, the fricativeless gave way first to trilling (the Qh branch) or the voicelessness first to voicing (the Pu branch).

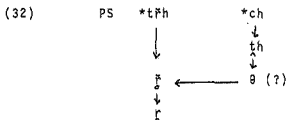
Temporarily excluding Qh from the discussion, the development of palatals appears quite straightforward. We

assume that palatal \*ch changed its position (as given in (26) on page 174), and then fricativized accordingly in SS and NS, that is \*ch → tʰh → ʃ. In Ts, Pu, Tl and Lo, fricativization consistently did not occur in this series, and observe that in Pu the aspiration of this reflex was lost here, as in postnasal position (see previous section). The development for \*ch for these languages is given below:



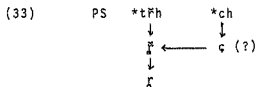
We have no explanation as to why fricativization failed to occur in this series in some languages, nor for the loss of aspiration in Pu.

As table (28), page 176, shows, tʰ has been merged between the Qh reflexes of \*tʰh and \*ch. Both sounds have become the voiceless alveolar trill ɽ. If we assume that in Qh, as in SS and NS, \*ch changed positions before it fricativized, then the development of \*ch and its subsequent merger with \*tʰh would be:



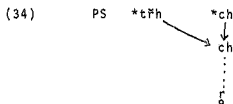
Another possibility however, is that \*ch fricativized first, and only afterwards did the stops of this series (those in postnasal position and therefore not subject to fricativization) become dentals. This gives the development:





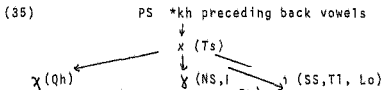
It seems to us that there is no principled way of deciding what the intermediate ancestor of Qh ʒ from \*ch was - something like ɟ, or something like ɟ̥, and we leave this question open.

A third possibility that must, however, be ruled out at once, is that the Qh change from alveolar \*tʃh to palatal \*ch (see (25), page 174) preceded fricativization, and thus caused the merger. That is



The reason that we must rule this out is because in the cases where \*tʃh and \*ch failed to undergo fricativization, being in postnasal position, the reflexes of \*tʃh remained distinct from those of \*ch, which would not have been the case if development (34) had occurred.

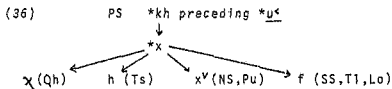
Preceding the back vowels, \*a<sub>2</sub>, \*ɔ<sub>2</sub> and \*u, the development of \*kh was as follows:



That is, \*kh becomes the voiceless velar fricative x in Ts, which in turn becomes uvular ɣ in Qh, or by intervocalic

voicing assimilation voiced velar ɣ in NS and Pu, or, by loss of the velar articulation altogether, becomes glottal h in SS, Tl and Lo.

Preceding centralized \*u<sup>◌</sup>, the development was different, though not analogous to the development of postnasal \*kh in this environment (see (27), page 175). This development was as follows:



The reflexes of \*kh in this environment are shown below in the radical \*-khu<sup>◌</sup>m- 'get rich' (compare these reflexes with those of the Cl 9 noun \*n<sup>◌</sup>khu<sup>◌</sup>m<sup>◌</sup> 'wealth' given on page 175):

(37) CB \*-kum- 'become rich'

PS	*-khu <sup>◌</sup> m-
Qh	-χum-
Ts	-hum-
SS	-fum-
NS	-x <sup>v</sup> um-
Pu	-x <sup>v</sup> um-
Tl	-fum-
Lo	-fum-

The symbol x<sup>v</sup> for NS and Pu stands for a velar fricative which is made with the tongue not as close to the velum as for usual x. Auditorily the difference between x and x<sup>v</sup> is that the latter has less rough friction. (No instrumental investigation was carried out here however, and the mechanism for obtaining the 'smooth'

friction effect, may in fact be different to what has been suggested above.)

Observe that in Qh, postnasal \*kh preceding \*u remains velar, but fricativized \*kh (that is i-v/w-i) becomes uvular preceding \*u, as it does preceding other vowels.

The development of voiceless aspirated segments in i-v/w-i position is now summarized:

- (i) \*ph fricativized to ɸ in NS, Pu, Tl and Lo, and subsequently became Ts and SS f, and Qh h;
- (ii) \*tʰh fricativized to \*ɸ (unattested), then by trilling became voiceless trill ɸ in Qh; by trilling and voicing became voiced trill ɸ in Ts, SS, NS, Tl and Lo; and by voicing only became the voiced fricative f in Pu;
- (iii) \*ch became tʰh in Ts, and then fricativized to ɸ in SS and NS. In Pu, \*ch became cɸ, exceptionally losing its aspiration. In Tl and Lo, it became ɸh, and as in Pu and Ts, did not fricativize. In Qh, the fricativized version of \*ch (θ (?) or ç (?)) merged with that of \*tʰh to give eventually, with trilling, ɸ.
- (iv) \*kh preceding the back vowels first became x, as in Ts, but changed to voiced ɣ in NS and Pu, to h in SS, Tl and Lo, and ɣ in Qh. Preceding \*u, \*kh also became ɣ in Qh, but in Ts it became h, in Pu and NS x<sup>v</sup>, and in SS, Tl and Lo f.

Before giving an overall summary of our findings in

friction effect, may in fact be different to what has been suggested above.)

Observe that in Qh, postnasal \*kh preceding \*u remains velar, but fricativized \*kh (that is i-v/w-i) becomes uvular preceding \*u, as it does preceding other vowels.

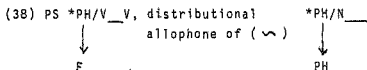
The development of voiceless aspirated segments in i-v/w-i position is now summarized:

- (i) \*ph fricativized to ɸ in NS, Pu, Tl and Lo, and subsequently became Ts and SS f, and Qh h;
- (ii) \*tʰh fricativized to \*tʰ (unattested), then by trilling became voiceless trill ɬ in Qh; by trilling and voicing became voiced trill ɮ in Ts, SS, NS, Tl and Lo; and by voicing only became the voiced fricative ʃ in Pu;
- (iii) \*ch became tʰh in Ts, and then fricativized to ɸ in SS and NS. In Pu, \*ch became cʰ, exceptionally losing its aspiration. In Tl and Lo, it became tʰ, and as in Pu and Ts, did not fricativize. In Qh, the fricativized version of \*ch (ɸ (?) or ɸ (?)) merged with that of \*tʰh to give eventually, with trilling, ɬ.
- (iv) \*kh preceding the back vowels first became x, as in Ts, but changed to voiced ɣ in NS and Pu, to h in SS, Tl and Lo, and χ in Qh. Preceding \*u, \*kh also became χ in Qh, but in Ts it became h, in Pu and NS xʷ, and in SS, Tl and Lo f.

Before giving an overall summary of our findings in

this chapter, it is appropriate here to show how i-v/w-i fricativization led to the overall restructuring of the Sotho lexicon with regard to reflexes of proto-voiceless aspirated consonants.

As we have shown, fricativization occurred intervocalically and word-initially, but failed to apply postnasally. This development is summarized below (upper case 'PH', 'F' and 'M' standing for aspirated stop, voiceless fricative and nasal respectively at any place of articulation, and /V\_\_V and /N\_\_ standing for i-v/w-i and postnasal respectively):



Because the environment /V\_\_V represented most of the morphological environments \*PH could occur in, whereas /N\_\_ represented only three (preceding /psOP, ROP and Cl 9 NP), the fricativized form, F, of morphemes with F ~ PH alternation, came to be reanalysed as underlying, with the stop form, PH, derived from F only in postnasal position.

To give an actual example (from NS): PS 'give' was \*-ph-. This fricativized to ɸ intervocalically (for example as in \*khU+ph+a → xUɸa 'to give') and word-initially (for example as in \*ph+a+a → ɸaa 'give!'), but remained ph in postnasal position, which represented only three cases, namely \*-iN+ph+a → \*-imɸa → -ipha 'give oneself', \*-N+ph+a → -mpha 'give me' and \*n+ph+a → mpɸo 'gift(9)'. Because, after fricativization, the stop occurred so rarely, the



fricativized form  $\phi$  was considered now as *underlying*. Thus synchronically, a form such as - $\phi$ pha 'give me' is not derived from -N+pha (which is the correct diachronic derivation) but from - $\chi$ + $\phi$ a.

The rule converting the fricatives (back) to aspirated stops postnasally is found synchronically in all Sotho languages (although in some, for example Pu, there has been levelling so that in some cases fricatives now occur postnasally in derivations - see Ziervogel (1954:119)). For Qh, we have dealt with this as part of the allomorph selection process called Postnasal Stopping (which also includes cases of the stopping of originally voiced sounds) - see beginning of 11.3.2, page 167, and 5.4).

Although originally Postnasal Stopping in the voiceless and voiced series must have been regular, it became irregular to varying degrees in all languages, through changes in place of articulation (e.g. in Qh \*ch fricativized to alveolar  $\chi$ , but became dental postnasally) and through changes in voicing (e.g. in NS \*kh fricativized to voiced  $\chi$  instead of remaining voiceless as  $x$ ).

The rule also became morphologized due to the deletion of nonsyllabic nasals: this can be seen in that it still applies even though synchronically no nasals exist to trigger it, for example the NS instance given above where -i+ $\phi$ +a (from PS \*-iN+ph+a) has the surface form - $\phi$ pha 'give oneself'.

The deletion of nonsyllabic nasals also caused the phonemic split of these originally allophonic pairs, since once the nasal was lost, both sounds could occur in the

same environments. An example of this phonologization can be seen in the NS minimal pair -pəl- 'scrape' (from PS \*-pəl-) versus -phəl- 'win' (from PS \*-mpəl-).

#### 11.5 Summary of consonant reflexes in non-sibilantizing positions

The tables below summarize the findings of this chapter. Reflexes of the PS sounds we have reconstructed are given in all the languages, and as a reference point, Guthrie's CB forms head each table.

##### (i) NASALS, intervocalic or word-initial

CB	*m	*n	*ŋ	*ŋ
PS	*m	*n	*ŋ	-
Qh	m	ŋ	ŋ	-
Ts	m	n	n	-
SS	m	n	n	-
NS	m	n	n	-
Pu	m	n	n	-
Tl	m	n	n	-
Lo	m	n	n	-

##### (ii) NASALS, preconsonantal

CB	1psOP	*ni	C1	9	NP	*ŋ	Other N
PS		*N	*ŋ <sup>1</sup>	ŋ			*N
Qh		ŋ	e	ø			ø
Ts		ŋ	ŋ	ø			ø
SS		ŋ	ŋ	ø			ø
NS		ŋ	ŋ	ø			ø
Pu		ŋ	ŋ	ø			ø
Tl		ŋ	ŋ	ø			ø
Lo		ŋ	ŋ	ø			ø

Note: \*ŋ/monosyllabic stem, \*ŋ/polysyllabic stem



(iii) BILABIAL CONSONANTS

CB	*b		*p	
PS	*β/V	V ~ *b/N	*ph/V	V ~ *ph/N
Qh	b	p	h	ph
Ts	b	p	f	ph
SS	b	p	f	ph
NS	β	p	φ	ph
Pu	β	p	φ	ph
Tl	β	p	φ	ph
Lo	β	b	φ	ph

(iv) ALVEOLAR VOICED CONSONANTS

CB	*d	
PS	*l/V	X <sup>1</sup> ~ *l/V {i} ~ *dʃ/N
Qh	l	r c
Ts	l	d t
SS	l	d t
NS	l	ɹ t
Pu	l	dʃ tʃ
Tl	l	ɹ tʃ
Lo	l	ɹ dʃ

Note: X in /V\_X denotes a following vowel  
other than PS \*i or \*u (CB \*i or \*y).

(v) ALVEOLAR VOICELESS CONSONANT

CB	*t	
PS	*tʃh/V__V ~ *tʃh/N__	
Qh	ɾ	ch
Ts	r	th
SS	r	th
NS	r	th
Pu	ʃ	tʃh
Tl	r	tʃh
Lo	r	tʃh

(vi) PALATAL CONSONANTS

CB	*j		*c	
PS	*j/V__V ~ *j/N__		*ch/V__V ~ *ch/N__	
Qh	ɟ	ʃ	ɾ	ʃh
Ts	tʃ	tʃ	tʃh	tʃh
SS	tʃ	tʃ	ʃ	tʃh
NS	tʃ	tʃ	ʃ	tʃh
Pu	cʌ	cʌ	cʌ	cʌ
Tl	ʃ	ʃ	ʃh	ʃh
Lo	ɟ	ɟ	ʃh	ʃh

(vii) VELAR VOICED CONSONANT, intervocalic or word-initial

CB		*g	
PS	*g/___ <sup>1</sup> ___ <sub>R</sub>	↔	*g/___ <sup>1</sup> ___ <sub>R</sub> *g (all other positions)
Qh	∅		∅ or y      ∅
Ts	g <sup>2</sup>		∅      ∅
SS	g		y      ∅
NS	g		y      ∅
Pu	g		y      ∅
Tl	g		y      ∅
Lo	g		y      ∅

Note 1: /\_\_\_<sup>1</sup>\_\_\_<sub>R</sub> and /\_\_\_<sup>1</sup>\_\_\_<sub>R</sub> denote radical-initial and -final positions.

2: This g in all languages is deleted unless in a derivation it is preceded by a nasal.

(viii) VELAR VOICED CONSONANT, postnasal

CB		*g
PS	*g/N_	$\left\{ \begin{array}{c} a^h \\ o \\ u \end{array} \right\}$ ↔ *g/N_u <sup>&lt;</sup>
Qh	q	k
Ts	k	k
SS	k	k
NS	k	k
Pu	k	k
Tl	k	k
Lo	g	g

(ix) VELAR VOICELESS CONSONANTS

CB				*k
PS	*kh/V	$\begin{Bmatrix} a \\ j \\ u \end{Bmatrix}$	~ *kh/V_u < ~	*kh/N $\begin{Bmatrix} a \\ j \\ u \end{Bmatrix}$ ~ kh/N_u <
Qh	χ	χ	qh	kh
Ts	x	h	kxh	kh
SS	h	f	kxh	kxh
NS	ɣ	x <sup>v</sup>	kxh	kh
Pu	ɣ	x <sup>v</sup>	kxh	kh
Tl	h	f	kh	kh
Lo	h	f	kh	kh

11.6 Exceptions

The historical developments as we have described them in this chapter, hold true for the vast majority of Sotho consonants in non-sibilantizing environments. There are however sporadic exceptions to some of them, and these are exemplified briefly below.

PS \*l has become ɺ instead of regular l in Qh in some cases of the reversive extension, for example -bofi+opog+a (from \*-βoph+U1U1a) 'untie'. Cf. other Sotho -U1U1- or -U11- for this extension.

In some cases fricativization has failed to apply. For example PS \*-phUmU1- 'rest' gives fricativized -homol- in Qh, but unfricativized -phUmU1- in the other languages. Another example can be seen in PS \*matʔhI 'saliva', which gives unfricativized TS and SS mathI and Qh make, but fricativized (with trilling) NS maRI. An example in which fricativization has failed to apply in all languages is PS \*-phetʔh- 'fold', which has reflexes Qh -pach-, Ts, SS and NS -pheth- and all other -phetʔh-.

In some instances PS velars have failed to become uvulars in Qh, even though they precede original \*a>. For example PS \*mUtʃha>nga> gives Qh moraka 'cattle post' instead of expected moraqa, and \*ŋkha>kha> 'pangolin' gives khakha instead of expected qhaʃa (note also the failure of fricativization in the second \*kh).

We have no explanation for these and other similar exceptions.

## CHAPTER 12

THE DEVELOPMENT OF SOTHO CONSONANTS IN SIBILANTIZING ENVIRONMENTS

As mentioned at the beginning of Chapter 11, certain environments caused consonants at all four original places of articulation to become sibilants. We shall here investigate sibilantization separately as it developed from these four places. At the end of this chapter the development of nasals in similar environments will be looked at.

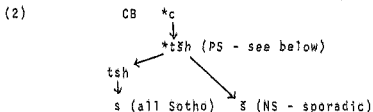
12.1 Palatals preceding y or a front vowel

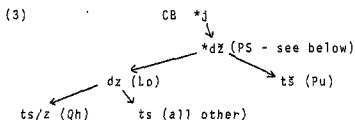
In these environments CB palatals give alveopalatal or alveolar sibilant reflexes. The glide y in such cases comes from the desyllabification of a front vowel followed by another vowel (see 10.3.3). After causing the sibilantization the y is deleted, for example the \*i in \*-cjam 'head-rest' became y, ultimately causing the \*c to become s as in the Qh reflex -sam.

Reflexes of sibilantizing palatals are given in table (1) overleaf:

(1)	'pillow'	'slander'	'path'	'village'
CB	*-cjamɔ	*-ceb-	*n+jida	*-ji
Qh	-samɔ	-seb-	tseIa	-ze
Ts	-samɔ	-seb-	tsIla	-tsI
SS	-samɔ	-seb-	tsIla	-tsI
NS	-samɔ	-seβ-	tsIla	-tsI
Pu	-samɔ	-seβ-	tʃIla	-tʃI
Tl	-samɔ	-seβ-	tsIla	-tsI
Lo	-samɔ	-seβ-	dzIla	-dzI

Note that only Pu has alveopalatal reflexes, and these only from the voiced CB series. There are however some cases of CB voiceless \*c giving alveopalatal instead of alveolar reflexes in NS, for example \*-cjad- 'remain' gives NS -ʃal-, but -sal- elsewhere. It is possible that alveopalatals actually developed first and were then alveolarized, except in the voiced series in Pu, and sporadically in the voiceless series in NS. The change from alveopalatal to alveolar appears to have been more likely than the other way round (since the change from alveopalatal to alveolar seems to occur more often in the world's languages than the opposite direction of change). We suggest then the following development of CB \*c and \*j in sibilantizing positions:

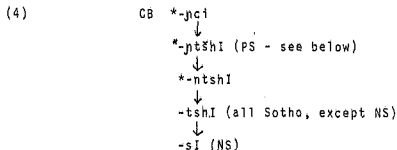




With respect to devoicing, the development of \*j in sibilantizing environments parallels that of \*j in non-sibilantizing environments (see (14) and (19) in Chapter 11). The reflexes are devoiced whether or not a nasal precedes in Ts, SS, NS, Pu and T1, devoiced in Qh only if a nasal precedes, and not devoiced at all in Lo.

The reflexes of the voiceless series, with regard to manner of articulation, behave typically. By fricativization (see 11.4.2), +STOP \*tʃh or \*tsh became ʃ and s respectively when word-initial or intervocalic (as shown in the examples in (1) above), but when preceded by a nasal remained -STOP, thus the C19 noun from the radical \*-ce 'slander' gives tsheɔ (Qh, SS, Ts)/tsheɔ (all others).

There is one case at least however in NS, in which a -STOP reflex occurs when \*c was originally preceded by a nasal, and that is in the stem \*-nci 'down'. It is probable in this case that fricativization was permitted to apply here, after the nasal had been deleted, that is:





For palatals in non-sibilantizing positions we somewhat arbitrarily chose as the PS ancestors, \*ch and \*j, on the grounds that there was no principled way of deciding the place of articulation of the proto-form from the modern dental, alveolar laterally released or palatal laterally released reflexes (11.3.1). In sibilantizing positions, on the other hand, we suggest that \*tʃh and \*dʒ were the ancestors here. This then gives us the palatal PS phonemes \*ch ~ tʃh and \*j ~ dʒ, with the former allophones occurring in non-sibilantizing environments, and the latter in sibilantizing environments.

Since alveolars are so widely the reflexes of the sibilantized allophones, we assume that alveolarization of these allophones took place relatively soon after PS (except in Pu in the voiced series, and sporadically in the voiceless series in NS).

#### 12.2 Velars preceding y or a front vowel

Sibilantizing velars give alveolar or alveopalatal sibilants. It will be recalled that CB \*g falls out in i-v/w-i position (see 11.3.1), so the only sibilantizing cases of \*g are those in postnasal position. Examples are given below of sibilantized reflexes of velars:

(5) 'grind' 'walk' 'cut' 'wake(v.t.)'

CB \*-kjd- \*-kimbid- \*-kek- \*bjuk+i+a

PS \*-khiI- \*-khImbI- \*-khek- \*-ByUkhya

Qh -ʃil- -ʃepel- -ʃeχ- -zoʃa

Ts -sil- -sIpI- -sIx- -tsUʃa

SS -sɪl- -sIpI- -seh- -tsUʃa

NS -ʃil- -sIpI- -seχ- -tsUʃa

Pu -ʃil- -sIpI- -seχ- -tsUʃa

Tl -sil- -sIpI- -seh- -tsUʃa

Lo -sil- -tʃhIbI- -tʃéh- -dzUʃa

(5 cont.) 'fly' 'enter'

CB \*p+gi \*-ggen-

PS \*ggi \*-ggen-

Qh itʃi -tʃén-

Ts ɲtsi -tsen-

SS ɲtsi (-ken- exception)

NS ɲtʃi -tsen-

Pu ɲtʃi (-ken- exception)

Tl ɲtsi -tsen-

Lo ɲdʒi -dʒén-

We assume that sibilantizing velars first became alveopalatal, and then alveolarized as follows:

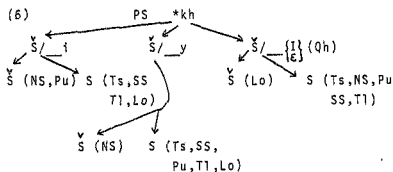
(i) Qh: no cases'

(ii) Ts, SS and Tl: all cases

(iii) Lo: preceding PS \*ɣ or \*ɟ, but not \*ɪ or \*ɛ;(iv) NS: preceding PS \*ɪ or \*ɛ, but not \*ɣ or \*ɟ;(v) Pu: preceding \*ɣ, \*ɪ or \*ɛ, but not \*ɟ.

Using the upper case symbols 'S' and 'S'' to represent

alveolar and alveopalatal places of articulation only, the development of sibilantizing \*kh can be shown as follows:



An exception to this scheme of development can be found in the Qh reflex of the productive causative extension, CB \*ikj. Since a vowel (tense suffix or that of another extension) must follow this morpheme, the second i became y by desyllabification, to give PS \*-ikhy-. In Qh alveolarization has occurred exceptionally here, giving -is-, instead of -iš-. In the other languages the reflex is regular: -iš- in NS, and -is- in the rest.

It appears that the development of sibilantizing postnasal \*g parallels that of \*kh (with the exclusion of the SS and Pu reflexes of \*ngen-, which are exceptional - see 12.8). Cases of proto \*g in sibilantizing environments are relatively scarce however, which is why \*g is not so comprehensively exemplified as \*kh in table (5).

In terms of manner of articulation, sibilantizing \*kh has developed in the manner typical of voiceless aspirated PS stops, by becoming -STOP intervocalically/ word-initially by fricativization. Only in Lo has fricativization not occurred in all cases (preceding \*i or \*g). The C1 7 NP of Lo, namely khī-, is particularly interesting because here neither sibilantization nor fricativization



### 12.3 Alveolars preceding *y*

The only CB forms here with Sotho reflexes contain the voiced alveolar CB \*d (PS \*1), for example CB \*-bidj+a 'call', giving PS \*-βilya. We can however reconstruct a voiceless PS sequence \*tʰh.y+a (which would correspond to CB \*t+j+a) from the comparison of forms such as (from Qh) -apara 'get dressed' and -apeša 'dress(v.t.)'. -apara has the CB form \*-yambat+a (PS -ambatʰh+a), and from -apeša we can deduce CB \*-yambet+j+a (PS \*-ambetʰh+y+a), where the CB \*-j- (PS \*-y-) is the same old causative suffix as found in for example CB \*-biuk+j+a (PS \*-βyUkh+y+a), see (5) in preceding section.

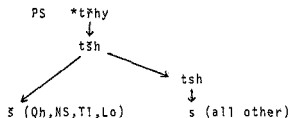
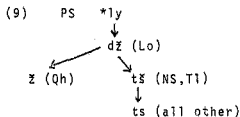
If this is correct, then the Sotho reflexes of sibilantizing voiced and voiceless alveolars are as follows:

(8)	'call'	'dress(v.t.)'
CB	*-bidj+a	*-yambat+j+a
PS	*-βilya	*-ambetʰhya
Qh	-biža	-apeša
Ts	-bitsa	-apesa
SS	-bitsa	-apesa
NS	-βitša	-apeša
Pu	-βitsa	-apeso
Tl	-βitša	-apeša
Lo	-βidža	-abeša

Once again we assume that the first place change was to alveopalatal, and that alveolarization subsequently occurred in Ts, SS and Pu, but not in the other languages. Observe that in all languages except Qh and Lo, devoicing has happened in the voiced series. This is parallel to the

development of \*j ~ dʒ (see 12.1).

The general scheme of the sibilantization of alveolars can be shown as follows:



As can be seen from this, sibilantizing \*tʃh in intervocalic/word-initial position (no examples could be found postnasally) fricativizes in the typical manner.

An interesting exception to this general scheme in all languages is the reflex of CB \*di+a 'eat'. This proto-form (PS \*-ly+a) gives:

- (10) Qh and Pu: -ja  
 Ts and SS: -dʒa  
 NS and T1: -ʒa  
 Lo: -la

In Qh and Pu, there has been no sibilantization, and \*ly has simply become a palatal stop. In Lo the glide has been deleted without affecting the \*l. In Ts, SS, NS and T1, devoicing has not taken place, and in the latter two the resulting sound ʒ is -STOP instead of +STOP. We have no

explanation of the exceptional behaviour of this particular morpheme.

Sibilantization of alveolars has as its synchronic reflex in Qh the process we have called Alveolar Alveopalatalization (4.6). In addition pairs of lexical items such as -apar/-apeš- (see above) are related historically by this process. Rules and lexical pairings analogous to these in Qh exist in the other languages.

#### 12.4 Bilabials preceding w

Because in the voiceless series we have found only one case of a bilabial in the appropriate environment which has Sotho reflexes, and because the reflexes of this form, which is CB \*-pʷan- 'resemble', are somewhat irregular, we shall use reconstructed passives to illustrate the voiceless series. (The voiced series is quite straightforward.) Examples of reflexes are:

(11)	'stone'	'dog'	'be paid'
CB	*-bue	*p+bʷa	*-dip+u+a
PS	*-βwe	*mbwa	*-lɪphwa
Qh	-ʒwe	etšwa	(-leñwa -see below)
Ts	-dʒwe	ɲtša	-lɪšwa
SS	-dʒwe	ɲtša	-lɪšwa
NS	-βʒe	mpša	-lɪfša/-lɪfšwa
Pu	-βʒe	mpša	-lɪfša
Tl	-βye	mpya	-lɪfya
Lo	-βye	mpya	-lɪfya

The changes here appear to be motivated by the need to dissimilate the bilabial from the following (also

bilabial anteriorly) w. Two strategies for effecting this dissimilation can be seen. In T1 and Lo, the w is simply converted to palatal y, that is

$$(12) \quad \begin{array}{ccc} *βw & *mbw & *phw \\ \downarrow & \downarrow & \downarrow \\ βy & mby & phy \end{array}$$

With Postnasal Devoicing in T1, mby gives mpy, and phy, with fricativization gives T1 and Lo φy.

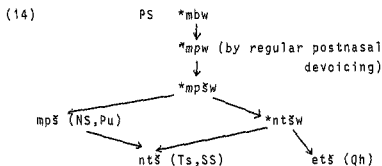
In the other languages the development is more complicated, and it appears that an alveopalatal fricative has been inserted between the bilabial and the w. Thus the other reflexes of the bilabial+w in 'be paid' appear to have been derived as follows:

$$(13) \quad \begin{array}{c} PS \quad *phw \\ \downarrow \\ φw \text{ (by regular fricativization)} \\ \downarrow \\ φšw \text{ (as possibility in NS)} \\ \swarrow \quad \searrow \\ φš \text{ (NS, Pu)} \quad šw \text{ (Ts, SS)} \end{array}$$

After the insertion of the š, the w is lost in Pu, and optionally lost in NS, and the bilabial is lost (or possibly assimilates to the š, after which the resulting geminate is simplified) in Ts and SS. (In Qh, this (voiceless series) dissimilation no longer takes place in passives, since PS \*ph has become glottal h, and thus the motivation for the dissimilation has disappeared.)

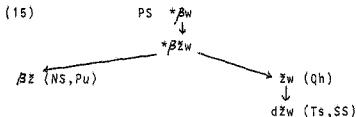
A similar derivation to (13) above can be given for the reflexes of 'dog', but note that here even in Ts and SS, which can generally be thought of as w-retaining languages, the w has been lost:





After the intrusion of ɬ, w is lost in the NS, Pu branch. In the other branch it is retained, and mp assimilates in place of articulation to the ɬ. At this point, the syllabic nasal is vocalized to give Qh etɬw. The Ts and SS form could come by place of articulation assimilation from the NS, Pu form, or by the deletion of the w from the immediate predecessor of the Qh form.

A similar derivation can be given for 'stone' as:



Here the Ts and SS forms have the +STOP version of the Qh ɬ.

The historical developments of bilabial + w sequences have synchronic reflexes in all languages, causing the appropriate change when a w follows a bilabial in the derivation of passives and diminutives. The synchronic process for Qh has been dealt with in 4.2.

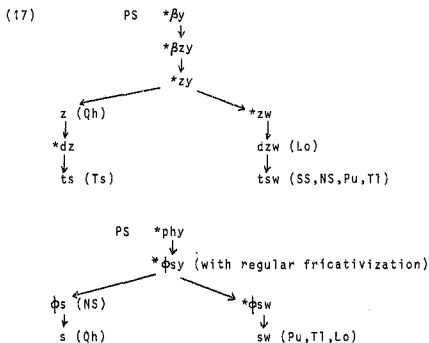
### 12.5 Bilabials preceding y

Except in Ts and SS in the voiceless series where alveopalatalization occurs, this sequence, bilabial+y, results in alveolarization. Examples of reflexes are given below:

(16)	CB	*-bjad-	'give birth'	*-pia	'new'
	PS	*-βyal-		*-phya	
	Qh	-zal-		-sa	
	Ts	-tsal-		-ša	
	SS	-tswal-		-ntšha	
	NS	-tswal-		-φsa	
	Pu	-tswal-		-tshwa	
	Tl	-tswal-		-swa	
	Lo	-dzwal-		-swa	

We assume here that an alveolar fricative was inserted between the bilabial and the y. Although in the voiced series it appears as though the bilabial simply became an alveolar (since there are no reflexes with bilabials), the voiceless series' form -φsa in NS suggests that this was not so. Rather, it appears as if in all cases except -φsa, the bilabial was deleted after the insertion of the alveolar fricative. Observe also that in some cases the y was deleted, but in others it was converted to w.

We assume that the historical development of PS \*By and \*phy (excluding Ts and SS for the voiceless series) was as follows:



The stopping and devoicing of \*zw in the relevant languages is paralleled in the formation of alveolars from the voiced series of other places of articulation. Note that we have shown *Pu* as having sw in the voiceless series, but in this particular morpheme ('new') fricativization exceptionally failed to apply.

We have no explanation for the alveopalatalization rather than alveolarization that occurred in *Ts* and *SS* in the voiceless series. The nasal in the *SS* form is etymologically the *C1 9* prefix, which has been lexicalized as part of the adjective itself.

A note concerning the conversion of y to w in those languages in which this occurs should be made here. If the original bifabial+y sequence is followed by a high back vowel, then this conversion fails to occur, and the y is

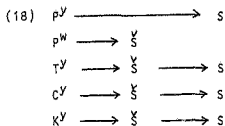
simply deleted. Consider for example the reflexes of PS \*ByUkhy- 'wake up (v.t.)' which are given in (5) above. The failure of y to become w in such cases is reflected as a restriction on the formation of glides preceding a same-backness high vowel in the modern languages. In Qh this is treated in 2.7.

The historical process of alveolarization is reflected in Qh by the synchronic process Non-nasal Bilabial Alveolarization (4.4) in diminutive formation as well as by lexical pairings such as -rap-/-rats- 'wash (oneself)/wash (something)' from PS \*-chamb-/-chamby-. These pairings exist in the other languages as well (e.g. NS -lap-/-latsw- corresponding to the Qh example above), but in some languages in diminutive formation, Bilabial Alveolarization has been replaced by Bilabial Alveopalatalization, so that synchronically formed bilabial+y as well as bilabial+w sequences are treated as historical bilabial+w sequences. Examples from Ts are: tshipi+ana → tshitšwana 'small piece of iron' (cf. Qh tshetsana) and lIsapp → lIsatšwana 'small bone' (cf. Qh leratšwana).

Finally we should mention that in some morphemes in some languages, alveolarization has occurred when the bilabial is followed by a high front vowel (as opposed to glide) \*i. For example, the Cl & NP (occurring only in Qh and Lo) PS \*βi-, becomes Lo dzwi- (cf. Qh bi-). This alveolarization was however sporadic and most \*βi sequences remained unchanged, for example Lo -βin- and -βib- from PS \*-βin- 'sing/dance' and \*-βimb- 'conceal' respectively.

### 12.6 Sotho schema for the origin of sibilants

Before looking at exceptional cases of sibilantization we present below a diagram showing in broad outline the origin of Sotho sibilants. Upper case symbols P, T, C, K, S and  $\text{ʃ}$  are used to represent the places of articulation, and superscript  $^w$  or  $^y$  indicate the environments 'preceding w' or 'preceding y or a front vowel' respectively:



Precise details of alveolarization after alveopalatalization are to be found in the preceding sections. It must also be remembered of course that Tl and Lo P<sup>w</sup> was not subject to sibilantization.

### 12.7 Sibilantization associated with Ci 5 NP, and other exceptional cases

Sporadically in all languages, noun-stem-initial consonants have undergone sibilantization when preceded by the Ci 5 NP (le- in Qh, elsewhere li-, from PS \*li-, CB \*di-). Examples from Qh and Ts, with affected PS \*β, \*tʃh and \*kh are given below:

(19)	'breast'	'cheek'	'thief'
CB	*dibeede	*ditama	*dikody
PS	*liβele	*liitʃhama	*likholu
Qh	lebele	lerama	lešoru
Ts	litswele	lisama	lixodu

Here, in Qh, PS \*kh has been sibilantized, and in Ts \*β and \*tʃh have been.

Sibilantization preceding Cl 5 NP is no longer productive, and in most cases in singular Cl 5/plural Cl 6 pairings, the alternations have been levelled, for example in Qh the Cl 6 plural of leʃoru 'thief' is not \*maʃoru (without sibilantization), but maʃoru, where the originally sibilantized allomorph -ʃoru has replaced \*-ʒoru.

Another case of exceptional sibilantization is the sporadic alveopalatalization of Qh velars when preceded by a nasal, but followed by a back vowel. Examples of such reflexes are given below (contrasting Qh with Ts):

(20)	'get satisfied'	'nose'	'smell'
CB	*-ŋkut-	*ŋ+go	*-nugk+a
PS	*-ŋkhUtʃh-	*ŋgo	*-ŋkha
Qh	-tshoŋ-	ŋtʃo	-ŋtʃha
Ts	-kxhUr-	ŋko	-ŋkxha

Observe that in Qh, the forms for 'nose' and 'smell' are exceptional also in that nasal vocalization has not occurred.

Finally we should mention the alveopalatalization or labiodentalization caused by a following w, from CB \*y, PS u<. It was noted in Chapter 11, that with respect to velars, a following \*u< behaved neither as a back nor as a front vowel (for example in Qh velar+back gave uvular, velar+front gave alveopalatal, but velar+\*u< gave velar). However, w from desyllabified \*u<, appears to act often as a front glide, affecting preceding velars and alveolars. As an example of this, consider the following reflexes (the

symbol \*w< is used here for PS, to differentiate this glide from ordinary w from true back vowels):

(21)	CB	*-kɥ+a	'die'	*-tɥ+a	'spit'
	PS	*-khw<a		*-tʃhw<a	
	Qh	-ʒwa		-tʒhwa	
	Ts	-ʒwa		-kxhwa	
	SS	-ʒwa		-kxhwa	
	NS	-x <sup>v</sup> wa		-tshwa	
	Pu	-x <sup>v</sup> wa		-tshwa	
	Tl	-fa		-tshwa	
	Lo	-fa		-tshwa	

In 'die', \*kh has alveopalatalized in Qh, Ts and SS, become the smooth-friction velar x<sup>v</sup> in NS and Pu (this being the usual reflex of \*kh preceding \*u<), and has become labiodental f in Tl and Lo. (This results in Tl and Lo having the unusual f/ɸ contrast, for example fa 'die' versus ɸa 'give' (from \*pha). In 'spit' the situation is less clear. Observe first-ly that no fricativization has occurred. The sibilantizing effect of \*w< however can be clearly seen in all languages except Ts and SS, in which, somewhat perversely, the \*w< has had the effect of backing the alveolar into a velar.

Sibilantization by following \*w< still occurs in 'otho (see rz-Alveopalatalization in 4.7 for Qh), but only affects reflexes of PS \*l when, in diminutive formation a following \*u< is desyllabified. Compare the reflexes of \*pkhu<lu<ana (with affected \*l) with those of \*lɪtʃhu<ana (with unaffected \*tʃh):

(22)	'small tortoise'	'small cloud'
CB	*n+kɔdy+ana	*di+ty+ana
PS	*ŋkhu<lw<ana	*litʃhw<ana
Qh	khužwana	lerwana
Ts	khutšwana	lirwana
SS	kxhutšwana	lirwana
NS	khutšwana	lirwana
Pu	khutšwana	lirwana
Tl	khutšwana	lirwana
Lo	khudžwana	lirwana

#### 12.8 Failures of sibilantization

Sibilantization has failed to occur in some morphemes containing proto-velars and palatals preceding front vowels. In a few cases, the failure is confined to a couple of languages (for example SS and Pu reflexes of \*-ngɛn- 'enter' in (5), page 194). In other cases, sibilantization has not occurred in all languages. Two examples of its failure are shown below:

(23)	CB	*-ŋje 'outside'	*ŋgi- 'lips SP'
	PS	*-ŋje	*ŋgi-
	Qh	-ɛtɛ	ke-
	Ts	-ŋtʃɛ	kI-
	SS	-ŋtʃɛ	kI-
	NS	-ŋtʃɛ	kI-
	Pu	-ŋcɔɛ	kI-
	Tl	-ŋtʃɛ	kI-
	Lo	-ŋde	gi-



### 12.9 Bilabial nasals preceding w

As with non-nasal bilabial+w sequences, two strategies occurred to dissimilate the sounds. In Lo \*w is simply converted to y and in the rest of the languages, the \*m is converted to velar ŋ. Examples of reflexes are:

(24) CB \*mu+ana 'child' \*-dum+u+a 'be bitten'

PS * <u>mwana</u>	*-1 <u>Umwa</u>
Qh (mochwana)	-1 <u>ŋwa</u>
Ts <u>gwana</u>	-1 <u>ŋwa</u>
SS <u>gwana</u>	-1 <u>ŋwa</u>
NS <u>gwana</u>	-1 <u>ŋwa</u>
Pu <u>gwana</u>	-1 <u>ŋwa</u>
Tl <u>gwana</u>	-1 <u>ŋwa</u>
Lo <u>myana</u>	-1 <u>Umya</u>

Note that synchronically the desyllabification in the C1 1 NP mo-/mU- which would cause the velarization (or in Lo the conversion of w to y), does not occur, for example (from SS) mU+ahi gives surface mUahi 'builder', and not mwahi, and hence ŋwahi.

The historical development of m-velarization, or w-to-y conversion preceding m, has reflexes synchronically in all languages in diminutive and passive formation. For Qh this has been dealt with in 4.3

### 12.10 Alveolar nasals preceding y

In all cases the sequence \*n+y becomes simply the palatal nasal ɲ. We must assume that this change postdated the change from PS \*n to Qh ɲ/other ɲ - see 11.2 - since

otherwise n from ny would have undergone the same change.

A set of reflexes illustrating this development is given below, together with reflexes of \*n not followed by y, for comparison:

(25) 'cause to enter/insert'		'enter'
CB	*-ngen+ja	*-ngen-
PS	*-ngenya	*-ngen-
Qh	-tšepa	-tšep̥
Ts	-tsepa	-tsen-
SS	-kepa	-ken-
NS	-tsoṅpa	-tsen-
Pu	-kepa	-ken-
Tl	-tsepa	-tsen-
Lo	-džepa	-džen-

In all languages this historical process leaves a synchronic reflex whereby alveolar (dental in Qh) nasals preceding y are converted to n in diminutive formation. This is dealt with for Qh in 4.5. As table (25) shows, there are also lexically related pairs of causative/non-causative verbs.

#### 12.11 Palatal nasals - exceptional sporadic changes

In 11.2 we explained how \*n became Qh n and other Sotho n. Although this is generally true, there are some instances in which \*n remained palatal, or became velar ŋ. Examples of these changes (or non-changes) are given below for Qh, Ts, SS and NS:

(26)	PS *n+anga 'doctor'	*-ŋIna 'earring'
	Qh naqa	-ŋena
	Ts ŋaka	-ŋIna
	SS ŋaka	-ŋIna
	NS ŋaka	-ŋIna

#### 12.12 Word-final sequence \*n+high front vowel

Word-finally the sequences PS \*ni or \*ni were subject to Vowel Absorption (except in T1 and Lo - see 10.4), but in addition there was a change in place of articulation to palatal ɲ in T1 and Lo, and to velar ŋ in the other languages.

It is probable that word-final \*ni and \*ni first became ni and ni (as in T1 and Lo), then underwent vowel absorption to syllabic ɲ, before becoming velar ŋ. However, to our knowledge word-final ɲ is not attested. Examples of the reflexes of these word-final sequences can be found in 10.4.

## CHAPTER 13

COMPARATIVE ANALYSIS OF QHALAXARZI AND NORTHERN SOTHO TONE

In this chapter we shall firstly review the CB tones for noun stems and verb radicals as reconstructed by Guthrie. Secondly, we shall show how these tones developed into their modern lexical equivalents in Qh and NS. Finally, we shall compare the tones of main verb constructions (MVCs) which Qh and NS have in common to determine how they differ and are similar with respect to tone rules. It should be noted here however, that Lombard (1976) (our reference for the NS tonal data) and this study make several different starting assumptions for tones in NS and Qh respectively. For example, in a NS form such as ga ké epó1'1é taba 'I don't dig the matter up' the first H of the verb stem is introduced in Lombard by the rule 's2StNeg' (which stands for 'second stem syllable, negative'), the second by 'Toon-assimilasié' and the third by 'Toonrepetisié' (pages 39 and 97). The derivation of the stem is thus: epolle → epó1le → epó1'1é.

In the comparable Qh form hakéepó1ó1é sje1o 'I don't dig the thing up', the tense suffix é is regarded underlyingly as H, and the Hs on -ó1ó1- derived by Left Suffix Raising. (The H on é in Qh comes from Right Prefix Raising, not relevant to the present discussion.) The derivation is thus (ignoring RPR) epó1ó1é → epó1ó1é.

Since it is beyond the scope of this study to compare in detail the two treatments of tone, all examples of NS constructions are compared with their Qh equivalents according to the tonal framework devised for Qh in Chapter 8. For the example given above for instance, we would therefore say that given that the tense suffix Qh e/NS e is H underlyingly, the rule of Left Suffix Raising is common to both languages.

Because we do not have sufficient tonal data for all the languages, we shall make no proper attempt to reconstruct tone for Proto-Sotho. The data we do have will give some indication of what that tonal system must have been like, but a complete reconstruction will have to wait until further tonal analysis of the other languages has been carried out.

Since tone is our only concern in this chapter, our examples will be given segmentally in their orthographic representations, with the exception that a cedilla under the symbols e and o in Northern Sotho replaces the usual circumflex accent.

### 13.1 Guthrie's CB Tone

Guthrie reconstructs CB with two tones, H and L. Sequencing of tones in morphemes containing two vowels or more is limited only to the extent that two vowels standing together in a verb radical will have the same tone. Extensions of verb radicals, for example \*-ud- in \*-púúud- 'rest', are left unmarked, being regarded as toneless.

Since unextended radicals occur only in the syllabic shapes \*CV, \*CVC and \*CVVC, they may only be H, L, HH or LL,

for example

- (1) \*CV: \*-dɪ- 'eat', \*-dù- 'fight'  
 \*CVC: \*-bón- 'see', \*-bàd- 'count'  
 \*CVVC: \*-dádá- 'sleep', \*-bèèj- 'carve'

Noun stems most commonly have the structure \*CVCV, and since there is no restriction on tone sequences, these are HL, HH, LH and LL, for example

- (2) \*-cúngù 'pain', \*-bádà 'colour'  
 \*-cɪmbɪ 'iron', \*-pádá 'impaia'  
 \*-bòmbó 'bridge of nose', \*-bàdé 'sorghum'  
 \*-dídò 'fire', \*-gùbbò 'blanket'

Less commonly other syllable structure shapes occur:

- (3) \*CV: \*-gɪ 'fly', \*-jɪ 'village'  
 \*CVV: \*-bǎǎ 'dog', \*-cɔ 'face'  
 \*CVVCV: \*-béédè 'breast', \*-cókò 'head'  
 \*CVVCVCV: \*-yéédéj 'star', \*-dɪmídà 'Pleiades'

### 13.2.0 The Development of Qh and NS Noun Stem and Verb Radical Tones

In this section we will examine separately the lexical tones of verb radicals and noun stems.

#### 13.2.1.0 Lexical Tones of Verb Radicals

In all Sotho languages the following two segmental changes occurred resulting in differences of underlying tonal representation. These were (1) the desyllabification or deletion of the vowel in original \*CV radicals (see 10.3), and (2) the merging of double- and single-vowel radicals

to single-vowel radicals (10.2). We deal separately with the tonal results of these changes.

### 13.2.1.1 Desyllabification/deletion of V in \*CV-radicals

It is reasonable to speculate that at an early stage of Proto-Bantu at least, radicals existed as independent words, so for example \*-df- could have existed in isolation as \*df 'eat'. However, by the time of PS, and even long before that, radicals had ceased to exist in isolation, and could only occur as bound forms, necessarily followed by a tense suffix, or a non-syllabic radical plus tense suffix. Since all tense suffixes and non-syllabic radicals commenced in a vowel, the vowel of the \*CV-shaped radical in all cases found itself in the desyllabification/deletion environment. The result of this process in all surface contexts, meant that the lexical form of the radical came to contain no vowel, and because tone, being autosegmental, was not affected by this process desyllabifying/deleting its syllabic base (the vowel), it came to be associated with a non-syllabic radical, for example:

- (4) CB \*-df+V-commencing suffix  
       ↓  
       \*-dy-  
       ↓  
       -j- 'eat' (Qh and NS)

As (4) shows, this is how (usually with other segmental changes) Qh and NS came to have nonsyllabic radicals bearing a tone. (4) shows the development of a H nonsyllabic radical, but of course, L \*CV-radicals developed in the same way, for example

(5) CB \*-dũ- → -lŵ- 'fight' (Qh and NS)

In a modern derivation, as we have shown for Qh in Chapter 8, the H tone of a nonsyllabic radical is associated with a following vowel in order to be realized phonetically, by the rule we called Unassociated Tone Attachment (UTA), so for example underlying xo+ɟ+a (where here and henceforth, except in the CB examples, an unmarked vowel indicates a L tone) becomes surface xoɟá 'to eat'. The same process is found in NS, for example go+ɟ+a → go ɟá.

Synchronically, we have treated originally L nonsyllabic radicals as toneless in Qh (see Chapter 8). This was because if such a tone is followed by a L then UTA is vacuous (L replaces L), and if the following tone is H, then it is not replaced by the L of the radical, and would have to be deleted instead. Thus, for reasons of economy, it is better to treat such radicals as underlyingly toneless. The same holds true for NS. Therefore originally L radicals like lŵ 'fight' are treated simply as toneless in both languages, and from underlying structures like Qh xo+lŵ+a/NS go+lŵ+a no rule applies to give the surface forms xolŵa/go lŵa 'to fight'.

Note finally that extensions in Qh and NS are treated underlyingly as L, not toneless as in Guthrie's CB, and tense suffixes may be H or L.

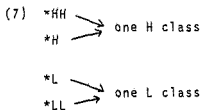
### 13.2.1.2 Merging of double and single vowels to single vowels

That this merger took place in both languages can be seen in the following examples in (6):

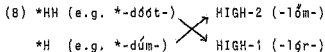


(6)	CB	Qh	NS	
	*-bèəj-	-bət-	-bətI-	'carve'
	*-bàd-	-baI-	-baI-	'count'
	*-dódt-	-lqr-	-lqr-	'dream'
	*-dúm-	-lóm-	-lóm-	'bite'

In NS, but not Qh, the result of this segmental merger meant also tonal merger between original CB \*L and \*LL, and \*H and \*HH radicals. Thus in NS:



Qh however, although it shares with NS the merger to one L class of the original \*L and \*LL radicals, maintains the distinction between original \*HH and \*H radicals. \*HH radicals become what we have called in Chapter 8 the HIGH-1 class, and \*H radicals the HIGH-2 class (members of which it will be remembered were analysed as having two underlying Hs, the second of which is manifested on a following syllable in a derivation). It would appear from this that there has been a 'switch-over' of some sort, as diagrammed below:



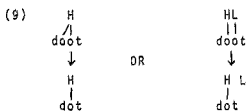
This seems to us an unlikely development however, and it leaves open two obvious questions:

(i) In view of the tonal stability during the

desyllabification/deletion of the vowel in \*CV-radicals, how is it that the second H of \*HH radicals has simply been lost?

(ii) Where does the second H of HIGH-2 radicals come from?

To attempt an answer to the first question, it would appear that if tonal stability was a consistent accompaniment to desyllabification/deletion of vowels (and there is good reason to believe this, at least for Qh, as previous chapters have shown), then the CB form of say \*-dóót- 'dream' could not have had two H tones, but only one. By the autosegmental well-formedness condition (Clements and Goldsmith, 1984:10), this H could have been associated with both vowels or with only the first, the second being simply L. The development of the double/single vowel merger (ignoring the segmental changes in consonants) would thus have been



In the first option, when the second vowel was deleted, its tone association line would simply have been cancelled out. In the second option, the L would have been reassociated with the following syllable (but since it would have replaced a L there, or been deleted if a H followed, it may for all practical reasons be considered to have been deleted in any case (see 13.2.1.1 for the rationale for considering original unassociated Ls on nonsyllabic radicals to be absent synchronically)).

There are data from Northern Bantu languages, in which the double/single vowel distinction in radicals has been maintained, which support particularly the second option of (9) above. In Ganda for example, Guthrie's \*HH radicals have HL reflexes, for example \*-túúú- → -túúú- 'sit down' (Cole, 1967) (for other examples also from Cole (1967) see Dickens (1984:117)). Henceforth therefore we shall regard these radicals as having proto-tones \*HL, and we shall use this designation \*HL instead of Guthrie's \*HH for this class of CB radicals.

Given that this argument is correct, namely that there could not have been two Hs in the proto-forms because the second would have survived the deletion of the second vowel, we might, by the same token, explain the modern presence of a second H in HIGH-2 radicals as resulting from the deletion of a second H-toned vowel in Guthrie's \*H radicals. Although there is no evidence that Qh H-2 radicals like -lóm- 'bite' came from a double vowel form like \*\*-dúúú-, there is evidence that such forms could originally have been \*CVCV, perhaps in this case \*-dúúú-.

This evidence comes from the South-western Bantu languages in which, in certain verbal constructions, the verb stem has the form radical+V(vowel). For Ndonga, Fivaz (1984) calls this V following the radical a 'Harmonic Vowel Suffix' (page 149), and gives as its significance 'repetitive or repeatable aspect, called "iterative"' (page 148). It is regarded as a harmonic suffix because it shows 'complete assimilation to the vowel of the verb root' (page 154), for example in otandi lond+n 'I am climbing' where -lond- is radical, and

o is V. There are cases however, as Fivaz himself (page 154) admits, in which this V is not harmonic, for example in otandi popi 'I am speaking', and it is clear that in these cases at least, the V is part of the radical, and not a suffix at all. For example, when the suffix a is used in forming the infinitive, 'to speak' comes out as okupopya (infinitive prefix oku-), where the y between -pop- and -a is obviously the desyllabified version of the final -i in otandi popi. The reason that a back vowel was deleted preceding this infinitive a, instead of being desyllabified to w ('to climb' for example is okulonda, not okulondwa) might have been because the passive is formed by adding w (thus okulondwa means 'to be climbed'). (The case is not as straightforward as this however, since usually front vowels are also deleted preceding infinitive a, for example otandi lilil 'I am crying', but okulila 'to cry', not okulilya.)

Note finally that this final V of CVCV forms corresponds paradigmatically to the final V of \*CV radicals, where there is no question that the V is part of the radical, and not a suffix. Examples are:

(10)	CV:	otandi li	'I am eating'
		okulya	'to eat'
	CVCV:	otandi popi	'I am speaking'
		okupopya	'to speak'
		otandi londo	'I am climbing'
		(okulonda)	'to climb'

We may question also the 'repetitive or repeatable aspect' that Fivaz attributes to this V. Out of the twenty-

nine aspect/tense forms he gives on pages 154 and 155, twenty-one of them have final V, and although he calls all of them 'iterative' or 'repetitive', from his translations it would appear that these forms are simply unmarked with respect to 'iterative', for example 'Imperfect iterative: onda londo I climbed' and 'Iterative continuative imperfective: otandi londo 'I am climbing'. In the cases where the 'iterative' meaning unequivocally appears in the translation, there is always some other marker in any case, for example, forms translated with 'always' always have the form (o)handi preceding the radical, for instance 'Habitual perfective iterative past: onda li handi londo 'I was always climbing' and 'Habitual imperfective iterative present: ohandi londo I am always climbing'.

What we suggest is that the form with final V is, historically at least, a basic or uninflected form, the forms with other final elements being inflections from it. This would accord well with our proposal that such radicals were originally \*CVCV, and not \*CVC.

Unfortunately, when it comes to tone, we have no data at hand to show that if these forms were originally \*CVCV then both vowels were H-toned as we have suggested. Therefore, insofar as our hypothesis can be further supported, it will have to wait until more tonal information becomes available on these South-western languages.

We shall in the meantime however assume that the second H of HIGH-2 radicals in Qh arose by the loss of a final V in original \*CVCV forms, and that this final V had been deleted in all environments long before PS arose as a

separate group. (The latter assumption must be made because, to our knowledge at least, there is no modern evidence of such a vowel in Eastern and Central Bantu, although there is evidence of the second H tone - for example in Xhosa (Lanham, 1960) and Rimi (Schadeberg, 1982).) Henceforth we shall represent the proto-forms of Guthrie's \*H radicals as \*HH.

Below we summarize our position this far:

- (i) CB had four tonal radical types. These are reconstructed by Guthrie as:

\*L   \*-bād- 'count'  
 \*LL   \*-bèèj- 'carve'  
 \*H   \*-dúm- 'bite'  
 \*HH   \*-dóót- 'dream'

- (ii) By the arguments given above, we replace Guthrie's H radical reconstructions as follows:

Guthrie's replaced by this study's

\*H (-dúm-)                   \*HH (-dúmú-)  
 \*HH (-dóót-)               \*HL (-dóót-)

- (iii) By the time of Proto-Sotho, the final V of our \*HH forms had been deleted, giving HIGH-2 lexical items, for example \*-dúm- (with segmental changes, \*-lúm-).

Let us return now to NS, where, as we have indicated, our \*HL and \*HH (Guthrie's \*HH and \*H respectively) radicals have merged. This merger was in the direction from \*HL to \*HH. That radicals all have two H tones in this language can be seen from the following comparison between NS and Qh

reflexes of etymologically \*HL and \*HH radicals (given here in the positive infinitive):

(11)	<u>Etymological</u>	<u>NS</u>	<u>Qh</u>
	*HL	go phómóla	xohómola 'to rest'
	*HH	go gópóla	xoxópóla 'to remember'

The direction of the merger to \*HH is obscured in monosyllabic radicals by a very general rule (see below, page 224) whereby final prepausal H is lowered if preceded by a H. Thus in bisyllabic stems (that is, monosyllabic radical plus tense suffix), the HH sequence is only seen if an adjunct follows (denoted by '...'), for example:

(12)	<u>Etymological</u>	<u>Prepausal</u>	<u>Non-prepausal</u>
	*HL	go bótša	go bótšá... 'to tell'
	*HH	go lóma	go lómá... 'to bite'

(cf. Qh xobózja 'to ask' and xolómá 'to bite' whether prepausal or not)

The second H of monosyllabic radicals may also be seen when these are extended, since in these cases the extension (that is, the first extension if there is more than one) is H, for example:

(13)	go bótšána	'to tell each other'
	go lómána	'to bite each other'
	(cf. Qh <u>xobózjana</u>	'to ask each other' and
	<u>xolómána</u>	'to bite each other')

Note finally, that even H nonsyllabic radicals, when doubly extended, have two H tones, for example -jéšána (from j+eš+an) 'cause each other to eat'. Since proto-forms of such radicals (in this case \*-if-) could not have

contained two Hs, we must assume that the second H in doubly extended forms of these radicals was introduced by analogy, once original \*HL and \*HH radicals had merged to the HH form.

Lombard analyses this situation differently. He treats all H-class radicals as containing only one H, on the first syllable, with the second H derived in all cases by the rule Toonrepetisie (page 39). Without intending any criticism of Lombard's analysis, which is in any case a strictly synchronic one, we shall, in order to facilitate comparison later on of rules affecting verbal constructions in Qh and NS, analyse the H monosyllabic and bisyllabic (fused extended) radicals of NS in the same way as we have analysed HIGH-2 radicals of Qh. Thus the radicals exemplified in the tables above will for the present purposes be regarded underlyingly as follows:

(14)	NS		cf. Qh
	-b <sup>h</sup> ótš-	'tell'	-b <sup>h</sup> óžj- 'tell'
	-l <sup>h</sup> óm-	'bite'	-l <sup>h</sup> óm- 'bite'
	-phóm*ó1-	'rest'	-hóm*ó1- 'rest'
	-góp*ó1-	'remember'	-xóp*ó1- 'remember'

Giving monosyllabic forms such as -b<sup>h</sup>ótš- and -l<sup>h</sup>óm- in NS two Hs underlyingly, requires a rule converting the second to L if it occurs prepausally (we shall call this 'Final Lowering', after Lombard's (page 27) 'Verlagung nach die finale sillabe'), for example go+b<sup>h</sup>ótš+a → gobótšá by UTA, → go bótša by Final Lowering (FL).

Nonsyllabic radicals may likewise be analysed with two underlying H tones, for example -š- 'eat'. Here (a special NS version of) UTA would replace the following two



Ls with Hs if two or more L syllables followed the radical, or, if only one L followed the radical, the remaining unassociated H would be automatically deleted by the well-formedness condition (WFC), for example

(15) 'eat'	'feed'	'feed each other'
U: -j+a	*-j+eš+a	*-j+eš+an+a
UTA: j á	j éš á	j éš án
WFC: j		
S: -já	-jéšá	jéšána

(In the case of -jéšá, if it were prepausal, Final Lowering would convert it to -jéša.)

In table (16) below the development of H radicals in Qh and NS is summarized:

(16) *CV (-11-)	*CVVC (-dád-)	*CVCV (-dám-)
(i) $\begin{array}{c} H \\   \\ CV \end{array}$	$\begin{array}{c} HL \\   \quad   \\ CVVC \end{array}$	$\begin{array}{c} H \quad H \\   \quad   \\ CVCV \end{array}$
(ii) $\begin{array}{c} H \\   \\ C\emptyset \end{array}$	$\begin{array}{c} HL \\   \\ C\emptyset C \end{array}$	$\begin{array}{c} H \quad H \\   \quad   \\ CVC\emptyset \end{array}$
(iii) $\begin{array}{c} H \\   \\ C \end{array}$	$\begin{array}{c} H \\   \\ CVC \end{array}$	$\begin{array}{c} HH \\   \\ CVC \end{array}$
(iv) $\begin{array}{c} HH \\   \\ C \end{array}$	$\begin{array}{c} HH \\   \\ CVC \end{array}$	$\begin{array}{c} HH \\   \\ CVC \end{array}$

At stage (i) three H-toned radicals exist, \*CV, \*CVVC and \*CVCV, with tones \*H, \*HL and \*HH respectively.

At stage (ii), final vowels are deleted from \*CV and \*CVCV. This results in underlyingly unassociated H tones in newly created C and CVC radicals respect-

ively. In addition to this, double vowels of \*CVVC radicals become single. This means that the second tone of such radicals comes to be associated with the following syllable (that of extension or tense suffix). However, because this tone is L, it has no surface effect on the following syllable, and (to all intents and purposes) may be regarded as having been deleted.

Stage (iii) represents the H-toned radical classes found in Qh, after the changes of stage (ii) are complete.

At stage (iv), representing NS, original \*HL \*CVVC and \*HH \*CVCV have merged to a single HH CVC class. By analogy, H \*CV forms have also come to have two underlyingly H tones.

Taking Qh as representing an older tonal form of NS (since there the two-way original \*HL/\*HH distinction is maintained) we can find in it, the possible seeds of the later NS merger between \*HL and \*HH. These are as follows: Firstly, as was shown in 2.6, prepausal HH and HL sequences are realized very similarly in Qh, as  $\bar{H}LL$  and  $\bar{H}HL$  respectively. This similarity, though only in this position, would make a merger more likely. In the second place, as we have shown in 8.3, there are certain MVCs in which final HH sequences are converted prepausally to HL sequences. We feel that this alternation, given the similarity between the sequences, might have facilitated confusion between the two tone classes, and ultimately led to their merger.

The development of the L radicals is less controversial,

and probably took place as follows:

(17) <u>*CV (-dū-)</u>	<u>*CVVC (-bēēj-)</u>	<u>*CVC (-bād-)</u>
(i) $\begin{array}{c} L \\   \\ CV \end{array}$	$\begin{array}{c} LL \\   \\ CVVC \end{array}$	$\begin{array}{c} L \\   \\ CVC \end{array}$
(ii) $\begin{array}{c} L \\   \\ C\emptyset \end{array}$	$\begin{array}{c} LL \\   \\ CV\emptyset C \end{array}$	$\begin{array}{c} L \\   \\ CVC \end{array}$
(iii) C	$\begin{array}{c} L \\   \\ CVC \end{array}$	$\begin{array}{c} L \\   \\ CVC \end{array}$

At stage (i) three L-tones radical types exist, \*CV, \*CVVC and \*CVC. (The last-mentioned could have existed as \*CVCV, for although there is no tonal evidence here for the second V, as there is with the \*HH \*CVCV radicals, this second V occurs in the South-western languages, whether a radical developed from an original H or L form.)

At stage (ii) the final vowel is deleted from \*CV (and possibly \*CVCV) forms, resulting in L \*CVs becoming L nonsyllabic radicals. The double vowels of \*CVVC forms became single, resulting in a second, unassociated, L.

Stage (iii) represents both Qh and NS. Unassociated Ls are regarded as having been deleted, since synchronically they have no surface effect. Original \*CVVC and \*CVC forms merge to a single L radical class with CVC shape.

### 13.2.2 Lexical tones of noun stems

We begin with the most common noun stem shape of C $\emptyset$ , namely \*CVCV. Here we find that there has been no change in

\*LL and \*LH sequences, for example:

(18)	CB	NS	Qh	
	*-d1db	-11q	-1e1q	'fire'
*LL	*-j1dà	tse1a	tse1a	'path'
	*-gùbò	kobq	qobq	'blanket'
	*-bèdè	-bè?é	-bè1é	'sorghum'
*LH	*-jàdɛ	tladɛ	tarzɛ	'lightning'
	*-nùngú	nokó	noqó	'porcupine'

In \*CVCV, original \*HH and \*HL have mostly merged to HH in both Qh and NS. This is obscured in NS in final position by Final Lowering, but the second tone surfaces as H when the stem is followed by the diminutive suffix -ana (in which case the H is manifested on the first a of this suffix), or by the locative suffix -ng. Examples (giving uninflected and diminutive or locative stems for NS) are as follows:

(19)	CB	Qh	NS	
	*-kócɛ	qhósjɛ	kgóšɛ/ kgóšána	'chief'
*HL	*-kúúq	khúrú	khúdu/ khútšwána	'tortoise'
	*-búnù	-bónó	-bóno/ -bónóng	'anus'
	*-címɛ	tshépé	tshɛpi/ tshítšwána	'iron'
*HH	*-yáá	-ná1é	-ná1a/ -ná1ána	'nail'
	*-béq	péú	péu/ péwána	'seed'

In Qh and NS there do still however exist HL CVCV noun stems. In Qh these are less classifiable into the following types:

(i) borrowing, for example támo 'dam' (from Afrikaans

'dam', kópi 'cup' (from Afrikaans 'koppie');

(ii) stems derived from suffixing agentive -i or impersonal -g to HIGH-1 radicals, for example pózzg 'question' (from radical -bózzj- 'ask'), (mo)sámq 'pillow' (from radical -sám- 'lay down one's head');

(iii) a few stems whose etymology is not clear, for example hǎlǎ 'bat (animal)', nyǎla 'bean and spinach dish', (sǎjǎ)thúnyǎ 'flower/gun'.

In NS the picture is less clear. Some borrowings are HH, but others HL, for example (giving the basic stem, plus diminutive or locative, in order to obviate the obscuring effect of Final Lowering) HH báki/báking 'jacket' (from Afrikaans 'baadjie', but HL (se)kǎlǎ/(se)kǎlong 'school' (from Afrikaans 'skool'). Nouns formed from the equivalents of Qh HIGH-1 (originally \*HL, but in NS, HH) radicals are sometimes HH, sometimes HL, for example HH pótǎg/pótǎng 'way of telling' (from radical -bótǎ- 'tell'), but HL (go)sǎg/(go)sǎng 'building' (from radical -ǎg- 'build'). There is also a miscellaneous group whose etymology is not clear, for example (se)thúnyǎ/(se)thúnyana 'blossom/gun', (mo)ótǎwa/(mo)ótǎwǎng 'thorn'. Finally, we have found one original \*HL form which is also HL in NS, namely púdi/pútsana 'goat' (from CB \*-búdi, cf. Qh púrzǎ). This would indicate that some \*HL nouns (probably there are more than just this one) have failed to undergo the merger to HH.

In original \*CV stems there has been no change tonally in either language, for example:

(20)	CB	NS	Qh	
	*-jɿ	-tse	-ze	'village'
*L	*-nɔ̃	-nɔ̃	-nɔ̃	'finger'
	*-bɔ̃	-mɔ̃	-bú	'soil'
*H	*-gɔ̃	-kú	-kú	'sheep'

In both languages the development of \*CVV stems shows the desyllabification or deletion of the first V. If the tone of this V was H, it is manifested on the second vowel, where it replaces the original L there. The only CB stems of this shape for which both languages have reflexes are:

(21)	CB	NS	Qh	
	*-bɔ̃ə	-pɛ́á	-tjwá	
*HL	*-pfa	-fsá	-sá	'new' (adjective stem)
	*-bùè	-bjɛ	-zjwɛ	'stone'
*LL	*-gùè	-kwɛ	-qwɛ	'leopard'

Only four CB stems with the structure \*CVVCV could be found which had reflexes in both NS and Qh. These are

(22)	CB	NS	Qh	
	*-béédè	-bɛ́lɛ̃/-bɛ́lɛ̃ng	-bɛ́lɛ́	'breast'
	*-cɔ́ókò	hlɔ́gɔ̃/hlɔ́gɔ̃ng	thɔ́xɔ̃	'head'
	*-kúáyá	-gáé/-gáéng	-xáá	'home'
	*-pɿɿf	-fɿfɿ	-hihi	'darkness'

It is probable here that the CB form for 'head' was \*-cɔ́ókò, rather than Guthrie's \*-cɔ́ókò. This would account better for the HL in the reflexes of this word, but the HH in 'breast' and 'home'. It is not clear why the final H of the CB form for 'darkness' has been lost in Qh and NS.

Reflexes for only two \*CVCVCV forms were found, these being

(23)	CB	NS	Qh	_____
	*-dímídà	-leməla	-leməla	'Pleiades'
	*-yédédí	nálédí	nyélérzi	'star'

We have no explanation for the tonal changes in the reflexes of 'star'.

Note finally, that the noun prefixes in both languages are all L, except C1 2b, bá-. This is the same as in CB.

### 13.3.0 Tone Rules in Main Verb Constructions in Qh and NS

Before looking at the constructions themselves we shall consider in summary the underlying tone differences of the morphemes constituting these constructions in the two languages. The tonal classes of verb radicals have been dealt with already in 13.2.1.0.

The other morphemes relevant to our comparison (for which no tones are reconstructed by Guthrie for CB) are as follows (in the examples, the morphemes in question are underlined):

- (i) Negative preprefix: In both languages this is L, Qh ha and NS ga, for example

NS	Qh	
<u>ga</u> sé fe	<u>hasjé</u> he	'he(7) doesn't give'

- (ii) Subject prefixes: In NS, SPx (for the difference between SPx and SPy, see 7.3) is underlyingly L for first and second persons in the Positive Indicative, otherwise all SPxs are H. This differs from Qh, in which SPx is L for C1 1, 4 and

9 in the Positive Indicative, and otherwise H, for example,

<u>NS</u>	<u>Qh</u>	
o tlátšá kópi	óddázjé kópi	'you(sg) fill the cup'
ó tlátšá kópi	óddzja kópi	'he(1) fills the cup'
ga ó tlátšé kópi	haóddázjé kópi	'you(sg) don't fill the cup'
ga á tlátšé kópi	haóddázjé kópi	'he(1) doesn't fill the cup'

In NS, SPy is L for all cases, but in Qh SPy of 1ps, 2ps and Cl 1 is L, but otherwise H, for example:

<u>NS</u>	<u>Qh</u>	
á hlaba	á raba	'he(1) slaughtered'
ra hlaba	há raba	'we slaughtered'

(iii) Relative prefixes: In both languages these are H, for example:

<u>NS</u>	<u>Qh</u>	
yó á rátagó	yó orácdyó	'he(1) who loves'
bá bá lwagó	má bá lwaxó	'they(2) who fight'

(iv) Negative prefixes: In both languages the negative participial prefix is L, Qh sjaa, NS sa. The negative subjunctive/imperative prefix is likewise L, Qh sje, NS sa or se, for example

<u>NS</u>	<u>Qh</u>	
gé á sa tlátše hq	šjaadázjé	'if he(1) doesn't fill'
se bólaye	sjebóláe	'don't kill!'

The Negative Infinitive is formed differently in the two languages. In NS the same negative



prefix found in imperatives or subjunctives is used, with the H tense suffix é; in Qh the negative prefix is sjáá (not found in other constructions) and the L tense suffix a is used, for example:

<u>NS</u>	<u>Qh</u>	
go <u>se</u> lwé	xosjáá <sup>á</sup> lwa	'not to fight'

- (v) Aspect/mood prefixes: The potential morpheme is H in both languages, as is the progressive: Qh qá, NS ká, and Qh sjá, NS sá respectively, for example

<u>NS</u>	<u>Qh</u>	
se <u>ká</u> lwa	sjeqá <sup>á</sup> lwa	'he(7) can fight'
ke <u>sá</u> hlaba	késjá <sup>á</sup> rabaxó	'I am still slaughtering'

- (vi) Object prefixes: In NS these are all H, but in Qh those of 1ps, 2ps and C1 1 are L, and all others are H, for example:

<u>NS</u>	<u>Qh</u>	
go <u>á</u> tháta	xonchá <sup>á</sup> cá	'to love me'
go <u>df</u> épolla	xorz <sup>á</sup> fépoloia	'to dig them(10) up'

- (vii) Extensions: These are L in both languages, for example:

<u>NS</u>	<u>Qh</u>	
go bala	xoba <sup>á</sup> la	'to count'
go ba <sup>á</sup> la	xoba <sup>á</sup> la	'to count for'
go ba <sup>á</sup> la <sup>á</sup> na	xoba <sup>á</sup> la <sup>á</sup> na	'to count for each other'

It will be remembered however, that extensions

following any H radical in NS, becomes H by UTA and in Qh, an extension following a HIGH-2 radical or H nonsyllabic radical becomes H by the same rule.

- (viii) Tense/mood suffixes: The perfect/stative suffix differs tonally in NS and Qh, being LL -ilɛ in the former, and HH -lɛ in the latter, for example:

NS

ke badilɛ 'I have counted'

Qh

obarzɪlɛyɔ 'he(1) has counted'

This difference can also be seen where the suffix has 'infiltrated' the radical (see 7.9.1), for example:

NS

ke apɛrɛ 'I am dressed'

Qh

oapɛrɛyɔ 'he(1) is dressed'

With respect to the 'general' suffixes (see 7.9.2), Lombard (page 53) regards these as underlyingly L. According to his analysis they become H by rule in certain constructions. We have found however that the NS tones of these morphemes correspond exactly to those in equivalent Qh constructions, provided one bears in mind the general NS rule of Final Lowering. The

tones of these morphemes will therefore be taken as the same as those of Qh. The only difference we have found here has been segmental, namely that in the Negative Present Indicative and Participial, NS has é [í], whereas Qh has é [é]. A few examples showing tonal correspondences are given below:

Infinitive Positive

NS: go bóláya      Qh: xobóláa      'to kill'

Present Indicative Negative

NS: ga á hlabé      Qh: haárabé      'he(1) doesn't slaughter'

Past Negative

NS: ga sé ke balé      Qh: hasé kebalé      'I didn't count'

Imperative Positive

NS: balá      Qh: balá      'count!'

- (ix) Postsuffixes: NS has only one postsuffix, namely qá, which is the cognate of Qh xá. Qh also has ya which is used only if the SP is 1, 4 or 9. In NS, the postsuffix is used only in the relative (whether or not an adjunct follows). In Qh the postsuffixes are used in the relative and in the indicative positive constructions if no adjunct follows. Observe, from the examples below, that the NS construction Positive Indicative without adjunct (first example) has no formal equivalent in Qh:

<u>NS</u>	<u>Qh</u>	
ke a hlaba	kérábaxó	'I slaughter'
tsó dí lápíšagó	zjé rzílápíšaxó	'they(10) who tire(v.t.)'

We are now in a position to review the rules of Qh as presented in Chapter 8 and investigate the similarities and differences found between NS and Qh. The abbreviations of the rules' names used here are as in Chapter 8.

### 13.3.1 Pre-xó Lowering

This rule occurs in both languages, for example:

(24)	U:	<u>NS</u>	bá bá+rát+a+gó	<u>Qh</u>	mbá bá+rác+a+xó
	UTA:		rát á		rác á
	PxoL:				a
	S:		bá bá ráta.'		mbá bárácaxó 'they(2) who love'

In Qh, the xó is omitted if the construction precedes an adjunct, and in such a case, the H lowered by PxoL is restored, cf. mbá bárácá basézana 'they(2) who love girls'. In NS the gó is not dropped if an adjunct follows, but the second H can be seen in non-relatives, such as bá ráta basé-tsana 'they(2) love girls'.

### 13.3.2 Right Prefix Raising

RPR occurs in both languages as well. It must be borne in mind though that in NS this rule is never triggered by an SPy, since these are all L, and never affects an OP, since these are all H. Below we show first how a H SPx causes a L radical to become H in both languages, for example

in the Positive Indicative (25), the Positive Participial (26) and the Positive Subjunctive (27). All other rules which occur in the derivations will be discussed fully in subsequent sections.

(25) U: NS bá+hlag\*ol+el+a... Qh bá+be!+is+ezj+a...  
 RPR: hlag bál  
 Adfu!R: - - é  
 LSR: - - fs @zj  
 S: bá hlágoléla... bábirzisezjá...  
 'they(2) weed for' 'they(2) boil...for'

Compare these outputs with the following forms where the same verbs, but L SPs are used: NS re hlágoléla... 'we weed for', Qh obirzisezja... 'he(1) boils...for'.

(26) U: NS lé+ep+ol+l+a' Qh lé+ep+olol+a  
 RPR: ép ép  
 S: lé épolla léépolola  
 'he(5) digging up'

(27) U: NS ré+hlag\*ol+el+é Qh hé+be!+is+ezj+é  
 OPIessL: - é  
 RPR: hlag bál  
 S: réhlágolélé hébirzisezje  
 'let us weed for' 'let us boil...for'

A difference in the domain of RPR may be observed in the Negative Present Indicative. In this construction the rule occurs in Qh, but not in NS, for example (radical following the H SP underlined):

(28) NS: ga bá hlágóléle 'they(2) don't weed for'  
 Qh: habábirzisezje 'they(2) don't boil...for'

With respect to OPs as the trigger of RPR, the domain of the rule differs again. In Qh it applies whenever its structural description is met. In NS it applies in the Present and Past Positive Indicative and in the Positive Participial (in (29) below), but not in the negative equivalents of these three, and nor in the Subjunctive and Imperative, whether these are positive or negative (in (30) below). In the examples following, the radicals following the H OP are underlined:

- (29) NS                      Qh
- ke a é ɛpolla kéɛɛpɔlɔlaxɔ 'I dig it(9) up'  
 ka é ɛpolla qaɛɛpɔlɔlɔ 'I dug it(9) up'  
 ré e ɛpolla héɛɛpɔlɔlɔ 'we digging it(9) up'

Observe that in the last NS example the OP has become 'L after spreading its H tone to the radical. This lowering is caused by a rule which we call 'Triple High Dissimilation', which is discussed below.

- (30) NS
- ga ké é ɛpɔl'le (Gloss as for Qh below)  
 ga sé ké é ɛpɔl'le  
 ké sa é ɛpɔl'le  
 ké é ɛpɔl'le  
 ké se é ɛpɔl'le  
 é ɛpɔl'le  
 se é ɛpɔl'le
- Qh
- hakɛɛɛpɔlɔlɔ 'I don't dig it up'  
 hasé kéɛɛpɔlɔlɔ 'I didn't dig it up'

késjaaééppó1ó1é	'I not digging it up'
kéééppó1ó1é	'I should dig it up'
késjéééppó1ó1é	'I shouldn't dig it up'
ééppó1ó1é	'dig it up!'
sjeééppó1ó1é	'don't dig it up!'

From the data here it would appear that in Qh RPR has become more general than in NS. The failure of RPR to apply in the constructions shown means that in NS the *underlying* L and H radicals are kept distinct for these constructions in the surface structure, whereas in Qh the underlying difference is neutralized. For example, compare NS épo11 'dig up' with H kó1ó1bét3 'baptize' in the Negative Present Indicative: ga ké mó épo1'1e 'I don't dig him(1) up' and ga ké mo kó1ó1bét3e 'I don't baptize him' with Qh L épo1o1 'dig up' and H khúrzmó1 in hakéééppó1ó1é 'I don't dig it up' and hakééékhúrzmó1é 'I don't uncover it'.

Triple High Dissimilation (see last example in (29) and also the lowering of mó in ga ké mo kó1ó1bét3e in the preceding paragraph) has no parallel in Qh. It is described by Lombard (page 26) as follows: 'Wanneer drie of meer sillabes, wat almal /+H/ (that is, H - PD) is, naas mekaar te staan *kam*, *gebeur dit onder sekere omstandighede dat* (een van) die sentrale (middelste) sillabe(s) dissimileer... tot /-H/ (that is, L - PD)'.

### 13.3.3 Adjunctless Lowering

In Qh AdlessL has a highly specific domain, operating only in prepausal Negative Present Indicatives and in Imperatives (positive or negative) to convert a final H tense suffix

preceded by a H, to L. In NS on the other hand, the analogue of this rule, which we have called Final Lowering (see page 224), operates on all prepausal HH sequences, converting the final H to L. The examples below show where AdlessL/Final Lowering occur in both languages (31), and a few instances are given where this lowering occurs only in NS (32):

(31) <u>NS</u>	<u>Qh</u>	
ga ké ɛpól'le	hakéɛpólólɛ	'I don't dig up'
(cf. ga ké ɛpól'lé...)	hakéɛpólólɛ...	
bóláya	bóláa	'kill!'
(cf. bóláyá...)	bóláá...)	
se lap'ɛ	sjelapfɛ	'don't tire(v.t.)!'
(cf. se lapísfɛ...)	sjelápísfɛ...)	

(32) <u>NS</u>	<u>Qh</u>	
go bɔ́nɔ́	xobɔ́nɔ́	'to see'
(cf. go bɔ́nɔ́...)	xobɔ́nɔ́...)	
bá se bóláyɛ	básjébóláɛ	'they(2) shouldn't kill'
(cf. bá se bóláyɛ...)	básjébóláɛ...)	
ga sé ke bóláyɛ	hasé kébóláɛ	'I didn't kill'
(cf. ga sé ke bóláyɛ...)	hasé kébóláɛ...)	

This data suggests that Qh here represents an older stage, and that in NS AdlessL was generalized to all constructions in which prepausal HH occurred, so that today Final Lowering precludes the possibility of any prepausal HH sequences. As we have indicated in 13.2.1.2, the neutralizing effect of AdlessL on original \*HH and \*HL radicals was



probably instrumental in causing their merger in NS.

#### 13.3.4 Left Suffix Raising

LSR occurs both in Qh and NS in all constructions in which the general tense suffix is H (except in the Positive Subjunctive without OP, in which case OPlessL applies before LSR, and lowers the tense suffix - see 13.3.6). The constructions involved are: Present Indicative Negative, Past Indicative Negative, Present Participial Negative, Imperative Positive or Negative, Subjunctive Positive with OP and Subjunctive Negative.

Observe that in the examples of the constructions listed above (to be found in (36)), in NS, Final Lowering (FL) always obscures the fact that the tense suffix is underlyingly H, for instance:

(33) U: ga+ké+ep+ol+ l+é 'I don't dig up'  
 LSR:            ól 'l  
 FL:                            e  
 S: ga ké epól'le

The same effect can be seen in Qh in the Negative Indicative and in Imperatives by the application of AdlessL, for example:

(34) U: ha+ké+ep+ol+ol+é 'I don't dig up'  
 RPR:            ép  
 LSR:            ól ól  
 AdlessL:                            é  
 S: hakéépólólé

That the tense suffix in these constructions is indeed

underlyingly H however can be shown by using a monosyllabic L radical, such as NS hlab, Qh rab 'slaughter'. Here, because there are no extensions, LSR does not raise the tone preceding the tense suffix, and a final HH sequence does not result. Therefore neither Final Lowering (for NS) nor AdlessL (for Qh) can apply (for the structural index of AdlessL see 8.3), for example:

(35) NS                      Qh  
           ga ké hlabé        hakérabé 'I don't slaughter'

Below in (36) examples are given in which LSR has applied in both languages. The construction types are given in the same order in which they are listed above:

(36) NS                      Qh  
           ga ré épól'le        hahéépólólé 'we don't dig up'  
           ga sé ré épól'le        hasé heépólólé 'we didn't dig up'  
           ré sa épól'le        hésjaépólólé 'we not digging up'  
           épól'la                      épólola 'dig up!'  
           se épól'le                      sjeépólólé 'don't dig up!'  
           ré é épól'le                      héépólólé 'let us dig it up'  
           ré se épól'le                      hésjeépólólé 'let us not dig up'

### 13.3.5 Adjunctful Raising

In Qh this rule is restricted to applying only in the Present Positive Indicative, and then only if the SPX is H. In NS on the other hand, AdfulR, it would seem from Lombard (pages 40, and 83-84), occurs both in the Present Positive Indicative and in the Infinitive, but only (but see below) with H radicals, irrespective of the tone of the SPX. As in Qh, the raising of the tense suffix by this



(40) With H SPx	With L SPx	
bá hlágoŋla...	ke hlágoŋla...	'they/I weed for'
bá lǎpiša...	ke lapiša...	'they/I tire'
bá tlišá...	ke tliša...	'they/I bring'
bá lwá...	ke lwa...	'they/I fight'

In the H SPx series, the radical syllable, where there is one, is raised by RPR. It would appear that the tense suffix in tlišá and lwá has been raised by AduŋR, and perhaps this represents an older stage of the Qh forms, where AduŋR achieved a foothold, so to speak, on L radicals.

However, just as these cases could be exceptional applications of AduŋR in NS, so they could equally well be exceptional applications of RPR, where RPR spreads its H tone over the radical boundary (applying twice in the case of tlišá) onto the tense suffix. It may be recalled that a similar exceptional application of RPR was found in Qh, where RPR applied to the L tense suffix in infinitives of nonsyllabic toneless radicals when they were preceded by a H OP (see 8.11).

Finally we give below an example of how AduŋR applies to infinitives in NS, but not in Qh:

(41) NS	Qh
go bóŋyá khúdu	xobóŋá khúrú
'to kill the tortoise'	

In applying to infinitives in NS, it would seem that this represents a broadening of the domain from Qh, which in this aspect would then represent an earlier stage.

### 13.3.6 OP-less Lowering

In Qh the tense suffix of the Positive Subjunctive without OP is lowered, and if a H extension immediately precedes this, then it is lowered as well. This rule is ordered prior to LSR to prevent extensions from being raised (for an example of the ordering see Chapter 8, (28), page 120).

In NS, *OPlessL* does not occur as a rule affecting the tense suffix, but it does apply to an immediately preceding H extension, for example:

(42)	U:	bá+ból*áy+é	bá+rát+an+é
	UTA:	-	rát án
	OPlessL:	ay	an
	S:	bábdlayé	bárátané
		'they should kill'	'they should love each other'

Compare the outputs of (42) with the equivalent Qh forms, respectively bábdlayé and bárátané.

The fact that this rule does not affect the tense suffix is obscured with prepausal monosyllabic and non-syllabic radicals, by Final Lowering, for example:

(43)	U:	lé+rát+é	lé+lw+é
	UTA:	rát	-
	OPlessL:	(inapplicable, no preceding H extension)	
	FL:	é	é
	S:	léráte	lélwe
		'he(5) should love'	'he(5) should fight'

The underlying HH sequences when not prepausal are realized as HH, for example when the plural suffix -ng (no equivalent in Qh) is added to such forms, as in lé rárténg 'you(pl) should love' and lé lwéng 'you(pl) should fight'.

It would appear from this comparison that Qh has been innovative with the reinterpretation of OPlessL as affecting not only a H extension, but also the tense suffix in this construction.

### 13.3.7 SPx Low Assimilation

In Qh this rule causes a H SPx to become L in the Negative Past if a L (OP or radical) follows, for example:

(44) U: hasé ké+bal+é but: hasé ké+bózz+é

SPLA: ke -

S: hasé kebalé hasé kébózzé

'I didn't count' 'I didn't ask'

In NS this rule does not exist. Instead, the H SPx dissimilates (DISS) to L, if a H tone follows. As in Qh, the rule-triggering tone may belong to the following OP or radical, for example:

(45) U: ga sé bá+kól\*ǵb+ǵtš+é ga sé lé+lw+é

DISS: ba le

LSR: ǵtš -

FL: e -

S: ga sé ba kólǵbǵtše ga sé le lwé

'they didn't baptize' 'he(5) didn't fight'

Examples showing no change to the SPx if it is followed by a L are ga sé ré hlagótlé 'we didn't weed for', and ga sé ó tlfé 'you(sg) didn't bring'.

Although we have dealt with this dissimilation as a separate rule, it could be the case that it is simply one instance of Triple High Dissimilation, since in each case where it applies, the underlyingly H SPx is surrounded by Hs.

### 13.3.8 SP-Lowering

In both languages, preceding potential qá (Qh) or ká (NS), all SPxs are lowered in the positive indicative, for example:

(46)	<u>NS</u>	<u>Qh</u>	
	re ká apara	heqápara	'we can dress'
	ba ká lwa	baqá lwa	'they(2) can fight'

### 13.3.9 Inter-High Raising

There appears to be no NS equivalent of IHR in Qh, the effect of this rule being to convert a L surrounded by Hs into a H. Indeed in NS, Triple High Dissimilation, which lowers a H surrounded by Hs, has precisely the opposite effect.

These two rules could exist in the languages possibly as a result of different overall tendencies. Lombard (page 20) writes that 'Skeenbaar is dit by sprekers van Pedi (that is, NS - PD) n onbewustelike neiging om toon op opeenvolgende sillabes...af te wissel...' This alternation of Hs and Ls is embodied in the Triple High Dissimilation rule. On

the other hand, in Qh just the opposite tendency can be ascertained (particularly if a MVC commences and ends on a H-toned morpheme) to make all tones H - hence the Inter-High Raising rule.

### 13.3.10 Summary of findings

Although as we mentioned earlier, a Proto-Sotho tonology cannot be reconstructed on the basis of comparing only two languages, we can nevertheless give some indication of what such a system *must* have been like. We make the following tentative proposals concerning lexical tones:

- (i) PS had three tone classes of radicals, H-1, H-2 and L. In NS the former two were merged to H-2, whereas in Qh the three-way distinction was *maintained*.
- (ii) PS extensions were all L.
- (iii) Tense suffixes were H or L, with L (segmental \*a<sup>h</sup>) occurring in Positive Infinitives, Present and Past Indicatives and Participials, and H (segmental \*I, \*e or \*a<sup>h</sup>) occurring in all other constructions.
- (iv) Postsuffixes were probably H xó and L yo, with the former taking over the function of the latter in NS.
- (v) The negative prefixes were L, and the aspect/mood prefixes H.
- (vi) The negative preprefix was L.
- (vii) It is impossible at this stage to say anything about the tones of SPs and OPs, since the two



languages are so often in disagreement.

Rules in common (though not necessarily in agreement in all details) between the two languages, and which therefore can be put forward tentatively for PS are as follows:

- (i) Pre-x<sub>0</sub> Lowering
- (ii) Right Prefix Raising: As mentioned earlier, the NS form of this rule, which does not apply to L radicals in certain constructions, is probably the older form, with Qh innovatively applying it in all constructions.
- (iii) Adjunctless Lowering: It appears here that Qh, in which this rule is highly restricted, represents the older form of the NS version of this rule, Final Lowering.
- (iv) Left Suffix Raising.
  - (v) Adjunctful Raising: It is possible that this rule applied at first only with H radicals preceded by a H SP. Later in Qh this was extended to L radicals as well, but also only with a H SP. In NS it was extended to H radicals even with a L SP, and L nonsyllabic radicals (or, as we have analysed them synchronically, toneless radicals) or monosyllabic L radicals with H SP.
- (vi) OP-less Lowering: The more restricted application of this rule in NS (only to a H extension immediately preceding the tense suffix) suggests that Qh was innovatory here in extending its application to the tense suffix as well.
- (vii) SP-Lowering.

The other rules, Qh Inter-High Raising and SP Low Assimilation, and NS Triple High Dissimilation (and perhaps its particular instance we have called *Dissimilation in Past Negatives*) appear to be innovations of the two languages, as there is no evidence of their being shared. As mentioned earlier, these could have arisen as the result of early differing tendencies, once Proto-Sotho had already split into what was to become Northern Sotho and Qhalaxarzi.

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## APPENDIX A

SUGGESTED QHALAXARZI ORTHOGRAPHY

Unlike other Sotho orthographies, the one we have selected for Qhalaxarzi is *conjunctive*, not *disjunctive*. Our reasons for this choice are essentially the same as those set out in Cole 1955:xxix-xxxv for Tswana.

Although we have indicated tone in most parts of this study, in practice it would not be necessary to indicate it except here and there. This is because, like many Bantu languages, Qh has relatively few minimal pairs distinguished by tone alone, and those that there are would be differentiated by context.

As for the segmental symbols, each graph or digraph represents of course one phoneme. In selecting the letters we have in most cases tried to keep to the I.P.A. However, occasionally, for typographical convenience or economy this has not been practicable.

The alphabet of Qhalaxarzi is presented below together with the I.P.A. equivalents where the signs of the two systems differ:

a	[a <sup>◌</sup> ]	ph	
b		q	
c		qh	
ch		r	[ɾ]
d	[ɟ]	rz	[r]
e		s	
ɛ	[ɛ <sup>◌</sup> ]	sj	[ʃ]
g		t	[t̚]
h	[h]	th	[t̚h]
i		tj	[t̚ʃ]
j	[ɟ̚]	tjh	[t̚ʃh]
k		ts	
kh		tsh	[t̚sh]
l		u	[u <sup>◌</sup> ]
m		w	
n	[n̚]	x	[χ]
ng	[ŋ̚]	y	[j]
ny	[ɲ̚]	z	
o		zj	[ʒ]
ɔ	[ɔ̚]	/n	[n̚]
p		ln	[l̚n̚]

In addition, syllabic nasals are indicated by m (bilabial, preceding h or a bilabial), n (dental preceding a vowel, otherwise the same place of articulation as the following consonant) and ŋ (velar, word-final).

## APPENDIX B

## MAIN VERB CONSTRUCTIONS — DATA FOR THE TONAL ANALYSIS

Below we present the main verb constructions collected in our data. Each construction-type is exemplified by the following radical-types and instances:

Toneless nonsyllabic:	<u>-k-</u>	'mention'
Low Monosyllabic:	<u>-ba1-</u>	'count'
Low bisyllabic	<u>-lapis-</u>	'tire(v.t.)'
High nonsyllabic	<u>-f-</u>	'eat'
High-1 monosyllabic	<u>-bózj-</u>	'ask'
High-1 bisyllabic	<u>-hómozj-</u>	'rest(v.t.)'
High-2 monosyllabic:	<u>-lóm-</u>	'bite'
High-2 bisyllabic:	<u>-xópól-</u>	'remember'

Where a H SP or L SP may occur in the same construction-type, this is indicated, and exemplified as follows:

H SPx:	<u>há-</u>	'we'
L SPx:	<u>o-</u>	'he(1)'
H SPy:	<u>há-</u>	'we'
L SPy:	<u>a-</u>	'he(1)'

All constructions are shown as they occur without an OP, with a H OP, using -bá- 'them(2)' and with a L OP, using -mo- ʌ -m- 'him(1)'.<sup>1</sup>

Where a construction differs according to whether an adjunct follows it or not, this is indicated.

The rules which have applied to a form are shown by means of numbers (except DOWNSTEP which is not indicated) as follows:

- 0(v) UNASSOCIATED TONE ATTACHMENT (vacuous)
- 1 SP-LOW ASSIMILATION
  - 2 OP-LESS LOWERING
  - 3 RIGHT PREFIX RAISING
  - 4 ADJUNCTFUL RAISING
  - 5 LEFT SUFFIX RAISING
  - 6 ADJUNCTLESS LOWERING
  - 7 INTER-HIGH RAISING
  - 8 PRE-x LOWERING
  - 9 SP-LOWERING
  - 10 EXCEPTIONAL RIGHT PREFIX RAISING

1a. INFINITIVE POSITIVE

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
xoka	xobáká 10	xomoka
xobala	xobábála 3	xombala
xolapisa	xobálapisa 3	xomolapisa
xojá 0	xobájá 0	xomojá 0
xobózja	xobábózja	xombózja
xohómozja	xobáhómozja	xomohómozja
xolómá 0	xobálolómá 0	xomolómá 0
xo:órpóla	xobáxórpóla	xomoxórpóla



1b. INFINITIVE NEGATIVE

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
xosjááka	xosjáábáká 10	xosjáámoka
xosjáábala	xosjáábábála 3	xosjáámabala
xosjáálapisa	xosjáábálapisa 3	xosjáámolapisa
xosjáájá 0	xosjáábájá 0	xosjáámojá 0
xosjáábózja	xosjáábábózja	xosjáámbozja 7
xosjááhómzja	xosjáábáhómzja	xosjáámhómzja 7
xosjááólómá 0	xosjáábáólómá 0	xosjáámólómá 0,7
xosjááxópóla	xosjáábáxópóla	xosjáámóxópóla 7

2a. IMPERATIVE POSITIVE WITHOUT ADJUNCT

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
ká	báké	moké
balá	bábalé	mbalé
lapísa 5,6	bálapíse 3,5,6	molapíse 5,6
já 0v	bájé 0v,6	mojé 0v
bózja 6	bábózje 6	mbózje 6
hómzja 5,6	báhómzje 5,6	mohómzje 6
ólómá 0v,6	báólómé 0v,6	molómé 0v,6
xópóla 6	báxópóle 6	moxópóle 6

2b. IMPERATIVE POSITIVE WITH ADJUNCT

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
ká	báké	moké
balá	bábalé 7	mbalé
lapísa 5	bálapíse 3,5	molapíse 5
já 0v	bájé 0v	mojé 0v
bózjá	bábózje	mbózje
hómzjá 5	báhómzje 5	mohómzje 5
ólómá 0v	báólómé 0v	molómé 0v
xópóla	baxópóle	moxópóle

2c. IMPERATIVE NEGATIVE WITHOUT ADJUNCT

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
sjeké	sjebáké	sjemoké
sjebalé	sjebábalé	sjembalé
sjelapísé 5,6	sjebálapísé 3,5,6	sjemolapísé 5,6
sjejé 0v	sjebájé 0v,6	sjemojé 0v
sjebózzjé 6	sjebábózzjé 6	sjembózzjé 6
sjehómózzjé 5,6	sjebáhómózzjé 5,6	sjemohómózzjé 5,6
sjelómé 0v,6	sjebálolmé 0v,6	sjemolómé 0v,6
sjexóppólé 6	sjebáxóppólé 6	sjemoxóppólé 6

2d. IMPERATIVE NEGATIVE WITH ADJUNCT

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
sjeké	sjebáké	sjemoké
sjebalé	sjebábdlé 7	sjembalé
sjelapísé 5	sjebálapípsé 3,5	sjemolapísé 5
sjejé 0v	sjebájé 0v	sjemojé 0v
sjebózzjé	sjebábózzjé	sjembózzjé
sjehómózzjé 5	sjebáhómózzjé 5	sjemohómózzjé 5
sjelómé 0v	sjebálolmé 0v	sjemolómé 0v
sjexóppólé	sjebáxóppólé	sjemoxóppólé

3a. INDICATIVE PRESENT, H SPX, POSITIVE, WITHOUT ADJUNCT

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
hékaxó	hebákaxó	hémókaxó 3
hebáloxó 3	hebábáloxó 3	hémbalaxó 3
helápisaxó 3	hebálapisaxó 3	hémolapisaxó 3
héjjaxó 0,8	hebájjaxó 0,8	hémójaxó 0,3,8
hebózzjaxó	hebábózzjaxó	hémózzjaxó 3
héhómozjaxó	hebáhómozjaxó	hémóhómozjaxó 3
helómamaxó 0,8	hebálolmaxó 0,8	hémólolmaxó 0,3,8
héxóppólaxó	hebáxóppólaxó	hémóxóppólaxó 3

3b. INDICATIVE PRESENT, L SPx, POSITIVE, WITHOUT ADJUNCT

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
okayq	obákayq	omokayq
obalayq	obábálayq 3	ombalayq
olapisayq	obálapisayq 3	omolapisayq
ojáyq 0	obájáyq 0	omojáyq 0
obózjayq	obábózjayq	ombózjayq
ohómozjayq	obáhómozjayq	omohómozjayq
olómáyq 0	obálolómáyq 0	omolómáyq 0
oxórpólayq	obáxórpólayq	omoxórpólayq

3c. INDICATIVE PRESENT, H SPx, POSITIVE, WITH ADJUNCT

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
héká 4	hebáká 4	hémóká 3,4
hebálá 3,4	hebábálá 3,4	hémbálá 3,4,7
hélápfisá 3,4,5	hebálapfisá 3,4,5	hémólapfisá 3,4,5,7
hējá 0	hebájá 0	hémójá 0,7
hebózjá 4	hebábózjá 4	hémbózjá 3,4
héhómózjá 4,5	hebáhómózjá 4,5	hémóhómózjá 3,4,5
hélómá 0	hebálolómá 0	hémólolómá 0,3
hexórpólá 4	hebáxórpólá 4	hémóxórpólá 3,4

3d. INDICATIVE PRESENT, L SPx, POSITIVE, WITH ADJUNCT

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
oka	obáká 10	omoka
obala	obábála 3	ombala
olapisa	obálapisa 3	omolapisa
ojá 0	obájá 0	omojá 0
obózja	obábózja	ombózja
ohómózja	obáhómózja	omohómózja
olómá 0	obálolómá 0	omolómá 0
oxórpóla	obáxórpóla	omoxórpóla

3e. INDICATIVE PRESENT NEGATIVE WITHOUT ADJUNCT

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
hahéke 6	hahébáke 6	hahémoke 6
hahébalé	hahébábalé	hahémbalé 3
hahélápisé 3,5,6	hahébálápisé 3,5,6	hahémólápisé 3,5,6,7
hahéjé 0v,6	hahébájé 0v,6	hahémójé 0v
hahébózzé 6	hahébábózzé 6	hahémbózzé 3,6
hahéhómózzé 5,6	hahébáhómózzé 5,6	hahémóhómózzé 3,5,6
hahélómé 0v,6	hahébálómé 0v,6	hahémólómé 0v,3,6
hahéxóppolé 6	hahébáxóppolé 6	hahémóxóppolé 3,6

3f. INDICATIVE PRESENT NEGATIVE WITH ADJUNCT

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
hahéké	hahébáké	hahémóké 7
hahébalé 7	hahébábalé 7	hahémbalé 3,7
hahélápisé 3,5	hahébálápisé 3,5	hahémólápisé 3,5,7
hahéjé 0v	hahébájé 0v	hahémójé 0v,7
hahébózzé	hahébábózzé	hahémbózzé 3
hahéhómózzé 5	hahébáhómózzé 5	hahémóhómózzé 3,5
hahélómé 0v	hahébálómé 0v	hahémólómé 0v,3
hahéxóppolé	hahébáxóppolé	hahémóxóppolé 3

4a. INDICATIVE PAST POSITIVE, H SPY

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
háka	hábáka	há móka 3
hábala	hábábála 3	há mbála 3
hálapisa	hábálápisá 3	há mólapisa 3
hájá 0	hábjá 0	há mójá 0
hábózza	hábébózza	há mbózza 3
háhómozza	hábéhómozza	há móhómozza 3
hálóma 0	hábálóma 0	há mólóma 0,3
háxóppóla	hábáxóppóla	há móxóppóla 3

4b. INDICATIVE PAST POSITIVE, L SPY

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
aka	abáka	amoka
abala	abábála 3	ambala
alapisa	abálapisa 3	amolapisa
ajá 0	abájá 0	amojá 0
abózja	abábózja	ambózja
ahómozja	abáhómozja	amohómozja
alómá 0	abáalómá 0	amolómá 0
axópóla	abáxópóla	amoxópóla

4c. INDICATIVE PAST NEGATIVE, COMPLEMENT OF hasé

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
heké 1	hebáké	hemoké 1
hebalé 1	hebábalé	hembalé 1
helapísé 1,5	hebálapísé 3,5	hemolapísé 1,5
hejé 0v,1	hebájé 0v	hemojé 0v
hebózjé	hebábózjé	hembózjé
héhómózzjé 5	hebáhómózzjé 5	hemohómózzjé 5
helómé 0v	hebáalómé 0v	hemolómé 0v
hexópólé	hebáxópólé	hemoxópólé

5a. PARTICIPIAL PRESENT POSITIVE

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
heka	hebáka	hemóka 3
hebála 3	hebábála 3	hémbala 3
heiapisa 3	hebálapisa 3	hémolapisa 3
hejá 0	hebájá 0	hémojá 0
hebózja	hebábózja	hémbózja 3
héhómozja	hebáhómozja	hémóhómozja 3
helómá 0	hebáalómá 0	hémolómá 0,3
hexópóla	hebáxópóla	hémóxópóla 3

5b. PARTICIPIAL PRESENT NEGATIVE

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
hészjaaké	hészjaabáké	hészjaamoké
hészjaabalé	hészjaabábalé	hészjaambalé
hészjaalapfsé 5	hészjaabálapfsé 3,5	hészjaamolapfsé 5
hészjaajé 0v	hészjaabájé 0v	hészjaamojé 0v
hészjaabózzé	hészjaabábózzé	hészjaambózzé
hészjaahómózzé 5	hészjaabáhómózzé 5	hészjaaomómózzé 5
hészjaalómé 0v	hészjaabáalómé 0v	hészjaamolómé 0v
hészjaaxópólé	hészjaabáxópólé	hészjaamoxópólé

6a. SUBJUNCTIVE POSITIVE

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
héké 2	hébáké	hémóké 7
hébalé 2,3	hébábalé	hémbalé 3
hélapisé 2,3	hébálapisé 3,5	hémólapisé 3,5,7
héjé 0v,2	hébájé 0v	hémójé 0v, 7
hebózzé 2	hébbózzé	hémóózzé 3
héhómozze 2	hébhómózzé 5	hémóhómózzé 3,5
héalómé 0v,2	hébáalómé 0v	hémóalómé 0v,3
héxópolé 2	hébáxópólé	hémóxópólé 3

6b. SUBJUNCTIVE NEGATIVE

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
hészjeké	hészjébké 7	hészjemoké
hészjebalé	hészjébbalé 7	hészjembalé
hészjelapfsé 5	hészjébalapfsé 3,5,7	hészjemolapfsé 5
hészjejé 0v	hészjébájé 0v,7	hészjemojé 0v
hészjébbózzé 7	hészjébbábózzé 7	hészjembózzé
hészjéhómózzé 5,7	hészjébhómózzé 5,7	hészjemohómózzé 5
hészjéalómé 0v,7	hészjébbáalómé 0v,7	hészjemolómé 0v
hészjéxópólé 7	hészjébbáxópólé 7	hészjemoxópólé

### 7. POTENTIAL POSITIVE INDICATIVE

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
heqáka 9	heqábáka 9	heqámóka 3,9
heqábala 9	heqábábala 3,9	heqámabala 3,9
heqálapisa 9	heqábálapisa 3,9	heqámólapisa 3,9
heqájá 0,9	heqábájá 0,9	heqámójá 0,9
heqábózja 9	heqábábózja 9	heqámóbózja 3,9
heqáhómozja 9	heqábáhómozja 9	heqámóhómozja 3,9
heqálóma 0,9	heqábálóma 0,9	heqámólóma 0,3,9
heqáxpóla 9	heqábáxpóla 9	heqámóxpóla 3,9

### 8. PRESENT STATIVE INDICATIVE

As we have indicated in the text of this study, the stative suffix -flé only occurs in native forms in the indicative with inchoative radicals. Not all radical-types therefore could be found which would occur in this mood in the stative form. Below we use just the radicals L -ngn- 'become fat', HIGH-1 -dál- 'become full' and HIGH -rac- 'fall in love' (the last-mentioned also has the non-inchoative meaning 'love'). Observe that with -dál-, the -flé suffix is not used, but instead the lexical stative form -dǎé- occurs (that is edǎlayq 'it(9) is becoming full' but edǎéyq 'it(9) is full'.)

In these examples, we use H SPx ǎ 'they(6)' and L SPx e 'it/he(9)'.

Only -rac- out of these three radicals may take an object for example, kémóráclǎxǎ 'I am in love with her(1)'.

Ba. POSITIVE, H SPX, WITHOUT ADJUNCT

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
ánónfnexq 3,8	-	-
ádéexq 8	-	-
árácfléxq 0v,8	ábárácfléxq 0v,8	ámórácfléxq 0v,3,8

Bb. POSITIVE, L SPX, WITHOUT ADJUNCT

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
enonfnéyq	-	-
edééyq	-	-
erácfléyq 0v	ebárácfléyq 0v	emórácfléyq 0v

Bc. NEGATIVE WITHOUT ADJUNCT

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
haánónfné 3,6	-	-
haádéé 6	-	-
haárácflé 0v,6	haábárácflé 0v,6	haámórácflé 0v,3,6

Bd. NEGATIVE WITH ADJUNCT

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
haánónfné 3	-	-
haádéé	-	-
haárácflé 0v	haábárácflé 0v	haámórácflé 0v,3

Be. POSITIVE, H SPX, WITH ADJUNCT

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
ánónfné 3	-	-
ádéé	-	-
árácflé 0v	ábárácflé 0v	ámórácflé 0v,3



8f. POSITIVE, L SPX, WITH ADJUNCT

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
enonifé	-	-
edéé	-	-
erácfilé Ov	ebárácfilé Ov	emorácfilé Ov

9. PERFECT/STATIVE PARTICIPIAL

Since none of the radicals listed on page 255 are inchoative, the following participials are all perfect, translating (approximately) as '...(not) having...-en'. Observe that not all of the radicals take -ilé itself as the perfect suffix, but may have lexical allomorphs of this form, or (like -xópól-) may have a particular stative stem (in this case -xópózjé).

9a. PERFECT POSITIVE

<u>No OP</u>	<u>H OP</u>	<u>L OP</u>
hékfíé	hébákfíé	hémókfíé 3
hebárfíé 3	hebábárfíé 3	hémbárfíé 3,7
hélápfísfíé 3,5	hebálápfísfíé 3,5	hémólápfísfíé 3,5,7
héjéíé Ov	hebájéíé Ov	hémójéíé Ov,3
hébózfíé	hebábózfíé	hémbózfíé 3
hémózfíé 5	hebáhémózfíé 5	hémóhémózfíé 3,5
hélómíé Ov	hebálómíé Ov	hémóómíé Ov,3
hékópózjé	hebákópózjé	hémókópózjé 3

## 9b. PERFECT NEGATIVE

<u>No</u> OP	<u>H</u> OP	<u>I</u> OP
hésjaakf1é	hésjaabákf1é	hésjaamokf1é
hésjaabarzf1é	hésjaabábárf1é 3	hésjaambarzf1é
hésjaalapfsfzjé 5	hésjaabá1ápfzfzjé 3,5	hésjaamolapfsfzjé 5
hésjaajé1é 0v	hésjaabá1jé1é 0v	hésjaamojé1é 0v
hésjaabózfzfjé	hésjaabábózfzfjé	hésjaambózfzfjé
hésjaahómózfzfjé 5	hésjaabáhómózfzfjé 5	hésjaamohómózfzfjé 5
hésjaalómf1é 0v	hésjaabá1ómf1é	hésjaamolómf1é 0v
hésjaaxópózejé	hésjaabáxópózejé	hésjaamoxópózejé

## 10. RELATIVES

Unlike other Sotho languages (for example Tswana, see Cole 1955:178) Qhalaxarzi forms its relatives on the indicative, not the participial.

The positive relative is formed directly from the indicative, with the relative prefix put before it. In the negative, the indicative SPx's are used, but instead of the negative preprefix ha-, the participial negative prefix -sjaa- is used. In addition in the negative relatives, the postsuffixes -xó and -yó are used, which is not the case in either negative participials nor indicatives.

## APPENDIX C

SHORT QHALAXARZI VOCABULARY

Below we present our short Qhalaxarzi vocabulary of nouns, adverbs, verb-, adjective- and relative-stems.

Each Qh item is indicated as belonging to one of these categories, as follows:

Adverbs, adjective-stems and relative-stems are marked ADV, ADJ and REL respectively. Transitive verbs are marked VT and intransitive verbs VI. Nouns are marked according to their Class number, 1, 1a, 2 etc. Class 5 nouns which take their plural in Class 10, instead of the usual Class 6, are marked 5/10.

An asterisk preceding a form indicates that its tones are not known.

abdomen	mǎpá (9)
lower part of...	khóbuú (9)
above	xurzfǎmó (15, ADV)
acacia luderitzi	mokhá (3)
acc. ...	sekisa (VT)
acquainted, be...with	tqǝla (VT)
Adam's apple	qorzuqórzú (9)
Afrika...	Sjiburzu (7)
Afrikaner	Liburzu (5)
afternoon	malatjfbóya (6, ADV)
agree	rzumǝla (VI)
alike, be...	tjhwána (VI)
, make...	tjhwána (VT)
ankle	lemekana (5)
annoy	cena (VT), tshwenya (VT)
...by making a noise	thórzfya (VT)
answer	ǎrába (VT), hǝcǝla (VT), qǎrábǝ (9)
ant, small black kind	tshǝsq (9)
, big black kind	motsótsone (3)
anus	sjebónó (7)
arm	lebǝxǝ (5), ekhá (9)
armpits	masjwáhá (6)
arrive	hithǝla (VI)
ashes	melǝra (4)
ask	bózja (VT)
aunt, paternal...	raqhárzf (1a)
autumn	lethabula (5)
axe	sjelǝpǝ (7)
baboon	*tshwǝne (9)

baby	lesjéa (5/10)
back, of person	mothánd (3)
, of knee	mosjiha (3)
, of neck	kirzikirzi (9)
bad(ness)	masjwé (6, REL)
bag	qhetsf (9)
ball	bdlu (9)
bangle	leséqa (5)
bark (at)	bóxóla (VT)
bark, of tree	lebacf (5)
green strips of...	boqótjé (14)
bat (animal)	mmámáchwane (fa), húfē (fa)
bead	calamá (9)
beam, of roof	thométjho (9)
bean	nawá (9)
...and spinach dish	nyóla (9)
...soup	qhorú (9)
bear, humans	bélexa (VT)
, animals	zála (VT)
beard	rzicerzu (10)
bee	nósjí (9)
beetle, kind of...	tabua (9)
begin	sfmólola (VT)
believe	tshépa (VT)
bewitch	lqa (VT)
big	cóna (ADJ), xólo (ADJ)
bird	nnyáne (9)
bite	lómá (VT)
black	ntsho (ADJ), sjíhi (REL)

bladder	*sjera (7)
blanket	qobq (9)
blind person	sjeboxu (7)
blister	lerophi (5)
blood	marzf (6)
...vessels	*ržitjtja (10) (zjamarzf)
blossom	sjichūnyī (7)
blow, with mouth	buzjezja (VT)
, of the wind	hoqa (VI)
blue	całá (ADJ)
book	búka (9)
bone	lerápq (5)
bottle	sjikūpu (7)
boy	mháñtjáná (1)
brain	boqg (14)
branch	qala (9)
bread	boxqbe (14)
break	bútá (VT), qháóla (VT), bútxa (VI)
breasts	mabéłé (6)
breathe	hema (VI)
breed (livestock)	rúá (VT)
bridge of nose	mbopq (3)
bridle	chómó (9)
bring	nére (VT)
...back	bótsa (VT)
brown	coka (ADJ)
bucket	qháméłq (9)
build	zjéxa (VT)
builder	mozjóxi (1)
bullet	lirzūmó (5)

burn, of fire	cuca (VI)
...oneself	sá (VI)
bustard	qhówéé (9)
buttocks	maráxó (6)
buy	réqá (VT)
buyer	moréqí (1)
calf (animal)	námané (9)
call	bfzjá (VT)
candle	kháñtele (9)
carry (child on back)	bələxa (VT)
cart	kárza (9)
carve	bəta (VT)
cat, domestic	*katse (9)
, wild...	pháxé (9)
catch	tjhwára (VT)
cattle post	moraké (3)
chair	sjicúlo (7)
cheeks	marámá (6)
cheetah	lengau (5)
chest (of human)	sjixúba (7)
chew	ráxúna (VT)
chief	qhósjí (9), *moreña (1)
child	mochwana (1)
chin	sjələrzu (7)
chop (wood etc.)	hatja (VT), éda (VT)
clap	opa (VT)
cleavage (of breasts).	iepara (5)
clever, be...	tháíéha (VI)
cleverness	botháíé (14)

climb	páláma (VT), páxáma (VT)
clitoris	motopa (3)
close	kwálá (VT), hftjá (VT), chfbá (VT)
cloth	khái (9)
cloud	liru (5)
clump (of grass)	sjirfcé (7)
coals	maxala (6)
cobra (kind of)	káké (1a)
cold, be...	kuma (VI)
collar bone	lerápó lapíya (5)
collect	phucha (VT)
colon (intestine)	munínú (3)
colour	mbálá (3)
come	da (VI)
...from	zjwa (VI)
continue	zjwél(é)la péle (VI)
cook	réláa (VT), réléxa (VT)
coolness	mulucq (3)
cottage (small house)	loba (5/10), leba (5/10)
cough	qhórdla (VI)
count	bala (VT)
cover (pot)	chfbá (VT)
cow (head of cattle)	mhó (9)
crow	lexákábé (5)
cry	lela (VI)
cultivate	lema (VT)
cushion	mosámq (3)
cut	sjéxá (VT)
...into strips	tsá (VT)



dam	támo (9)
dance	bíná (VT)
dark	sjihi (REL)
darkness	lihihi (5)
day	latjfi (5)
...s	matjfi (6), malatjfi (6)
...before yesterday	mołoba (3, ADV)
deaf, be...	thqqa xudzwá (=lack hearing)
defecate	nya (VI)
deny	xáná (VI)
depression between collar bones	pfiya (9)
despise	nyatsa (VT)
diaphragm	lezjwalq (5)
die	sjwá
different, be...	qhóáxana (VI)
make...	qhóáxanya (VT)
dig	épa (VT)
dirt	china (9)
discard	láthá (VT)
dish	sjexq (7)
dishonest	manq (6, REL)
dish up	xá (VT)
divining bones	rzithaqú (10)
do	rzíha (VT)
doctor	nyaqa (9)
dog	etjwá (9)
donga	chqłq (9)
donkey	tóńki (9)

door	lebacf (5), sjetswalo (7)
doorway	qhoró (9)
down	hatshé (ADV), datshé (ADV)
draw (water etc)	xá (VT)
dream	lóra (VI)
dregs	boróú (14)
dress (get dressed)	apara (VI)
drink	nwá (VT)
drive (car etc.)	qhwe'tsa (VT)
drop	lerochórzí (5)
drum, 40gallon...	dqzrómq (9)
small tin...	kapá (9)
dry, become...	óma (VI)
...oneself	phótá (VT)
...leaves	bébe (9)
duiker	phuchí (9)
dung	busú (14)
...beetle	phírf'tja (9)
ear	tjébé (9)
...mark (on cattle)	tjhwa (VT), letjhoq (5)
early	phakéla (ADV)
earrings	mangóna (6)
east	bozjwalatj (14, ADV), boraba (14, ADV)
eat	já (VT)
edge	nthá (9)
egg, of bird, reptile	litshf (5)
, of spider	tshilwana (9)
eland	phóxo (9)
elbow	sjeqhónó (7)

elephant	tou (9)
end	hǎlǎ (VI), hǎzǎǎ (VT)
enter	tǎǎna (VI)
err	hǎsa (VI)
escape	thomola (VI)
examine	tháthóba (VT)
examination	tháthóbq (9)
exhausted, be...(tired)	tribala (VI)
exit	zǎwa (VI)
explain	thálósa (VT)
eye	lǎfrǎ (5)
	mǎrǎ (6)
eyebrow	lǎsǎf (5/10)
face	bosǎ (14)
faeces	lǎsǎfkǎ (5)
fall	wa (VI)
(of rain)	na (VI)
(of hail)	pótónoxa (VI)
fall-asleep	qǎǎla (VI)
farmer	molǎmǎ (1)
fart	phǎla (VI)
fast	qǎbozǎqǎq (ADV)
fat, become...	nǎna (VI)
(noun)	mǎxǎrǎ (6)
father, my/our...	tǎtǎ (1a)
your...	ǎrǎ (1a)
his/her/their...	ǎsǎ (1a)
fear	*tǎjhaba (VT)
fields (of crops)	masǎmǎ (6), rzǎtshǎmǎ (10)

fight	lwa (VI), ecwa (9)
fill	dázja (VT)
find	hithēla (VT)
finger	mong (3), monwana (3)
finish	-see <u>end</u>
fire	molelq (3)
first	péle (POSS), nthá (POSS)
firstly	lwanthá (ADV)
flame	qaló (9)
flay	zjua (VT), zjwaa (VT)
flirt	rázjana (VI)
floating ribs	*rziphetshwana (10)
flower	-see <u>blossom</u>
fly	hoha (VI)
fly, common house...	itji (9)
other kinds of...	lehólo (5), kurzj (9), sjekhwana (7)
fold	phęcha (VT)
follow	laca (VT)
fontanelle	phusjǝ (9)
foot	lengyǝ (5)
forehead	phata (9)
forget	lebaia (VT)
form	bǝpá (VT)
fox	phǝqǝzjwǝ (9)
silver...	chukwǝ (9)
frighten	tjhǝsja (VT)
frightened, be...	tjhǝxe (VI)
fuck	xwǝla (VT)
full, become...	d.1a (VI)
gall bladder	sǝánhǝqǝwǝ (1a)
gap	letjhgba (5)

gift	ephó (9)
giraffe	chuzwa (9)
girlfriend	ngetsí (9)
give	há (VT), náa (VT)
give birth -see <u>bear</u>	
glans (of penis)	sjetoní (7)
go	sjékéla (VI), sjépéla (VI)
...to	a (VI)
goat	púrzi (9)
God	Murzfmó (1)
goose (kind of)	thósjf (1a)
gossip (about)	séba (VT)
govern	búsa (VT)
government	libúsp (5)
grain (of sand)	libú (5)
grass	bozjwáñg (14)
dry...	sjelóqá (7)
graze	hula (VI)
green	calá (ADJ)
greet	rzumezja (VT)
grey	kwebú (REL)
groin	mazjaqa (6)
ground squirrel	chaqarú (9)
grow up	xólá (VI)
growl (at)	xaqala (VT)
guess	halokanya (VT)
guinea fowl	qháqa (9)
guitar	katara (9)
gum (of tree)	boroqu (14)

gums (of the mouth)	maiya (6)
gun	thobólq (9)
hail	*sjehaqq (7)
hair	mirfrf (4)
hand	sjeata (7)
hang	péxa (VI)
hartebeest	kukama (9), qháma (9)
hat	hútshi (9), hútsi (9), sjepóti (7)
hate	-see <u>despise</u>
head	thóxo (9)
head of cattle - see <u>cow</u>	
heal	alaha (VT)
hear	úzwá (VT)
heart	peld (9)
heavy	bíma (14, REL)
heel	sjeréccé (7)
help	chwísa (VT)
herbivore	phólóhóló (9)
herd	lésa (VT)
hide	híra (VT)
hip	nóká (9)
hit, in shooting	sjúlá (VT)
...with hand etc.	nóccá (VT), ngóccá (VT), paléla (VT)
hold	tjhwára
hole	*tikuta (5)
home	lexáá (5)
hoof	thaqú (9), calatshf (9)
horn	lenaqá (5/10)
horse	pezé (9)

house	eto (9)
how much?	boqahé (14)
hump (of earth)	ch'ca (9)
hunt	zóma (VT)
hunter	mozúmi (1)
hurry	aqotsha (VT), ftháxáñena (VI)
hurt	nqca (VT), palqala (VT)
hyaena	phfrítshwane (9), phfrí (9)
impala	phála (9)
increase	qtjezja (VT)
insert	tjénya (VT)
intestines	mala (6)
iron	tshépe (9)
itchy, be...	bábá (VI)
jaw	lorá (5/10)
jealousy	lixúhá (5)
joint (of body)	cqqqlq (9)
judge	sthóla (VT), moathúrzi (1)
jump	tola (VI)
just	hérzi (ADV)
kick	rexa (VT)
kid	púzjána (9)
kidney	phiyq (9), phíhq (9)
kill	bólaa (VT)
knee	lengqíq (5)
...cap	cheleerzi (9)
knife	mháqá (3)
know	zé (VT)
knuckle	cqqqlq (9)

kraal	lesaká (5)
lack	thoqa (VT)
lame hand	puto (9)
lamp	lebone (5)
larva	sjeboqó (7)
larynx	qorzu (9)
laugh (at)	tshexa (VT)
lawn	mothwa (3)
lay down one's head	sáma (VI)
leaf	lekapi (5)
learn	tchúca (VI)
leave	doxa (VI)
...something alone	lesja (VT)
left (side)	kólé (POSS)
leg	lqccú (5)
...s	maqccú (6)
...below the knee	mongwá (3)
leopard	oqwé (1a), nqwé (1a)
lick	látsa (VT)
...one's fingers clean	ftsámá (VI)
lid	sjichibé (7)
lie down	rápáma (VI)
lies (untruths)	manq (6)
lift (from lying position)	rápólola (VT)
light (a fire etc.)	tshuba (VT)
light (of weight)	tshqhe (REL)
lightning	tarzf (9)
like	rácá (VT)
limp	rozja (VI)
lion	cad (9)



listen (to)	réčzja (VT)
liver	sjebéčé (7)
lizard	taŋtapf (1a)
long ago	boxóloxólo (14, ADV)
look after	boloqa (VT); thóqómeŋa (VT)
look at	lábá (VT)
look for	bata (VT), *senka (VT)
lorry	lórzi (9)
louse	ecá (9)
love	rácá (VT), lerécó (5)
lung	letjhwahó (5)
lynx	chwáné (1a)
make -see <u>do</u>	
man	mondna (1)
marrow	meqó (4)
marry, of men	ngwála (VT)
, of women	ngwálwa (VI)
master	múnyf (1)
...s	bényf (2)
mean	rád (VT)
meat	nama (9)
medicine	moré (3)
meet	kopana (VI)
mention	ka (VT)
midday	sjeqháu (7)
middle	haxáre (ADV)
midnight	haxáre xábósfxo (ADV)
milk	xámá (VT) murfso (3)
mistake	phósq (9)

money	marzi (6)
mortar (of pestle)	moqháliq (3)
mother, my/our... your...	mmé (1a) nnqxq (1a)
his/her/their	nnále (1a)
mould	bópá (VT), púpúca (VT)
mouse	pəba (9)
mustache	rzicerzu (10)
mouth	molomo (3)
much	cháca (ADV)
mucus (nasal...)	mamina (6)
muscle	khunq (9), ...s of the neck mexanq (4)
musical instrument (kind)	sjexáñkürzi (7)
mute person	sjimúmq (7)
nail (of finger)	lenáá (5/10)
name	ráá (VT)
navel	muxúbú (3)
neck	chamo (9), lesjore (5)
nest	sjethatha (7)
new	sá (ADJ)
night	bosfxo (14)
nod (the head)	qca (thqxq) (VT)
north	botshfká (14, ADV)
nose	ntjg (9)
now	həmbé (ADV)
oil	maxúrá (6)
open	bula (VT)
orphan	khúzáná (9)
ostrich	otjhwé (1a)
outside	qáéte (ADV)

owl	khóba (9)
pain	boróqó (14), sjerabí (7)
palate	qhátsana (9)
pan (geographical)	letjhá (5)
pancreas	lebécé (5)
pangolin	khákhá (9)
pant	həxəia (VI)
parallel, become...	bapa (VI)
pass	heca (VT)
path	tseia (9)
paw	liripa (5)
pay	leha (VT)
...tax	qhəcha (VT)
peel (of sunburnt skin)	qhóbóxa (VI)
pen	pəne (9)
pencil	pənsəiə (9)
penis	pəiə (9)
person	mocho (1)
pestle	qhobo (9)
pick (fruit)	xá (VT)
pick up	tshóla (VT)
piebald	phatshwa (ADJ)
pink	mapáne (6, REL)
pins and needles	rziqhatsú (10)
pipe (for water)	leká (5)
plant ...a plant	kaba (VT)
...a pole	thəma (VT)
plaque (of teeth)	rzipou (10)
play ...a game	khəié (VT), sjéna (VT)
...instrument	lezja (VT)
...in water	tiba (VI)

player	mokhēléd (1)
Pleiades	sjelemēla (7)
plough	lema (VT)
point	ntjǫ (9), nthá (9)
pole (supporting roof beams)	leocwána (5)
poor, be...	bǫpǫlola (VI)
porcupine	noqó (9)
pot	pizjá (9)
pour	káná (VT), tjhēla (VT)
praise	bǫqá (VI)
pubic bone	sjenaná (7)
pubic hair	maboyá (6)
pugnacity	bosjéld (14)
put down	báa (VT), bēa (VT)
python	tharu (9)
rabbit	thǫjǫ (9)
rain	na (Vi., pdlá (9)
rainbow	mosjéxá wǫbǫrzipa (3)
raisin berries	*rzichǫzwa (10)
raisin berry bush	*morezwana (3)
read	bała (VT)
reader	mbarzi (1)
red	sjixǫbǫ (7), tarzǫ (REL)
...-brown	khǫndǫ (REL)
refer (to)	ka (VT)
refuse	xáná (VI)
relish	sjesjabǫ (7)
remember	ǫkánya (VT), xǫpǫla (VT)
rest	hǫmola (VI), hǫmozja (VT), phǫmoiq (9)

return	bōa (VI), bōtsa (VT), chiba (VT)
rib	lixupo (5)
ribcage	rziqhūpua (10)
rich, become...	xumā (VI)
ride -see <u>climb</u>	
right (side)	kōlōpo (POSS)
river	molapq (3), noqā (9)
roar	rzuma (VI)
roast	sjā (VT), qsja (VT)
roll (a cigarette)	tshōphā (VT)
roof	xurzfōmō (15)
root	chapq (9)
rub (with oil)	tjhātjhd (VT)
rubber	sjesdthq (7)
run	raxoxa (VI), raoxa (VI), cābōxa (VI)
saddle	sāle (9)
saliva	maché (6)
salivary glands	mazéléxuma (6)
salt ...food	lédha (VT), letswāi (5)
satisfaction	motjhōrq (3)
satisfied, become...	tjhōra (VI)
saw	sjāxā (VT)
say	re (VT)
scar	lebarzi (5)
...on shins from fire	pala (9)
scarred, become...	zjwa lebarzi (VI)
scratch	xarziza (VT), xwanya (VT), xqnya (VT)
seated, be...	ndzji (VT)
see	bōnā (VT)

seed	péu (9), tlhəlwá (9)
...of maize	mmirzi (3)
sell	rəqfisa (VT)
send	rómá (VT)
separate	raola (VT)
set (a trap)	cháa (VT)
set (of the sun)	rwa (VI)
sew	róqá (VT)
shade	murfcí (3)
shake	síkinya (VT)
sharpen	bəta (VT)
shave	*boola (VT)
sheep	ikú (9)
shift (oneself to make space)	sucəla (VI)
shirt	həmpə (1a)
shoe	sjeraqó (7)
shop	lebqitəle (5)
short	sjetəbana (7, REL)
shoulder	lirdrf (5)
...blade	lesjddá (5)
shut	-see <u>close</u>
sick, be...	khama (VI)
silent, be...	khálá (VI)
sin	lédxə (VI)
sinew	musjiha (3)
sing	əpəla (VT)
sit down	rzuła (VI)
skin	ledalə (5)
slaughter	raba (VT)

sleep, go to...	roƀala (VI)
...the night	lála (VI)
sleep (in the eyes)	matseme (6)
smegma	bokoni (14)
smoke	xóxá (VT), busjfi (14)
snake	nóxá (9),
kinds of...	mokwépa (3), nénébú (9)
snap	qháðla (VI)
sneeze	tjhímoxa (VI)
soccer	búlu (9)
soil	mabú (6)
sole	Texácó (5/10)
song	pína (9)
sorghum	mabéle (6)
sour, make...	búrzísezja (VT)
sourberry	phétjhwá (9)
south	borwá (14)
spade	xaráwe (9)
speak	bóla (VT), lqqa (VT)
spend the day	rwéle (VI)
spider	*sjeqhoqho (7)
spinal cord	moqólela (3)
spine	mokoxú (3)
spit	tjhwá (VI), maché (6)
splinter	leqdele (5)
split, become...	phátóxa (VI)
spoil	sjena (VT)
spoon	lesjg (5)
spoor	mothald (3)

spring (the season)	rzikucuhalq (10)
springbok	tshéppé (9)
squat	kúkúmalá (VI), tútúmalá (VI)
squeeze	tjhina (VT)
stab	phúnyá (VT), raba (VT)
stand	éma (VI)
...up	metshé (VI)
star	nyélerzi (9)
stay (behind)	sála (VI)
steal	fbá (VT)
step (on)	xácá (VT)
steenbuck	púrzdúbrzú (9)
sternum	*sjepeka (7)
stick (to stir food)	leherq (5/10)
...for turning meat	mohécólo (3)
...s supporting dung wall	rziquhthwane (10)
stink	ntjha (VI)
stir	xurzua (VT)
stomach	lisu (5)
stone	lezjwé (5)
stork	lerqqqlq (5)
strength	nónóhq (9)
str-tch oneself	fnótólola (VI)
strike (of lightning)	xarzima (VI)
stupidity	botakala (14, REL)
suck	ángwá (VT)
summer	sjelemq (7)
swallow	cenezja (VT)
swear (at)	róxá (VT)



sweat	húhúla (VT), muhúhútsq (3)
swelling (on horse's leg)	maxwéle (6)
table	*tafolé (9)
tail	mosjéla (3)
take	tséa (VT)
...out	somola (VT), ntsha (VT)
call	célelé (ADJ)
tank	tánká (9)
teach	rúca (VT)
tear	xaxola (VT), xaxoxa (VI)
tell	zjwéla (VT)
testicle	lesjéce (5)
thank	leboxa (VT)
thatch	rúléla (VT)
thicket	sjeqhwa (7)
thief	lesjorzu (5)
thigh	sjeropi (7)
thin	sísfnyana (ADJ)
, be...	bópáma (VI), qméléla (VI)
thing	sjelo (7)
think	ákánya (VT)
thong	qhólé (9)
thorn	tshéq (9)
throat	mmelq (3)
throb	qpa (VI)
throttle	qhama (VT)
throw	*koiopa (VT)
...as a donkey off its back	*khwéla (VT)
...away	láthá (VT)
tick (arachnid)	qhóróla (9)

tie up	bôhá (VT)
...supports of hut	balêla (VT)
...trousers with belt	bâfta (VT)
time	*naqwê (9)
tip	nthá (9)
tire	lapisa (VT)
tired, become...	lapa (VI)
tobacco	motsokó (3)
today	hômbezjwa (ADV)
tomtit	côrgncôrwê (9)
tomorrow	qâmôsjô (ADV)
tongue	le...tshô (5)
tooth	lîng (5)
(teeth)	wênô (6)
tortoise	khûrzú (9)
trample	xácá (VT)
tree	sjethari (7)
tree stump	sjesjá (7)
tree trunk	cicá (9)
trough	mogôrzô (3)
trousers	borôqhó (14)
truffles	maxupú (6)
trunk (container)	terzánká (9,
try	leqa (VT)
tsamma melon	lesjêlwá (5)
uncle, maternal...	málômô (1a)
uncover (a pot)	khûrzúmolá (VT)
understand	úzwá (VT)
undress	apola (VT)
unfold	phechonona (VT)

untie	bǝhóloia (VT), bǝhónona (VT)
urinate	roca (VI)
urine	mosq (3)
uvula	lelángwána (5)
vagina	pǝsǝ (9)
vertebra	qhádána (9)
vertical, be...	thámálala (VI)
village	moze (3)
visit	ǝcǝla (VT)
vomit	rátsá (VI)
vulture	lenóu (5)
wag (as a dog its tail)	aqha (VT)
wait for	leca (VT)
walk	sjékéla (VI), sjépéla (VI)
wall	lemqcana (5)
want	-see <u>look for</u>
wart	thókóǝla (9)
wash	ratsa (VT)
watch	lábá (VT)
water	mazf (6)
wealth	khómó (9)
wear, hat, shoes, watch	rwǝla (VT)
...shirt, pants, dress	apara (VT)
well	sjirziba (7)
west	borwalatǝf (14, ADV), bophrǝfma (14, ADV)
what?	eńg (9)
when?	leńg (ADV)
where?	qahé (ADV)
whip	chupa (VT), sjemé (7)

white	tshou (ADJ)
whiteman	leqhóa (5)
who?	ányf (1a)
wildebeest	qhóqhóng (9)
wind	phəhə (9)
wing	lihúká (5/10)
winter	marfsjá (6)
witch	moloi (1)
woman	mosárzi (1)
womb, of human	púpélo (9)
...of animal	magáú (6)
wood, piece of...	lexóhg (5/10)
...ed area	sjeqhwa (7)
word	lehoqo (5)
work	bérzəka (VT), chéóxa (VT)
worm -see <u>larva</u>	
wound	eché (9)
write	kwáld (VT)
yawn	árdma (VI)
year	mongwáxá (3)
yellow	tshəthá (ADJ)
yesterday	molóbána (3,ADV)
young man	mocháká (1)
young woman	mosézanj (1)

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