A RECONSTRUCTION OF THE PHONOLOGY OF PROTO-SOUTHERN BANTU

by

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Abstract.

A Reconstruction of the Phonology of Proto-Southern Bantu.

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The comparative method is applied to data drawn from a list of 800 Zulu, North Sotho, Venda, Tsonga and Zezuru glosses to obtain a reconstruction of the phonemes of Proto-Southern Bantu. The phonological relationship between these phonemes, and the general phonological structure of the proto-language, are examined; next, the reconstruction is compared to the reconstructions of Proto-Bantu made by Guthrie and Meeussen. Finally the phonological derivation of the Southern Bantu data-languages is shown, and genealogical groupings, based on common phonological innovations, are sought. The evidence examined suggests that the Southern Bantu group may form a subgroup within Bantu, but that dialectal differentiation existed even at the earliest stages. However, the focus of this study has been within the group: it is therefore premature to say whether the innovations constitute sufficient evidence of a a separate Southern Bantu subgroup.

Declaration.

I declare that 'A Reconstruction of the Phonology of Proto-Southern Bantu' is my own work, and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references. The thesis is being submitted for the degree of Master of Arts at the University of South Africa in Pretoria. It has not been submitted, in whole or in part, for examination at any other university.

Signed: Andrew van de Spuy

This 23rd day of June, 1989.

Dedication.

This thesis is dedicated to my parents.

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I should like to thank the following people for the help, advice and encouragement they have given me. Firstly, I should like to express my gratitude to my supervisor, Professor Rosalie Finlayson, whose unflagging enthusiasm and extensive knowledge of the Comparative Bantu field were a constant source of inspiration, and who also provided excellent advice on the practicalities of conducting the study.

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Abbreviations.

The abbreviations of phonological features given below are generally those used in Sloat, Taylor and Hoard (1978: 89) and to an extent, in Chomsky and Halle (1968). The abbreviation 'del' for 'delayed release' is my own.

ant	anterior	lam	laminal
asp	aspirated	lat	lateral
cons	consonantal	nas	nasal
cont	continuant	son	sonorant
cor	coronal	syl	syllabic
del	delayed release	tns	tense
glot	glottalic	vd	voiced
n	noun	NS	North Sotho
r	rule	PB	Proto-Bantu
v	verb	PSB	Proto-Southern Bantu
vi	intransitive verb	SB	Southern Bantu
vt	transitive verb	SUF, suf	suffix
C	consonant	TS	Tsonga
G	glide	V	vowel
H	high tone	VE	Venda
IPA	International Phonetic Alphabet	ZE	Zezuru
L	low tone	ZU	Zulu
N	nasal		

Symbols.

+	morpheme boundary.
$	syllable boundary.
→	becomes (in synchronic rules).
>	becomes (in historical rules).
<	is derived from.
*	before a stem: reconstructed or unattested form.
	after a stem: indicates that the form is commented on in the notes.
( )	encloses an optional element; in glosses, an affix.
{ }	encloses alternatives.

#	word boundary.
[ ]	phonetic transcription; phonological features.
/ /	encloses a phonological transcription.
-	zero attestation in a comparative series.
∅	phonologically null.
:	after a consonant, shows that it is syllabic.
C_0	indicates any number of consonants, including nought.

Phonological symbols.

Only phonological symbols used in the quoted data are given here. For typological reasons, certain of the symbols used in this work differ from the standard IPA symbols. The term 'aspirated', when applied to voiced consonants, refers to a set of phonologically related phenomena, whose net effect is to produce a form of voicing intermediate between voicelessness and full voicing. This includes breathy voice and relatively slow glottal vibration (see 1.4.2).

Bilabial consonants.

/p/	Voiceless bilabial stop.
/ph/	Voiceless aspirated bilabial stop.
/b/	Voiced bilabial stop.
/6/	Voiced implosive bilabial stop.
/bh/	Voiced aspirated bilabial stop.
/ɸ/	Voiceless bilabial fricative.
/β/	Voiced bilabial fricative.
/m/	Voiced bilabial nasal resonant.
/mh/	Voiced aspirated bilabial nasal resonant.

Labiodental consonants.

/f/	Voiceless labiodental fricative.
/v/	Voiced labiodental fricative.
/pf/	Voiceless labiodental affricate.
/bv/	Voiced labiodental affricate.

Labio-alveolar consonants.

/s^w /	Voiceless labio-alveolar fricative.
/z^w /	Voiced labio-alveolar fricative.
/ts^w /	Voiceless labio-alveolar affricate.
/ts^w h/	Voiceless aspirated labio-alveolar affricate.

Dental consonants.

/ʿt/	Voiceless dental stop.
/ʿth/	Voiceless aspirated dental stop.
/ʿd/	Voiced dental stop.
/tθ/	Voiceless dental affricate.
/dð/	Voiced dental affricate.
/ʿn/	Voiced dental nasal resonant.
/ʿl/	Voiced dental lateral resonant.

Alveolar consonants.

/t/	Voiceless alveolar stop.
/th/	Voiceless aspirated alveolar stop.
/d/	Voiced alveolar stop.
/ɜ/	Voiced implosive alveolar stop.
/dh/	Voiced aspirated alveolar stop.
/ts/	Voiceless alveolar affricate.
/tsh/	Voiceless aspirated alveolar affricate.
/tɬ/	Voiceless alveolar lateral affricate.
/tɬh/	Voiceless aspirated alveolar lateral affricate.
/ɬ/	Voiceless alveolar lateral fricative.
/dɮ/	Voiced alveolar lateral affricate.
/ɮ/	Voiced alveolar lateral fricative.
/s/	Voiceless alveolar fricative.
/z/	Voiced alveolar fricative.
/n/	Voiced alveolar nasal resonant.
/nh/	Voiced aspirated alveolar nasal resonant.
/l/	Voiced alveolar lateral resonant.
/r/	Voiced alveolar trill.
/rh/	Voiced aspirated alveolar trill.
/D/	Voiced alveolar flap.

Retroflex consonants.

/dʾ/	Voiced retroflex stop.
/dzʾ/	Voiced retroflex affricate.
/L/	Voiced retroflex flap.

Alveopalatal consonants.

/tʃ/	Voiceless alveopalatal affricate.
/tʃh/	Voiceless aspirated alveopalatal affricate.

/d3/ Voiced alveopalatal affricate.

/ʃ/ Voiceless alveopalatal fricative.

/3/ Voiced alveopalatal fricative.

Palatal consonants.

/c/ Voiceless palatal stop.

/j/ Voiced palatal stop.

/ny/ Voiced palatal nasal resonant.

/y/ Voiced palatal glide.

Velar consonants.

/k/ Voiceless velar stop.

/kh/ Voiceless apirated velar stop.

/g/ Voiced velar stop.

/gh/ Voiced aspirated velar stop.

/kxh/ Voiceless aspirated velar affricate.

/x/ Voiceless velar fricative.

/ɣ/ Voiced velar fricative.

/ŋ/ Voiced velar nasal resonant.

/ŋh/ Voiced aspirated velar nasal resonant.

Glottal consonants.

/h/ Glottal fricative, voiceless after voiceless consonants and voiced elsewhere, except initially and intervocalically in Zulu, where it is voiceless.

Clicks.

Only three clicks occur in the quoted data.

/|/ Voiceless dental click.

/!h/ Voiceless aspirated alveolar click.

/!gh/ Voiced aspirated alveolar click.

Vowels.

/i/ High tense front vowel.

/ɪ/ High front vowel, phonologically [-tns].

/e/ Mid front vowel.

/a/ Low central vowel.

/o/ Mid back vowel.

/ʊ/ High back vowel, phonologically [-tns].

/u/ High tense back vowel.

Cover symbols.

/N/ A nasal resonant unspecified for place of articulation. This symbol only has this value within words. In phonological rules it stands for any nasal. The nasal resonant takes on the place of articulation of a following consonant, or when it occurs finally, it takes on the negative place values, [- ant, -cor] of the word-boundary, # (see 1.4.2).

/F/ A fricative assimilating in frontness to a following vowel, and agreeing in voicing with a preceding consonant.

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1.0 Introduction.

1.1 Aim of the research.

Since the early years of the last century, it has been recognised that the Bantu languages constitute a family. The term 'family' appears to have been first applied to them by James C Pritchard in 1826 (Doke 1960). The first systematic account of the phonological correspondences between the members of the family was given by Bleek (1862), who was also the first to use the term 'Bantu' (Doke 1960: 202), and the first comparative phonological reconstruction was made by Meinhof (1899), who called this proto-language 'Ur-Bantu'.

The question of the subclassification of the languages has important implications for history, in terms of the deductions that can be made about the migration of groups of Bantu-language speakers, and their influence on each other. So far, the two major subclassifications have been areal and typological, that is, they have no historical implications. The first of these is Guthrie's (1948), which is largely areal, but bases its areal subdivision on typological criteria or 'differentia' (1948: 20), which are not consistently applied. This classification has been severely criticised for its method and results, for instance, by Lestrade (1948). The second is Doke's (Cole 1959), where the method of classification is not described at all. Besides these, there are several lexicostatistical classifications. The most comprehensive of these is Heine's (1973), but the author does not show how he arrived at his conclusions. Others are those of Guthrie (1971), Henrici (1973) and Flight (1988). All of these deal only with the relationships between Guthrie's twenty-eight 'test languages'. One of the aims of the present thesis is to attempt a phonological subclassification of the Southern Bantu languages in accordance with Henrici's (1973: 103) suggestion for further research:

> The purely lexical classification used so far should be paralleled by grammatical or phonological classifications. ... If classifications using totally different sets of attributes could be shown to lead to broadly similar results it would go a long way towards establishing their validity.

The primary aim of the thesis is to reconstruct the phonology of the common intermediate ancestor of the Southern Bantu languages, and to determine which languages fall into the Southern Bantu group. It is well established on typological and lexicostatistical grounds that the Southern Bantu languages form a group within Bantu, but the question of the inclusion of Shona in this group is still debatable. Van Warmelo (1927) excluded it from the group of Southern Bantu languages, largely on typological grounds. Guthrie at first (1948) excluded it from his Zone S of the Bantu languages, and put it and Tsonga together in a separate zone, Zone T, but later (1971) he included it with Nguni, Sotho, Venda and Tsonga in Zone S, presumably in response to criticism such as Lestrade's (1948). Doke included it as a subzone of his South-Eastern Zone (Cole 1959). Henrici's work (1973) is not conclusive, as it deals with only twenty-eight of the hundreds of Bantu lan-

guages; however, it does group the Shona dialects included in the study with the other languages of Guthrie's Zone S. Cope (1971), combining Guthrie and Doke's classifications, treats the area in question as a zone, Zone S, which is coextensive with an area, the south-eastern (SE) area. He leaves the question of the position of Shona somewhat ambiguous, placing it, on lexicostatistical grounds, in a special subzone of the South-Eastern Area (1971: 231).

1.2 Methodology of the study.

It was decided to begin the reconstruction from scratch, without any reference to earlier reconstructions of Proto-Bantu. The reason for this was that the aim of the study was to find if it was possible to arrive at a common intermediate ancestor, separate from Proto-Bantu. Also, it was the intention that feedback should be avoided, that is, that no assumptions should be made about the nature of Proto-Southern Bantu. Guthrie defines 'feedback' as follows (1962b: 1):

> 'feed-back' is the introduction of some of the results of an investigation into the conduct of the investigation itself. The need to use techniques that avoid the use of feed-back is of course well recognised in the field of comparative linguistics, but is usually implied rather than stated, especially when data are available about some ancestor languages.

Guthrie is speaking of written data, but in the Bantu field, his remarks might equally well apply to his own work on Proto-Bantu, which could lead investigators in sub-fields into assuming too close an identification between their work and his. Of course, there always existed the possibility that Proto-Southern Bantu would prove to be exactly the same as Proto-Bantu, but this should naturally be one of the conclusions of the investigation, if it were the case, and not one of its premises. At every stage (see 2.4), the proposed reconstructions are justified in terms of King's criterion (1969: 155):

> One cannot reconstruct in a vacuum, without asking most of the questions relevant to any theory of diachronic change: What changes when language changes? What constitutes a plausible step in going from Language L to the later language L'?

The method used was the traditional comparative method, as described and applied in numerous works on historical reconstruction, for example King (1969: 175-185); Bynon (1977: 45-58). King's transformational approach to the subject was adopted, in terms of which phonological innovation is seen as a matter of rule addition, rule loss, rule change and rule reordering. This is also discussed in Bynon (1977: 108-145). Ideally, the approach taken should not affect comparative work, provided it is applied consistently. Hoenigswald (1973: 53) states:

> for the efficacy of the comparative method lies in the fact that it is essentially independent of notation [that is, theoretical approach], since it is based on processes which must appear invariant under any notation ... .

1.3 The Southern Bantu languages.

Both Doke (Cole 1959) and Guthrie (1972) arrange the Bantu languages into groups, which form components of larger units called 'zones'. The two authors generally mean something different by this term, but Doke's South-Eastern Zone and Guthrie's Zone S are similar in most respects. Though Henrici deals with only five of Guthrie's Zone S languages, his results indicate that they form a cluster separate from the languages in other zones (1973: 97). However, it should be noted that he has not tested any languages from the Tsonga or Inhambane groups. Although Borland (1982) claims to have confirmed Henrici's findings, Flight (1988) takes Henrici to task for the methods he uses, pointing out that they were outdated even when Henrici used them, and he applies his own method to the same data. His results show a different overall pattern for the relationships between Guthrie's twenty-eight test languages, the twenty-eight languages of Henrici's study, but the Southern Bantu branch remains intact. Flight lists the test languages of this branch as 'Xhosa, Zulu, Sotho [sic], Manyika, and Venda' (1988: 33).

The following is a combined summary of Guthrie and Doke's lists of languages and language groups in this zone, which may be referred to as the Southern Zone (Guthrie 1971: 62-64; Cole 1959: 205-207). The basic list is Guthrie's; where Doke has additional or divergent information, this is noted in parenthesis. Group names are given at the head of each list of languages. The numbering systems are omitted, as they differ in the two lists. The dialectal divisions of the languages are also omitted, because they have not been used in the present reconstruction.

1. Nguni:
   a. Zulu
   b. Xhosa
   c. Swazi
2. Sotho (Doke also gives Lozi and Kgalagadi):
   a. Southern Sotho
   b. Northern Sotho
   c. Tswana
3. Venda
4. Tsonga:
   a. Ronga
   b. Tsonga
   c. Gwamba (Doke gives this as a dialect of Tsonga)
   d. Tswa

5. Shona:
    a. Zezuru
    b. Manyika
    c. Korekore
    d. Ndau
    e. Karanga
    f. Kalanga
6. Inhambane:
    a. Chopi.
    b. Gitonga.

The groups of languages are arguably languages, the so-called languages being the major dialects, and the so-called dialects being sub-dialects. Cole (1959: 198) points out that within the groups 'the languages have the salient phonetic and grammatical features in common, and are so similar as to be mutually intelligible to a considerable extent.' Dalby (1966: 172) points out that a similar situation holds in most of Africa: 'the terminological distinction between "language" and "dialect" does not normally occur in African languages themselves'. In order to limit the scope of this thesis to workable proportions, only one language has been taken from each group.

The languages chosen were:

1. Zulu
2. North Sotho
3. Venda
4. Tsonga
5. Zezuru.

Zulu and North Sotho were chosen on geographical grounds, as they were the languages which were more or less in the middle of the Nguni and Sotho areas respectively (see Doke 1954: endpaper). Choice was also made on grounds of accessibility in terms of materials: as the Chopi group is virtually inaccessible, and has very little written about it, it has been omitted. Tsonga is the literary form of the Tsonga group of languages, and is based on 'the centrally located dialects of the Tsonga area' (Bill 1983: 9). Similarly, Zezuru was chosen because it is the major literary dialect of Shona (Mkanganwi 1975: 253).

To limit the number of data-languages in this fashion may bring about results different from those that would be obtained if all the Southern Bantu languages were used in the reconstruction. However, no phonological reconstruction can hope to be anything but a summary of our knowledge of the relationships between languages. As further knowledge is acquired, so our picture of the reconstructed proto-language will change. This is acknowledged by Meeussen (1973: 7), who

speaks of a reconstructed form as symbolising a 'correspondence, which may eventually be viewed as belonging to prehistory (as a reconstruction), if no counterindications turn up'.

1.4 Sorting the data.

1.4.1 Compiling a list of glosses.

A list of glosses was sought in order to compile comparative series. These glosses would be basic words whose equivalents were likely to be found in each of the languages under consideration. Swadesh's lists (Bynon 1977: 268; Lehmann 1962: 108) of core-vocabulary glosses are well established as the basis of lexicostatistical work, and their accuracy for this purpose has been confirmed by Borland (1982), but they seemed too small for accuracy in phonological work. For this reason, Guthrie's (1971) approximately eight-hundred glosses of Common Bantu were chosen as a basis for the list of glosses. It must be emphasised that it was not assumed that all the words in Proto-Southern Bantu could be derived from the Proto-Bantu which Guthrie reconstructs from Common Bantu. This list of words merely provided a set of English glosses, larger than the Swadesh vocabularies, and likely to have equivalents in the Bantu languages. At this stage, no reference was made to Guthrie's Common Bantu forms or reconstructed proto-forms.

Guthrie has divided his Common Bantu vocabulary into three major groups. He states (1967: 84):

> A 'General' section of the common language can be established, and this comprises about 23 per cent of all the C[omparative] S[eries]. Most of the remainder can be assorted into either a 'Western' or an 'Eastern' section ... .

Of these Western and Eastern sections he states (1967: 82):

> if the two areas are taken vertically, two groupings which will be termed 'regions' are produced: a 'Western' consisting of NW, CW and SW, and an 'Eastern' consisting of NE, CE and SE.

The abbreviations refer to Guthrie's 'areas', which are designated by geographical location. 'SE' is the South-Eastern area, which contains the P and S Zones. As Zone S falls into the Eastern region, only glosses that Guthrie has marked general (G or GG) or Eastern (E) were listed.

The resulting list was then edited to make it accessible for dictionary work. For instance, several of Guthrie's glosses have very specific meanings connected to the stems of Common Bantu. Examples of these are:

abdomen (below the navel)	dance about in joy
answer a call	fish with line
driver or army ant	open space
barren woman	fork in road
base of tree trunk	hit with missile
bat, kind of	hit with hammer
bubble up	hollow in tree
carry on head	put pot on fire
white clay	squeeze (esp. with fingers).

Occasionally a dictionary would yield the required meaning for one of these glosses, but this was rare. These precise meanings are specific to the vocabulary of Common Bantu, and by inference, to Proto-Bantu, and to use them would be to assume that languages in the Southern Zone had retained the semantic structure of Proto-Bantu. This would almost inevitably mean looking for the reflexes of Proto-Bantu stems, that is, it would imply that Proto-Southern Bantu showed no innovations in vocabulary. A wordlist for the purposes of establishing cognates should be as general as possible, though of course reference can be made to cultural features and climatic and geographical phenomena familiar to the speakers of the languages being compared. For this reason, the list was edited to make it more general. To take examples from the above list,

'abdomen below the navel' became 'abdomen';
'answer a call' became 'answer';
'bat, kind of' became 'bat';
'hit with missile' and 'hit with hammer' were merged as 'hit';
'squeeze (esp. with fingers)' became 'squeeze'.

1.4.2 Transcription.

Where transcriptions and analyses differed, the more recent one was followed. For example, Doke (1954: 206) gives the pronunciation [pk, bg, mbg] for Zezuru labio-velars, but Fortune (1967: xiii) states that the pronunciation is [px, bɣ, mbɣ], and they have been transcribed accordingly. The data was transcribed phonologically, so that any predictable phonetic phenomena which can be accounted for by rule are not shown in the transcription. This reduces the transcription to the minimum data that is necessary to establish a correspondence, and lessens the possibility of missing correspondences obscured by phonological conditioning factors. For example, if the syllable /mu/ in Zulu were transcribed in its two phonetic forms [mu] and syllabic [m:], it might mean that the generalisation would be missed that the latter form is derived from phonological /mu/, and the /u/ corresponds to /u/ in other languages. Similarly, the relationship between [l] and [d] in Sotho,

which constitute a single phoneme /l/, provides evidence of the nature of the relationship between the stop and affricate consonants reconstructed for Proto-Southern Bantu, namely that the latter were derived from the former. For typographic reasons, certain of the symbols used in this work differ from the standard IPA symbols. The phonological rules in question are listed below.

Mid-vowel height.

In Zulu, North Sotho, Venda and Tsonga, mid vowels may be either half-close or half-open. The distribution of these is determined by a rule which states that a mid vowel is half-closed if there is a high vowel or half-closed mid vowel in the following syllable (Doke 1954: 26). In the rule formulation given below the feature [+tns] is used to designate the half-closed mid vowels, followed Sloat, Taylor and Hoard (1978: 87-88).

$$\begin{bmatrix} V \\ -high \\ -low \end{bmatrix} \rightarrow [+tns] \quad / \quad \_ \quad C_0 \quad \begin{Bmatrix} V \\ [+high] \\ [+tns] \end{Bmatrix}$$

Therefore /e/ and /o/ in these languages represent either half-closed or half-open vowels, depending on the vowel in the following syllable.

Ejection.

This applies in all the languages except Zezuru. However, it is a phenomenon of other Shona dialects (Mkanganwi 1975: 233). A voiceless obstruent is ejective if it is not aspirated.

$$\begin{bmatrix} -son \\ -vd \\ -asp \end{bmatrix} \rightarrow [+glot]$$

The consonants /p t k ts tʃ/ in these languages are ejective, as are all the affricates created by the rule of postnasal affrication discussed below. Phonologically it is sufficient to distinguish the aspirated consonants from the ejectives by means of the feature [±asp].

Voiced aspirated sounds.

The term 'voiced aspirated' is used to make a phonological distinction between two kinds of voiced sounds. Like the two kinds of voiceless consonant distinguished under 'Ejection' above, voiced consonants may be conveniently distinguished in terms of the feature [±asp](see Baumbach 1974). These are the so-called depressor consonants (Traill, Khumalo and Fridjhon, 1987: 254). Voiced aspiration is sometimes referred to as 'breathy voice' but this term is misleading, as it is realised as any of a range of various phenomena of which breathy voice is just one example. Discussing the phenomenon in Zulu, Traill, Khumalo and Fridjhon state (1987: 254):

> Our preliminary work ... still suggests that breathy voice is not a *reliable* concomitant of Zulu depressor consonants.

See also Traill and Jackson (1988: 398) for the various ways this phenomenon is manifested in Tsonga speech. As the transcription used here is phonological, the exact phonetic manifestation of the phenomenon need not be taken into consideration. The phonetic voicing type associated with it is found, in various languages, as follows:

1. In Zulu and Zezuru, on fricatives and affricates, and on postnasal voiced stops.
2. In Venda, Tsonga and Zezuru, on the glottal fricative, which is voiced in these languages.
3. On vowels which follow voiced aspirated consonants. This applies in all languages which have the phenomenon of voiced aspiration.

In none of the above cases is voiced aspiration phonologically distinctive, and so it is not shown in transcription. However, low-voiced resonants occur in the Tsonga and Zezuru data, and contrast phonologically with fully voiced resonants, which means that their occurrence is not phonologically predictable. Therefore, they are marked with a following glottal fricative: /mh/, /nh/, /rh/. Zulu and Tsonga also have contrasting aspirated and non-aspirated voiced obstruents, which occurred only in the early stages of the data sorting (see 1.4.3). The aspirated members of the pairs are symbolised /bh, dh, gh/ etc.

Nasal assimilation.

This rule applies in all five languages, and was presumably a phonological rule of Proto-Southern Bantu, as any phenomenon occurring in all attesting languages may be most simply explained by postulating it of the parent-language. A non-syllabic nasal assimilates in place to a following consonant. If rules are assumed to be extrinsically ordered, then the qualifying phrase 'non-syllabic' is unnecessary. Its function is to prevent the Zulu syllabic nasal created by the following rule from feeding this one. In North Sotho, the rule applies to syllabic nasals as well. North Sotho also allows a word-final syllabic nasal, which is always velar. Velar consonants are place-marked in with negative features [-ant, -cor]. If it is assumed that boundaries have only negative features (Chomsky and Halle 1968: 66), the velar articulation of this final nasal can be explained as assimilation to the negative place-features of the word-boundary, #. Hock (1986: 96) gives an example of the same change taking place in a dialect of Spanish.

$$N \rightarrow [\alpha place] \; / \; \_ \; \begin{bmatrix} -syl \\ \alpha place \end{bmatrix}$$

Syllabic consonants.

These occur in Zulu, Sotho and Venda. In Zulu, the syllable [m] is an allophonic variant of the syllable [mu] (Louw and Marivate: forthcoming).

$$mu \rightarrow \underset{[+syl]}{m} \; / \; \_ \; CVCV$$

Certain North Sotho syllabic consonants are lexical, but some are morphologically derived. North Sotho has a special rule of vowel deletion between non-nasal resonants.

$$\underset{[-tense]}{i} \rightarrow \emptyset \; / \; \begin{bmatrix} C \\ +son \\ -nas \end{bmatrix} \_ \begin{bmatrix} C \\ +son \\ -nas \end{bmatrix}$$

This feeds a general rule of syllabic consonant realisation:

$$C \rightarrow [+syl] \; / \; \_ \; [-syl]$$

A consonant is syllabic if it is followed by another consonant or a word boundary. Thus the word for 'to cry', phonologically /lɪla/, is realised as [l:la] by these rules.

In Venda, a nasal becomes syllabic before a monosyllable.

$$N \rightarrow [+syl] \; / \; \_ \; CV\#$$

The alternation d/l in Sotho.

[d] and [l] are allophones of the same phoneme in North Sotho, the former occurring before high tense vowels, and the latter occurring before all other vowels. The Sotho languages distinguish between two levels of high vowels. Roux (1979) discusses the possibility of these being distinguished in terms of the phonetic feature [advanced tongue root], and comes to the conclusion (1979: 47-48):

> a widening of the pharynx takes place concomitantly with the raising of the tongue. This observation effectively rules out any attempt to make a distinction between the vowel systems in Sesotho in terms of a distinctive feature 'advanced tongue root.'

He also rejects [tense] as a distinguishing phonetic feature, on the grounds that Doke (1954: 26) denies that non-tense vowels occur in Southern Bantu. But the present account is phonological, and the feature [tense] serves adequately to distinguish the two classes of high vowels: this is the feature used for such distinctions in Sloat, Taylor and Hoard (1978: 87-88). Again, the exact phonetic nature of this phenomenon is beyond the limits of this study.

$$\begin{bmatrix} C \\ +ant \\ +cor \\ +vd \\ -nas \end{bmatrix} \rightarrow [-cont] \; / \; - \; \begin{bmatrix} +high \\ +tns \end{bmatrix}$$

Postnasal affrication.

This applies in all the daughter languages of Proto-Southern Bantu. No fricative may occur after a nasal, only stops and affricates. In North Sotho and Tsonga, both aspirated and non-aspirated voiceless affricates occur after nasals, so it is necessary to distinguish them (in this transcription, by marking the aspirated ones with /h/). In Zulu only non-aspirated voiceless affricates occur, so all that is necessary is to show the fricative element after the nasal; and in both Zulu and Zezuru, a voiced fricative after a nasal must be interpreted by phonological rule as a low-voiced affricate (see 'Voiced aspirated sounds', above). In languages where an affricate has no corresponding fricative occurring as a phoneme, the affricate is written after the nasal. Tsonga has the affricate /d£/, but it does not have the fricative /£/, therefore the nasal combination is written /Nd£/, although /N£/ would have the same phonetic realisation. The latter is not used in Tsonga, because it suggests a non-occurring phoneme */£/ distinct from /d£/.

$$\begin{bmatrix} C \\ -son \end{bmatrix} \rightarrow [-cont] \; / \; N \; \_$$

1.4.3 Gathering the Southern Bantu data.

Once a list of glosses had been established, the dictionaries of the various languages were consulted for equivalents (Biehler 1950, Cuenod 1967, Dent and Nyembezi 1969, Doke, Malcolm and Sikakana 1958, Doke and Vilakazi 1953, Hannan 1984, Kriel 1967, Kriel 1976, Swiss Mission in South Africa 1974, Van Warmelo 1937, Wentzel and Muloiwa 1982, Ziervogel and Mokgokong 1975). This information was stored on computer.[1] Where several equivalents were found for a given gloss, all these were entered. At this stage, no attempt was made to sort the data into any kind of order. Examples of entries from the initial lists follow:

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[1] The information was stored on mainframe using IBM's DCF wordprocessing package. The XEDIT 'sort' and 'all' commands were used for sorting the data.

GLOSS	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
DRINK	phuza hubhuluza !hafa ghwinya minya	nwa phʊka	nwa 3aNbula	nwa phuza khula orhoβela	nwa kera kururira
EXTINGUISH	ǀima ǀiʃa bhula	tima ɸeliʃa	dzima	tima herisa	dzima dzimura
PUMPKIN	iiphuzi iithaNga	lifoli	furi luɸuri	rirhaNga	nhaNga

Most of the dictionaries consulted yielded only three or four equivalents, on average, per gloss. The exception is the highly detailed Shona dictionary (Hannan 1984), where great attention is paid to subtleties of meaning. In order to save space, only the equivalents with the most general meanings were taken from this dictionary.

Next, the data was rearranged so that words which might probably correspond appeared next to each other. The effect of this can be seen in the rearrangement of the above chart:

GLOSS	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
DRINK	- phuza hubhuluza -	nwa phʊka - -	nwa - - -	nwa phuza orhoβela khula	nwa - kururira kera
EXTINGUISH	|ima |iʃa	tima ɸeliʃa	dzima -	tima herisa	dzima -
PUMPKIN	iiphuzi iiphuzi iithaNga	lifoli lifoli -	furi luɸuri -	- - rirhaNga	- - nhaNga

The list was then revised by entering all equivalents in the form of stems or affixes. Affixes are distinguished from stems by the inclusion of morpheme boundaries, and by quoting their glosses in parentheses. Verb stems were quoted in the present tense form, with final / + a/ of the present simple tense included. The reason for this was that the syllable structure of all the Southern Bantu languages is basically CV, a consonant followed by a vowel. To quote just the stem, without a final vowel, would be to quote a morphological abstraction which does not occur as such in any of the languages, and which would obscure a phonological environment. Final / + a/ occurs in the present tense of nearly all the verbs in all the languages. It therefore constitutes a valid correspondence. To quote this form would ensure that the stems are quoted in a 'natural' rather than an 'abstract' form. Provided that other tenses of the verbs are not quoted as separate correspondence series, there can be no danger of quoting the same comparative series twice. For instance if the present tense positive,

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
SEE	bona	βona	βona	βona	βona

is quoted, it would be wrong to quote the negative

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
SEE	boni	βonɪ	βoni	βoni	-

as a distinct comparative series. It would also be misleading to quote the present tense suffix as a distinct comparative series,

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
(PRESENT)	+a	+a	+a	+a	+a

seeing that it is included in every regular verb stem.

The next step was to enter all other affixes which occurred in the data as separate comparative series. An example of this is productive verbal suffixes. The following pairs of words are related by means of the simple derivational process of adding a productive verbal suffix, the causative suffix, to the simpler stem:

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
COME	za	tɬa	ʻda	ta	-
BRING	zisa	tɬiʃa	ʻdisa	tisa	-
STRAIGHTEN vi	-	-	LuLama	lulama	rurama
STRAIGHTEN vt	-	-	LuLamisa	lulamisa	ruramisa

From such pairs, it is simple to extract the correspondence:

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
(CAUSATIVE)	+isa	+iʃa	+isa	+isa	+isa

The following is another example of a derivational process. Here nouns are formed from verbs:

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
SHUT v	vala	-	vaLa	pfala	-
DOOR n	valo	-	vaLo	pfalo	-
DREAM v	-	lora	Lora	lorha	rota
DREAM n	-	loro	Loro	lorho	roto
URINATE v	-	ruta	ruNda	rhuNdzʾa	tuNda
URINE n	-	ruto	ruNdo	rhuNdzʾu	tuNdo

From these pairs, the following correspondence could be extracted:

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
(NOUN SUF)	+o	+o	+o	+o	+o

Here follows a complete list of the affixal correspondences established in this way. Henceforth, all forms quoted are single morphemes, except for the inclusion of the /+a/ verb ending, unless the contrary is expressly stated.

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
(APPLIED)	+ela	+ela	+eLa	+ela	-*
(CAUSATIVE)	+isa	+iʃa	+isa	+isa	+isa
(CLASS 1)	mu+	mʊ+*	mu+	mu+*	mu+
(CLASS 2)	ba+	βa+	βa+	βa+	βa+
(CLASS 3)	mu+	mʊ+*	mu+	mu+*	mu+
(CLASS 4)	mi+	mɪ+	mi+	mi+	mi+
(CLASS 5)	li+	lɪ+	-*	ri+	-
(CLASS 6)	ma+	ma+	ma+	ma+	ma+
(CLASS 7)	si+	sɪ+	tʃi+	ʃi+	tʃi+
(CLASS 10)	zi+	li+	dzi+	ti+	-
(CLASS 11)	lu+	-*	Lu+	-*	ru+
(CLASS 14)	bu+	βʊ+	βu+	βu+	u+
(CLASS 15)	gu+	ɣʊ+	-*	ku+	ku+
(NEUTER)	+ega	+eɣa	-	+eka	-*
(NOUN SUF)	+o	+o	+o	+o*	+o

The symbol - shows that there is no valid correspondence in the data.

Notes.

(applied). Zezuru has the phonologically skewed form /+ira/. (see 4.4.2).

(Class 1): North Sotho /mʊ+/ becomes a syllabic nasal before stems which begin with labial consonants.

Tsonga /mu+/ occurs only before monosyllables. Before polysyllables it becomes an assimilating non-syllabic nasal.

(Class 3): See (Class 1).

(Class 5): Venda has the phonologically skewed form /ʿli+/ which occurs mainly before monosyllables, but also unpredictably before stems like /faʿta/ 'twin'. This alternates with /∅/, as in Zezuru.

This class is marked in Zezuru by the prefix ∅ combined with certain consonantal changes, but this does not constitute a valid phonological correspondence with the other languages (see 5.8).

Tsonga /ri+/ occurs only before monosyllables, while there is a /∅+/ prefix before polysyllables. Unlike the /∅+/ prefixes in Venda and Zezuru, this does not cause consonant changes.

(Class 11): The Tsonga *ru+ has apparently been subsumed into Class 5, so that in Tsonga the prefix for Class 11 is /ri+/. Similarly, the Class 11 prefix in North Sotho is /lɪ+/ and not the expected /lu+/. This change is due to a morphological merger and not phonological conditioning, as there are no other cases of *u being realised as a high front vowel in either of these languages.

(Class 15): Venda has the phonologically skewed form /u+/.

neuter: Zezuru has the phonologically skewed form /+ika/ (see 4.4.2).

(noun suffix): Tsonga has a phonologically conditioned alternative /+u/ (see 2.4.7).

In most cases, noun class prefixes could readily be separated from their stems. In Tsonga, the Class 1 and Class 3 prefixes have lost their syllabic status, and become part of the first syllable of the stem. This makes it difficult to say where the prefix ends and the stem begins, for example,

BACK	Ntɬana
CASTOR BEAN	NtɬaNpfura.

Compare the plural (Class 4):

BACKS	mi+ɬana
CASTOR BEANS	mi+ɬaNpfura

and the Zulu:

BACK	mu+ɬane
CASTOR BEAN	mu+ɬaguve.

In such cases the Tsonga stem was obtained from the plural, where prefix and stem are phonetically easily separable. In North Sotho the Class 5 prefix is distinct from the stem but often has a morphophonological effect on it. This process also applies in Venda and Zezuru, where prefix and stem have become phonologically indistinguishable. Stems which had undergone this process were ignored because this is a phonological rule peculiar to the development of these three languages. To assume that it existed in Proto-Southern Bantu would be to invite feedback.

	N.SOTHO	VENDA	ZEZURU
ARM	li + tsoɣo	-	oko
CLAY	li + tsʊpa	vuNba	-
BUTTOCK	li + ʃaɣo	ʃaho	ðako
CHEEK	li + rama	ʃama	ðama

In these cases, the plural form (Class 6)

	N.SOTHO	VENDA	ZEZURU
ARM	ma + βoɣo	-	ma + oko
CLAY	ma + βʊpa	ma + βuNba	-
BUTTOCK	ma + raɣo	ma + raho	ma + tako
CHEEK	ma + rama	ma + rama	ma + tama

was used to obtain the stem.

In all languages, the Class 9 prefix is inseparable from the noun stem, and the stem is the same in both singular and plural. This is illustrated by the following examples:

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
DUIKER	NpuNzi	phuti	mhuti	-	-
HEAD	Nɬogo	ɬoɣo	ʻthoho	Ntɬoko	-
SEED	Nbewu	peu	Nbehu	Nbewu	Nbeu

Plural:

	ZULU	N.SOTHO	VENDA[2]	TSONGA	ZEZURU
DUIKER	zi + Npunzi	li + phuti	mhuti	-	-
HEAD	zi + Nɬogo	li + ɬoɣo	ʻthoho	ti + Ntɬoko	-
SEED	zi + Nbewu	li + peu	Nbehu	ti + Nbewu	zʷi + Nbeu

For this reason, the Class 9 prefix is assumed for phonological purposes to be part of the stem in the contemporary Southern Bantu languages.

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[2] The Venda plural has an optional prefix /dzi + /: see Ziervogel, Wentzel and Makuya 1972: 25.

The data was sorted (see 1.4.3: footnote) to ensure that a stem was not entered more than once under different glosses with similar meanings. Where this happened, glosses were collapsed. Examples:

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
BALDNESS	NpaN£a	phatɬa	phaN'da	NpaNd£a	mhaNza
FOREHEAD	NpaN£a	-	phaN'da	NpaNd£a	mhaNza
BE BITTER	baba	βaβa	βaβa	βaβa	βaβa
STING	baba	βaβa	βaβa	βaβa	βaβa

The gloss of a series therefore does not imply that each attesting stem in the series has the exact meaning of the gloss. Occasionally one language would contain a word that obviously belonged in one of these collapsed comparative series, but whose meaning was skewed. These cases are noted under the cited data in Chapter 2.

1.4.4 Establishing regular correspondences.

Gloss series were accounted valid if cognates appeared in three languages. Once the lists of potential cognates had been drawn up, the XEDIT 'all' command was used to check for regular correspondences. Generally, the majority of words included in the initial data corresponded in the number of their syllables. The few exceptions were examined, and where there were no possible conditioning factors, as happened in nearly all cases, stems with fewer or more syllables than other stems in a potential series were eliminated. The syllable was then taken as the basis of the first search for regular correspondences. Thus, an instruction would be given to display every instance of a given syllable in a given language. For example the syllable /ba/ in Zulu yielded the following data (this is a partial extract of the total, which is too extensive to quote here in full).

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
AFFAIR	Ndaba	taβa	-	-	Ndaβa
BE BITTER, STING	baba	βaβa	βaβa	bhaβa	βaβa
BE PLEASED	ethaba	thaβa	-	-	-
BECOME	ba	βa	βa	βa	βa
BEND	ghoba	koβa	-	-	-
BEND	ghoba	oβa	-	-	-
CHEST	fuba	huβa	-	fuβa	pfuβa
CHEST	fuba	khuβa	-	fuβa	pfuβa
COUNT	bala	βala	βala	-	-

DIVIDE	aba	aβa	-	aβa	-
FATHER	baba	-	bhabha	bhaβa	6a6a

'Bend' and 'chest' appear twice because certain languages have two possibly corresponding forms. The syllable /ba/ in Zulu corresponds, according to the data quoted here, to /βa/ in North Sotho, to /βa/ and /bha/ in Venda, to /βa/ and /bha/ in Tsonga, and to /βa/ and /6a/ in Zezuru. In each of the last three languages, the second correspondence occurred fewer than three times. Furthermore, there is no possibility of phonological conditioning, as the two sounds occur in identical environments. The second correspondence in each case appeared to be irregular. In order to confirm this, Zulu /ba/ was compared to other syllables containing /b/, for example /be/.

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
BEAR A CHILD	beletha	βeleɤa	-	-	6ereka
BREAST	bele	βele	-	βele	-
DEW	bethe	-	-	βerhe	-
PIG	Ngulube	kʊlʊβe	NguLuβe	Nguluβe	Nguruβe
EAR	N£ebe	tseβe	N'deβe	Nd£eβe	Nzeβe
HIT	betha	βetha	-	-	-
MILLET	bele	-	βele	-	-
PUT	bega	βɪa	βea	βeka	-

The syllable /be/ in Zulu corresponds to /βe/ in North Sotho, to /βe/ in Tsonga, and to /βe/ and /6e/ in Zezuru. The second correspondence in Zezuru occurs fewer than three times, and there is no possibility of phonological conditioning. This confirms that this correspondence is irregular. Now the same process was applied to /bo/.

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
ROT	bola	βola	-	bhola	ora
SEE	bona	βona	βona	βona	ona

The correspondence of Zulu /b/ to /β/ in North Sotho, /β/ in Venda and /β/ in Tsonga is confirmed. However, the */β/ expected in Zezuru is not present. Instead, there is ∅. But compare this with the correspondences for Zulu /bu/:

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
ASK	buza	-	-	-	bvunza
HIPPOPOTAMUS	Nvubu	kuβu	Nvuβu	Npfuβu	Nvuu
KILL	bulala	βʊlaya	βuLaya	-	uraya

KILL	bulala	βʊlaya	βuLaha	-	uraya
MOULD	buNba	βʊpa	βuNba	βuNba	uNba
(CLASS 15)	bu+	βʊ+	βu+	βu+	u+

'Kill' appears twice because Venda has two possible corresponding forms. Once again, the regular correspondences appear: Zulu /bu/ corresponds to North Sotho /βu/, Venda /βu/, and Tsonga /βu/. However, once again there is a ∅ correspondence in Zezuru. An obvious phonological conditioning factor is present, namely the back vowels. From this, it appears that Zulu /b/ corresponds to /β/ in North Sotho, /β/ in Venda, /β/ in Tsonga, and /β/ in Zezuru before front vowels, but ∅ before back vowels.

The data for /bu/ contains some other unexpected correspondences: /βu/ rather than /βʊ/ in the North Sotho word for 'hippopotamus', and /bvu/ in the Zezuru for 'ask'. Further checking of the data according to the above procedure showed that the North Sotho form is phonologically conditioned by the high tense vowel in the preceding syllable, and that the Zezuru form does not represent a regular correspondence in terms of the criterion of frequency.

The same procedure was followed for every other syllable in the Zulu data. When a sound showed no regular correspondences, it was eliminated. For example, the phoneme /!gh/ occurred in only the following data:

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
HILL	!ghuma	konya	-	-	ghomo
POUND	!ghula	tula	-	-	dz^{w} ura

No regular pattern emerges. Therefore, the two Zulu entries were eliminated from the data. The entire procedure was then repeated for the other four languages, until only stems containing regular correspondences remained in the data.

Occasionally there were not enough instances of a correspondence to establish whether it was regular or not. An example of this is the potential correspondence of North Sotho /ph/ to Tsonga /mh/.

	N.SOTHO	TSONGA
DUIKER	phuti	mhuNti
IMPALA	phala	mhala

In such instances, following Mann (1973), the disputed correspondence was compared to other sounds with almost identical features. The North Sotho sequence /th/ occurs in the following series:

	N.SOTHO	TSONGA
PERSON	thu	nhu

That is, an aspirated voiceless stop in North Sotho /ph/ or /th/ corresponds three times to an aspirated nasal in Tsonga. The correspondence was taken to be valid on grounds of frequency. In this way, correspondence by feature was also admitted.

Finally, the data was checked for tonal correspondences. The five languages each have two phonological tones, high [H] and low [L]. In noun stems, any syllable could be either H or L. Verbs are more complicated, as their tonal configurations change according to inflection: phonologically, however, all the languages have two verbal patterns, H and L, associated freely with the verb and copied onto the syllables of the verb stem in different ways, depending on the language. It was quickly established that, generally, a simple one-to-one correspondence exists:

ZU	NS	VE	TS	ZE
H	H	H	H	H
L	L	L	L	L

This applied to both nouns and verbs. For instance, a regular correspondence for a noun with a the tonal pattern LH would be LH in all the languages being compared. A regular correspondence for an H verb would be H in all languages, although the tonal configurations associated with the H verbs might be different. The one exception was that of noun stems which had a HH tonal contour in Zulu, Venda, Tsonga and Zezuru. These regularly corresponded to HL stems in North Sotho. This is accounted for by a minor tonal rule in North Sotho (5.6).

As this is a phonological reconstruction, morphological conditioning of sounds (morphophonological conditioning) was rejected as an explanation of any phonological irregularities in correspondence, in accordance with Hooper's theoretical approach, which divides sound-change rules into two kinds, namely phonetically conditioned rules and morphophonemic rules (1976: 14-15):

> Phonetically conditioned rules are rules describing alternations that take place in environments that are specified in purely phonetic terms ... Morphophonemic rules ... change phonological features in environments described in morphosyntactic or lexical terms.

Changes brought about by the latter kind of rule were deemed to be beyond the scope of this study.

Words which did not show regular phonological correspondences were eliminated. The criterion of regular correspondence was applied very rigidly. For instance, even if a language contained a correspondence that was almost exact but deviated in only one respect it was eliminated. This process will be illustrated as applied to the following data:

		ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
COUGH	H	khoɬela	ɣoɬola	hoʻtola	khoɬola	kosora

The Tsonga /kh/ does not occur in any regular correspondences, therefore this word was eliminated.

		ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
COUGH	H	khoɬela	ɣoɬola	hoʻtoLa	-	kosora

The Zulu consonants correspond regularly to the consonants in the other words, but the vowel /e/ in the second syllable does not correspond to the vowels in the second syllables of the words in the other languages, and there is no possible reason for *o to become /e/ in this stem. The final, regular correspondence series is thus:

		ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
COUGH	H	-	ɣoɬola	hoʻtoLa	-	kosora

A word series was allowed as valid if it involved cognates in at least three languages. From these regularly corresponding word series, phonological series were extracted, for example:

ZU	NS	VE	TS	ZE
kho	ɣo	ho	ko	ko

A phonological series was counted as valid if it occurred twice and involved at least four languages. Compare Guthrie's methods (1962b: 10), by which it is assumed that a certain number of occurrences imply validity. This criterion was also applied to tonal correspondences, and forms whose tones did not correspond regularly were eliminated even if their segmental phonemes corresponded exactly according to pattern. This resulted in the elimination of certain fundamental core vocabulary words, for example:

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
CHILD	-	ŋwana	ŋwana	ŋwana	mŋana
		LH	HH	HL	LH

where no pattern of three identical tonal configurations emerges.

1.5 *Summary.*

As shown above, the data was carefully sorted for regular correspondences, which might be correspondences in terms of phonemes or phonological features. At no stage was reference made to any preconceived ideas of grammatical analysis, nor was there any reference to reconstructions of Proto-Bantu. The effect of this was to re-establish certain correspondences which are well-known from works such as those of Meinhof (1899), Guthrie (1971) and Van Warmelo (1927), but with reference to an attempt at reconstructing Proto-Southern Bantu and not Proto-Bantu.

1.6 *Analysis and presentation of the data.*

To conclude this chapter, a brief outline will be given of the contents of the subsequent chapters and appendices.

In Chapter 2, the phonological comparative series are presented, together with the word-series attesting them. A reconstruction is postulated for each phonological comparative series, in terms of the comparative method, as explained in 1.2. Detailed explanations for each reconstruction are also given in Chapter 2.

In Chapter 3, the initial reconstruction is tested for phonological plausibility. The possible phonetic realisation of the proto-phonemes is discussed, and also the phonological structure of the proto-language, including phonological features, phonotactics and phonological processes.

As it became obvious that all the phonological forms reconstructed for Proto-Southern Bantu were derived from Proto-Bantu, a series of rules for this derivation is given in Chapter 4. Certain possible innovations, which may separate Proto-Southern Bantu from Proto-Bantu, are examined. The implications of this are further discussed in Chapter 5.

In Chapter 5, the reconstruction of Proto-Southern Bantu is tested by postulating a series of rules deriving each of the five present-day languages of the study from the reconstructed phonemes. The plausibility of the rules is a test of the reconstruction. Rules which are common to several languages are examined to see whether they constitute evidence of shared innovation or rule borrowing. The resulting indications of relationship are compared to the lexicostatistical genealogies of Henrici (1973), Finlayson (1976) and Borland (1982). The historical implications of the rules and the way they appear to have applied are discussed briefly in that chapter.

The list of English glosses used and their reconstructed equivalents are given in Appendix 1, followed by a glossary giving the English equivalents of each reconstructed form. The noun classes of the nouns in the attesting languages are listed in Appendix 2, as considerations of space prevented their being quoted in Chapter 2. A glossary of forms derivable from Proto-Bantu is given in Appendix 3.

2.0 Reconstruction.

2.1 Introduction.

The phonological comparative series attested by the data are given below. For convenience of reference, they are grouped together under the proto-phonemes reconstructed for them. Each group of comparative series is followed by an explanation of the reconstruction. A list of stems attesting each series follows the series. Verbal extensions, the noun suffix /+o/, and noun class prefixes are included in the list as separate 'stems'. Other prefixes and suffixes did not occur in the data, except for the present tense suffix /+a/, which is treated as part of the verb stem (see 1.4.3) Indeed, this is why attesting forms are listed as 'stems' not 'morphemes' as all the verb forms, and several of the noun forms, given in the data are bimorphic. The situation with Class 9 nouns is ambiguous, as is mentioned in Chapter 1, as it is possible to analyse these stems as consisting of a ∅ prefix followed by a nasal-commencing root, or as a nasal prefix followed by the stem. The former alternative is preferred. However, this makes no difference to the phonological analysis of these stems. Note that the syllabic nasals occurring before monosyllabic Class 9 stems in North Sotho, and before monosyllabic Class 9 stems containing voiceless consonants in Venda, are treated as prefixes, as their occurrence is morphologically not phonologically conditioned. However, this makes no difference to the phonological analysis of these stems. For the consonants, the list of attesting stems is divided into two sections, stem-initial attestations and stem-medial attestations. For the vowels, usually only stem-initial attestations are given in full, as there are too many medial attestations to quote conveniently, though examples of non-initial attestations of vowel series are quoted when these differ from the most prevalent pattern of correspondence owing to some conditioning factor. The tonal correpondences for each series are given after the gloss. For the interpretation of tonal correspondences, see 1.4.4.

Cognates within comparative series are given in phonological transcription. Where a particular language does not have a valid entry for a series, this is marked by a dash: -. Series where the correspondences are dubious, or where there are alternative correspondence series, conditioned phonologically, are accompanied by commentary. There are also notes on forms with skewed meanings or phonologically or morphologically skewed shapes. Forms with skewed meanings are included in the series, marked with a following asterisk, *, and the meaning is given in the notes that follow each series, often without further comment. Phonologically skewed forms are generally omitted, but occasionally there is a reason to comment on them: for instance, if there is a possibility that the skewing is only apparent, and they are in fact regular, or if they are apparently regular in all respects but are actually tonally skewed.

The data in this chapter was taken from the following dictionaries: Biehler 1950, Cuenod 1967, Dent and Nyembezi 1969, Doke, Malcolm and Sikakana 1958, Doke and Vilakazi 1953, Hannan

1984, Kriel 1967, Kriel 1976, Swiss Mission in South Africa 1974, Van Warmelo 1937, Wentzel and Muloiwa 1982, Ziervogel and Mokgokong 1975. I should like to express my gratitude to Professor James Khumalo, who showed me how to interpret Doke and Vilakazi's (1953) phonetic account of Zulu tones in phonological terms.

2.2 The phonemes of Proto-Southern Bantu.

The following is a list of the reconstructed phonemes, quoted here to provide the reader with a reference for the rest of this chapter. It also serves to show how the reconstructed phonemes relate to one another in terms of place and manner of articulation, and voicing. This is discussed fully in Chapter 3. The reconstructed phonemes are presented in the following order (to be read from left to right, and then down):

Voiceless stops.

*p	*Np	*pw	*Npw
*t	*Nt	*ty	
*c	*Nc		
*k	*Nk	*k(y)	

Voiced stops.

*b	*Nb	*bw	*Nbw
*d	*Nd		
*j	*Nj		
	*Ng		

Voiceless affricates.

*pF
*tF
*kF

Voiced affricates.

*bF	*NbF
*dF	*NdF
*gF	*NgF

Nasal resonants.

*m	*mw
*n	
*ny	

Glides.

*y

*w

Vowels.

*i *e *a *o *u

The phonemes are ordered from 'most closed' to 'most open' in terms of articulation. The so-called 'nasal compounds' (Guthrie 1967: 52) or 'nasal complexes' (Meeussen 1967: 83), that is, sequences of nasal and obstruent, follow the simple obstruents. They are treated as units for the purpose of reconstruction, as the modern reflexes of obstruents in these combinations are often different from the reflexes of the simple obstruents. For the same reason, certain sequences of obstruent and glide are treated in this manner, namely bilabial consonants followed by glides, and any consonant followed by the glide *y. Within each of the consonantal groups, phonemes are presented from front to back in terms of place of articulation:

Bilabials
Alveolars
Palatals
Velars.

The vowels are presented in the traditional IPA order.

The proto-form reconstructed for each comparative series should logically follow the discussion of reconstruction. However, these forms serve as a convenient method of referring to the comparative series, and so are used as headings for each series. It may appear that this constitutes presuming the conclusion before examining the data, contrary to the 'two-stage method' advocated by Guthrie (1962a), but it is merely to provide a heading and reference. Each reconstruction started from an examination of the data, and is explained below the attesting comparative series: it was always borne in mind that a reconstruction represents a conclusion, not a presupposition.

2.3 Lenition.

Certain assumptions are made about the likely direction of sound change in language, so that when two corresponding forms have different manners of articulation, different voicing or different places of articulation, there is a standard by which to judge which is likelier to have retained the 'older' features. The kind of sound change which Southern Bantu consonants are expected to undergo is lenition. This assumption is based on the nature of the environment in which the consonants and consonant clusters of Southern Bantu occur: either stem-initially or between vowels. (Note here the mention of consonant clusters, which for the purpose of reconstruction are treated as units, but

which in the discussion of the phonological structure of Proto-Southern Bantu are treated as sequences of consonants.) These two environments can be viewed as one, if it is remembered that the Southern Bantu languages make intensive use of prefixes, and the stems would normally have occurred after prefixes with the shape CV. That is, for consonants and consonant clusters, the environment of change is between vowels, the environment in which the change of lenition is to be expected (Hock 1986: 80-86). In the discussion of each reconstruction, the changes due to lenition will be described, but without references: in each case, the assumed reference is to Hock (1986), as above. When other factors have to be taken into consideration, they are duly noted. A summary of the changes brought about by lenition is set out in 5.3.

2.4 The reconstructed phonemes and their attestations.

2.4.1 Voiceless stops.

***p.**

Phonological comparative series.

ZU	NS	VE	TS	ZE
ph	ɸ	ɸ	h	p

The majority of the attesting consonants are voiceless and bilabial. Only Tsonga /h/ is voiced. Two are stops (/p/, /ph/), and the rest are fricatives. A change from stop to fricative is to be expected intervocalically, and so the sound reconstructed for this series is a voiceless bilabial stop.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
boil over	L	phuphuma*	-	ɸuɸuma	huhuma	pupuma*
burn	H	-	ɸiʃa	ɸisa	hisa	pisa
dig	L	phaNda	ɸata	-	haNdz'a	paNda*
finish	H	phela	ɸela	ɸeLa	hela	pera
fly	H	phapha	-	-	haha	papa*
give	H	pha	ɸa	ɸa	ha	pa
handle	HH	phini	ɸiN	-	-	pini
knife	HH	-	ɸaka	ɸaNga	-	paNga
pass	L	phiNda*	ɸita	-	hiNdz'a	piNda
rest	H	phumula	-	ɸumuLa*	humula	pumura
scrape	H	phala	ɸala	ɸaLa	hala	para

underneath	LH	phaNsi	ɸasi	ɸasi	haNtsi	pasi
winnow	H	phephetha*	ɸeɸera	ɸeɸera	-	pepeta

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
boil over	L	phuphuma*	-	ɸuɸuma	huhuma	pupuma*
fly	H	phapha	-	-	haha	papa*
pay	L	-	hɨɸa	Liɸa	riha	ripa
tendon	LL	sipha	ʃiɸa	-	siha	-
tie up	H	bopha	βoɸa	βoɸa	-	-
winnow	H	phephetha*	ɸeɸera	ɸeɸera	-	pepeta

Notes.

boil over: Zulu /phuphuma/ 'overflow'.

Zezuru /pupuma/ 'froth, foam'.

dig: Zezuru /paNda/ 'break up a hard surface'.

Tsonga /haNdzʾa/ 'scratch in the soil'.

fly: Zezuru /papa/ 'float on surface of water; flutter'.

pass: Zulu /phiNda/ 'repeat'.

rest: Venda /ɸumuLa/ 'be silent'.

winnow: Zulu /phephetha/ 'blow'.

***Np.**

Phonological comparative series.

ZU	NS	VE	TS	ZE
Np	ph	ph	mh	mh

The Zulu attestation is a sequence of consonants, while in the other languages the attestation is a single consonant. As there is no factor such as a preceding nasalised vowel which might have conditioned the insertion of a nasal consonant, it is assumed that the Zulu attestation reflects the original situation, and that the other languages each lost a consonant from the sequence by cluster simplification. Nurse (1987: 10) mentions the 'Instability of [a] nasal followed by [a] homorganic voiceless stop' attested in sixty-three percent of Bantu languages.

All the attesting consonants are bilabial. The Zulu sequence consists of a nasal followed by stop; the single-consonant attestations in the other languages are either nasals or voiceless stops.

Therefore the sound sequence reconstructed from this series is a voiceless bilabial stop preceded by a homorganic nasal.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
baldness, forehead	HH	NpaN£a	phatɬa	-*	-	mhaNza
impala	LH	Npala	phala	phaLa	mhala	mhara
wildcat	HH	Npaga	phaɣa	phaha	-	-

*Stem-medial attestation.*No examples in the data.

Notes.

baldness, forehead: Venda has the tonally skewed form /phaN$^{\downarrow}$da/, HL.

***pw.**

Phonological comparative series.

ZU	NS	VE	TS	ZE
ʃ	sw	s^{w}	-	ts^{w}

The majority of these sounds have two points of articulation: bilabial and alveolar. All are voiceless. In Zezuru the attestation is an affricate, while in the other languages, it is a fricative. Intervocalically, affricates become fricatives, so *ts^{w} is a likely candidate for the proto-phoneme. However, there is the problem of the Zulu form, which is palatal. Other problems are the series *pF, which produces alveo-labial forms in Venda and Zezuru, and *bF, which produces a labialised alveolar in North Sotho, suggesting that this series might be related to the affricates. The Zulu palatal can be compared to the reflexes for *bw and *mw, which are also palatal, confirming that the proto-form of this series had a bilabial quality. If an early change from *pw to *pF is assumed for the other languages, then the alveolar articulation which appears there can be accounted for in terms of alveolar allomorphy of the fricative element. See the series *pF and *tF for a full discussion. Such a change from glide to fricative is also presumed in order to explain the Venda reflex of *ky in the series *k, *ky.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
burn	H	ʃa	swa	s^{w}a	-	ts^{w}a
new	H	ʃa	-	s^{w}a	-	ts^{w}a

*Stem-medial attestation.*No examples in the data.

Notes.

burn: Tsonga has /ts^{w} ha/, which may represent a regular correspondence, but there is no other evidence of alveolabial correspondences among the Tsonga attestations in the series *bw, *pF, *bF or *NbF.

***Npw.**

Phonological comparative series.

ZU	NS	VE	TS	ZE
-	pʃh	-	phy	px

There is only one attesting word for this series, but the North Sotho and Zezuru forms are the voiceless equivalents of the reflexes of *Nbw; and the Tsonga reflex of *by is also a palatalised bilabial. The reconstruction here is easier to arrive at than in the case of *pw, as all three forms suggest a sequence of stop and glide (the glide becoming an obstruent by assimilation after the stop in North Sotho and Zezuru). The glide is reconstructed as *w (though the North Sotho and Tsonga palatal forms would suggest *y), as the Zezuru velar is more easily derived from *w with its labio-velar articulation. The presence of a nasal is assumed, as the Tsonga and North Sotho forms are aspirated affricates, not fricatives: all other aspirated voiceless non-continuants in these languages are the reflexes of nasal compounds. Assuming that there was a nasal provides a further reason for reconstructing the glide as *w: the glide *y in the reconstructed forms *ty and *ky appears to prevent these forms from being preceded by a nasal (see 3.4.1).

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
dry	H	-*	pʃha	-	phya	pxa

*Stem-medial attestation.*No examples in the data.

Notes.

Zulu has the form /ʃa/, which might be a member of this series, but the presence of the nasal in the reconstruction would lead one to expect the reflex */Nʃa/.

*t.

Phonological comparative series.

ZU	NS	VE	TS	ZE
th	r	r	rh	t

All the attesting consonants are alveolar. Two are stops (Zulu /th/, Zezuru /t/), and the rest are resonants. The change from an alveolar stop to a resonant is to be expected intervocalically, for example, the flapping of /t/ in American English: (Hock 1986: 82; Fromkin and Rodman 1978: 125), or the similar change from *t to trilled /r/ in the Chadic languages Kanakuru and Hausa (Schuh 1974: 96). Therefore, it is most likely that the original phoneme was a stop.

Three of the attesting sounds are voiced and two are voiceless. A change from voiceless to voiced normally occurs between vowels. Thus the proto-phoneme is reconstructed as a voiceless stop.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
basket	HH	-*	rʊtʊ	ruNdu	rhuNdzʾ.u	-
begin, precede	H	-	raka	raNga	rhaNga	taNga
bone	HH	thaNbo	rapo	raNbo	rhaNbu	-
bow	H	-	ra	ra	rha	ta
broth	L	-	ro	ro	-*	to
buttock	HH	-	raɣo	raho	-	tako
buy	H	theNga	reka	reNga	-	teNga
carry	H	thwala	rwala	-*	rhwala	twara
cheek	HH	-*	rama	rama	rhama	tama
chop	H	-	rema	rema	-	tema
curse	H	thuga	rʊɣa	-	rhuka	tuka
gather wood	H	theza	-	reʻda	-	teza
namely*	L	gu + thi	ɣʊ + rɪ	-	-	ku + ti
pick up	H	thola	-	-	rhola	tora*
pumpkin	LL	thaNga	raka*	raNga	rhaNga	-
send	H	thuma	rʊma	ruma	rhuma	tuma
sew	H	thuNga	rʊka	ruNga	rhuNga	tuNga
shiver	L	thuthumela	rʊrʊmela	-	rhurhumela	-
sleep	LL	thoNgo	roko	-	rhoNgo	-
spittle	H	the	re	re	-	te
three	HH	thathu	rarʊ	raru	-*	-*

tree	H	thi	rɪ	ri	rhi	ti
urinate	L	thuNda	rʊta	ruNda	rhuNdz'a	tuNda

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
ash	LL	lotha	-*	Lora	lorha	-
bend	L	khothama	-	-	korhama	kotama
buffalo	HH	nyathi	-*	ʻnari	nyarhi	-*
dream	H	-	lora	Lora	lorha	rota
have enough	H	sutha	-	fura	ʃurha	guta
oil	HH	futha	hura	pfura	furha	-
three	HH	thathu	raru	raru	-*	-*
warm oneself	H	otha	ora	ora	orha	-
wear	L	eNbatha	apara	aNbara	-	-
winnow	H	phephetha*	ɸeɸera	ɸeɸera	-	pepeta

Notes.

ash: see notes to *d.

basket: Zulu has the tonally skewed /si + thuNdu/, LL.

broth: see notes to *o.

buffalo: see notes to *ny.

carry. Venda has /hwaLa/, which suggests that its reflex of *t before *w is /h/. However, there are no other examples in the data to support this.

cheek: Zulu has the tonally skewed /thama/, HL, 'mouthful'.

namely: The attestations in this series consist of a verbal root *ti preceded by the Class 15 prefix.

pick up: Zezuru /tora/ 'take; fetch; accept'.

pumpkin: North Sotho /lɪ + raka/, small squash, cucumber.

three: Tsonga has tonally skewed /rharhu/, HL.

Shona has phonologically and tonally skewed /nhatu/, LH.

winnow: see notes to *p.

***Nt.**

Phonological comparative series.

ZU	NS	VE	TS	ZE
Nt	th	th	nh	nh

This series is the alveolar equivalent of the labial *Np. The reasons for reconstructing it as a sequence of nasal and voiceless stop are the same, and as all the attesting consonants are alveolar, the

proto-form is assumed to have been alveolar. Although there is only one attesting stem-series, it shows alveolar reflexes which correspond exactly to *Np in terms of manner of articulation.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
person	L	Ntu	thu	thu	nhu	nhu

*Stem-medial attestation.*No examples in the data.

*ty.

Phonological comparative series.

ZU	NS	VE	TS	ZE
th	tʃh	ʃ	tʃh	ə

The majority of the attesting consonants are voiceless. There are two stops (/th/, /ə/), two instances of the affricate /tʃh/, and one fricative, /ʃ/. A change from stop to affricate or fricative commonly occurs between vowels. The stops are alveolar, whereas the affricates and fricative are palatal. A change from alveolar to palatal would usually require a conditioning factor such as a front vowel or a palatal glide, not overtly present in any of the reflexes (Hock 1986: 73-75). No examples of palatal affricates or fricatives becoming alveolar stops are known. Therefore, the sound reconstructed for this series is an alveolar stop accompanied by a palatal glide. In Zulu, this glide is completely lost, and the remaining *t merges with the already existing *t. In Zezuru, the glide causes the stop to be voiced, and is subsequently lost. This is unusual, but compare *ky. There is only one attesting form in Zezuru, but it parallels the reflex of *ky and the changes brought about by the Class 5 prefix (see 5.8).

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
fear, flee	H	-	tʃhaβa	ʃaβa	tʃhaβa	-
pour	L	thela	tʃhela	ʃeLa	tʃhela	-*
pour	L	thulula	tʃhʊlʊla	ʃuLuLa	tʃhulula	ərura

*Stem-medial attestation.*No examples in the data.

Notes.

pour: Zezuru has /əira/, which contains a skewed vowel. The expected form is */əera/. This may

be because the ending /+ira/ is the applied extension, which would be expected to have this vowel in Zezuru, but there is no stem *tya to confirm this.

*c.

Phonological comparative series.

ZU	NS	VE	TS	ZE	
s	s	s	s	-	Before *i.
ɬ	s	s	ɬ	s	Before *e.
ɬ	ɬ	ʻt	ɬ	s	Elsewhere.

All of the attesting sounds are voiceless. The majority are either lateral or central alveolar fricatives. The one exception is the Venda /ʻt/, a dental stop. Stops tend to become affricates or fricatives between vowels. This stop is reconstructed as palatal to bring it into line with the nasal palatal series *ny, where the Venda reflex is /ʻn/. Also compare Castilian Spanish, where the dental /θ/ is the reflex of palatalised Proto-Romance *k, which, like this form, also has alveolar reflexes. The stop seems to have become a lateral affricate first (judging by the predominance of lateral obstruents) and then a central one, though before *i it may have been central from the start. A change from lateral to central is to be expected, as lateral obstruents are 'marked', (Lass 1984: 150, 156) whereas central obstruents are unmarked. The opposite change would require a special conditioning environment. However, the change from a palatal consonant to a lateral consonant is unusual; but it is interesting to note that the correspondence /ts: tθ: tɬ/ occurs in the Na-Dene language family of North America (Krauss 1973), suggesting a similar proto-consonant. Krauss postulates that this was *tθ (1973: 944), but in the Southern Bantu case, the palatal reconstruction is made to preserve the symmetry of this correspondence with that between Venda dental /ʻn/ and palatal nasals in other languages. However, this means that three voiceless palatal obstruents, *c, *ty and *ky, are reconstructed for Proto-Southern Bantu, which seems unlikely. This may be a further indication that *c was not a palatal consonant in Proto-Southern Bantu. Owing to the element of doubt, the symbol *c (and likewise the symbol *j, see the discussion below) can be taken as a cover symbol for a phonological entity which cannot be accurately defined phonetically.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
ant, termite	H	ɬwa	ɬwa	ʻtwa	ɬwa	-
arrow	LL	-	seβe	seβe	-	seβe
back	HL	-	ɬana	ʻtana	ɬana	-*
basket	LL	-	selo	-*	ɬelo	sero
bathe	L	ɬaNba	ɬapa	ʻtaNba	ɬaNba	saNba

chew	H	ɬafuna	ɬahuna	ʻtafuna	-	-
five	HL	ɬanu	ɬanʊ	ʻtanu	-	-
laugh	L	ɬega	seɣa	sea	ɬeka	seka
meet	L	ɬaNgana	ɬakana	ʻtaNgana	ɬaNgana	saNgana
pestle	L	-	sɪ	si	si	-
sand, soil	HH	ɬaba*	ɬaβa	ʻtaβa	ɬaβa	-
reed, stalk	LL	ɬaNga	ɬaka	ʻtaNga	ɬaNga	-
strain	L	ɬuza	ɬʊtɬa	ʻtuʻda	ɬuta	-
undress	L	ɬubula	ɬʊβʊla	-	ɬuβula	-
vomit	H	ɬaNza	ɬatʃa	ʻtaNza	ɬaNta	-
weed	L	ɬagula	ɬaɣʊla	ʻtahuLa	ɬakula	sakura
winnow	L	ɬuNgula	ɬʊkʊla	ʻtuNguLa	-*	suNgura*

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
cough	H	-	ɣoɬola	hoʻtoLa	-	kosora
eye	HH	-	iɬo	iʻto	tiɬo	ziso
hide	H	fiɬa	ɸiɬa	sʷiʻta	fiɬa	-
lose	H	laɬa	laɬa	Laʻta	laɬa	rasa
milk n	HH	bisi	βɪsɪ	βisi	βisi	-
surpass	H	aɬula	ɬʊla	-	ɬula	-

Notes.

back: Shona has tonally skewed /mu + sana/, HH.

basket: Venda has the verb stem /sela/ 'winnow'.

sand, soil: Zulu /mu + ɬaba/, 'earth, country'.

winnow: Zezuru /suNgura/ 'strain (as liquid)'.

Tsonga has /ɬuNgula/, H, tonally skewed.

***Nc.**

Phonological comparative series.

ZU	NS	VE	TS	ZE	
Ns	s	s	Nts	s	Before *i.
Nɬ	tɬh	ʻth	Ntɬh	-	In monosyllabic stems.
Nɬ	ɬ	ʻth	Ntɬh	-	Elsewhere.

In the majority of cases, the attesting sounds are sequences of alveolar lateral nasal and voiceless alveolar obstruent. The difference between the monosyllabic and polysyllabic forms in North Sotho is attributable to the prefix /N+/ which occurs before the monosyllable. A fricative may not occur after nasals in North Sotho (see 1.4.2). The occurrence of the simple fricative between vowels indicates that this developed out of an affricate. Only in Venda is the attestation not an alveolar lateral affricate or fricative, but a dental stop. Except for the presence of the nasal, this series parallels the previous one, *c, and therefore the sound sequence may be reconstructed as a nasal followed by a voiceless palatal stop.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
fish	LL	NɬaNzi	ɬapi	-	NtɬaNpfi	-
head	HH	-*	ɬoɣo	ʿthoho	Ntɬoko	-
point	H	-	tɬha	ʿtha	tɬa	-
termite	H	ɬwa	tɬwa	ʿtwa	-	-

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
underneath	LH	phaNsi	ɸasi	ɸasi	haNtsi	pasi

Notes.

head: Zulu has /NɬogO/, HL, tonally skewed.

***k.**

Phonological comparative series.

ZU	NS	VE	TS	ZE	
kh	ɣ	h	k	k	Initially; after morpheme-initial vowels; after *k followed by [-front] vowels.
g	ɣ	h	k	k	Elsewhere.

Half the attesting sounds (Zulu /kh/, Tsonga /k/, Zezuru /k/) are voiceless velar stops. The voiced sounds /g/, /ɣ/ and /h/ in Zulu, North Sotho and Venda can be ascribed to intervocalic voicing. The fricative sounds /ɣ/ and /h/ in North Sotho and Venda can be ascribed to intervocalic fricative formation. See also the series *k(y).

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
(Class 15)	L	gu+	ɣʊ+	-	ku+	ku+
bend	L	khothama	-	-	korhama	kotama
big	HH	khulu	ɣʊlʊ	huLu	kulu	kuru
charcoal	HH	-	ɣala	haLa	kala	kara
cough	H	-	ɣoɬola	ho'toLa	-	kosora
crust	HH	khokho	-*	-	koko	koko
deny	H	-	ɣana	hana	-	kana*
draw water	H	kha	ɣa	-	ka	-
grow up	H	khula	ɣʊla	huLa	kula	kura
pull	H	khokha*	ɣoɣa	hoha	koka	-
roast	H	-	ɣalika	hadziNga	katiNga	-
milk, squeeze	H	khama	ɣama	hama	kama	kama
think	H	khuNbula	ɣʊpʊla	huNbuLa	-	-
tie up	H	khulega	ɣʊleɣa	-	kuleka	-

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
(neuter)	L	+ega	+eɣa	-	+eka	-*
announce	H	biga	βiɣa	-	-	βika
arm	HH	-	βoɣo	-	βoko	oko
arrive	L	figa	-	-	fika	s^{w}ika
bleed, cup	H	lumega	lʊmeɣa	-	lumeka	-*
build	H	akha	aɣa	-	aka	-
buttock	HH	-	raɣo	raho	-	tako
chicken	HH	Nkukhu	kxhʊɣʊ	khuhu	huku	huku
crust	HH	khokho	-*	-	koko	koko
curse	H	thuga	rʊɣa	-	rhuka	tuka
cut	H	-	seɣa	tʃea	ʃeka	tʃeka
head	HH	-*	ɬoɣo	'thoho	Ntɬoko	-
laugh	L	ɬega	seɣa	sea	ɬeka	seka
pull	H	khokha*	ɣoɣa	hoha	koka	-
put	H	bega	-	βea	βeka	-
snake	HH	nyoga	noɣa	-*	nyoka	nyoka
spread	H	enega	aneɣa	anea	aneka	-
twist	L	aluga	lʊɣa	-	luka	ruka

weed	L	ɬagula	ɬaɣula	ʿtahuLa	ɬakula	sakura
wildcat	HH	Npaga	phaɣa	phaha	-	-

Notes.

(neuter): see notes to *e.

bleed, cup: see notes to *d.

crust: North Sotho has tonally skewed /lɪ + ɣoɣo/.

deny: Tsonga has the extended form /kaneta/.

Zezuru: /kana/ 'quarrel; fight'.

head: see notes to *Nc.

(neuter): see notes to *e.

pull: Zulu /khokha/ 'draw out'.

snake: Venda has /ʿnowa/ for expected /ʿnoha/.

***Nk.**

Phonological comparative series.

ZU	NS	VE	TS	ZE
Nk	kxh	kh	h	h

The Zulu attestation is a sequence of nasal and voiceless stop, while in the other languages the attestation is an affricate, stop or fricative. As with *Np, this series occurs intervocalically and not in any special environment which might have conditioned the epenthesis of a nasal. It can therefore be assumed that the Zulu attestation reflects the original situation, and that the other languages each lost the nasal consonant.

The majority of attesting sounds are velar and voiceless (/Nk/, /kxh/, /kh/). The affricate can be derived from the aspirated postnasal voiceless consonants evident in North Sotho and Venda. By analogy with *Np and *Nt, it would be expected that the Tsonga and Zezuru forms would be */ŋh/, but instead, the attestation is the low-voiced glottal fricative. This is presumably because velar sounds, are weak sounds (languages are more likely to have alveolar and labial obstruents than velar ones (Lass 1984: 94)) and so elide easily. In this case only the phonological aspiration of the nasal remains. Therefore the sound sequence reconstructed from this series is a velar nasal followed by a voiceless velar stop.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
chicken	HH	Nkukhu	kxhuɣu	khuhu	huku	huku
chief	HH	Nkosi	kxhoʃi	khosi	hosi	hosi*

firewood	HH	Nkuni	kxhʊN	khuni	hunyi	huni
fish	HH	-	kxhoβe	khoβe	-	hoβe
guinea-fowl	HH	-	kxhaka	khaNga	-	haNga
partridge	LH	Nkwali	kxhwalɪ	khwaLi	-*	-
snail	LH	-*	kxhʊpa	khuNba	huNba	-

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
smell	L	-*	Nkxha	nukha	nuha	-

Notes.

chief: Zezuru /hosi/ 'senior wife'.

partridge: Tsonga has /ŋhwari/, which suggests that the attestation of *Nk before *w is /ŋh/. However, there are no other examples in the data.

smell: Zulu has /nuga/ for expected */nuNka/.

snail: Zulu has tonally skewed /NkuNba/ LL.

***k(y).**

Phonological comparative series.

ZU	NS	VE	TS	ZE	
s	s	f	ʃ	g	Before *u
s	s	tʃ	ʃ	tʃ	Before *i, *e, *a.

It is noteworthy that while the series *k does not occur before front vowels, the series /s: s: tʃ: ʃ: tʃ/ only occurs before front vowels and *a. This is reminiscent of the Romance reflexes of palatal *k, which are similar sounds. If we assume that the occurrence of this series before *a reflects *kya, *k before a palatal followed by *a, it means that two series with very limited distribution can be brought together as one series which occurs before all five reconstructed proto-vowels. The series /s: s: f: ʃ: g/ occurring before *u is very similar to the series /s: s: tʃ: ʃ: tʃ/ if the /f/ and /g/ are ignored. We may postulate the reconstruction *ky for this series, as with *kya. The various reflexes, palatal affricate, palatal fricative and alveolar fricative may be explained by palatalisation of the *k before front vowels and *y, followed by affrication and subsequent frication. This is very similar to the process which took place under these conditions in Romance, and the process which is assumed to have taken place in early Indo-European (Hock 1986: 76; Collinge 1985: 133-139). However, the forms /f/ and /g/ before *u are left unexplained. They occur in both the word series which attest the series /s: s: f: ʃ: g/, so they cannot be conveniently written off as skewed forms. But compare the Zezuru voiced /ð/, which is the reflex of voiceless *ty. By analogy, *ky could have produced

/g/, though only in one environment, before *u. The explanation would be assimilation of the *k to the voicing of the glide. This leaves open several questions, for instance, why consonants should not assimilate to vowels in voicing if they assimilate to glides. A possible explanation lies in the fact that Zezuru voiceless stops are phonologically aspirated (Fortune 1967: x). If this aspiration took place only before vowels, not glides, then the voicing confined to the latter environment can be accounted for. The reconstruction will be accepted as plausible, even if it is not entirely explained. Venda /f/ is usually the reflex of affricates, as is attested by the series *tF, *kF. If an early change *kyu > *kFu is postulated, with the glide becoming a labial fricative under the influence of the preceding obstruent and the following labialised vowel, then Venda /f/ is also accounted for.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
(Class 7)	L	si+	sɪ+	tʃi+	ʃi+	tʃi+
cut	H	-	seɣa	tʃea	ʃeka	tʃeka
dawn	H	sa	sa	tʃa	ʃa	-
have enough	H	sutha	-	fura	ʃurha	guta
tail	HH	sila	sɪla	tʃiLa	-	tʃira
ten	HL	-	sʊmɪ	fumi	-	gumi

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
bee	HH	nyosi	nosɪ	ʿnotʃi	nyoʃi	-*
roast	L	osa	-	otʃa	oʃa	otʃa

Notes.

bee: see notes to *ny.

tail: Tsonga has the form /tʃila/ for expected */ʃila/.

ten: Zulu has /ʃumi/, but the /s/ correspondence evidenced in 'have enough' must be assumed to be regular, if the *kyu series does attest the same proto-phoneme as the other *k series.

2.4.2 Voiced stops.

*b.

Phonological comparative series.

ZU	NS	VE	TS	ZE	
b	β	β	β	∅	Before back vowels.
b	β	β	β	β	Elsewhere.

All of the attesting consonants are bilabial and voiced. Most are fricatives, with only the Zulu attestation being a stop. A change from stop to fricative is usual, intervocalically, therefore the sound reconstructed for this series is a voiced bilabial stop.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
(Class 14)	L	bu+	βʊ+	βu+	βu+	u+
(Class 2)	L	ba+	βa+	βa+	βa+	βa+
announce	H	biga	βɪɣa	-	-	βika
arm	HH	-	βoɣo	-	βoko	oko
bad	H	bi	βɪ	βi	-	-
be bitter, sting	H	baba	βaβa	βaβa	βaβa	βaβa
become	H	-*	-*	βa	βa	βa
body	LL	-	βɪlɪ	βiLi	-*	βiri
boil	L	bila	βɪla	βiLa	βila	βira
call	H	biza	βitʃa	βidza	βita	-
clay	HH	buNba	βʊpa	βuNba	βuNba	-
colour, spot	HH	bala	βala	-	βala	βara
come back	H	buya	βʊa	βuya	βuya	uya*
count	L	bala	βala	βaLa	-	-
fur	LH	boya	βoya	-	βoya	-
gather, heap up	H	buNga	βʊka	-	βuNga	-*
growl, roar	L	-	βopa	βoNba	βoNba	oNba
kill	H	-	βʊlaya	βuLaya	-	uraya
milk n	HH	bisi	βɪsɪ	βisi	-	-
millet	LH	bele	βele	βeLe	-	-
mould	H	buNba	βʊpa	βuNba	βuNba	uNba

pus, rottenness	LH	bovu	βolu	-	βopfu	-
put	H	bega	-	βea	βeka	-
rot	L	bola	βola	-	-	ora
see	H	bona	βona	βona	βona	ona
them	L	bo	βo	-	βo	-
tie up	H	bopha	βoɸa	βoɸa	-	-
two	LH	bili	-	βiLi	-	βiri

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
affair	LL	Ndaba	taβa	-	-	Ndaβa
arrow	LL	-	seβe	seβe	-	seβe
be bitter, sting	H	baba	βaβa	βaβa	βaβa	βaβa
chest	HH	fuba	huβa	-	fuβa	pfuβa
divide, apportion	L	aba	aβa	aβa	aβa	-
ear	LH	N£ebe	tseβe	N'deβe	Nd£eβe	Nzeβe
fear, flee	H	-	tʃhaβa	ʃaβa	tʃhaβa	-
fish	HH	-	kxhoβe	khoβe	-	hoβe
forget	L	libala	liβala	LiβaLa	riβala	riβara
garment	LL	Ngubo	kuβo	Nguβo	Nguβu	Nguo
hippopotamus	LH	Nvubu	kuβu	Nvuβu	Npfuβu	Nβuu
know	H	-	tsiβa	'diβa	tiβa	ziβa
mouse, rat	LL	-	peβa	Nbeβa	Nbeβa	Nbeβa
pig	LLL	Ngulube	kuluβe	NguLuβe	Nguluβe	Nguruβe
pool, well	LL	ziba	liβa	dziβa	tiβa	dziβa
sand, soil	HH	ɬaba*	ɬaβa	'taβa	ɬaβa	-
undress	L	ɬubula	ɬuβula	-	ɬuβula	-

Notes.

become: Zulu has tonally skewed /ba/, L.

North Sotho has tonally skewed /βa/, L.

body: Tsonga has the skewed form /miri/.

come back: Zezuru /uya/ 'come'.

gather: Zezuru has the extended form /uNgana/.

hippopotamus: see notes to *NgF.

sand, soil: see notes to *c.

*Nb.

Phonological comparative series.

ZU	NS	VE	TS	ZE
Nb	p	Nb	Nb	Nb

The majority of attestations in this series are sequences of bilabial nasal followed by a voiced bilabial stop. Correspondence between a voiced sound in the other languages and a voiceless obstruent in North Sotho occurs regularly: compare *Nd, *Ng. The loss of the nasal in North Sotho is also paralleled in other series where a nasal compound is reconstructed.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
cooking-pot	LH	Nbiza	pitʃa	-	Nbita	-
goat	HH	Nbuzi	puli	Nbudzi	-*	Nbudzi
heart	LH	-	pɪlʊ	NbiLu	Nbilu	-
mouse, rat	LL	-	pɛβa	Nbeβa	Nbeβa	Nbeβa
seed	HH	Nbewu	peu	Nbeu	Nbewu	Nbeu

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
bathe	L	ɬaNba	ɬapa	ʻtaNba	ɬaNba	saNba
bone	HH	thaNbo	rapo	raNbo	rhaNbu	-
clay	HH	buNba	βʊpa	βuNba	βuNba	-
mould	H	buNba	βʊpa	βuNba	βuNba	uNba
rain	LH	-	-	bvuNbi	pfuNbi	bvuNbi
river	LL	laNbo	lapo	LaNbo	laNbu	-
roar, growl	L	-	βopa	βoNba	βoNba	oNba
sing	H	-	-	iNba	yiNba	iNba
snail	LH	-*	kxhʊpa	khuNba	huNba	-
speak	L	aNba*	apa	aNba	aNba	-
think	H	khuNbula	ɣʊpʊla	huNbuLa	-	-
wear	L	eNbatha	apara	aNbara	-	-

Notes.

goat: Tsonga has tonally skewed /Nbuti/, HL.

speak: see notes to *a.

snail: see notes to *Nk.

*bw.

Phonological comparative series.

ZU	NS	VE	TS	ZE
tʃ	β3	-	by	bɣ

The majority of attesting sounds are voiced. Three have double articulation, with one point of articulation being bilabial in each case. In two of the double-articulated attestations (/β3, by/), the other point of articulation is palatal, and the Zulu consonant is also palatal. This suggests that the original sound was labio-palatal, and voiced. However, the velar sound in Zezuru indicates that the labio-velar glide *w is the more likely source of the various reflexes. The *w became *y in the other languages. This parallels *pw. No correspondences are found for Venda, and the Zezuru form could be regarded as dubious as it only occurs once, but it has the expected phonological shape if it is compared to the Zezuru reflexes of *Npw and *Nbw, which are /px/ and /Nbɣ/ respectively.

One attestation is a stop followed by a glide, /by/, two are heterorganic affricates, and one is a fricative. Again, as with *pw, it is assumed that a glide was assimilated to a preceding obstruent.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
plant	H	tʃala	β3ala	-	byala	-
stone	L	tʃe	β3e	-	bye	bɣe

*Stem-medial attestation.*No examples in the data.

*Nbw.

Phonological comparative series.

ZU	NS	VE	TS	ZE
Nd3	pʃ	Nbɣ	-	Nbɣ

The majority of the attesting sounds consist of sequences of nasal and affricate and in most cases, the affricate is voiced and heterorganic. In three cases, one element is bilabial, while the other element is velar in Venda and Zezuru, and palatal in North Sotho. The Zulu homorganic affricate is palatal.

This suggests that the original sound consisted of a nasal followed by a voiced bilabial stop, in some way modified to account for the development of a palatal or velar sequence. The sound sequence reconstructed for this series is thus similar to that reconstructed for the series *bw, except for the addition of an initial nasal. There is only one attesting series, but it is of the expected phonological shape for the reconstruction.

The relationship between the North Sotho attestation in this series, /pʃ/, and North Sotho /β3/ in the previous series, *bw, is similar to the relationship between /p/ in the series *Nb and /β/ in the series *b, in that where there is a stop in the first case, there is a fricative in the second. This is further evidence that the sound was originally voiced.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
dog	H	Nd3a	pʃa	Nbɣa	-	Nbɣa

*Stem-medial attestation.*No examples in the data.

***d.**

Phonological comparative series.

ZU	NS	VE	TS	ZE	
l	l	l	r	r	Before *i.
l	l	l	l	r	Elsewhere.

All attestations are voiced alveolar resonants, the majority being lateral. The expected reconstruction would be *l. However, a change from lateral resonant to trill is unusual. Rather to be expected is a change from stop to lateral and stop to trill, as is postulated in certain other language families, for instance Malayo-Polynesian, where Tagalog /l/ is derived from *dˀ, and Tagalog [r], an allophone of /d/, is derived from *d (Dyen 1971: 32-33). Dyen suggests that *d and *dˀ may even have been one proto-phoneme (1971: 33). Therefore, the Proto-Southern Bantu phoneme is reconstructed as *d. This reconstructed phoneme occurs in more stem-series than any other reconstruction. If this retention reflects its original distribution, it appears to have been the commonest phoneme in Proto-Southern Bantu stems.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
(Class 11)	L	lu+	-	Lu+	-	ru+
ash	LL	lotha	-*	Lora	lorha	-
be ill	H	-	lwala	LwaLa	-	rwara

be straight	L	lulama*	-	LuLama	lulama	rurama
beard, chin	LL	levu	lelu	Lebvu	lepfu	-
bewitch	L	loya	loya	Loya	loya	roya
bite	H	luma	lʊma	Luma	luma	ruma
bleed, cup	H	lumēga	lʊmeɣa	-	lumeka	-*
cry	L	lila	lɪla*	LiLa	rila	rira
cultivate	L	lima	lɪma	Lima	rima	rima
deny	L	laNdula	latʊla	LaNduLa	laNdz'ula	raNdura
dream	H	-	lora	Lora	lorha	rota
fight	L	lwa	lwa	Lwa	lwa	rwa
fire	LL	lilo	lɪlo*	LiLo	-	-
fit	L	liNgana	lɪkana	LiNgana	riNgana	riNgana
follow	L	laNdela	latela	-	laNdz'ela	-
forget	L	libala	lɪβala	LiβaLa	riβala	riβara
intestines	L	la*	la	La	-	ra
lie, sleep	H	lala	lala	LaLa	lala	rara
lose	H	laɬa	laɬa	La'ta	laɬa	rasa
mouth	LL	lomo	-*	Lomo	lomo	romo
palm-tree	LL	-*	lala	-	lala	rara
pay	L	-	lɪɸa	Liɸa	riha	ripa
river	LL	laNbo	lapo	LaNbo	laNbu	-
sore	LL	loNda	-	LoNda	loNdz'a	roNda
tongue	HH	limi	lɪmɪ	Limi	rimi	rimi
try	H	liNga	lɪka	LiNga	-*	-
wait	L	liNda	lɪta	LiNda	-	riNda

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
(applied)	L	+ela	+ela	+eLa	+ela	-*
abstain, be taboo	L	zila	ila	iLa	-	-
agree	L	vumela	lumela	bvumeLa*	pfumela	-
basket	LL	-	selo	-*	ɬelo	sero
be full	H	zala	tɬala	'daLa	tala	zara
be ill	H	-	lwala	LwaLa	-	rwara
be straight	L	lulama*	-	LuLama	lulama	rurama
big	HH	khulu	ɣʊlʊ	huLu	kulu	kuru
body	LL	bili	βɪlɪ	βiLi	-*	βiri
boil	L	bila	βɪla	βiLa	βila	βira
carry	H	thwala	rwala	-*	rhwala	twara

charcoal	HH	-	ɣala	haLa	kala	kara
cough	H	-	ɣoɬola	hoʻtoLa	-	kosora
colour, spot	HH	bala	βala	-	βala	βara
count	L	bala	βala	βaLa	-	-
cross	L	wela	-	weLa	wela	-
cry	L	lila	lɪla*	LiLa	rila	rira
finish	H	phela	ɸela	ɸeLa	hela	pera
fire	LL	lilo	lɪlo*	LiLo	-	-
flow	L	-	ela	ela	-	yera
forge	H	-	rula	fuLa	fula	pfura
grind	L	sila	ʃila	-	sila	sira
grow	L	mila	mɪla	-	mila	-
grow up	H	khula	ɣʊla	huLa	kula	kura
heart	LH	-	pɪlʊ	NbiLu	Nbilu	-
hunger	LL	Nɬala	tɬala	NʻdaLa	Ndɬala	Nzara
impala	LH	-*	phala	phaLa	mhala	mhara
kill	H	-	βʊlaya	βuLaya	-	uraya
lie, sleep	H	lala	lala	LaLa	lala	rara
measure	L	-	ela	eLa	-	yera
millet	LH	bele	βele	βeLe	-	-
open	L	vula	βula	vuLa	pfula	-
palm-tree	LL	-*	lala	-	lala	rara
partridge	LH	Nkwali	kxhwalɪ	khwaLi	-*	-
path	LL	-	tsɪla	NʻdiLa	-	Nzira
pick up	H	thola	-	-	rhola	tora*
pig	LLL	Ngulube	kʊlʊβe	NguLuβe	Nguluβe	Nguruβe
plant	H	tʃala	β3ala	-	byala	-
pour	L	thela	tʃhela	ʃeLa	tʃhela	-*
pour	L	thulula	tʃhʊlʊla	ʃuLuLa	tʃhulula	ðurura
rain	HH	Nvula	pula	NvuLa	Npfula	Nvura
remain	H	sala	ʃala	saLa	sala	sara
rest	H	phumula	-	ɸumuLa*	humula	pumura
rot	L	bola	βola	-	-	ora
scrape	H	phala	ɸala	ɸaLa	hala	para
shiver	L	thuthumela	rʊrʊmela	-	rhurhumela	-
shut	L	vala	-	vaLa	pfala	-
surpass	H	aɬula	ɬʊla	-	ɬula	
tail	HH	sila	sila	tʃiLa	-	tʃira

tie up	H	khulega	ɣʊleɣa	-	kuleka	-
twist	L	aluga	lʊɣa	-	luka	ruka
two	LH	bili	-	βiLi	-	βiri
undress	L	ɬubula	ɬʊβʊla	-	ɬuβula	-
weed	L	ɬagula	ɬaɣʊla	ʿtahuLa	ɬakula	sakura
winnow	L	ɬuNgula	ɬʊkʊla	ʿtuNguLa	-*	suNgura*

Notes.

(applied): see notes to *e.

agree: see notes to *bF.

ash: North Sotho has the skewed form /mʊ + rora/.

basket: see notes to *c.

be straight: Zulu /lulama/ 'stretch limbs'.

bleed, cup: Zezuru has the form /rumika/ with the high vowel found in extensions where other languages have a mid vowel.

body: see notes to *b.

carry: see notes to *t.

cry: North Sotho /lːla/ is phonetically realised as [lːla], by the rule given in 1.4.3.

fire: Tsonga has the form /Ndzʾilo/ for expected */nilo/ with plural */mi + rilo/.
North Sotho /mʊ + lːlo/: see note to 'cry' above.

forge: see notes to *pF.

intestines: Zulu /ma + la/ 'cavity in stomach'.

mouth: North Sotho has segmentally skewed /mʊ + lomʊ/

palm-tree: Zulu has tonally skewed /mu + lala/, HL.

path: see notes to *Nj.

pick up: see notes to *t.

pour: see notes to *ty.

rest: see notes to *p.

tail: see notes to *c.

try: Tsonga has tonally skewed /riNga/, L.

winnow: see notes to *c.

***Nd.**

Phonological comparative series.

ZU	NS	VE	TS	ZE
Nd	t	Nd	Ndzʾ	Nd

The majority of attesting sounds are alveolar, only the Tsonga sound being retroflex. The majority consist of a sequence of nasal and voiced stop, and the series is reconstructed as such.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
affair	LL	Ndaba	taβa	-	-	Ndaβa
louse	H	-	ta	Nda	-	Nda

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
abound	L	aNda	ata	aNda	aNdz'a	-
basket	HH	-*	rʊtʊ	ruNdu	rhuNdz'u	-
be thin	H	oNda	ota	oNda	oNdz'a	oNda
deny	L	laNdula	latʊla	LaNduLa	laNdz'ula	raNdura
dig	L	phaNda	ɸata	-	haNdz'a	paNda*
follow	L	laNdela	latela	-	laNdz'ela	-
journey	LL	eNdo*	eto	eNdo	eNdz'o	eNdo
knot	HH	-*	huto	pfuNdo	fuNdz'u	pfuNdo
pass	L	phiNda*	ɸɪta	-	hiNdz'a	piNda
sore	LL	loNda	-	LoNda	loNdz'a	roNda
urinate	L	thuNda	rʊta	ruNda	rhuNdz'a	tuNda
wait	L	liNda	lɪta	LiNda	-	riNda

Notes.

basket: see notes to *t.

dig: see notes to *p.

journey: see notes to *e.

knot: see notes to *pF.

pass: see notes to *p.

*j.

Phonological comparative series.

ZU	NS	VE	TS	ZE	
z	ts	ʻd	t	z	Before front vowels.
z	tɬ	ʻd	t	z	Elsewhere.

Most of the attestations are alveolar. Two are voiceless, and the rest are voiced. Two are stops (/ʿd/, /t/), one is an affricate, and in both Zulu and Zezuru the attestation is the fricative /z/. The alternation between the lateral /tɬ/ and the central /ts/ in North Sotho has the same environmental distribution as the alternation between /ɬ/ and /s/ for the series *c; and as with *c, the Venda attestation here is dental. This suggests that this series can be reconstructed as *j, the voiced equivalent of *c, which also has alveolar reflexes in Zulu and Zezuru.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
be full	H	zala	tɬala	ʿdaLa	tala	zara
come	L	za	tɬa	ʿda	ta	za
know	H	-	tsɪβa	ʿdiβa	tiβa	ziβa
village	L	zi	tsɪ	ʿdi	ti	-

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
drip	L	vuza	lutɬa	-	pfuta	-
gather wood	H	theza	-	reʿda	-	teza
strain	L	ɬuza	ɬʊtɬa	ʿtuʿda	ɬuta	-

***Nj.**

Phonological comparative series.

ZU	NS	VE	TS	ZE	
N£	ts	Nʿd	Nd£	Nz	Before front vowels.
N£	tɬ	Nʿd	Nd£	Nz	Elsewhere.

The majority of attestations are sequences of nasal and voiced fricative. The North Sotho attestation is an affricate, and the Venda is a nasal followed by a dental stop. An alternation between lateral and central in North Sotho shows that this series is parallel to the previous one, with the addition of an initial nasal.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
ear	LH	N£ebe	tseβe	Nʿdeβe	Nd£eβe	Nzeβe
elephant	LL	N£ovu	tɬou	Nʿdou	Nd£opfu	Nzou
house	L	N£u	tɬʊ	Nʿdu	Nd£u	-

hunger	LL	N£ala	tɬala	N'daLa	Nd£ala	Nzara
path	LL	-*	tsɪla	N'diLa	-	Nzira

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
baldness, forehead	HH	NpaN£a	phatɬa	-*	-	mhaNza
hand	LL	aN£a	atɬa	aN'da	aNd£a	aNza

Notes.

baldness, forehead: see notes to *Np.

path: Zulu has the phonologically skewed form /N£ela/.

*Ng.

Phonological comparative series.

ZU	NS	VE	TS	ZE
Ng	k	Ng	Ng	Ng

This is the velar equivalent of *Nb, *Nd, in that the North Sotho reflex is voiceless while the reflexes in the other languages are voiced.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
(instrumental)	L	Nga+	ka+	Nga+	-	-
crocodile	LL	Ngwenya	kwena	Ngwe'na	Ngwenya	-
drum	LL	Ngoma	koma*	Ngoma	Ngoma	Ngoma
garment	LL	Ngubo	kuβo	Nguβo	Nguβu	Nguo
leopard	L	Ngwe	kwe	Ngwe	Ngwe	Ngwe
pig	LLL	Ngulube	kuluβe	NguLuβe	Nguluβe	Nguruβe

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
begin, precede	H	-	raka	raNga	rhaNga	taNga
buy	H	theNga	reka	reNga	-	teNga
fit	L	liNgana	lɪkana	LiNgana	riNgana	riNgana
gather	H	buNga*	βuka	-	βuNga	-
guinea-fowl	HH	-	kxhaka	khaNga	-	haNga

horn	LH	-	naka	ʻnaNga	-	nyaNga
knife	HH	-	ɸaka	ɸaNga	-	paNga
meet	L	ɬaNgana	ɬakana	ʻtaNgana	ɬaNgana	saNgana
mix, join	H	vaNga	tswaka	vaNga*	pfaNga	-
porcupine	LH	nuNgu	nʊkʊ	nuNgu	nuNgu	nuNgu
pumpkin	LL	thaNga	raka*	raNga	rhaNga	-
roast	H	-	ɣalika	hadziNga	katiNga	-
reed, stalk	LL	ɬaNga	ɬaka	ʻtaNga	ɬaNga	-
sew	H	thuNga	rʊka	ruNga	rhuNga	tuNga
sleep	LL	thoNgo	roko	-	rhoNgo	-
try	H	liNga	lɨka	LiNga	-*	-
winnow	L	ɬuNgula	ɬʊkʊla	ʻtuNguLa	-*	suNgura*

Notes.

The occurrence of the series /ny: ɳ: ɳ: ɳ: ɳ/ before *VNg in the stem series 'medicine-man' (ZU nyaNga: NS ɳaka: VE ɳaNga: TS ɳaNga: ZE ɳaNga) can be attributed to an instance, unique in the Southern Bantu languages, of Meinhof's Rule, by which a voiced stop is assimilated to, or elided after, a preceding nasal, if the following syllable begins with a nasal (Meeussen 1962: 25). One occurrence is not enough evidence of a valid series, but the fact that there is a unique attestation in each language suggests that it may be valid (see 4.1.3).

begin: see notes to *t.

drum: North Sotho /koma/ means 'initiation school', and may not be a member of this series.

gather: see notes to *b.

mix, join: see notes to *bF.

pumpkin: see notes to *t.

try: see notes to *d.

winnow: see notes to *c.

2.4.3 Voiceless affricates.

***pF.**

Phonological comparative series.

ZU	NS	VE	TS	ZE	
f	ɸ	s^w	f	s^w	Before *i.
f	sw	f	f	-	Before *a.
f	h	pf	f	pf	Before *u.

The Venda and Zezuru attestations for the first of these series are voiceless labio-alveolar fricatives. (As the Zezuru attestation only occurs once, its validity is dubious, but there seems to have been a partial merger between this series and the series *pw, where the Zezuru attestation is also a labio-alveolar consonant, /ts^{w} /, and the Venda reflex is /s^{w} /, as here. In Zulu and Tsonga, the sound appears as a labiodental fricative, while in North Sotho it is a bilabial fricative. Again, this suggests a sound both labial and alveolar, which is also suggested by the North Sotho form in the second series. Tentatively, the reconstruction *ϕs can be proposed, which can be amended to *ps, as there are no other examples of series which can be reconstructed as doubly articulated fricatives.

Most of the attestations in the third series are labial affricates or fricatives, suggesting that the original sound was the affricate *pf.

*ps and *pf are in complementary distribution, and the two series can be reconstructed as a single affricate, *pF, whose offglide assimilates to a following segment in labiality. This pattern is repeated with the majority of series reconstructed as affricates in Proto-Southern Bantu, for example, *tF, *dF, *NdF and *gF. The alternation is discussed further in 3.2.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
arrive	L	figa	-	-	fika	s^{w} ika
chest	HH	fuba	huβa	-	fuβa	pfuβa
hide	H	fiɬa	ϕiɬa	s^{w} i ʻta	fiɬa	-
knot	HH	-*	huto	pfuNdo	fuNdzʾu	pfuNdo
oil	HH	futha	hura	pfura	furha	-
resemble	H	fana	swana	fana	fana	-*

*Stem-medial attestation.*No examples in the data.

Notes.
knot: Zulu has the skewed form /ii + fiNdo/.
resemble: Zezuru has /fana/ for expected */pfana/.

***tF.**

Phonological comparative series.

ZU	NS	VE	TS	ZE	
f	r	-	f	pf	before *u
s	ʃ	ts	s	ts	before *i

Most of the attestations in the first of these two series are labial affricates or fricatives. This would suggest that the original sound was the affricate *pf, as there is no factor which could have conditioned the affrication of a fricative. However, the North Sotho /r/ makes this analysis improbable. North Sotho /r/ is elsewhere shown as a reflex of *t. The original affricate may therefore provisionally be reconstructed as *tf, assuming loss of of the *f in North Sotho and the merger of the remaining *t with existing *t. In the other languages, *tf becomes *pf by assimilation, and then *f.

The majority of sounds in the second series are voiceless and alveolar. Although there is only one attesting word, it parallels *dF before *i, in that generally, the attestations are the voiceless equivalents of the attestations of *dF, except for the North Sotho and the Tsonga; but North Sotho refexes of voiced affricates differ from the reflexes of voiceless affricates in all cases, and Tsonga /s: f/ parallels /t: pf/ elsewhere, for instance, in the series *kF and *gF. Again, some of the attestations are affricates, and some are fricatives. The North Sotho sound is palatal, while the others are alveolar. The fact that the alveolar sounds are in the majority, and that this series occurs only before the front vowel *i where the alveolar could be assimilated to the palatal nature of the vowel, suggests that the original sound was a voiceless alveolar affricate, *ts.

This *ts and the previously reconstructed form *tf are in complementary distribution, the former occurring only before *i and the latter only before *u. The two forms can be reconstructed as one form, an affricate with a fricative element which assimilates in labiality to a following vowel, so that before *u it is realised as *f and before *i as *s. The form *tF is chosen as a cover symbol for this affricate, which will be realised as a heterorganic affricate (Sloat, Taylor and Hoard 1978: 37) before *u, and a homorganic affricate before *i. A similar alternation occurs in Swazi (Rycroft 1981: xi; Ownby 1981: 64).

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
cloud	L	fu	ru	-	fu	-
forge	H	-	rula	fuLa	fula	pfura
smoke	H	si	ʃi	tsi	si	tsi.
spear	HH	-	rumo	-	fumu	pfumo

*Stem-medial attestation.*No examples in the data.

*kF.

Phonological comparative series.

ZU	NS	VE	TS	ZE	
s	ʃ	s	s	s	Before *a, *i.
f	hw	f	f	f	Before *a.
f	h	f	f	f	Before *o, *u.

The familiar distribution pattern of labial before *u and alveolar before *i is once again apparent, but a complicating factor arises in that both series occur before *a. The /w/ in the North Sotho form in the second series suggests a sound which was present in the proto-language, but which the other languages lost after /f/.

All the attesting sounds in this series are voiceless fricatives, so the reconstruction should logically be an assimilating voiceless fricative, *F, but this leads to asymmetry in the reconstruction, with only one fricative, and no voiceless velar affricate. It is simplest to assume that the fricative was the the phonological realisation of the voiceless velar affricate. The North Sotho /ʃ/, occurring even when there is no influencing /i/, is due to the same change of alveolar to palatal seen with *tF and *dF. The glottal fricative /h/ can be explained by reference to the common change from fricatives with other places of articulation to glottal fricatives, as attested for instance in ancient Greek (Hock 1986: 86).

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
death	H	-	hu	fu	fu	fu
die	H	fa	hwa	fa	fa	fa
grind	L	sila	ʃila	-	sila	sira
leave	H	-	ʃia	sia	siya	siya
remain	H	sala	ʃala	saLa	sala	sara
soot	HH	sizi*	ʃili	-	siti	-
tendon	LL	sipha	ʃiɸa	-	siha	-

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
chew	H	ɬafuna	ɬahuna	ʻtafuna	-	-
(causative)	L	isa	iʃa	isa	isa	isa
burn	H	-	ɸiʃa	ɸisa	hisa	pisa
chief	HH	Nkosi	kxhoʃi	khosi	hosi	hosi*

Notes.

chief: see notes to *Nk.

soot: Zulu /mu + sizi/ 'medicinal powder prepared from charred bones or roots.'

2.4.4 Voiced affricates.

***bF.**

Phonological comparative series.

ZU	NS	VE	TS	ZE	
v	tsw	v	-	-	Before *a.
v	β	v	pf	-	Before *u.

The majority of sounds in these two series are voiced. There are two affricates, both voiceless. There is evidence elsewhere of a rule of affricate devoicing in certain languages (see *bw, *dF), so it may be assumed that the original sound was a voiced affricate. All of the attesting sounds are labial, except North Sotho /tsw/, which contains a labial. The evidence of North Sotho /sw/ in series *pF suggests that affricates in the Pre-Sotho dialect did not assimilate to *w. The *w here could represent a sound lost in other languages, as is strongly supported by the evidence for the series *tF, *kF and *dF. The series thus occur either before the vowel *u or the glide *w, so by analogy with the voiceless affricates, the proto-form is reconstructed as a voiced affricate with an assimilating fricative element, *bF. In North Sotho, the fricative element is lost before *u, as with the series *tF, *kF, but becomes alveolar elsewhere.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
mix, join	H	vaNga	tswaka	vaNga*	pfaNga	-
open	L	vula	βula	vuLa	pfula	-
shut	L	vala	-	vaLa	pfala	-

Stem-medial attestation.No examples in the data.

Notes.

mix, join: Venda /vaNga/ 'be extraneous, different from one's companions'.

shut: North Sotho has the extended form /tswalela/, confirming the validity of /tsw/ in /tswaka/.

***NbF.**

Phonological comparative series.

ZU	NS	VE	TS	ZE	
Nz	p	-	Npf	-	Before *i only.
Nv	p	Nv	Npf	Nv	Before *u only.

This series is equivalent of the previous one, with the addition of a nasal before the consonant. Note the parallel between *bF and *b in North Sotho, which both yield /β/, and *NbF and *Nb, which both yield /p/. In North Sotho and Tsonga, the first series forms the voiced counterpart of the series *pF. However, the expected Zulu attestation would then be */Nv/ not /Nz/. Therefore this series is of dubious validity, but the fact that both North Sotho and Tsonga have identical forms in the two series confirms its validity.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
rain	HH	Nvula	pula	NvuLa	Npfula	Nvura

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
fish	LL	Nɬ aNzi	ɬapi	-	Ntɬ aNpfi	-

***dF.**

Phonological comparative series.

ZU	NS	VE	TS	ZE	
-	tʃw	bv	pf	-	Before *a.
v	l	bv	pf	bv	Before *u.
z	tʃ	dz	t	dz	Before *a.
z	l	dz	t	dz	Before *i.

Most of the attestations in this series are affricates or fricatives, and most of them are voiced. The majority are either labial or alveolar, which suggests that the original sound was either *bv or *dz. But North Sotho /l/, phonetically [D] in this phonological environment (Doke 1954: 122), is alveolar even before *u. By analogy with *tF, the original affricate may therefore be reconstructed as *dF, assimilating to a following vowel or glide, and with loss of the fricative element in North Sotho, and homorganic assimilation of the *d to the *v in the other languages. The presence of

/w/ in the North Sotho form on the first series suggests a proto-form *dFwa, with a *w lost after labials in Venda and Tsonga.The third series can be reconstructed as *dFa. The Tsonga forms can be explained by rules of assimilation and devoicing. The reconstruction is corroborated by the following series, *NdF.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
agree	L	vumela	lumela	bvumeLa*	pfumela	-
bleed, come out	L	-	tʃwa	bva	pfa	-
drip	L	vuza	lutɬa	-	pfuta	-
rain	LH	-*	-*	bvuNbi	pfuNbi	bvuNbi
rumble	L	-	luma	bvuma	pfuma	-
(Class 10)	L	zi+	li+	dzi+	ti+	-
extinguish	H	-	-	dzima	tima	dzima
pool, well	LL	ziba	liβa	dziβa	tiβa	dziβa
root	L	-	li*	dzi	-	dzi

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
beard, chin	LL	levu	lelu	Lebvu	lepfu	-
pus, rottenness	LH	bovu	βolu	-	βopfu	-
call	H	biza	βitʃa	βidza	βita	-
cooking-pot	LH	Nbiza	pitʃa	-	Nbita	-
goat	HH	Nbuzi	puli	Nbudzi	-*	Nbudzi
moonlight	LH	nyezi	ŋweli	-*	-*	mŋedzi*
roast	H	-	ɣalika	hadziNga	katiNga	-
soot	HH	sizi*	ʃili	-	siti	-

Notes.

agree: Venda /bvumeLa/ 'answer a greeting.'

Zezuru has the phonologically skewed form /bvumira/, which can be explained by assuming that the /+ira/ ending is an extension: see notes to *e.

goat: see notes to *Nb.

moonlight: see notes to *mw.

rain: Zulu has tonally skewed /mu+vuNbi/, LL.

North Sotho has tonally skewed /mʊ+lupɪ/, LL.

root: North Sotho /mʊ+li/, 'a kind of creeper'.

soot: see notes to *kF.

***NdF.**

Phonological comparative series.

ZU	NS	VE	TS	ZE	
Nz	tʃ	Nz	Nt	-	Before *a.

This series is virtually identical to the previous one, except that it contains an additional preceding nasal. Significantly, there are no labial relexes. This is probably an accidental gap (see 3.4.1). The voiceless /tʃ/ in North Sotho can be ascribed to the influence of the nasal, by analogy with other series like *Nb, *Nd, *Ng. The Venda correspondence is doubtful, as it occurs only once, but the *dF series has an affricate reflex /dz/, and this /z/ is phonetically realised as an affricate.

Stem-initial attestation. No examples in the data.

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
vomit	H	ɬaNza	ɬatʃa	ʻtaNza	ɬaNta	-

***gF.**

Phonological comparative series.

ZU	NS	VE	TS	ZE	
v	∅	∅	pf	∅	Before *u.
z	∅	∅	t	z	Before *i.

The ∅ attestation in North Sotho, Venda and Zezuru suggests a weak sound, easily lost, such as a voiced fricative. However, the Tsonga attestation suggests that at some stage the sound was an affricate, as the intervocalic environment would not have caused a fricative to become an affricate, and so the sound is assumed to have been an affricate to begin with. A velar element, easily lost, is postulated, this becoming assimilated to the fricative in Tsonga, but disappearing in the other dialects. Again, as with *tF and *dF, the sound is labial before labials and alveolar elsewhere, and can be reconstructed as *gF.

Stem-initial attestation.

eye	HH	-	iɬo	iʻto	tiɬo	ziso
abstain, be taboo	L	zila	ila	iLa	-	-
tooth	HH	zinyo	ino	iʻno	-	zinyo

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
elephant	LL	N£ovu	tℓou	N‹dou	Nd£opfu	Nzou

***NgF.**

Phonological comparative series.

ZU	NS	VE	TS	ZE	
Nv	k	Nv	Npf	Nv	Before *u.

Most of the attestations in this series are sequences of bilabial nasal and bilabial fricative. The Tsonga voiceless bilabial affricate can be ascribed to the process of affricate devoicing seen in that language, and the apparent reconstruction for this series would then be *Nbv. However, the North Sotho attestation shows that the original sound was velar (the affrication being lost by the process postulated elsewhere for North Sotho: see *bF, *dF). Thus the reconstruction for this series is *NgF.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
hippopotamus	LH	Nvubu	kuβu	Nvuβu	Npfuβu	Nβuu

*Stem-medial attestation.*No examples in the data.

2.4.5 Nasal resonants.

***m.**

Phonological comparative series.

ZU	NS	VE	TS	ZE
m	m	m	m	m

The reconstruction here is straightforwardly *m.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
(Class 1)	L	mu+*	mʊ+*	mu+	mu+*	mu+
(Class 3)	L	mu+*	mʊ+*	mu+	mu+*	mu+

(Class 4)	L	mi+	mɪ+	mi+	mi+	mi+
(Class 6)	L	ma+	ma+	ma+	ma+	ma+
grow	L	mila	mɪla	-	mila	-
invite	H	mema	mema	-	mema	mema
me	L	mi	N*	-	mi	-
suck	H	-	mama	mama	mama	-
suck	L	munya	mʊna	mu'na	munya	munya*
wind	HH	moya	moya	-	moya	-

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
agree	L	vumela	lumela	bvumeLa*	pfumela	-
be straight	L	lulama*	-	LuLama	lulama	rurama
bend	L	khothama	-	-	korhama	kotama
bite	H	luma	lʊma	Luma	luma	ruma
bleed, cup	H	lumega	lʊmeɣa	-	lumeka	rumika
boil over	L	phuphuma*	-	ɸuɸuma	huhuma	pupuma*
cheek	HH	-*	rama	rama	rhama	tama
chop	H	-	rema	rema	-	tema
cultivate	L	lima	lɪma	Lima	rima	rima
dry	H	oma	oma	oma	oma	oma
extinguish	H	-	-	dzima	tima	dzima
invite	H	mema	mema	-	mema	mema
meat	LL	nyama	nama	'nama	nyama	nyama
mouth	LL	lomo	-*	Lomo	lomo	romo
rest	H	phumula	-	ɸumuLa*	humula	pumura
rumble	L	-	luma	bvuma	pfuma	-
send	H	thuma	rʊma	ruma	rhuma	tuma
shiver	L	thuthumela	rʊrʊmela	-	rhurhumela	-
suck	H	-	mama	mama	mama	-
spear	HH	-	rumo	-	fumu	pfumo
stand	H	ma	ema	ima	yima	ima
milk, squeeze	H	khama	ɣama	hama	kama	kama
ten	HL	-	sʊmɪ	fumi	-	gumi
tongue	HH	limi	lɪmɪ	Limi	rimi	rimi

Notes.

(Class 1): Zulu /mu+/ is phonetically realised as [m:] before polysyllables, and as [m] before vowels.

North Sotho /mu+/ is phonetically realised as [m:] before labials.

Tsonga /mu+/ is realised as an assimilating, non-syllabic nasal before polysyllables.

(Class 3): see '(Class 1)', above.

agree: see notes to *bF.

be straight: see notes to *d.

bleed: see notes to *d.

boil over: see notes to *p.

cheek: see notes to *t.

invite: Zezuru /mema/ 'make first payment of *roora*'.

me: The syllable /mi/ in other languages corresponds to /N/ in North Sotho before resonants, owing to the rule of syllabic consonant formation (see 1.4.2).

mouth: see notes to *d.

rest: see notes to *p.

suck: Zezuru /munya/ 'gnaw; chew with mouth closed'.

***mw.**

Phonological comparative series.

ZU	NS	VE	TS	ZE
ny	ŋw	ŋw	ŋw	mŋ

The majority attestation is a velar nasal resonant followed by a labiovelar glide. In Zezuru, the attesting consonant is a labio-velar nasal. This suggests a nasal resonant with both labial and velar articulation. As /w/ is a labio-velar glide, the sound which may tentatively be reconstructed for this series is *mw. The Zulu palatal nasal may be ascribed to dissimilation of the two labial sounds. Compare *bw and *pw, which also have palatal reflexes in Zulu.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
moonlight	LH	nyezi	ŋweli	-*	-*	mŋedzi*
one, other	L	nye	ŋwe	ŋwe	ŋwe	mŋe

Stem-medial attestation. No examples in the data.

Notes.

moonlight: Zezuru: /mŋedzi/ 'moon, month'.

Venda has tonally skewed /ŋwedzi/, HH.

Tsonga has tonally skewed /ŋweti/, HH.

*n.

Phonological comparative series.

ZU	NS	VE	TS	ZE	
n	N	n	ny	-	Before *i#
n	N	n	n	-	Before *uN
n	n	n	n	n	Elsewhere.

The majority attesting consonant is /n/, and therefore the reconstruction is *n. The Tsonga palatal nasal which occurs in the first series may be ascribed to palatal assimilation, while North Sotho /N/ only occurs finally, the *i disappearing. The nasal has subsequently assimilated to the negatively featured # (see 1.4.2). Final /N/ in North Sotho is syllabic (see 1.4.2). North Sotho also shows syllabification of *n in the combination *nuN.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
be fat	L	nona	nona	nona	nona	-
drink	H	-	nwa	nwa	nwa	nwa
finger	L	nwe	-	nwe	-	nwe
porcupine	LH	nuNgu	nʊkʊ	nuNgu	nuNgu	nuNgu
rain	L	na	na	na	na	na
smell	L	-*	Nkxha	nukha	nuha	-

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
(reciprocal)	L	ana	ana	ana	ana	ana
back	HL	-	ɬana	ʻtana	ɬana	-*
be fat	L	nona	nona	nona	nona	-
bird	LL	nyoni	noN*	ʻnoni	-	-
chew	H	ɬafuna	ɬahuna	ʻtafuna	-	-
deny	H	-	ɣana	hana	-	kana*
fit	L	liNgana	lɪkana	LiNgana	riNgana	riNgana
firewood	HH	Nkuni	kxhʊN	khuni	hunyi	huni
five	HL	ɬanu	ɬanʊ	ʻtanu	-	-
guest, stranger	LL	-	eN	eni	-	eni
handle	HH	phini	ɸɪN	-	-	pini
meet	L	ɬaNgana	ɬakana	ʻtaNgana	ɬaNgana	saNgana
resemble	H	fana	swana	fana	fana	-

see	H	bona	βona	βona	βona	ona
spread	H	enega	aneɣa	anea	aneka	-

Notes.

back: see notes to *c.

bird: see notes to *ny.

deny: see notes to *k.

resemble: see notes to *pF.

smell: see notes to *Nk.

***ny.**

Phonological comparative series.

ZU	NS	VE	TS	ZE
ny	n	ʻn	ny	ny

The majority of attesting sounds are palatal nasal resonants. The North Sotho alveolar /n/ may be ascribed to the same process which substituted alveolar /s/ for the earlier palatal in the series *k(y). The connection between the Venda dental and the palatal sounds in other languages is used to justify the earlier reconstructions *c, *Nc, *j and *Nj. Note that this series does not show any reflexes before *i. This suggests a merger with *ni in the previous series, which has a palatal reflex in Tsonga.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
bean	LH	-	nawa	ʻnawa	nyawa	-
bee	HH	nyosi	nosɪ	ʻnotʃi	nyoʃi	-
bird	LL	nyoni	noN*	ʻnoni	-	-
buffalo	HH	nyathi	-*	ʻnari	nyarhi	-*
defecate	L	nya	-	-	nya	nya
horn	LH	-	naka	ʻnaNga	-	nyaNga
meat	LL	nyama	nama	ʻnama	nyama	nyama
salt	H	nyu*	-	-	nyu	nyu
snake	HH	nyoga	noɣa	-*	nyoka	nyoka

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
crocodile	LL	Ngwenya	kwena	Ngweʻna	Ngwenya	-

suck	L	munya	mʊna	mu ʿna	munya	munya*
tooth	HH	zinyo	ino	i ʿno	-	zinyo

Notes.

bee: Zezuru has /nyutʃi/ with skewed vowel.

bird: North Sotho /noN/ 'vulture, large bird'.

buffalo: North Sotho has tonally skewed /narɪ/, LH.

Zezuru has tonally skewed /nyati/, HL.

salt: Zulu /mu + nyu/ 'sourness'.

snake: see notes to *k.

suck: see notes to *m.

2.4.6 Glides.

*w.

Phonological comparative series.

ZU	NS	VE	TS	ZE	
w	∅	∅	w	∅	Before *u.
w	w	w	w	w	Elsewhere.

The only attesting consonant is /w/. Its loss before *u can be ascribed to its acoustic weakness in this environment, as it is phonetically a [u] occurring at syllable onset rather than syllable peak. (Sloat, Taylor and Hoard 1978: 42-43).

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
cross	L	wela	-	weLa	wela	-
fall	L	wa	wa	wa	wa	wa
you	L	we	we*	we*	we*	we*

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
bean	LH	-	nawa	ʿnawa	nyawa	-
seed	HH	Nbewu	peu	Nbeu	Nbewu	Nbeu

Notes.

you: North Sotho /we/ occurs with the stabilising suffix /+na/.

Venda /we/ occurs as /iwe/ with the stabilising prefix /i+/.

Tsonga /we/ occurs as /yena/ with the stabilising suffix /+na/.

Zezuru /we/ occurs as /iwe/ with the stabilising prefix /i+/.

*y.

Phonological comparative series.

ZU	NS	VE	TS	ZE	
∅	∅	∅	y	∅	Initially before *i.
y	∅	∅	y	y	Initially before *e, and after high (front) vowels.
y	y	y	y	y	Elsewhere.

The only attesting consonant is /y/. As with *w before back vowels, its loss before and after *i can be ascribed to its acoustic weakness in this environment, as it is phonetically an [i], a front vowel, occurring at syllable onset rather than syllable peak (Sloat, Taylor and Hoard 1978: 42-43). The medial distribution of the second series, after all high vowels, applies only in North Sotho. In Venda the ∅ reflex occurs only after high front vowels.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
go	L	ya	ya	ya	ya	-
him, her	L	ye	-*	e*	ye*	ye*
flow	L	-	ela	ela	-	yera
measure	L	-	ela	eLa	-	yera
sing	H	-	-	iNba	yiNba	iNba
stand	H	ma	ema	ima	yima	ima

Stem-medial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
bewitch	L	loya	loya	Loya	loya	roya
come back	H	buya	βʊa	βuya	βuya	uya*
fur	LH	boya	βoya	-	βoya	-
kill	H	-	βʊlaya	βuLaya	-	uraya
leave	H	-	ʃia	sia	siya	siya
wind	HH	moya	moya	-	moya	-

Notes.

him, her: North Sotho has /ye/ for expected /e/, probably owing to morphological reanalysis. It occurs with the stabilising suffix /+na/.

Venda /e/ occurs with the stabilising suffix /+ne/.

Tsonga /ye/ occurs as /yena/ with the stabilising suffix /+na/.

Zezuru /ye/ occurs as /iye/ with the stabilising prefix /i+/.

2.4.7 Vowels.

Stem-medial attestations are not quoted for vowels, as they are far too numerous.

*i.

Phonological comparative series.

ZU	NS	VE	TS	ZE	
∅	e	i	i	i	After *y.
i	i	i	i	∅	After affricates; before palatals; next to syllables containing high tense vowels.
i	ɪ	i	i	i	Elsewhere.

The first series occurs after inital *y in the word-series *yima, *yiNba. As /ɪ/ occurs only in one language in a predictable environment, and all other attestations are /i/, the reconstruction is *i.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
(causative)	L	+isa	+iʃa	+isa	+isa	+isa

*e.

Phonological comparative series.

ZU	NS	VE	TS	ZE	
e	a	a	a	-	Before polysyllables.
e	e	e	e	e	Elsewhere.

As /a/ occurs only in a limited environment, the reconstruction is *e. It is assumed that *e was the original sound, and that initial *e became *a in all the attesting languages but Zulu. To assume the opposite would lead to the difficulty of explaining why *a sometimes remains before polysyllables

in North Sotho, Tsonga and Zezuru, and sometimes falls away (see *a, below). This rule would have operated after the rule of Initial *a Elision, as it does not feed it (see *a). There is only one example of Tsonga initial /a/, but as it accords with the forms in most of the other languages, it is admitted as valid.

Word series: stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
(applied)	L	+ela	+ela	+eLa	+ela	-
(neuter)	L	+ega	+eɣa	-	+eka	-
journey	LL	endo*	eto	endo	endz'o	endo
spread	H	enega	aneɣa	anea	aneka	-
guest, stranger	LL	-	eN	eni	-	eni
wear	L	eNbatha	apara	aNbara	-	-

Notes.

journey: Zulu /eNdo/ 'path; marriage.'

(applied): Zezuru has /+ira/. This is probably due to a morphological rule conditioning the vowel of extensions, as /i/ as a reflex of *e occurs nowhere else.

(neuter): Zezuru has /+ika/. This is probably due to a morphological rule conditioning the vowel of extensions, as /i/ as a reflex of *e occurs nowhere else.

***a.**

Phonological comparative series.

ZU	NS	VE	TS	ZE	
a	∅	-	∅	∅	Before polysyllables.
a	a	a	a	a	Elsewhere.

The majority of attestations are /a/, hence the reconstruction is *a. It is assumed that initial *a was elided before polysyllables, except in Zulu, as there is no factor which might have conditioned epenthesis. Epenthesis or prothesis of vowels usually occurs in consonant clusters (Lehmann 1973: 159). That is, a vowel may be inserted into a complex cluster, or before it, as in Romance languages like Spanish, where initial *sC clusters that occurred in Proto-Romance are realised as /esC/ (Hock 1986: 126).

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
(reciprocal)	L	+ana	+ana	+ana	+ana	+ana
abound	L	aNda	ata	aNda	aNdz'a	-

build	H	akha	aɣa	-	aka	-
divide, apportion	L	aba	aβa	aβa	aβa	-
hand	LL	aN£a	atɬa	aN‘da	aNd£a	aNza
speak	L	aNba*	apa	aNba	aNba	-
surpass	H	aɬula	ɬʊLa	-	ɬula	-
twist	L	aluga	lʊɣa	-	luka	ruka

Notes.
speak: Zulu /aNba/ 'be sarcastic'.

*o

Phonological comparative series.

ZU	NS	VE	TS	ZE	
o	o	o	u	o	Finally after syllables containing *u or *a.[3]
o	o	o	o	o	Elsewhere.

The majority of attesting vowels are /o/, and Tsonga /u/ occurs only in a limited environment, therefore the reconstruction is *o.

Stem-initial attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
be thin	H	oNda	ota	oNda	oNdz’a	oNda
dry	H	oma	oma	oma	oma	oma
(noun suffix)	L	+o	+o	+o	+o	+o
roast	L	osa	-	otʃa	oʃa	otʃa
warm oneself	H	otha	ora	ora	orha	-

Stem-final attestation.

GLOSS	TONES	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
bone	HH	thaNbo	rapo	raNbo	rhaNbu	-
broth	L	-	ro	ro	-*	to
garment	LL	Ngubo	kʊβo	Nguβo	Nguβu	Nguo

[3] Compare the distribution of high and mid vowels in extensions in certain Bantu languages, as described by Meeussen (1967: 84), quoted in 4.1.3.

knot	HH	-*	huto	pfuNdo	fuNdz$^{\flat}$u	pfuNdo
river	LL	laNbo	lapo	LaNbo	laNbu	-

Notes.

The final attestations are chosen to illustrate the Tsonga /u/ correspondence.

broth: Tsonga /rhu/ appears to have a skewed vowel. However, this is probably conditioned by the vowel of its singular noun-class prefix /mu+/.

knot: see notes to *pF.

***u**

Phonological comparative series.

ZU	NS	VE	TS	ZE	
u	u	u	u	u	After affricates; before and after syllables containing high tense vowels. In North Sotho, also finally after vowels.
u	ʊ	u	u	u	Elsewhere.

As /ʊ/ occurs only in one language in a predictable environment, and all other attestations are /u/, the reconstruction is *u. No stem-series are quoted for *u, as it never occurs stem-initially.

2.5 *Conclusion.*

The techniques of phonological reconstruction as described in King (1969), Bynon (1977) and Lehmann (1962) have been applied to the above data in order to find proto-phonemes for the various correspondence series. Hoenigswald (1973: 55) summarises the method as follows:

> reconstruction by the comparative method is attained by assembling correspondences, examining them for partial likeness and for 'complementarity' and reconstructing elements (for instance, phonemes) of the ancestor by grouping together partially alike and mutually exclusive correspondences.

In applying this method, some attempt has been made to allow for phonological symmetry within the proto-language being reconstructed (Hock 1986: 151-155) by comparing various series with common features, for instance those that contain voiceless stops or those that contain lateral obstruents. Lass (1984: 25) quotes the following as one of the general rules of phonological investigation:

> 'Make your system as symmetrical as possible.' ... It is uncertain whether constraints like this derive from the nature of the data or that of linguists, but the fact that they can often be utilised without excessive violence to the data suggests that in some way our desire for symmetry ... reflects ... 'the real world.'

The arguments for the coherence of the reconstruction are set out in more detail in the following chapter.

3.0 The Phonology of Proto-Southern Bantu.

3.1 Introduction.

In the previous chapter, the phonemes of Proto-Southern Bantu were reconstructed. In this chapter the way they are related to each other in terms of the phonological structure of the reconstructed proto-language will be discussed. The reconstruction is tested for plausibility in terms of symmetry, that is, the relationship between the reconstructed phonemes in terms of place and manner of articulation and voicing distinctions. The phonemes are listed, and their distinctive features given. Then the syllable combinations in which they occur are analysed. Finally, the phonological rules of Proto-Southern Bantu are reconstructed.

3.2 The phonemes of Proto-Southern Bantu.

In this section the reconstructed phonemes of Proto-Southern Bantu are discussed in terms of their major groupings, vowels and consonants.

Vowels.

Five vowels are reconstructed. They show the classic pattern for five-vowel languages, a pattern evidenced by about two-thirds of the Bantu languages (Guthrie 1967: 56, 66; Nurse 1987: 106). No allophonic alternations can be reconstructed for the vowels, except in the Pre-Sotho dialect. In North Sotho, high vowels have [+tense] reflexes after Proto-Southern Bantu fricatives and affricates, and also before palatals, and next to syllables containing high tense vowels. Proto-Southern Bantu high vowels also have [+tense] reflexes finally after syllables containing vowels (the two examples in the data are /peu/ 'seed' and /tɬou/ 'elephant'). Reflexes are [-tense] elsewhere. Although it is a well-known fact that tense and non-tense high vowels are different phonemes in modern North Sotho, in the data in this thesis they occur in complementary distribution, which implies that they were allophones in Proto-Southern Bantu. It is assumed that in the Pre-Sotho dialect of Proto-Southern Bantu, tense vowels occurred after affricates and and non-tense vowels occurred elsewhere. The other conditioning environments were only created later in the development of North Sotho, and so these are accounted for in Chapter 5 (5.6). The exact phonetic nature of the phonological distinction between the features [+tense] and [-tense] is open to dispute (Roux 1979: 56), but it will not be discussed further here, as the present work is concerned with phonology not phonetics (see 1.4.2).

Pre-Sotho:		Other pre-dialects.	
i ~ ɪ	u ~ ʊ	i	u
e	o	e	o
a		a	

Tones.

As all its daughter-languages have two tonemes, low and high, which correspond exactly, it can be assumed that Proto-Southern Bantu had the same phonological contrast. Bisyllabic noun stems (that is, nearly all the noun stems in the data), show all possible combinations of these two tones, namely HH, HL, LH, LL. Verbs have a single tone, either high or low, associated with them: it is beyond the scope of this work to establish how they were assigned to particular syllables in the proto-language, as the rules by which this takes place in the daughter languages are usually morphologically dependent.

Consonants.

The consonants show four places of articulation: labial, alveolar, palatal and velar. They are divided into obstruents and resonants. The obstruents are subdivided into voiced and voiceless pairs, and have two manners of articulation: stops and affricates. The resonants are either nasals or glides. There is no evidence of lateral or trilled resonants, existing as separate phonemes, but *d is reconstructed as having an allophone which is most likely to have been realised as a flap, as its reflexes are all non-nasal resonants. The unusual aspect of the reconstruction is the allophonic alternation between alveolar and labial offglides in the articulation of affricates. This produces heterorganic affricates, a phenomenon attested in several present-day Bantu languages. In Chapter 4, it is shown that these Proto-Southern Bantu affricates are derived from stops which occur before the Proto-Bantu high tense vowels. Some of the heterorganic affricates in the modern Bantu languages attesting them are derived from the same source. For example, Boma B.82[4] (Guthrie 1971: 38) has the combinations /tf dv kf/ derived from *t *d *k before *u, and Nyungwe N.43 has /ps bz/ derived from *p *b before *i Rundi D.62 also has heterorganic affricates, as do several of the modern-day Southern Bantu languages themselves: for instance, North Sotho, Venda, Zezuru, and Tsonga, though these sounds are generally derived from other sources, not from consonants before high tense vowels. Whether the reconstruction of the alternation accurately reflects the phonology of the proto-language is a question which cannot be resolved here. It may be an apparent alternation owing to incomplete data; but within the confines of the data, no contradictions arise from this reconstruction.

Here follows a list of the Proto-Southern Bantu consonants. Nasal compounds and combinations of consonant and glide, as reconstructed in the previous chapter, will be treated as sequences of phonemes at the phonological level, and are discussed in the section on phonotactics, below (3.4).

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[4] The classificatory numbers are Guthrie's.

	bilabial	alveolar	palatal	velar
stops	p	t	c	k
	b	d	j	g
affricates	pF	tF		kF
	bF	dF		gF
nasals	m	n	ny	
glides	w		y	

The affricates *tF, *dF, *kF and *gF have allophonic forms with labially articulated offglides, which occur before back vowels and the glide *w, and alternate with other forms which have alveolar articulation, and occur in all other environments. It is presumed that the other affricates also had their places of articulation determined by this rule. Thus

*pFi → *[psi] or *[pfi]

*pFu → *[pfu]

*tFu → *[tfu]

*tFi, *tFa → *[tsi, tsa]

*kFi, *kFa → *[si, sa]

*kFu, *kFwa → *[fu, fwa]

*bFi → *[bzi] or *[bvi]

*bFu → *[bvu]

*dFi, dFa → *[dzi, dza]

*dFu, *dFwa → *[dvu, dvwa]

*gFi → *[gzi]

*gFu, *gFwa → [gvu, gvwa]

In some of the pre-dialects, *pF and *bF may always have been realised as [pf, bv]. See the sections *pF, *bF, *NbF in the previous chapter. An alternation similar to the one postulated here for the Proto-Southern Bantu affricates occurs in Swazi, one of the dialects or sublanguages of Nguni. In this language, [ts] and [tf] are allophones of one phoneme /th/, and their voiced equivalents, [dz] and [dv] are allophones of one phoneme /d/ (Ownby 1981: 64). The distributional rule is the same as for Proto-Southern Bantu, with the labial offglides occurring before back vowels and /w/, and the alveolar offglides occurring elsewhere.

3.3 Distinctive features.

	cons	syl	cont	son	ant	cor	vd	nas	high	low	back
p	+	-	-	-	+	-	-	-	-	-	-
t	+	-	-	-	+	+	-	-	+	-	-
c	+	-	-	-	-	+	-	-	+	-	-
k	+	-	-	-	-	-	-	-	+	-	+
b	+	-	-	-	+	-	+	-	-	-	-
d	+	-	-	-	+	+	+	-	+	-	-
j	+	-	-	-	-	+	+	-	+	-	-
g	+	-	-	-	-	-	+	-	+	-	+
pF	+	-	-+	-	+	-	-	-	-	-	-
tF	+	-	-+	-	+	+	-	-	+	-	-
kF	+	-	-+	-	-	+	-	-	+	-	-
bF	+	-	-+	-	+	-	+	-	-	-	-
dF	+	-	-+	-	+	+	+	-	+	-	-
gF	+	-	-+	-	-	-	+	-	+	-	+
m	+	-	+	+	+	-	+	+	-	-	-
n	+	-	+	+	+	+	+	+	+	-	-
ny	+	-	+	+	-	+	+	+	+	-	-
y	-	-	+	+	-	-	+	-	+	-	-
w	-	-	+	+	-	-	+	-	+	-	+
i	-	+	+	+	-	-	+	-	+	-	-
e	-	+	+	+	-	-	+	-	-	-	-
a	-	+	+	+	-	-	+	-	-	+	-
o	-	+	+	+	-	-	+	-	-	-	+
u	-	+	+	+	-	-	+	-	+	-	+

Distinctive features have been assigned to the glides /w/ and /y/ in accordance with the method of Chomsky and Halle (1968: 176). Features are given for consonants only as they appear outside nasal compounds. The features given here are phonological distinctive features, that is, they are the minimum features necessary to distinguish the various phonemes from one another. They are not phonetic features, characterising sounds, but distinctions between oppositions. So for instance, as no pair of reconstructed phonemes has the contrast of laterality, it is not necessary to mark these phonemes for the feature [lateral]. Nor is it necessary to mark them for features such as [rounded], [strident], [distributed]. As mentioned above, the feature [tense] is used to distinguish between high vowel qualities in the Pre-Sotho dialect, but even here it is necessary in allophonic rules only, and not to distinguish the basic phonemes. The traditional feature [delayed release] has not been used for the affricates. This is because only their offglides change their place of artic-

ulation when they participate in phonological rules. For this reason, they are analysed as sequences of the features [-cont +cont].

3.4 Phonotactics.

3.4.1 Syllable structures.

Following Hooper (1976: 189-90) and Lass (1984: 250-252), it will be assumed here that languages have defined syllable structures which can be described by means of phonological rules. Hooper claims (1976: 190) that phonological generalisations can best be captured

> by stating sequential constraints in terms of the syllable rather than in terms of syntactic or semantic units ...

All the reconstructed syllables of Proto-Southern Bantu end in vowels, and most of them begin with consonants. Apparent syllables consisting of just a vowel may not actually have been syllables in Proto-Southern Bantu, but merely morpheme-initial elements, as they occur only in this environment. It is assumed that though morpheme structure must follow the order of syllable structure, morphemes need not coincide with syllables. This is argued further under 'Morpheme Structure' below.

The following is a list of the kinds of syllable found in Proto-Southern Bantu. The 'examples' attesting each syllable type constitute a complete list of such syllables in the reconstruction.

A consonant followed by a vowel.

$ *CV* $

Examples:

pa	pe	pi	po	pu
pFa	-	pFi	-	-
ta	te	ti	to	tu
-	-	tFi	-	tFu
ca	ce	ci	co	cu
ka	ke	ki	ko	ku
kFa	-	kFi	-	kFu
ba	be	bi	bo	bu
-	-	-	-	bFu
da	de	di	do	du
dFa	-	dFi	-	dFu
-	-	gFi	-	gFu
ja	-	ji	-	ju
ma	me	mi	mo	mu
na	ne	ni	no	nu
nya	nye	-	nyo	nyu
wa	we	-	-	wu
ya	ye	yi	-	-

A nasal followed by a consonant, followed by a vowel.

$\$NCV\$$

Examples:

Npa	-	-	-	Npu
Nta	-	-	-	Ntu
Nca	-	Nci	Nco	-
Nka	-	-	Nko	Nku
Nba	Nbe	Nbi	Nbo	Nbu
-	-	NbFi	-	NbFu
Nda	Nde	-	Ndo	Ndu
NdFa	-	NdFi	-	-
Nja	Nje	Nji	Njo	Nju
Nga	-	-	Ngo	Ngu
-	-	-	-	NgFu

A consonant followed by a glide, followed by a vowel.

$ *CGV* $

Examples:

pwa	-	-	-	-
twa	-	tya	tye	tyu
cwa	-	-	-	-
-	-	kya	-	kyu
kFwa	-	-	-	-
bwa	bwe	-	-	-
bFwa	-	-	-	-
dwa	-	-	-	-
dFwa	-	-	-	-
gFwa	-	-	-	-
mwa	mwe	-	-	-
nwa	nwe	-	-	-

A nasal followed by a consonant, followed by a glide, followed by a vowel.

$ *NCGV* $

Examples:

Npwa	-	-
Ncwa	-	-
Nkwa	-	-
Nbwa	-	-
-	Ngwe	-

Note.

A syllable consisting of the following sequence:

nasal - affricate - glide - vowel

might possibly occur, in accordance with the $ NCGV $ type above, but there are no examples of this. If it is taken that an affricate can be analysed as a sequence of consonants

$$\underset{[-cont]}{C}\quad\underset{[+cont]}{C}$$

rather than as a single consonant

$$\underset{[+delayed\ release]}{C}$$

then this may be due to a syllable structure rule which restricted the occurrence of sequences with more than three non-syllabic elements. That is, the following complex sequences were allowed before a vowel:

$$N\quad[-cont]\quad G\quad V$$

and

$$[-cont]\quad[+cont]\quad G\quad V$$

but not

$$N\quad[-cont]\quad[+cont]\quad G\quad V$$

This is a further reason for the analysis of the affricates as sequences of [-cont +cont] rather than as consonants with the feature [+delayed release] (see 3.3).

Summary.

The above may be summarised:

$ V $
$ CV $
$ NCV $
$ CGV $
$ NCGV $

This may be further summarised in a single formula:

$ ((N) C (G)) V $

This is read: 'The structure of a syllable is either

	V	(a vowel alone)
or	CV	(consonant - vowel)
or	NCV	(nasal - consonant - vowel)
or	CGV	(consonant - glide - vowel)
or	NCGV	(nasal - consonant - glide - vowel)'.

Note that the same syllable structure is found in most of the daughter languages under consideration, namely Zulu, Venda, Tsonga and Zezuru. The only exception is North Sotho, which has the syllable structure

$ (C (G)) V $.

That is, North Sotho does not allow a consonant to be preceded by a tautosyllabic nasal. Certain of these daughter languages (Zulu, North Sotho and Venda) have evolved to allow syllabic consonants,

$$\begin{matrix} C \\ [+syl] \end{matrix}$$

which are always resonant (and in Zulu and Venda, always nasal).

While the formula

$ ((N) C (G)) V $

accounts for the general structure of the Proto-Southern Bantu syllable as reconstructed, it still overgenerates considerably. It allows for forms like:

*pFo, *NtFa, *Nge,

which do not occur in the reconstruction. Combinations that are not permitted must be eliminated. To prevent overgeneration, allophonic generative rules must be formulated. These will be the phonological rules of the proto-language as far as they can be reconstructed, based on the internal structure and relationships of the reconstructed syllables.

Accidental vs structural gaps.

It is assumed that phonological combinations will occur symmetrically (Lass 1984: 25). That is, combinations will be repeated, and restrictions on combinations will follow generalised rules. What

prohibitions exist will be restrictions on classes of combinations. For instance, the Proto-Southern Bantu affricates are only found before the following vowels:

*i, *a, *u;

that is, they do not occur before mid vowels. As the phonemes before which they do not occur form a well-defined class, it is assumed that this was a rule of the proto-language, and is not just an accident brought about by the random survival of stems. On the other hand, certain combinations of sound which do not occur in the reconstructed forms are not necessarily prohibited. These gaps might be purely accidental, owing to incomplete data, or to accidental structural gaps in the original proto-language. For example: the largest series in the data are the following:

ba	be	bi	bo	bu	bwa	bwe
ma	me	mi	mo	mu	mwa	mwe
na	ne	ni	no	nu	nwa	nwe.

These show consonants occurring before all five vowels, and before *wa and *we. The only other combinations that occur are combinations of consonants and *y. The consonants that occur in this way are both voiceless stops:

tya	tye	tyu
kya		kyu.

We may assume, therefore, that these combinations of consonant and the five vowels, and consonant followed by *we and *wa are going to occur with the majority of consonants, but that sequences of a consonant and *y will only occur if the consonant is a voiceless stop. However, if we look at the list of reconstructed syllables, very few of them contain the sequence *we. The following combinations of voiceless stop and *we, for instance, do not occur:

*pwe, *twe, *cwe, *kwe.

There may have been a restriction on combinations with *we in all except a few instances: a possible rule is one disallowing voiceless stops before *we. However, the occurrence of the reconstructions *pwa, *twa, *cwa makes this unlikely, as some combinations of voiceless stop and *w are attested. This suggests that no generalised phonological rule can be postulated, and therefore it may be assumed that these gaps are accidental and not structural.

An interesting case is that of the reconstructed sound *j. This occurs only in the syllables:

*ji, *ja, *ju

which form a symmetrical pattern. There might have been a rule that the voiced palatal stop could only occur before high and low vowels, and that the syllables:

*je, *jo

were disallowed. But there is evidence against this. Firstly, the voiceless equivalent, the palatal stop *c, occurs in the combinations

*ca, *ce, *ci, *co;

that is, it also occurs with mid vowels. On the assumption, mentioned above, that rules apply as generally as possible unless there is good evidence to the contrary, it is unlikely that voiceless palatals would have occurred before mid vowels but that voiceless ones would not have. Secondly, *j could occur followed by any vowel, if it was preceded by a nasal - the sequences *Nja, *Nje, *Nji, *Njo and *Nju all occur in the reconstruction. Thus, although the distribution of *j looks symmetrical despite being limited, it is probable that here too the gaps are accidental. It should be noted, though, that Meeussen (1973: 9) points out that Proto-Bantu *j after nasals and Proto-Bantu *j elsewhere often have phonetically very different reflexes. This may reflect a phonological alternation in the proto-language. Proto-Southern Bantu *j is derived from Proto-Bantu *j (see Chapter 4), and if this phonological alternation was preserved, there may have been a phonotactic rule restricting the distribution of one of the allophones of *j.

Another, opposite, case, where an apparent accidental gap was probably not one, is the gap in the *ny series. One would expect the occurrence of the combination *nyi, but there is no reconstruction for this. However, there is some phonetic overlap between the reflexes of *n in the combination *ni, and the reflexes of *ny, suggesting that an earlier *nyi merged with *ni. This is borne out by the evidence of the relationship between Proto-Southern Bantu and Proto-Bantu (see 4.4.2).

Syllables consisting of glide and vowel form an oddly symmetrical pattern:

		wu	yi	
	we		ye	
		wa		ya

The reconstructed glides occur only before the non-high, non-back vowels *e and *a, or before high vowels that agree with them in backness. This could either be rule-governed or coincidental, and far more evidence would need to be gathered before any certainty could arise here.

Nasal compounds consist of sequences of nasal and both voiced and voiceless stops (*Nb, *Np, etc.). The voiceless stop sequences occur very infrequently in the data, and this presumably reflects the case in Proto-Southern Bantu. We may assume that the gaps in the sequences of nasal and

voiceless stop are accidental, owing to rare occurrence of this particular type of compound, but a rule might have existed here. The paucity of data makes it impossible to reconstruct. It is interesting to note the lack of combinations with nasal compounds and *we, (there are no instances of *Nbwe, *Ndwe, *Njwe) but the existence of the syllable *Ngwe implies that this too is due to an accidental gap in the data. The lack of a syllable *Ndi is also probably accidental, as it does not follow any general rule that can be formulated. The only velar stop which occurs before front vowels in the reconstruction is *k, and it is postulated that this was allophonically realised as a palatal affricate (see 3.6). However, both voiced and voiceless velar stops in nasal compounds appear only before *a and back vowels, which may indicate that *t$\int$ was a phoneme in its own right.

Far fewer consonants occur in nasal compounds than after vowels and initially. Only obstruents occur after nasals, and voiceless affricates do not appear to occur in this position. The same four positions of articulation evidenced for the plain consonants are once again apparent. It is presumed that allophonic variations of affricates after nasals occur as with the 'simple' varieties above, those not found in nasal compounds, but the only example in the data is *NbFi, which has dubious status, occurring as it does in a single stem attested in only three languages.

As mentioned above, the affricates occur only before the vowels *i, *a, *u; there are also attestations before *w. Many gaps occur in the affricate series, as there are far fewer attestations of them in the data: such gaps include the lack of *tFa, *pFa, *kFa, *bFa, *bFi, *gFa, *NgFa, *NgFi, *NbFa and *NdFu. Nasal compounds with affricates are all voiced. We may assume a loss of the nasal before voiceless affricates in the derivation of Proto-Southern Bantu from Proto-Bantu.

3.4.2 Phonotactic rules within syllables.

The generative rules are not extrinsically ordered in the formulation given here, as no attempt has been made, within the scope of the present work, to reconstruct the effect of morphological combinations on phonology. It is therefore impossible to give phonological derivations of sequences of morphemes, and to say in which order the rules applied.

Rule 1.
Only *t and *k may be followed by the glide *y.

$$C \rightarrow \begin{bmatrix} -vd \\ -cont \\ \alpha ant \\ \alpha cor \end{bmatrix} / \_ \; y$$

That is, a consonant before *y could be either [+ant, +cor] or [-ant, -cor]. Syllables of the following type do not occur:

*bya, *mye, *dFyo, *wya, *yya.

There is evidence, in the relationship between Proto-Bantu and Proto-Southern Bantu, of a rule assimilating glides to a preceding bilabial consonant (see 4.4.3, Rule 9).

Rule 2.
*ny may not occur before *i.

$$\begin{matrix} N \\ [+cor] \end{matrix} \rightarrow [+ant] \quad / \quad \_ \quad i$$

The syllable *nyi does not occur.

Rule 3.
A palatal resonant may not be followed by *w. There is no evidence in the data of such a combination: however, it is to be noted that this is not a rule of the Nguni daughter languages of Proto-Southern Bantu.

$$w \rightarrow \emptyset \quad / \quad \begin{matrix} C \\ \begin{bmatrix} -son \\ +ant \\ -cor \end{bmatrix} \end{matrix} \_$$

The sequences *yw, *nyw are eliminated by this rule.

Rule 4.
The glide *w may not occur between a consonant and a back vowel.

$$w \rightarrow \emptyset \quad / \quad C \quad \_ \quad \begin{matrix} V \\ [+back] \end{matrix}$$

This rule prevents sequences like *gwo, *bwo, *nwu.

Rule 5.
Stops and affricates are the only consonants that may follow nasals. This too is a rule of the present-day daughter languages.

$$C \rightarrow [-cont] \quad / \quad N \quad \_$$

Rule 6.

Affricates may not be followed by mid vowels.

$$V \rightarrow \begin{Bmatrix} [+high] \\ [+low] \end{Bmatrix} \quad / \quad \begin{matrix} C \\ [+cont \\ -son] \end{matrix} \quad \_$$

There are no instances of syllables like *pFe, *tFe, *bFo in the reconstruction.

Rule 7.

Nasals may not be followed by voiceless affricates.

$$\begin{matrix} C \\ [-cont\ +cont] \end{matrix} \rightarrow [+vd] \quad / \quad N \quad \_$$

There are no instances of *NpFV, *NtFV, etc.

Rule 8.

Sequences of nasal and affricate may not be followed by glides. See the earlier comment on the number of non-syllabic elements at the beginning of a syllable, at the end of 3.4.1.

$$G \rightarrow \emptyset \quad / \quad N \quad \begin{matrix} C \\ [-cont\ +cont] \end{matrix} \quad \_$$

3.4.3 Phonotactics across syllables.

There is no evidence of any rule of vowel harmony or consonant harmony, although rules of the latter kind are found in Nguni. (Khumalo 1987: 26). Sequences of consonants of any kind are allowed, without regard to voicing restrictions. Thus two voiced consonants or two voiceless consonants may occur in the same stem:

*baba 'be bitter', *bada 'count', *koka 'pull', *tatu 'three'.

as may sequences of voiceless and voiced or vice versa:

*acuda 'surpass', *bopa 'tie up'.

There are no restrictions on vowel sequences over syllables:

*baba 'be bitter', *beka 'put', *boya 'fur', *buya 'come back',
*kFiya 'leave', *cedo 'basket', *cebe 'arrow', *cuNguda 'winnow',
*dedFu 'beard, chin', *dFuNbi 'rain', *kFidFi 'soot',

*daNbo 'river', *daNdeda 'follow', *dido 'fire', *domo 'mouth'.

Nasal compounds may occur in successive syllables, though the only possible example of two voiced NC sequences following each other is in the stem *NgaNga. This may be further evidence that Meinhof's Rule applied in Proto-Southern Bantu (see 4.1.3), contrary to Meeussen (1962: 26) who includes among the 'languages in which the rule seems to be entirely absent' the Southern Bantu languages 'Shona, giTonga, Venda, Ndebele, Swazi, Zulu'. However, the evidence for the existence of this rule still remains tenuous.

The rule of vowel harmony, by which a high vowel in an extension became a mid vowel after a stem containing a mid vowel (Meeussen 1967: 84) does not apply. In the majority of the attesting languages, these alternating Proto-Bantu extensions all have mid vowels, the exception being Zezuru, which has high vowels.

3.5 Morpheme structure.

The structure of morphemes differs from the structure of words, because 'morphemes ... are not necessarily composed of complete syllables' (Hooper 1976: 117). It is assumed that morphemes are structured in such a way that when they are combined with other morphemes to form words, the resulting syllables will be acceptable syllables of the language; otherwise, one or more of the combining morphemes will undergo a phonological change.

For example: if a language has a syllable structure like that described for Proto-Southern Bantu, then if it has a morpheme of the shape CVC, this will never be able to stand by itself as a complete word. It must be followed by a V morpheme to yield the syllable structure

$ CV $ CV.

An example of this is the reconstructed verbs of the language, which are shown in the quoted data as apparently fitting perfectly into a CV syllable structure but each of which consists of two morphemes:

*dipa, 'pay' is really
*/ + dip + a + /.

The addition of the suffixal morpheme / + a/ accommodates the stem /dip/ to the syllable structure by yielding

$ di $ pa $.

Morphemes may thus have a different shape from syllables or combinations of syllables. Proto-Southern Bantu morphemes could end on consonants or on sequences of nasal and consonant:

+ ... X ... V (N) C +

as is evidenced by the stems *did+ 'cry', and *diNd+ 'wait', for example.

Morphemes could also begin with vowels. The following is a complete list of the reconstructed vowel-commencing morphemes in the data. There are morphemes beginning with the vowel *u. This may have been the result of a structural condition on such morphemes, but it is more likely that it is just an accidental gap.

*+ana	(reciprocal)	*aba	'divide'	*aNda	'abound'	*eni	'stranger'
*+eda	(applied)	*acuda	'surpass'	*aNja	'hand'	*oma	'dry'
*+eka	(neuter)	*aduka	'twist'	*eNbata	'wear'	*oNda	'be thin'
*+isa	(causative)	*aka	'build'	*eNdo	'journey'	*ota	'warm oneself'
*+o	(noun suffix)	*aNba	'speak'	*eneka	'spread'	*okya	'roast'.

The limited occurrence of vowels without consonants indicates that this was also a phonological rule of the proto-language, that is, there were no actual syllables of the form $ V $.

The commonest shapes for noun morphemes are (N)CV and (N)CV(N)CV. The reconstructed prefixes all have the form CV, and extensions, and some verb stems, have the form VC. Final suffixes have the form V. Combinations of affixes and stems may potentially violate syllable structure rules, in which case, phonological rules change the features of phonemes within the morphemes in order to accommodate them to these rules. For instance, no Zulu syllable may contain a nasal followed by an aspirated stop, but the Class 9 prefix /N/ may occur before a stem which begins with an aspirated stop, as in

/i + N + phil + o/.

This brings about a phonological change in accordance with the rule:

$$\begin{matrix} C \\ [-vd] \end{matrix} \rightarrow [-asp] \quad / \quad N \quad \_$$

to yield the phonologically acceptable form /iNpilo/. Similar rules must have existed in the proto-language: some possible examples are discussed in 3.6.

3.6 Phonological rules.

3.6.1 Phonological rules in morphological combinations.

The phonological rules arising from the constraints on syllable structure of a proto-language can only be reconstructed to a limited extent, as allophonic variation is evident in only a few cases. Morphological combinations are not discussed in the present thesis, because reconstruction has been lexical, not grammatical. What morphological reconstruction there has been, for instance the class prefixes and certain extensions, is only incidental. However, one rule of this nature is apparent from the data, the rule of vowel deletion.

Vowel deletion.
The vowel *u was glided or deleted before the vowel-commencing stems of a small number of nouns, so that the noun prefix becomes part of the first syllable of the stem.
The examples are

/boya/ from /bu + oya/ 'fur'
/moya/ from /mu + oya/ 'wind'
/mwedFi/ from /mu + edFi/ 'moonlight'.

$$u \rightarrow w \;/\; \_ \; V$$

$$w \rightarrow \emptyset \;/\; \begin{bmatrix} C \\ [+ant] \\ [-cor] \end{bmatrix} \; \_ \; \begin{matrix} V \\ [+back] \end{matrix}$$

As the evidence is very limited, it is impossible to say if this was a productive rule in Proto-Southern Bantu, or a relic of an older rule of Proto-Bantu.

3.6.2 Conditioned allophones.

The evidence for the majority of the following rules is the fact that these phonemes produce different reflexes in different environments: for instance, *d has resonant reflexes initially and intervocalically, but obstruent reflexes after nasals. This is true of its reflexes in all the daughter languages, and therefore it is simplest to presume that this reflects its phonetic character in Proto-Southern Bantu. Further evidence for the following rules is that some of them applied differently in different languages, for instance aspiration applied in the same general environment in these languages, but with different specific exceptions to the general rule in each language. This is evidence that the daughter-languages evolved from pre-dialects, which were already differentiated at

the Proto-Southern Bantu stage. The rules are given here in a very general form, as the exact shape they took in each of the pre-dialects in discussed in Chapter 5.

Flapping.

This appears to have been a phonological rule of all the dialectal forms of Proto-Southern Bantu. *d was flapped initially and between vowels. See 5.5, Rule 10.

$$\begin{bmatrix} C \\ -nas \\ +vd \\ +ant \\ +cor \end{bmatrix} \rightarrow [+cont] \; / \; [-nas] \; \_$$

Fricative assimilation.

Fricative offglides assimilate to a following vowel in labiality and place of articulation. This rule seems to have operated differently in the different proto-dialects (see 5.5, Rule 8). following chapter.

$$\begin{bmatrix} +cont \\ -son \end{bmatrix} \rightarrow \begin{bmatrix} +ant \\ -cor \end{bmatrix} \; / \; \_ \; \begin{matrix} V \\ [+back] \end{matrix}$$

Aspiration.

Voiceless consonants are aspirated. Again, this is a rule which applied generally in all the pre-dialects. However, it seems to have had minor exceptions in each language (see 5.5, Rule 12).

$$\begin{matrix} C \\ [-vd] \end{matrix} \rightarrow [+asp]$$

Velar palatalisation.

*k became a palatal affricate before front vowels and the glide *y (see 5.5, Rule 7).

$$\begin{bmatrix} C \\ -cont \\ -ant \\ -vd \end{bmatrix} \rightarrow \begin{bmatrix} +cor \\ -cont \; +cont \end{bmatrix} \; / \; \_ \; \begin{bmatrix} -back \\ -low \end{bmatrix}$$

Nasal assimilation.

A nasal is assimilated to a following consonant in terms of place. This rule is found generally in

all the Bantu languages, and is still a productive rule in the daughter languages of Proto-Southern Bantu. See 1.4.2, 5.7, and Doke (1954: 31).

$$N \rightarrow [\alpha place] \; / \; \_ \; \begin{matrix} C \\ [\alpha place] \end{matrix}$$

3.7 Conclusion.

An attempt has been made at reconstructing the phonological rules of Proto-Southern Bantu. While certain deductions can be made about the syllable structure of the language, the fact that the present study does not deal with morphological combination rules makes it difficult to generalise about the effects which such combinations had on phonological forms. Only a very small amount of evidence for morphologically induced phonological change appears in the data. The strongest evidence of phonological sound change rules that produce phonetic forms is the evidence for Aspiration, Fricative Assimilation, Nasal Assimilation and Flapping, each of which plays a part in the derivation of modern Southern Bantu forms.

Likewise, no attempt is made to reconstruct tonological rules, although tones are tentatively reconstructed. Tonological changes in modern Southern Bantu languages come about owing to morphological combinations, and as these have not been discussed, no conclusions can be stated about these.

The Proto-Southern Bantu phonology reconstructed is similar in several respects to modern Southern Bantu languages. It shows evidence of open syllables, nasal compounds, and glide combinations. However, these are general Bantu traits, and Proto-Bantu, as reconstructed, also has evidence of all of these. The question of whether Proto-Southern Bantu differs to any marked degree from Proto-Bantu is addressed in the next chapter.

4.0 Correspondences between Proto-Bantu and Proto-Southern Bantu.

4.1 Introduction: Proto-Bantu.

4.1.1 The model of Proto-Bantu.

In the first three chapters of this thesis Proto-Southern Bantu was reconstructed without any reference to Proto-Bantu: that is, the comparative method was applied to the Southern Bantu languages in this study as if the proto-language were being reconstructed for the first time. In the present chapter, the completed reconstruction will be compared to the currently established model of Proto-Bantu, as it has been developed by Guthrie (1967) and by Meeussen (1967). Although these two authors worked separately, and although there are certain differences between their approaches and their findings, on the whole their models are so similar, especially as far as the reconstructed phonology of Proto-Bantu is concerned, that for the purposes of this thesis their work will be treated as a single reconstruction; though due note will be made of any differences where they occur. Henceforth, 'Proto-Bantu' is taken to mean this composite model of Proto-Bantu.

The aim of this comparison between Proto-Bantu and Proto-Southern Bantu is to examine further the question of whether there is sufficient evidence of shared phonological innovations for the Southern Bantu group to be regarded as a linguistic unity with a common intermediate ancestor. All the phonemes reconstructed for Proto-Southern Bantu can be derived from Proto-Bantu, though not all the items of vocabulary can be so derived. In the following section of this chapter, the phonological correspondences between Proto-Bantu and Proto-Southern Bantu will be set out in detail. Guthrie and Meeussen's original notations for symbolising the proto-phonemes have been revised to accord with the phonological transcription used in this thesis. One of the major differences between this transcription and Guthrie's is that Guthrie distinguishes between symbols for comparative series, for which he uses lower-case letters based on the IPA symbols, and symbols for the reconstructed phonemes of the Proto-Language, for which he uses capital letters (1967: 60-63; 1970c: 24). Here, following present-day convention for symbolising proto-languages, only lower-case, IPA-derived symbols are used, except for the symbols /N/ and /F/, to which different place-values or voicing values are assigned in different circumstances (see 1.4.2; 3.2).

4.1.2 The phonemes of Proto-Bantu.

Guthrie (1967: 60-63) and Meeussen (1967: 82-85) reconstruct the following phonemes for Proto-Bantu:

*p	*t	*c	*k	*i	*u
*b	*d	*j	*g	*ɪ	*ʊ
*m	*n	*ny	*ŋ	*e	*o
				*a	

Besides the segmental phonemes, there are also two tonemes, high and low, which Guthrie symbolises with an accute accent and a grave accent respectively; Meeussen represents them with an acute accent and the absence of an accent. In this thesis they are symbolised by the letters H and L following the stem.

Meeussen's reconstruction differs from Guthrie's in the following respects:

1. There is no phoneme *ŋ.
2. There is no phoneme *y.

He argues (1973: 9-10) that Guthrie's reconstructions *y and *j were allophones of a single phoneme in Proto-Bantu, because they occur in complementary environments in the proto-language; similarly, that the status of Guthrie's *ŋ is extremely marginal (1973: 7), most of its instances being accountable for by Meinhof's Rule (see 4.1.2). The question of the distinction between Guthrie's *y and *j remains open, however, as in Southern Bantu they have different reflexes in similar environments. The Proto-Bantu sequence *yɪ yields Proto-Southern Bantu *yi, while Proto-Bantu *jɪ yields *ji, which has different reflexes from Proto-Southern Bantu *yi (see 2.4; 5.5). For the purposes of the present thesis, Guthrie's distinction between the two proto-phonemes will be maintained. The question of the status of *ŋ is irrelevant to the relationship between Proto-Bantu and Proto-Southern Bantu, as no stems containing this reconstructed phoneme have any corresponding forms in Proto-Southern Bantu. The general validity of this (combined) reconstruction is confirmed by Nurse (1987: 102), who presents a system with essentially identical oppositions, differing merely in notation. Like Meeussen, he does not reconstruct a phoneme *y; but like Guthrie, he does include *ŋ.

Neither Guthrie nor Meeussen gives any list of phonological distinctive features for the reconstructed phonemes. Although it is clear that the sets of high vowels *i, *u and *ɪ, *ʊ are phonologically distinct, the nature of the distinction between them is not made explicit in terms of phonological features, nor is there any attempt at establishing their probable phonetic values. In accordance with the practice used for North Sotho, which also has a seven-vowel system (see 1.4.2), the feature [tense] will be used here to distinguish between these sets, *i and *u being regarded as [+tns], and *ɪ and *ʊ being designated [-tns]. This will keep the analysis of such systems consistent within this thesis. Furthermore there is no reason, given the Southern Bantu evidence, to

assume the vowels of Proto-Bantu differed from those of North Sotho in pronunciation, as there is a one-to-one correspondence between the two sets of vowels.

Both Guthrie and Meeussen give the following list of compound consonants:

*Np *Nt *Nc *Nk
*Nb *Nd *Nj *Ng.

Meeussen adds four other compounds:

Nm Nn Nny Nŋ,

though essentially these are variants of *Nb, *Nd, *Nj, *Ng, as they arise morphophonologically through the operation of Meinhof's Rule, which will be discussed in 4.1.3.

In both reconstructions, syllables are of the following shape:

((N) C) V (V).

Guthrie puts certain constraints on the sequences of vowels permitted by the bimoric syllable type. These are:

1. that the two vowel morae may *either* be identical
2. *or* the first vowel must be a high vowel, not mid or low.

Meeussen disagrees with this analysis. He allows (1967: 82) any of the

> closed vowel[s] (i, u; ɪ, ʊ; e, o) followed by a more open vowel (ɪ, ʊ; e, o; a) ... to account for the occurrence of semi-vowels in the present-day languages.

That is, the mid-vowel *e and *o could also occur before other vowels (specifically, *a). He argues on grounds of vowel allomorphs in extensions (1973: 10) that *CV radicals in *e and *o must be reconstructed. When the sequence of vowels consists of a high vowel followed by another vowel, the reflex in present-day Bantu languages is either a glide or ∅. This indicates that a high vowel followed by another vowel in Proto-Bantu was probably phonetically realised as a glide. As there are no differences between reflexes of *e/*o glides and *ɪ/*ʊ glides in Proto-Southern Bantu, The transcription in this chapter will use only high vowels, following Guthrie (1967).

4.1.3 Morphophonological rules.

Meeussen (1967: 84-85) specifically mentions two morphophonological rules, whereas Guthrie gives no discussion of the phonological system of his reconstructed proto-language, though he mentions these rules as examples of historical 'sound shifts' (1967: 56, 59). These rules are Vowel Alternation and Meinhof's Rule.

Vowel alternation.

The vowels *ɪ and *e; *ʊ and *o alternate in verbal extensions. The mid vowels occur after stems which contain a mid vowel in their final syllables, and the high vowels occur elsewhere. Meeussen (1967: 84) gives the rule as follows:

> In a stem (either nominal or verbal), °ɪ appears as /e/ after either °e or °o:
>
> | | | |
> |---|---|---|
> | °-tend-ɪd-: | -tended- | 'say to...' |
> | °-dond-ɪd-: | -donded- | 'seek for...' |
>
> Similarly, °ʊ appears as /o/ after °o (but not after °e):
>
> | | | |
> |---|---|---|
> | °-pot-ʊd-: | -potod- | 'untwist'. |

This is manifested in Proto-Southern Bantu in the form of variants in the pre-dialects, with the majority of the languages (Zulu, North Sotho, Venda and Tsonga) studied in the present thesis attesting a proto-form * + eka, * + eda, while Zezuru attests a Pre-Shona form * + ika, * + ida in the neuter and applied extensions respectively.

Meinhof's Rule.

The second rule is the rule of consonant morphophonemes, known in the Bantu field as Meinhof's Rule. By this rule a voiced stop becomes a nasal after a nasal if the following syllable begins with a nasal.

$$\begin{matrix} C \\ [+vd] \end{matrix} \quad > \quad [+nas] \quad / \quad N \quad \_ \quad V \quad N$$

There is marginal evidence that this applied in Proto-Southern Bantu. No Proto-Southern Bantu stem contains the sequence

$$N \quad \underset{[+vd]}{C} \quad V \quad N,$$

with one possible exception, the stem *NgaNga (see 2.4.2, *Ng), whose initial sequence of phonemes is manifested as a simple nasal resonant in all five attesting languages. This stem is only tentatively regarded as part of the data, as its initial element does not display any regular pattern of correspondence. The extra four nasal compounds given by Meeussen as part of his reconstruction of the proto-language (see 4.1.2 above) are produced by this rule.

4.2 The method of comparison.

The method used was similar to the method used for the reconstruction of Proto-Southern Bantu (see 1.4.4), except now the presumed ancestral language and the intermediate ancestral language Proto-Southern Bantu were the two languages being tested for correspondences. As Hoenigswald says (1973: 60):

> relationship is a more primitive notion than descent; descent is a special case of relationship, discoverable by the comparative method.

That is, the approach used in comparing two proto-languages which are presumed to symbolise different stages in the historical development of a language need not differ from that used when comparing the modern extant languages. The glosses of the Proto-Southern Bantu stems were used as a basic list, and Proto-Bantu equivalents were sought. For this purpose, Guthrie's Common Bantu vocabulary was examined. This vocabulary represents roots which have a fairly wide dispersion over the Bantu area, a dispersion which Guthrie quantifies by means of a figure which he calls the 'modulus of dispersion' (1967: 81):

> the purpose of this modulus is to express numerically the relative extent of the area covered by any C[omparative] S[eries] without reference to the precise geographical location involved. ... the modulus of dispersion, denoted by the letter D, is either zero or a whole number not greater than 7.

Guthrie admits only his 'General' roots, 'those which ... cover the whole or the greater part of the Bantu area' (1962b: 14), as probable Proto-Bantu stems. However, for the purposes of the present work, it was assumed that a distribution value of 4 or more was sufficient indication of a probable Proto-Bantu stem. Guthrie's lists were supplemented by stems quoted by Meeussen (1967). Meeussen only quotes stems which he regards as probable Proto-Bantu items, so that when he quotes a stem which Guthrie gives as having a modulus of dispersion of less than 4, it has nevertheless been admitted to the lists. Once the lists were drawn up, they were checked for regular

patterns of correspondence, following exactly the method described for establishing the correspondence series in 1.4.4. The correspondences established are discussed below.

4.3 Direct correspondences.

To a large extent, the phonology of Proto-Southern Bantu proved to be very similar to that of Proto-Bantu. Many Proto-Southern Bantu consonants correspond exactly to their Proto-Bantu equivalents, having the same value in terms of voicing, manner and place; and similarly, there is often a one-to-one correspondence between the vowels of Proto-Southern Bantu and those of Proto-Bantu, though high tense vowels in Proto-Southern Bantu may correspond to both tense and non-tense high vowels in Proto-Bantu.

Vowels.

Proto-Bantu		Proto-Southern Bantu	
*i, *ɪ	*u, *ʊ	*i	*u
*e	*o	*e	*o
*a		*a	

The only predictable exception to this correspondence is Meeussen's rule of Vowel Alternation in Proto-Bantu extensions, which means that, in these morphemes only, high vowels in Proto-Bantu may correspond to mid vowels in Proto-Southern Bantu, except, as mentioned above, as attested in Zezuru. This leads to the postulation of a Proto-Southern Bantu which was divided into several dialects, as two proto-forms have to be postulated for certain extended radicals. These dialects will be referred to as Pre-Nguni, Pre-Sotho, Pre-Venda, Pre-Tsonga and Pre-Shona. Further evidence for this division is examined in Chapter 5, and its implications are discussed in the concluding section of that chapter.

Stops and nasals before vowels other than high tense vowels.

The following consonants and consonant combinations correspond directly in (N)CV syllables containing non-tense high vowels:

Proto-Bantu				Proto-Southern Bantu			
*p	*t	*c	*k	*p	*t	*c	*k
*b	*d	*j		*b	*d	*j	
*m	*n	*ny		*m	*n	*ny	
*Np	*Nt	*Nc	*Nk	*Np	*Nt	*Nc	*Nk
*Nb	*Nd	*Nj	*Ng	*Nb	*Nd	*Nj	*Ng.

Tonal correspondences.

On the whole, there is a one-to-one correspondence between the high tone of Proto-Southern Bantu and the high tone of Proto-Bantu; and between the respective low tones of the two proto-languages. However, there is an exception, namely noun stems which have the contour HL in Proto-Bantu. With one exception, (*bada HL 'spot', eliminated from the data), these are manifested with the contour HH in Proto-Southern Bantu. This is discussed further under the heading Tonal Correspondence (4.4.2).

4.4 Sound-change rules.

4.4.1 Ordering.

In this section the rules detailing the changes from Proto-Bantu to Proto-Southern Bantu are listed, together with examples of the Proto-Bantu words affected by each rule. Where applicable, the rules are given in feeding-and-bleeding order, as defined by Kiparsky (1968: 37-41). King (1969: 175) summarises Kiparsky's definition as follows:

> Two rules A-B are said to be in bleeding order if A 'bleeds' B: removes representations to which B could apply. Two rules A-B are in feeding order if A 'feeds' B: supplies a new set of cases to B.

The forms affected by the later rules may therefore be the output of earlier rules, and not the Proto-Bantu forms; that is, they are Pre-Proto-Southern Bantu forms. In such cases, this is indicated by a note in brackets. The column in which they occur is still headed 'PB', as the rules may also affect Proto-Bantu forms which have not undergone changes. To illustrate: in Rule 6 of the ordered rules, the example

*budaga (<r5) > *budaya

means that a form *budaga, derived from an earlier form by Rule 5, becomes *budaya. However, certain rules do not have any effect on the others, and could apply at any point in the derivation of one language from the other. Therefore the rules are divided into two sets, unordered and ordered.

As in Chapter 1, stems are quoted in phonologically acceptable forms, that is, as fitting into the syllable structures of Proto-Bantu (see 4.1.2) or Proto-Southern Bantu (see 3.4.3). This means, once again, that Class 9 nouns are quoted with their prefixes attached to their stems, in both Proto-Bantu and Proto-Southern Bantu; and that verbs are quoted with the final vowel * + a, the present tense marker, as is explained in 1.4.3. Thus the Proto-Bantu stem for 'crocodile' is given by Guthrie as *-guena; this is quoted as *Nguena in the following discussion, as it is a Class 9 noun. The verb stem * + dɪm + , 'cultivate', is quoted as *dɪma, which divides into two phonologically acceptable syllables. Similarly, the verb 'to be or become' in Proto-Bantu is + ba + ; for the sake of consistency, this is quoted with its present tense suffix as *baa.

Test stems.

In order to show the operation of the rules, a list of Proto-Bantu test stems containing the sounds which undergo change in the transition from Proto-Bantu to Proto-Southern Bantu has been compiled. These illustrate all the changes brought about by the rules. The effect of the changes on these stems is shown after each rule, as explained above. Each stem is followed by a representation of its tonal character. As in Proto-Southern Bantu and the modern Southern Bantu languages, verb stems have only a single toneme associated with them. Except in the operation of the two tonal rules, the tones are the same in Proto-Bantu and Proto-Southern Bantu, and are therefore only quoted once.

*baa H 'become'
*bɪada H 'plant'
*bɪdɪ LL 'body'
*bʊdaga H 'kill'
*buaNga H 'mix'
*ciada H 'stay'
*cida L 'grind'
*dɪma L 'cultivate'
*dumida L 'agree'
*gʊa L 'fall'
*gaba L 'divide'
*gida L 'avoid'
*ikʊta H 'have enough'
*kaana H 'deny'
*kipa LL 'tendon'
*Nguena LLL 'crocodile'.
*pɪa HL 'new'
*paNga HL 'knife'
*puana H 'resemble'
*tooda H 'pick up'
*yɪma H 'stand'
*yɪNba H 'sing'
*ye H 'him/her'
*yico HL 'eye'
*yino HL 'tooth'
*yota H 'warm oneself'

4.4.2 Unordered rules.

Nasal palatalisation.

*n became *ny after a front vowel. This is an example of palatalisation, defined by Hock (1986: 73) as 'partial assimilation of a consonant to a neighbouring front vocalic segment'. This rule does

not feed or bleed any other rules, as neither *n nor *ny participate in any of the other rules necessary to describe the differences between Proto-Bantu and Proto-Southern Bantu.

$$n \quad > \quad ny \qquad / \qquad \underset{[+front]}{V} \quad \_$$

Example:

PB	PSB
*Nguena LLL 'crocodile' >	*Nguenya LLL

This rule also applied to the stem *yino 'tooth', but there is no way of telling whether this was before or after the operation of Ordered Rule 4. A similar rule merges *n and *ny before *i. It is impossible to tell whether the two forms both became palatal in the proto-langauge, or both alveolar, as the reflexes are alveolar in some languages and palatal in others. A purely arbitrary choice was made, and the product of this merger is symbolised as *ni. This merging rule may or may not be a subsection of Nasal Palatalisation.

Vowel realisation in extensions.

Like Nasal Palatalisation, this rule does not affect any of the other rules, as vowel quality is never pertinent in the derivation of Southern Bantu, with the exception of the merger of tense and non-tense high vowels, and certain minor rules applying in North Sotho and Tsonga. The rule is morphologically conditioned, in that the vowel change only took place in specific morphological environments. Effectively, what happened was that a morphophonological alternation ceased to operate, and one or the other member of the alternation became the sole form. Hock (1986: 242) states that unproductive (morphologically conditioned) rules are likely to yield to productive ones. Whether this is an adequate explanation for the regularisation of the vowels in extensions is difficult to tell, as the fact that Zezuru generalised the *i extensions while the other pre-dialects generalised *e suggests that the two versions of the applied and neuter suffixes occurred with approximately equal frequency.

In the majority of dialects, the rule applied as follows:

$$\begin{bmatrix} V \\ -low \\ +front \end{bmatrix} \quad > \quad [-high] \quad / \quad \_extension$$

This did not apply in Zezuru, where the rule was

$$\begin{bmatrix} V \\ -low \\ +front \end{bmatrix} > [+high] \; / \; \_extension$$

Example:

PB	PSB
*dumida L >	*dumeda/ *dumida 'agree'

Tone lowering.

All pronominal roots in Proto-Bantu are quoted as having high-toned stems; however, all Southern Bantu pronominal roots (and hence, presumably those of Proto-Southern Bantu) have low tones. Therefore, it can be assumed that Proto-Bantu high tones on pronouns became low tones in Proto-Southern Bantu. Again, this is a morphologically conditioned rule, and hence speculation as to its causes is strictly outside the scope of this thesis, but it serves to illustrate part of the phonological relationship between the two proto-languages.

$$V > [-high\ tone] \; / \; \_pronoun$$

Example:

PB	PSB
*ye H 'him/her' >	*ye L

Tone raising.

It is not certain whether this is a rule or not. It may be due to faulty recording of the data. Proto-Bantu noun stems with the tonal pattern HL correspond to Proto-Southern Bantu stems with the pattern HH, with the sole exception of the stem *bada 'spot', which is listed in Appendix 3 as a tonally skewed stem.

$$HL > HH$$

Examples:

PB	PSB
*pɪa HL 'new' >	*pɪa HH
*paNga HL 'knife' >	*paNga HH

Vowel shortening.

There is no evidence of any vowel-length distinction in Southern Bantu roots. Vowel length distinctions have arisen in affixal morphology, but this appears to be a post-Proto-Southern Bantu development; an example is the Zulu remote past prefix). According to Nurse (1987: 111) this is a common change in Bantu, and is especially characteristic of the eastern Bantu languages:

> Neutralisation of inherited contrast in vowel length (43% of languages)... Changes in vowel length are frequent in natural languages, but are often, at least initially, context-sensitive. There is no evidence within eastern Bantu languages that this neutralisation of vowel length was ever context-sensitive, so we could assume that it was a case of vowel coalescence.

The rule is formulated:

$$V \quad > \quad [-long]$$

Examples:

PB	PSB
*baa H 'become' >	*ba
*kaana H 'deny' >	*kana
*tooda H 'pick up' >	*toda

4.4.3 Ordered rules.

Rule 1. *yik becomes *ky.

This change is best formulated as a sequence of rules, with *k becoming palatalised after the high tense vowel *i, with subsequent loss of the initial syllable *yi.

$$k \quad > \quad ky \quad / \quad yi \quad \_$$

$yi \quad > \quad \emptyset \quad / \quad \# \quad -$

Example:

PB	PSB
*yikʊta H 'have enough' >	*kyʊta
*yijada H 'be full' >	jada

One of the reconstructions of the Proto-Bantu word for 'ten' is *kʊmɪ, while the Proto-Southern Bantu form is *kyumi. It is logical to assume that the latter was derived by the rule *yik > *ky. Proto-Bantu *kʊmɪ is given by both Guthrie and Meeussen as a Class 5 noun. The Class 5 prefix in Proto-Bantu may well have been *yi+ or *i+ (Meeussen 1967: 97), so that this can be taken as a regularly corresponding form.

Rule 2. High vowel gliding.

A high vowel was realised as a glide before a lower vowel. This was probably a phonological rule of Proto-Bantu, as the reflexes of *i, *u, *ɪ, and *ʊ in this position are glides in many Bantu languages. Nurse (1987: 111) states:

> Sequences with /i, u/ as the first element were most likely interpreted as glide plus vowel.

The rule is as follows, though it would need reformulating if *e and *o were also realised as glides before other vowels (4.1.2).

$$\begin{bmatrix} -cons \\ +high \end{bmatrix} \quad > \quad [-syl] \quad / \quad C \quad \_ \quad V$$

Examples:

PB	PSB
*bɪada H 'plant' >	*byada
*ciada H 'stay' >	*cyada
*gʊa L 'fall' >	*gwa
*pɪa HL 'new' >	*pya
*puana H 'resemble' >	*pwana

It is presumed that this rule produced two varieties of *w and two of *y, differentiated by the feature [tense]. The reason for this is discussed under Rule 4.

Rule 3. Velar and palatal merger.

Proto-Bantu velars and palatals merge as obstruents in Proto-Southern Bantu. This rule probably represents palatalisation of velar consonants before high tense vowels. However, the exact phonetic nature of the merger is uncertain, as the reconstruction of Proto-Southern Bantu suggests a velar not a palatal consonant (2.4.1; 2.4.2). For this reason, examples are not given for this rule. The merged palatals and velars feed the following rule, where their reflexes are represented as *kF, *gF.

$$\begin{bmatrix} C \\ -ant \end{bmatrix} > \begin{bmatrix} -son \\ +cor \end{bmatrix} / \_ \begin{bmatrix} -cons \\ -back \\ +high \\ +tns \end{bmatrix}$$

Rule 4. Affrication.

Stops became affricates before high tense vowels and glides. This and the following rule are presented as a sequence of processes, as it is easier to formulate the rules as a sequence. but they probably represent a single process. The affrication of the stops may well have been a compensatory measure for the merger of the tense and non-tense high vowels, and the effect of the pair of rules is observable as a single change between the forms reconstructed for Proto-Bantu and the forms reconstructed for Proto-Southern Bantu.

In Pre-Sotho, the change applied only in two restricted environments: voiceless stops were affricated before the high tense vowel *i; and all stops were affricated before high tense glides. This is why this rule has to follow Rule 2: if affrication preceded tensing, it would be difficult to explain why Pre-Sotho consonants fricativised only before tense vowels which were due to become glides, and not before other high tense vowels.

The general form of the rule was:

$$\begin{matrix} C \\ [-son] \end{matrix} \quad > \quad \begin{matrix} C \\ [-cont\ +cont] \end{matrix} \quad / \quad \_ \quad [+tns]$$

In Pre-Sotho there would be restrictions stating that the tense elements must be a glide; or that it must be a high front vowel if the consonant undergoing the change is voiceless. The effects of Rule 3 are observable in the identity of the reflexes of *c and *k, *y and *g. In this rule and the previous one only, glides are [+ tns]. In all subsequent rules there is no distinction between types of glide.

Examples:

PB	PSB (Pre-Sotho)	PSB (Other)
*bwaNga H 'mix' (< r2) >	*bFwaNga	*bFwaNga
*kFyada H 'stay' (< r3) >	*kFyada	*kFyada
*kFida L 'grind' (< r3) >	*kFida	*kFida
*duma L 'rumble' >	*duma	*dFuma
*gida L 'avoid' >	*gida	*gFida
*yico HL 'eye' >	*gico	*gFico
*kFipa LL 'tendon' (< r3) >	*kFipa	*kFipa
*pwana H 'resemble' (< r1) >	*pFwana	*pFwana

Rule 5. Vowel and glide tensing.

Non-tense high vowels and glides become tense. As discussed under the previous rule, there appears to have been a difference between Pre-Sotho and the other Southern Bantu dialects, in that Pre-Sotho did not apply this rule, except after nasals (and except, perhaps, to the glides). This is a further indication that there was dialectal division even at the Pre-Proto-Southern Bantu stage. This rule has to follow or accompany the previous rule, as it would otherwise bleed its input.

$$\begin{bmatrix} -cons \\ +high \end{bmatrix} \quad > \quad [+tns]$$

Examples:

PB	PSB
*bɪdɪ LL 'body' >	*bidi
*bʊdaga H 'kill' >	*budaga
*yɪma H 'stand' >	*yima

By this rule, glides in stems like *byada (< r2), *gwa (< r2), would become tense.

Rule 6. Velar weakening.

Except when it becomes an affricate before tense vowels (see Rule 4), Proto-Bantu *g corresponds to *y or ∅ in Proto-Southern Bantu. This is explained in terms of Hock's weakening hierarchy (1986: 83). *g became a glide between vowels and then disappeared altogether. Presumably there was a fricative stage in between, though Nurse (1987: 102) comments that *g might well have had a fricative pronunciation in Proto-Bantu anyway. This does not affect *g in the combination *Ng or in the combination *gF, therefore it must have applied after Rule 4. As *y elision is fed by forms other than those derived from Proto-Bantu *g, it is given as a separate rule (Rule 7).

$$g \quad > \quad y \quad / \quad [-nas] \quad \_$$

Examples:

PB	PSB
*budaga H 'kill' (< r5) >	*budaya
*gaba L 'divide' >	*yaba
*gwa L 'fall' >	*ywa

Rule 7. Gliding.

*y is deleted in most environments, but remains initially before front vowels, and medially between non-front vowels.

$$y \quad > \quad \emptyset \quad / \quad \begin{Bmatrix} \# \_ \begin{bmatrix} -cons \\ +front \end{bmatrix} \\ \begin{matrix} V \\ [+front] \end{matrix} \_ \begin{matrix} V \\ V \end{matrix} \\ \begin{matrix} V \\ V \end{matrix} \_ \begin{matrix} V \\ [+front] \end{matrix} \\ \begin{matrix} C \\ \begin{bmatrix} +cont \\ -son \end{bmatrix} \end{matrix} \_ \end{Bmatrix}$$

Examples:

PB	PSB
*yaba L 'divide' (<r6) >	*aba
*ywa L 'fall' (<r6) >	*wa
*yota H 'warm oneself' >	*ota
kFyada H 'stay' (<r4) >	*kFada

Rule 8. High vowel gliding.

This is the same rule as Rule 4. It was apparently still a productive rule, to an extent, as it applied to the forms created by the deletion of *g (Rule 6). It appears, though, to have applied only sporadically, which suggests that it had become morphologised. For example, the noun prefix *du+ followed by the stem *eNdo (<*geNdo by Rules 6 and 7) should yield *dweNdo; but in North Sotho and some Tsonga dialects the prefix is still a separate syllable: /lɪeto/, /rieNdz'o/. There is a possibility, however, that these forms are not derived from Proto-Southern Bantu, but productively in terms of the synchronic rules of North Sotho and Tsonga. As the rule is exactly the same as Rule 4, it will not be reformulated here.

Examples:

PB	PSB
*bu+oya H (<r7) >	*bwoya > *boya
*mu+edFi HL (<r7) >	*mwedFi LH

Note that in the first example the *w is deleted in accordance with the general constraint against /w/ occurring between a consonant and a back vowel in Southern Bantu (see 3.4.2).

The second example is tonally skewed.

Rule 9. Glide labialisation.

The distinction between *y and *w was neutralised after labial consonants. The Venda and Zezuru evidence suggests that both were pronounced *w, as their reflexes of this sound are velar, presumably preserving the velar quality of the *w (see the discussion of *pw, *bw, etc. in 2.4) However, the Zulu, Sotho and Tsonga evidence is different, as here the reflexes are palatal and suggest original *y. This rule is fed by the previous rule. If the two proto-phonemes merged to become *w, then this rule is assimilatory rather than dissimilatory, which is to be expected: the glide assimilated to the labial quality of the stop. According to Hock (1986: 111):

dissimilation and metathesis ordinarily are irregular or sporadic processes. However, it has been noted that some of the most 'shining examples of regularity' come from this class of notoriously irregular changes.

Nevertheless it is necessary to postulate that dissimilation did take place in the ancestral languages of Zulu, North Sotho and Tsonga to produce the palatal *y. Economically it might be best to suppose that there was a difference here between the different pre-dialects, and that in some, Proto-Bantu *w and *y became *y, while in Pre-Shona and Pre-Venda they became *w after bilabials; but for the sake of consistency, it will be presented as a single rule.

$$G \quad > \quad [-front] \quad / \quad \begin{bmatrix} -ant \\ -cor \end{bmatrix} \quad \_$$

Examples:

PB	PSB
*byada H 'plant' (< r2) >	*bwada
*pɪa HL 'new' >	*pwa

4.5 *Conclusion.*

It can be seen that there is a large degree of resemblance between the phonological structures of Proto-Bantu and Proto-Southern Bantu, in terms of consonant and vowel inventory, tonemic oppositions and syllable structure. The major differences are:

1. Vowel shortening.
2. Affrication before tense segments.
3. The merger of tense and non-tense vowels.

Other differences expressed in terms of the rules given in this chapter are trivial (for example nasal palatalisation, which applies to only a very few stems) or doubtful (for instance, the tonal differences observed may be due to faulty data). High vowel gliding was probably a phonological rule of Proto-Bantu, and the status of the proto-forms *g and *y suggests that they were weak elements, and that the latter, especially, might have been a zero.

The first of the major differences listed has been shown to be a general characteristic of the Bantu languages in the east of the Bantu area, and affrication and vowel merging are also widely attested. In fact, Nurse states (1987: 104; 106):

> spirantisation [that is, affrication or fricativisation] of consonants before high vowels ... has affected 81% of the 111 languages examined ... .

The fact that Sotho only participated partially in the affrication and tense/non-tense merger rules means that there is very little evidence that these innovations separate the Southern Bantu languages from the rest of Bantu as a coherent group. There is other evidence that the Southern Bantu languages were differentiated into several pre-dialects (Pre-Sotho, Pre-Nguni, etc.) even at the time of the most recent intermediate ancestor. There is the difference displayed between Pre-Shona vowels in extensions, and those in the other languages; and the likelihood that Pre-Shona and Pre-Venda merged postlabial glides as *w while others merged them as *y. This last rule, Glide Merging, is perhaps the strongest evidence of a shared innovation, but in dealing with a field as complex as the Bantu languages, where phonological rules could easily be borrowed, more evidence is necessary.

The reconstruction of Proto-Southern Bantu given here may represent a much broader intermediate ancestor, perhaps Proto-Eastern Bantu - assuming that Heine's Osthochland-Gruppe (1973: 172) represent the descendants of a common ancestor. However, the reconstruction has been pursued only from within the Southern Bantu languages, with little or no reference to other language groups. To determine whether Proto-Southern Bantu differs significantly from other groups in Eastern Bantu, it is necessary to reconstruct the phonologies of the intermediate ancestors of these groups. When the Southern Bantu languages are considered as a group, then the reconstruction presented here can be taken to represent Proto-Southern Bantu; but more evidence is needed before it can be said whether or not Proto-Southern Bantu is distinct from, or identical to, Proto-Eastern Bantu or some other similar broad division.

5.0 Southern Bantu phonological relationships.

5.1 Introduction.

5.1.1 Phonological innovations.

Henrici suggests (1973: 103), as one of the directions for future research into historical Bantu linguistics, that phonological genealogies should be compiled, and compared to lexicostatistical genealogies. This chapter is an attempt to do this for the Southern Bantu languages. Genealogical divisions on phonological grounds have frequently been made in historical linguistic studies. The major traditional division in the Indo-European family of languages is the 'kentum-satem' division (Collinge 1985: 134). Similarly, there is the division of the Celtic languages into 'p' and 'q' Celtic (Lehmann 1962: 31). These groupings, though, are based on single differentiating criteria, not on sets of phonological rules. The question of what quantity of evidence is sufficient in order to determine relationships if shared phonological innovations are used as a criterion remains debatable. Hoenigswald (1973: 59) states:

> Ideally, this is not a question of amassing evidence. If the tree is a true depiction of actual history, and if the shared innovations are significant rather than trivial (that is, if they are not open to the suspicion of independent duplication) one example is as good as a hundred. In other words, if 'one' shared innovation links A and B significantly against C, there should be none to link A with C or B with C.

Phonological genealogy is based on the assumption that if two languages share an innovation, they have a common derivation. However, there are two possible reasons why this assumption may be false. Firstly, there is the possibility of independent but similar innovations: in Hoenigswald's terms, trivial innovations. For instance, fricativisation as exemplified in the rules given below, is a lenition process that must be assumed to have applied at least twice in the course of the development of North Sotho (Rules 4 and 10). This raises the question of whether it was indeed a shared innovation or just the spontaneous application of a natural rule. Secondly, there is the possibility of rule borrowing. According to Campbell (1976: 183),

> Not only can foreign segments be borrowed into native lexical items in language contact, but foreign phonological rules can be borrowed as well, without necessarily depending on concomitant lexical borrowing.

Lexical borrowing can be identified, though it presents certain difficulties: in historical linguistics where there is no written evidence, it is doubtful whether the borrowing of phonological rules can be identified at all, except where two different families or two quite separate branches of one family

are involved. Within languages, as is well known, sound change may spread gradually, both chronologically and geographically (Bynon 1977: 173-183). This kind of spread among dialects is part of the nature of the way in which sound change may operate. This being the case, a phonological genealogy can only be based on the assumption that if two dialects of the same family show evidence of similar changes, similarly ordered with respect to other rules, then they share a common innovation and a common history, unless there is other evidence to suggest the contrary. In Africa, this assumption can only be made tentatively. Dalby points out (1966: 174) that

> in the field of language, relationships and inter-relationships are certainly more complex than comparative scholars have sometimes suggested. In Africa, a multitude of languages have been in contact with one another over a period of many millenia. Countless linguistic elements have passed between them, and linguistic change and interaction must frequently have been accelerated by social upheaval, by economic penetration, by slave-raiding and inter-marriage, and by wars and conquests.

5.1.2 Rule ordering.

Diachronically, rules will operate for a certain length of time, and after that, though their effects will be present, the rules themselves will be unrecoverable without historical evidence. As some rules are ordered in feeding and bleeding relationship to each other (see 4.4), they can be ordered chronologically. For instance, consonant devoicing after nasals in North Sotho feeds nasal deletion before consonants. The opposite order would result in voiced as well as voiceless obstruents of certain kinds in North Sotho, for example the word for elephant would be something on the order of *d£ou.[5] However, there are certain rules which apply recursively or continuously throughout the history of a language family. An example of this is the rule of nasal assimilation, by which a nasal consonant always has the same place of articulation as a following tautosyllabic consonant. This rule occurs in Proto-Southern Bantu and in all its daughter languages except North Sotho, which does not have consonants occurring with tautosyllabic nasals. North Sotho has a similar rule, though, as syllabic nasals assimilate to a following consonant in that language. As there is no evidence to the contrary, it can be presumed that the rule applied at every stage of the development of Southern Bantu, and was never lost. Such rules, not being innovations, cannot be used for a genealogy. In order to use phonological rules for genealogical purposes, obviously only rules shared between two or more languages need to be taken into consideration. Occasionally, though, a rule unique to a particular language feeds a shared rule, and such one-language rules are therefore included in the list of rules in 5.5.

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[5] Gregersen (1967) has shown that this principle can be used to date the entry of known loanwords into languages.

The Proto-Southern Bantu reconstructed in Chapters 1-3 represents a model of the ancestral language of the modern Bantu languages discussed in this thesis, and it is presumed that the change which took place to produce the modern forms were changes in rules, in accordance with the transformationalist theory of language change (King 1969). Hooper summarises the position as follows (1976: 86):

> In reality, phonetic innovation is only rule modification, not rule addition.

Guthrie (1971: 30-64) lists the changes from Proto-Bantu to various modern Bantu languages, but there are problems with applying Guthrie's methods, in that he merely gives rules for the changes affecting each reconstructed phoneme, and makes no attempt to find out even the common rules within a language, let alone those rules that were most likely shared between languages of a single group. In what follows, it will be shown that a series of rules can be postulated to account for the development of the modern Southern Bantu languages. This series will be examined to see whether it can serve as the basis of a genealogy of the five Southern Bantu languages of this study, which may then be compared to other genealogies that exist. However, it must be borne in mind that the Proto-Language is not an attested language: it is merely a hypothetical construct, a 'common denominator' prototype parent language as reconstructed from the daughter languages.

Previous classifications, made using the lexicostatistical method (see 1.1), are in effect measures of the degree by which each daughter language differs from the prototype parent and differ from their sister languages in terms of vocabulary; similarly, the genealogy in this chapter attempts, firstly, to outline the minimum number of phonological innovations necessary to distinguish the daughter language from the prototype, and secondly, to discover whether any clear grouping of the daughter languages can be detected from shared innovations.

5.2 Sound changes.

The operation of sound-change rules.

The sound changes operate on the rules defining the relationships between the proto-phonemes as reconstructed. The kinds of sound change which operate are assumed to follow certain natural tendencies in rules, notably the tendency either to rule simplification or to phonetic simplification.

Intermediate stages.

The phones found in the modern languages are obviously the product of these rules, but the sounds in one language may represent earlier forms through which other sounds passed. For example, /kh/ in Zulu represents a form which would be a logical step in the development from Proto-Southern Bantu *k to North Sotho /ɤ/, and so *kh can be assumed to represent an intermediate form in the development of North Sotho. Alternatively, a plausible but non-attested intermediate form must

be postulated in certain cases. For example, the nasal and voiceless stop combination *Np is manifested in the modern daughter languages as follows:

*Np > /Np/ (Zulu)
/mh/ (Tsonga and Zezuru)
/ph/ (North Sotho and Venda).

The most economical explanation of these differences is that there were two routes of development:

*Np > /Np/
*Np > *Nph > /mh/
*Nph > /ph/

An intermediate aspirated form, *Nph, is postulated as the ancestor of both the Zezuru/Tsonga and North Sotho/Venda forms, but not of Zulu, as Zulu would then require a further rule of *deaspiration*. The kind of development postulated is as natural as possible. Effectively this means that sound change will take place in terms of lenition, which is described in the next section.

The postulation of intermediate forms leads to certain anomalies which would arise if each rule applied only once. For instance, if it is assumed that the change from palatal *c to /s/ in Zezuru and Venda took place along the following route:

*c > *tʃ > *ʃ > s

then this leads to a conflict with the development:

*ki/*ke > *tʃi/*tʃe.

The change to *c must have taken place well before the change to *ki/*ke, or else one is faced with the difficulty of explaining why *tʃ derived from *c fricativises while *tʃ derived from *k does not.

Of course, the change from *c to *s may have taken place along a different route. If it is assumed that the Southern Bantu languages were like Na-Dene (see 2.4), and that the sound reconstructed for the attesting comparative series should be *tθ, then another anomaly arises:

*tθ > *ts > s

but

*tF > ts, with no further change.

Note that *tF → *ts is assumed to be a phonological rule of the proto-language. Again, it is simplest to assume that the change from *c to *s took place well before the other changes, whatever its intermediate route.

The derivation of the reflexes of *j, the voiced equivalent of *c, confirms this: if

*j > *dð > *dz > z

this conflicts with

*dF > dz, with no further changes.

Again, a possible merger has produced different reflexes, and therefore could not have been a merger. Compare Tsonga, where the expected merger does take place:

*j > *dz > *ts > t
*dF > *dz > *ts > t.

Once more, this lends weight to the hypothesis that the Zezuru change from palatal stop to alveolar fricative must have taken place before the affrication rule. This in turn lends further support to the observation that there was already dialectal differentiation at the Proto-Southern Bantu stage; as Tsonga, for instance, did not undergo complete fricativisation of *j. The implications of the division into pre-dialects are discussed at the end of this chapter.

Another apparent anomaly that arises is the following, in Venda:

*ty > *tʃ > ʃ

but

*ky > tʃ, without further change.

This can only be explained if it is assumed that the change from *ty to /ʃ/ was complete by the time *ky became /tʃ/.

In Tsonga, the exact opposite occurs:

*ky > *tʃ > ʃ

but

*ty > *tʃ > tʃh.

Here it is assumed that the change to *ky was complete before *ty changed.

5.3 *Lenition.*

As stated in 2.3, Proto-Southern Bantu consonants occur in the following environments:

N _ [-cons]
V _ [-cons]
_ [-cons]

The third environment can be viewed as a type of the second, because the languages are prefixing, and prefixes would either end in a vowel, or in a nasal, in which case they have been considered as part of the stem (see 1.4.3). Therefore the second and third environments can be summarised as

V _ [-cons]

That is, Proto-Southern Bantu consonants and consonant compounds occur intervocalically, and in this environment changes due to lenition 'make up the bulk of regular change' (Hock 1986: 61). Hock describes the processes of lenition as follows (1986: 81):

> the first step is intervocalic voicing ... The second step diminishes oral contact by fricativisation or gliding, changing the voiced stop to fricative or even to glide. And only then comes the final stage, the total disappearance of the 'offending' segment. Other scenarios [include] first ... fricativization, then voicing, and finally loss.

He summarises (1986: 82) the changes of lenition as taking place in terms of

> a weakening hierarchy largely defined by a combination of increased voicing and sonority ... weakening of oral stops is blocked next to a nasal.

and states (1986: 83)

> these changes have a strong tendency to occur in just two environments: medial intervocal (or intersonorant) position, and word- or syllable-final environment.

Obviously the latter does not apply in the Southern Bantu languages, with their open-syllable structure. Lenition can be seen as a process of assimilation, as the obstruents assimilate to the surrounding vowels in terms of voicing and openness.

The majority of the changes postulated for Southern Bantu are ascribable to lenition, or otherwise to assimilation in consonant compounds. Where other factors and other kinds of change are involved, this is noted.

5.4 Presentation of the rules.

In the following section, the rules for the derivation of the Southern Bantu languages from Proto-Southern Bantu are given. The rules are stated informally and formally, and each rule is accompanied by a table of stems containing sounds affected by the rule, and by a brief paragraph of comment. Where no rule is given, it can be assumed that no change occurred. For instance, except in one case in North Sotho, the tonemes of Proto-Southern Bantu correspond exactly in value to the tonemes of the daughter-languages, so the only rule given for this is a minor rule for North Sotho. In the other languages, no change took place. The early rules in this section were probably phonological rules of Proto-Southern Bantu (see 3.6). They are presented in greater detail here, with reference to their operation in each pre-dialect. As mentioned above, in certain cases, a rule will have several restrictions on its application, which apply in different pre-dialects. In this case, only the general rule is given formally, and the restrictions are described informally. The rules are given in a form which assumes the existence of certain redundancy rules. It is the phonological structure of Proto-Southern Bantu which is affected by these rules. No account is taken of any possible borrowed segments, or their effects on the phonology of the pre-dialects (Campbell 1976: 183), as these do not form any part of the data. Thus, in a rule, a class of segments designated by a particular feature is assumed to consist of the original Proto-Southern Bantu phonemes classed by that feature, or those created by a rule given here. If a rule bleeds a certain class of segments in a dialect, this is also taken into account.

Following each rule there is a table showing examples of stems which undergo the changes of the particular rule. The following is an example (taken from Rule 8):

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
*pwa 'burn'	(no change)	> *pFa	*pFa < r6 > *psa	-	*pFa < r6 > *psa
*tFumo 'spear'	-	> *tumo	-	> *tfumo	> *tfumo

This means that the proto-form *pwa 'burn' remains unchanged in Zulu, in terms of this particular rule. This proto-form has produced an intermediate form *pFa, in North Sotho, Venda and Zezuru, by Rule 6; under the present rule, Rule 8, this becomes *psa in all three languages. The asterisk indicates that this is another intermediate form which will undergo further changes. The stem *pwa has produced no regular reflex in Tsonga. The proto-form *tFumo 'spear' has undergone no previous changes, and by Rule 9 it becomes *tumo, *tfumo and *tfumo in North Sotho, Tsonga and Zezuru respectively: it has no regular reflexes in either Zulu or Venda.

If a rule applies only to one or two pre-dialects, then the other pre-dialects are not represented in the table. It is necessary to include such limited rules, as they bleed and feed other, general rules. Rules applying in only one or two pre-dialects are designated 'minor' rules, and are not formally stated; the other rules are 'major' rules.

Sample derivations.
Each rule is tested by means of sample derivations applied to stems which would have undergone the changes in question. The following is a list of all such stems used as examples:

*aduka 'twist'
*buNba 'mould'
*bwada 'plant'
*bFwaNga 'mix'
*bFuda 'open'
*caNdFa 'vomit'
*dida 'cry'
*dFumeda 'agree'
*dFwa 'come out'
*eneka 'spread'
*eNbata 'wear'
*gFico 'eye'
*jada 'be full'
*jiba 'know'
*kama 'squeeze'
*keka 'cut'
*kyuta 'have enough'
*kFada 'remain'
*kFuNdo 'knot'
*mwedFi 'moonlight'
*nuNka 'smell'
*nyoki 'bee'
*okya 'roast'
*paNci 'underneath'
*pwa 'burn'
*pFica 'hide'
*pFuba 'chest'
*pFwana 'resemble'
*tyududa 'pour'
*tFi 'smoke'
*tFumo 'spear'
*yima 'stand'
*yiNba 'sing'
*Nbewu 'seed'
*Nbwa 'dog'
*NbFuda 'rain'
*NbidFa 'cooking-pot'
*NbudFi 'goat'
*NcaNbFi 'fish'
*Ngubo 'garment'
*Njebe 'ear'
*Njida 'path'
*NjogFu 'elephant'
*NkokFi 'chief'
*Nkuku 'chicken'
*Nkuni 'firewood'
*NpaNja 'baldness'
*Npwa 'dry'
*Ntu 'person'

5.5 The rules.

These rules are rules that applied in all the languages, or feed or are bled by rules that apply in all the languages. For convenience of reference, they are numbered in sequence, though some are

minor rules, applying in only one or two languages, while others are major rules, applying in three or more languages. The status of each rule is given in brackets after the rule number.

Rule 1 (minor). Preglide voicing and implosion.

This rule applied only in Zezuru. A consonant was voiced before *y. If alveolar, it became an implosive. This is observable as a single event, but presumably it represents a sequence of events: voicing and then alveolar implosion. *k only becomes voiced before the sequence *yu, which perhaps reflects a difference in the way *ky was pronounced before *u from the way it was pronounced before other vowels. A possible explanation is that *k was voiced after Proto-Bantu *yi.

	ZEZURU
*tyududa 'pour'	> *ɘyududa
*kyuta 'have enough'	> *gyuta

Rule 2 (minor). Glide elision.

*y was elided after a consonant. This rule applied in Zulu, where it was only effective after *t; and in Zezuru, where it was fed by Rule 1.

	ZULU	ZEZURU
*tyududa 'pour'	> tududa	*ɘyududa <rl > *ɘurura

Rule 3 (minor). Palatal merger.

This rule applied only in Sotho. *ky and *k before front vowels merge with *c. This is assumed because the reflexes of these two proto-phonemes in sequences before front vowels are exactly the same in North Sotho, which is not the case in any other dialect.

	N.SOTHO
*keka 'cut'	> *ceka
*nyoki 'bee'	> *nyoci

Rule 4 (minor). Palatalisation and fricativisation.

This rule (or series of rules) applied only in Venda. *ty became a palatal affricate *tʃ, and subsequently became a palatal fricative ʃ. This rule had to apply at this early point, because *ky later produces a palatal affricate which does not fricativise (see 5.2).

	VENDA
*tyududa 'pour'	> *ʃududa

Rule 5 (major). Palatal stop fronting.

The general effect of this rule was to front the palatal stops. The exact nature of the fronting differs from language to language, and from phonological environment to phonological environment, in some cases producing alveolar fricatives, *s and *z, while in others it produces affricates, *tɬ, *dɮ. After nasals, the reflexes are always affricates, but this is probably because of the general Southern Bantu syllable structure constraint that no fricative may follow a nasal. The fact that all the reflexes are front consonants, and the majority are affricates or fricatives, lends support to the view that even at the Southern Bantu stage the proto-phonemes were probably affricates; the only counter-evidence comes from Venda, where they become stops in most circumstances; and from the palatal nasal, which in North-Sotho and Venda also participates in this rule, suggesting that *c and *j were originally palatals and stops.

$$\begin{bmatrix} C \\ -ant \\ +cor \end{bmatrix} > \begin{bmatrix} +ant \\ -cor \end{bmatrix}$$

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
*Ncoko 'head'	-	> *Ntɬoko	> *N'toko	> *Ntɬoko	-
*paNci 'underneath'	> *paNtsi	> *paNtsi	> *paNtsi	> *paNtsi	> *paNtsi
caNdFa 'vomit'	> *tɬaNdFa	> *tɬaNdFa	> *'taNdFa	> *tɬaNdFa	-
*jada 'be full'	> *dzada	> *dɬada	> *'dada	> *dzada	> *zada
*jiba 'know'	> *dziba	> *dziba	> *'diba	> *dziba	> *ziba
*nyoki 'bee'	(no change)	*nyoci < r3 > *nosi	> 'noki	(no change)	-
*Njebe 'ear'	> *Ndɬebe	> *Ndzebe	> *N'debe	> *Ndɬebe	> *Ndzebe
*NpaNja 'baldness'	> *NpaNdɬa	> *NpaNdɬa	-	-	> *NpaNdza

There is no reason to postulate that Zezuru *c and *j became anything but *s and *z intervocalically. Zezuru does not participate in the general rule of fricativisation, Rule 10 (see 5.2).

Rule 6 (major). Glide fricativisation.

This rule applied in all languages except Zulu (the evidence for Tsonga is unreliable, as it is uncertain whether

*pwa 'burn' > ts^w ha

represents a regular reflex). A glide became a fricative after certain consonants. In the majority of languages this applied only to *w in the combination *pw. In Venda it also applied to *y in the combination *kyu. This assimilation feeds the later Rule 8.

$$G \;>\; \begin{bmatrix} -son \\ -vd \end{bmatrix} \;/\; \begin{matrix} C \\ \begin{bmatrix} -cor \\ -vd \end{bmatrix} \end{matrix} \;\_$$

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
*pwa 'burn'	(no change)	> *pFa	> *pFa	?	> *pFa
*kyuta 'have enough'	(no change)	-	> *kFuta	(no change)	*guta <r2 (no change)

Rule 7 (major). Velar fronting.

*k is assimilated in place of articulation to a following palatal glide or front vowel. This rule applied in all languages. As it always becomes an affricate or a fricative, never a stop in this environment, it is assumed that it was affricated at the same time, and that a following *y was lost in the affrication process. In Zulu and North Sotho, *k may have become alveolar in this environment, as there is no evidence of palatal articulation. This is supported by the consideration that a palatal affricate would have merged with the *tʃ derived from *tF in North Sotho, in terms of Rule 8. Of the development of palatalised *k in French, Bourciez and Bourciez (1982: 128) state:

> Continuant sa progression, [k^y] a basculé dans la zone d'avant, aboutissant à un [t^y] qui s'est résolu soit en [tʃ], soit (par une avancée plus nette) en [ts].

This suggests that a change *k > *ts, without intervening steps, has a precedent.

The rule is formulated:

$$k \quad > \quad \begin{bmatrix} -cont\ +cont \\ -ant \\ +cor \end{bmatrix} \quad / \quad - \quad \begin{bmatrix} -cons \\ +front \end{bmatrix}$$

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
*keka 'cut'	-	> *tseka	> *tʃeka	> *tʃeka	> *tʃeka
*kyuta 'have enough'	> *tsuta	-	*kFuta < r6 (no change)	> *tʃuta	*guta < r2 (no change)
*okya 'roast'	> *otsa	-	> *otʃa	> *otʃa	> *otʃa

Rule 8 (major). Offglide assimilation.

The offglide of an affricate assimilated in backness to a following vowel or glide. This was most likely a phonological rule existing in Proto-Southern Bantu, as it operates in all the pre-dialects. It is an assimilatory rule. In Tsonga, *bF became *bv, even before *i: that is, the assimilation was occasionally progressive and not regressive; in Zulu, *pFi becomes *pfi. In North Sotho, the change described by the rule was accompanied or preceded by untensing of vowels which did not follow Proto-Southern Bantu fricatives, and followed by a merger of *kʃ and *tʃ as *tʃ, and also a loss of the fricative element before *u. The manifestation of the fricative after alveolar consonants was palatal, and the rule did not only apply to voiceless back consonants before *i and to voiced consonants before glides. In Zezuru, the rule did not apply to *gF before *u, which became *gu. In Venda, *gF became *g before all high vowels.

$$\begin{bmatrix} C \\ +cont \\ -son \end{bmatrix} \quad > \quad [\alpha back] \quad / \quad C \quad \_ \quad \begin{bmatrix} -cons \\ \alpha back \end{bmatrix}$$

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
*bFwaNga 'mix'	> *bvwaNga	> *bzwaNga	> *bvwaNga	> *bvwaNga	-
*bFuda 'open'	> *bvuda	> *buda	> *bvuda	> *bvuda	-

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
*dFumeda, *dFumida 'agree'	> *dvumeda	> *dumeda	> *dvumeda	> *dvumeda	> *dvumida
*gFico 'eye'	-	> *gico	> *gico	> *gziko	-
*kFu 'death'	-	> *ku	> *kfu	> *kfu	> *kfu
*kyuta 'have enough'	*tsuta <r7 (no change)	-	*kFuta <r6 > *kfuta	*tʃuta <r7 (no change)	guta <r2 (no change)
*dFiba 'pool'	> *dziba	> *diba	> *dziba	> *dziba	> *dziba
*NbFuda 'rain'	> *Nbvuda	> *Nbuda	> *Nbvuda	> *Nbvuda	> *Nbvuda
*NkokFi 'chief'	> *Nkoksi	> *Nkotʃi	> *Nkoksi	> *Nkoksi	> *Nkoksi
*pwa 'burn'	(no change)	pFa < r6 > *psa	*pFa <r6 > *psa	(no change)	*pFa <r6 > *psa
*pFwana 'resemble'	> *pfana	> *pswana	> *pfana	> *pfana	-
*NcaNbFi 'fish'	*NtɬaNbFi <r5 > *NtɬaNbzi	*NtɬaNbFi <r5 > *NtɬaNbi	-	*NtɬaNbFi <r5 > *NtɬaNbvi	- -
*tFi 'smoke'	> *tsi	> *tʃi	> *tsi	> *tsi	> *tsi
*tFumo 'spear'	-	> *tumo	-	> *tfumo	> *tfumo
*pFica 'hide'	*pFitɬa <r5 > *pfitɬa	*pFitɬa <r5 > *pfitɬa	*pFi'ta <r5 > *pfi'ta	*pFitɬa <r5 > *pfitɬa	- -

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
*pFuba 'chest'	> *pfuba	> *puba	-	> *pfuba	> *pfuba
*NjogFu 'elephant'	*Nd£ogFu <r5 > *Nd£ogvu	*Nd£ogFu <r5 > *Nd£ogu	*N'dogFu <r5 > *N'dogu	*Nd£ogFu <r5 > *Nd£ogvu	*NdzogFu <r5 > *Ndzogu

Rule 9 (major). Fricativisation.

Affricates were weakened to fricatives, except after nasals. In Zulu, this applied generally. In Venda, it only applied to bilabial and velar consonants. In Zezuru it applied only to velars. In Tsonga and North Sotho it only applied to voiceless consonants. In North Sotho, Venda and Zezuru the affricate *ps changed to a heterorganic fricative *ɸs, which became the alveolabial fricative s^w . This underwent a further weakening to /sw/ in North Sotho.

$$\begin{bmatrix} C \\ +ant \\ -cor \end{bmatrix} > \emptyset \; / \; [-nas] \_ \begin{bmatrix} C \\ +ant \\ -cor \end{bmatrix}$$

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
*pFica 'hide'	*pfitɬa <r8 > fiɬa	*pfitɬa <r8 > fiɬa	*psi'ta <r8 > s^w i'ta	*pfitɬa <r8 > fiɬa	-
*pFuba 'chest'	*pfuba <r8 > fuba	*puba <r8 (no change)	-	*pfuba <r8 > *fuba	*pfuba <r8 (no change)
*pFwana 'resemble'	*pfwana <r8 > *fwana	*pswana <r8 > swana	*pfwana <r8 > *fwana	*pfwana <r8 > *fwana	-

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
*bFwaNga	*bvwaNga <r8 > *vwaNga	*bzwaNga <r8 (no change)	*bvwaNga <r8 > *vwaNga	*bvwaNga <r8 > *bvwaNga	-
*kyuta 'have enough'	*tsuta <r7 > *suta	-	*kfuta <r8 > *futa	*tʃuta <r7 > ʃuta	*guta <r2 (no change)
*NcaNbFi 'fish'	*Ntɬ aNbzi <r8 (no change)	*Ntɬ haNbi <r8 (no change)	-	*Ntɬ haNbvi <r8 (no change)	

Rule 10 (major). Alveolar sonorant formation.

*d is pronounced as a flap initially or after a vowel. As it applies in all the pre-dialects, this was presumably another allophonic rule operating in Proto-Southern Bantu. Later, this flap sound developed into a lateral sonorant or a trill. In North Sotho, it also applied to the *d created by the offglide assimilation rule, and therefore it follows Rule 8. In other languages, it is unordered with respect to that rule.

$$\begin{bmatrix} C \\ -nas \\ +ant \\ +cor \\ +vd \end{bmatrix} > [+son]$$

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
*dFumeda, *dFumida 'agree'	*vumeda <r9 > *vumela	*dumeda <r8 > *Dumela	*dvumeda <r8 > *dvumeLa	*dvumeda <r8 > *dvumela	*dvumida <r8 > *dvumira
*dida 'cry'	> lila	> lila	> LiLa	> rila	> rira

Rule 11 (major). Homorganic affricate formation.

Heterorganic affricates became homorganic. This rule is fed by Rule 8, which creates affricates, and is bled by Rule 9, which makes some of them into fricatives. It feeds the later rule of affricate devoicing (Rule 25).

$$\begin{matrix} C \\ [-cont] \end{matrix} \quad > \quad [\alpha place] \quad / \quad \_ \quad \begin{matrix} C \\ [\alpha place] \end{matrix}$$

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
*tFumo 'spear'	-	*tumo < r8 (no change)	-	*fumo < r9 (no change)	*tfumo < r8 > *pfumo
*dFumeda, *dFumida 'agree'	*vumela < r10 (no change)	*Dumela < r10 (no change)	*dvumeLa < r10 > *bvumeLa	*dvumela < r10 > *bvumela	*dvumira < r10 > *bvumira
'mix'	*vwaNga < r9 (no change)	*bzwaNga < r8 > *dzwaNga	*vwaNga < r9 (no change)	*bvwaNga < r9 (no change)	-
*NjogFu 'elephant'	*Ndɬovu < r9 (no change)	*Ndɬogu < r8 (no change)	*N'dogu < r8 (no change)	*Ndɬobvu < r8 > *Ndɬobvu	*Ndzogu < r8 (no change)
*NcaNbFi 'fish'	*NtɬaNbzi < r8 > NtɬaNdzi	*NtɬhaNbi < r8 (no change)	-	*NtɬhaNbvi < r8 (no change)	

Rule 12 (major). Aspiration.

Voiceless stops and affricates became aspirated. This rule represents assimilation of the vowel to the voicelessness of the preceding consonant, as [h] is really a voiceless vowel. In all the pre-dialects there were evironmental conditions on the operation of this rule. In Zulu it never applied after nasals, or to intervocalic *k unless there was a *k in the preceding syllable. In North Sotho it did not apply to intervocalic *t, as this was later voiced, and eventually became a sonorant. In Tsonga it did not apply to *k, except after nasals. In Venda it did not apply to *'t and *t, except after nasals. In Zezuru affricates were only aspirated postnasally.

$$\begin{matrix} C \\ [-cont \\ -vd] \end{matrix} \quad > \quad [+asp]$$

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
*keka 'cut'	- -	*tseka <r7 > *tsekha	tʃeka <r7 > tʃekha	*tʃeka <r7 (no change)	tʃeka <r7 > tʃeka
*kyuta 'have enough'	*suta <r9 > sutha	-	*futa <r9 (no change)	*ʃuta <r9 > *ʃutha	*guta <r2 > gutha
*kama 'squeeze'	> *khama	> *khama	> *khama	(no change)	> *khama
Nkuku 'chicken'	> *Nkukhu	> *Nkhukhu	> *Nkhukhu	> *Nkhuku	> *Nkhukhu

Rule 13 (major). Labial dissimilation.

This rule had two parts. Firstly, *m became /ŋ/ before *w. This did not apply in Zulu, and Zulu forms in *mw feed the next part of the rule. Secondly, *w became *y after bilabial stops (and nasals in Zulu). This rule, or pair of rules, represents an assimilation of the nasal to the place of articulation of the glide.

$$\begin{matrix} N \\ [-cor] \end{matrix} \quad > \quad [-ant] \quad / \quad \_ \quad \begin{matrix} G \\ [-ant] \end{matrix}$$

$$G \quad > \quad [-front] \quad / \quad \begin{matrix} C \\ [+ant \\ -cor \\ -cont] \end{matrix} \quad \_$$

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
*mwe 'one'	*mye	> ŋwe	> ŋwe	> ŋwe	(no change)
*pwa 'burn'	*phwa <r12 > *phya	swa <r9 (no change)	s^{w}a <r9 (no change)	-	*ts^{w}a <r11 (no change)
*bwada 'plant'	*bwala <r10 > *byala	*bwala <r10 > *byala	-	*bwala <r10 > *byala	-
*Nbwa 'dog'	> *Nbya	> *Nbya	(no change)	-	(no change)

Rule 14 (major). Velar gliding.
In North Sotho, Venda and Zezuru, *g became a glide assimilating in backness to a following vowel.

$$g > \underset{[\alpha back]}{G} \; / \; \_ \; \underset{[\alpha back]}{V}$$

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
*gFico 'eye'	-	*gitɬho <r12 > *yitɬho	*gi'to <r8 > *yi'to	*dzitɬho <r12 (no change)	*ziso <r12 (no change)
*NjogFu 'elephant'	*Ndɮovu <r9 (no change)	*Ndɮogu <r8 > *Ndɮowu	*N'dogu <r8 > *N'dowu	*Ndɮobvu <r11 (no change)	*Ndzogu <r8 > Ndzowu

Rule 15 (major). Glide elision.
*w was elided after a bilabial consonant. This rule represents the elision of a very weak sound (in terms of the hierarchy of weakness) next to a sound with the same place of articulation. It applied vacuously in Sotho, because there were no bilabial continuants (see 5.9.2).

*w was also elided in North Sotho, Venda and Zezuru next to *u. The palatal equivalent of this rule also applied, and *y was elided next to *i. In Zulu this only applied initially. In Tsonga it did not apply at all.

$$\begin{matrix} G \\ [\alpha back] \end{matrix} \quad > \quad \emptyset \quad / \quad \left\{ \begin{matrix} [\alpha back]\ \_ \\ \_\ [\alpha back] \end{matrix} \right\}$$

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
*bFwaNga 'mix'	*vwaNga <r9 > *vaNga	*dzwaNga <r11 (no change)	*vwaNga <r9 > *vaNga	*bvwaNga <r8 > *bvaNga	-
*pFwana 'resemble'	*fwana <r9 > *fana	*swana <r9 (no change)	*fwana <r9 > *fana	*fwana <r9 > *fana	-
*Nbewu 'seed'	(no change)	*Nbewʊ <r8 > Nbeʊ	> *Nbeu	(no change)	> *Nbeu
*yima 'stand'	> *ima	*yɪma <r8 > *ɪma	> ima	(no change)	> *ima
*gFico 'eye'	-	*yitɬho <r14 > *itɬho	*yiʻto <r14 > *iʻto	*dzitɬho <r12 (no change)	*ziso <r12 (no change)
*NjogFu 'elephant'	*Ndɮovu <r9 (no change)	*Ndɮowu <r14 > *Ndɮou	*Nʻdowu <r14 > *Nʻdou	*Ndɮobvu <r11 (no change)	*Ndzowu <r14 > Ndzou

Rule 16 (major). Initial *a-elision.

This rule did not apply in Zulu, and the data does not attest whether or not it applied in Venda. *a was elided at the beginning of a polysyllabic stem.

$$a \quad > \quad \emptyset \quad / \quad \# \quad \_ \quad CVCV$$

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
'twist'	*aluka <r10 (no change)	*alukha <r12 > *lukha	-	*aluka <r10 > luka	*arukha <r12 > ruka

Rule 17 (major). Front vowel lowering.

A front vowel was lowered at the beginning of a polysyllabic stem. This rule must follow Rule 16,

as it would otherwise have fed it, resulting in forms like *neka for 'spread' in Tsonga, say; but this pair of rules is unordered with respect to all other rules. This rule did not apply in Zulu.

$$e \quad > \quad a \quad / \quad \# \quad \_ \quad CVCV$$

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
*eneka 'spread'	(no change)	*enekha <r12 > *anekha	*enekha <r12 > *anekha	> *aneka	-

Rule 18 (major). Glide fricativisation.

*y > *ʃ, *3 after labial obstruents in Zulu and Sotho, and *w > *x, *ɣ in Venda and Shona. Here the glide become an obstruent, assimilating in manner of articulation to the preceding consonant. The rule feeds Rule 20, Place Assimilation.

$$G \quad > \quad \begin{bmatrix} -son \\ \alpha vd \end{bmatrix} \quad / \quad \begin{matrix} C \\ [-nas] \end{matrix} \quad \_$$

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
*pwa 'burn'	*phya <r13 > *pʃha	swa <r9 (no change)	s^{w}a <r9 (no change)	-	ts^{w}a <r11 (no change)
*bwada 'plant'	*byala <r13 > *b3ala	*byala <r13 > *b3ala	*bwaLa <r10 > *bɣaLa	*byala <r13 (no change)	-
*Nbwa 'dog'	*Nbya <r13 > *Nb3a	*Nbya <r13 > *Nb3a	> *Nbɣa	-	> *Nbɣa

Rule 19 (major). Voiced stop fricativisation.

This applied in all languages except Zulu. It occurred only before vowels in most languages, but in North Sotho it also applied before the offglides of heterorganic fricatives. It must apply after Rule 8, which feeds it in North Sotho, and bleeds it in other languages. It is also fed by Rule 18.

$b \quad > \quad [+cont] \quad / \quad [-nas] \quad \_$

The consonant becomes continuant under the influence of the surrounding vowels.

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
*bwada 'plant'	*b3ala <r18 (no change)	*b3ala <r18 > *β3ala	*bɣaLa <r18 (no change)	*byala <r13 (no change)	-
*pFuba 'chest'	*fuba <r9 (no change)	*puba <r8 > *fuβa	-	*fuba <r9 > *fuβa	*pfuba <r8 > *pfuβa
*buNba 'mould'	(no change)	> *βuNba	> *βuNba	> *βuNba	> *βuNba

Rule 20 (minor). Place assimilation.

This rule applied in Zulu only. It has to precede Rule 25, as it feeds affricate devoicing, unless that rule applied to heterorganic affricates. An obstruent was assimilated to a following consonant in place of articulation. The rule also applies to nasals, as *my > ny, presumably via *Ny.

$$C \quad > \quad [\alpha place] \quad / \quad \_ \quad \begin{matrix} C \\ [\alpha place] \end{matrix}$$

	ZULU
*bwada 'plant'	*b3ala <r18 > *d3ala
*mwe 'one'	*mye <r18 > *nye
*pwa 'burn'	*pʃha <r18 > *tʃha
*Nbwa 'dog'	*Nb3a <r18 > *Nd3a

Rule 21 (major). Voiceless stop lenition.

A voiceless stop becomes a fricative after [- nas], except for *t or *th, which became trills. This is assimilatory, as the stop becomes assimilated to the surrounding vowels in manner of articulation ([+cont]). This rule only applied in Sotho, Venda and Tsonga.

$$\begin{matrix} C \\ [-vd] \end{matrix} \quad > \quad [+cont] \quad / \quad \_ \quad \begin{matrix} V \\ [-tns] \end{matrix}$$

It was followed by a rule of fricative weakening, applying variously in various dialects. In North Sotho, *x > ɣ intervocalically, except next to tense vowels, where it became /h/. In Venda, *x became /h/, and was lost altogether after front vowels. In Tsonga, *ɸ > /h/.

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
*keka 'cut'	-	*sekha <r12 > sexa > seɣa	tʃekha <r12 > *tʃexa > *tʃea	*tʃeka <r7 (no change)	*tʃeka <r7 (no change)
*kFu 'death'	-	> *khu <r12 (no change)	*fu <r9	*fu <r9 (no change)	*fu <r9 (no change)
*kyuta 'have enough'	*sutha <r12	-	*futa <r9 > *fura	*ʃutha <r12 > *ʃurha	gutha <r12 (no change)
*paNci 'underneath'	*phaNtsi <r12 (no change)	*phaNtshi <r12 > *ɸaNtshi	*phaNtshi <r12 > *ɸaNtshi	*phaNtshi <r12 > *ɸaNtshi > haNtshi	*phaNtshi <r12 (no change)
*tFumo 'spear'	-	*tumo <r8 > *rumo	-	*fumo <r9 (no change)	*pfumo <r8 (no change)

Rule 22 (minor). Nasal aspiration.

In Tsonga and Zezuru the nasals compounds *Nph, *Nth and *Nkh (from Rule 12) became voiced aspirated nasals, witht the velar weakening further to become a glottal fricative.

	TSONGA	ZEZURU
*NpaNja 'baldness'	-	*NphaNdza <r10 > mhaNdza
*NkokFi 'chief'	*Nkhosi <r12 > hosi	*Nkhosi <r12 > hosi
*Ntu 'person'	Nthu <r12 > nhu	Nthu <r12 > nhu

Rule 23 (minor). Postnasal Devoicing.

In North Sotho, a consonant became voiceless after a nasal.

	N.SOTHO
*caNdFa 'vomit'	*tɬhaNd3a <r9 > *tɬhaNtʃa
*Njebe 'ear'	*Ndzeβe <r19 > *Ntseβe
*NjogFu 'elephant'	*Ndɮou <r15 > *Ntɬou
*buNba 'mould'	*βuNba <r19 > *βuNpa
*Nbwa 'dog'	*Nb3a <r18 > *Npʃa

Rule 24 (major). Nasal elision.

In Sotho, Venda, and Zezuru a nasal is deleted before a voiceless consonant. In Tsonga, this only applied before monosyllables.

$$N > \emptyset \;/\; \_\; [-vd]$$

There was a morphological aspect to this rule, as in North Sotho it did not apply to the Class 9 prefix, which has become a syllabic nasal. This is not described further in this thesis. Venda has a similar rule, with *N becoming syllabic before monosyllabic Class 9 stems beginning in voiced consonants. The very minor rule changing North Sotho *nʊN to *NN would have applied just before this, or else its environment would have been lost in some cases.

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
*NjogFu 'elephant'	*Ndɬovu <r9 (no change)	*Ntɬou <r23 > tɬou	*N'dou <r15 (no change)	*Ndɬobvu <r11 (no change)	Ndzou <r15 (no change)
*buNba 'mould'	(no change)	*βuNpa <r23 > βupa	*βuNba <r19 (no change)	*βuNba <r19 (no change)	*βuNba <r19 (no change)
*paNci 'underneath'	*phaNtsi <r12 (no change)	*ɸaNtshɪ <r21 > *ɸatshɪ	*ɸaNtshi <r21 > *ɸatshi	*haNtshi <r21 (no change)	*phaNtshi <r12 > *phatshi
*Npwa 'burn'	-	*NpʃIa <r18 > pʃIa	-	*Nphya <r12 > phya	*Npxa <r18 > pxa
*Ntu 'person'	(no change)	*Nthu <r12 > thu	*Nthu <r12 > thu	nhu <r23 (no change)	nhu <r23 (no change)
*nuNka 'smell'	-	*nʊNkha <r12 > *Nkha	*nunkha <r12 > *nukha	*nuha <r22 (no change)	-

Rule 25 (major). Fricativisation.

Aspirated homorganic affricates became fricatives intervocalically.

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
*pwa 'burn'	*tʃha <r20 > *ʃa	swa <r9 (no change)	s^wa <r9 (no change)	-	ts^wa <r11 (no change)
*paNci 'underneath'	*phaNtsi <r12 (no change)	*ɸatshɪ <r24 > ɸasɪ	*ɸatshi <r24 > ɸasi	*haNtshi <r21 (no change)	*phatshi <r24 > phasi

Rule 26 (major). Affricate devoicing.

In Zulu, North Sotho and Tsonga, affricates become voiceless, except after nasals. In Tsonga all affricates, except lateral affricates, become voiceless, even after nasals.

$$\begin{bmatrix} -cont \\ +asp \end{bmatrix} > [-vd] \quad / \quad [-nas] \_$$

	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
*jiba 'know'	-	*dzɪβa <r19 > tsɪβa	*ʻdiβa <r19 (no change)	*dziβa <r19 > *tsiβa	*dziβa <r19 (no change)
*bFwaNga 'mix'	*vaNga <r15 (no change)	*dzwaka <r24 > tswaka	*vaNga <r9 (no change)	*bvaNga <r15 (no change)	-
*bwada 'plant'	*d3ala <r20 > *tʃala	*β3ala <r19 (no change)	*bɣaLa <r18 (no change)	*byala <r13 (no change)	-
*gFico 'eye'	-	*iɬo <r25 (no change)	*iʻto <r15 (no change)	*dziɬo <r25 > tsiɬo	*ziso <r12 (no change)
*NjogFu 'elephant'	*Ndɮovu <r9 (no change)	*tɬou <r24 (no change)	*Nʻdou <r15 (no change)	*Ndɮobvu <r11 > Ndɮopfu	Ndzou <r15 (no change)

Rule 27 (minor). Palatal affrication.

*ty > *tʃ in North Sotho and Tsonga only. This must occur after fricativisation, otherwise *tʃ derived from *ty would merge with *tʃ derived from *tF, and yield *ʃ (see 5.2).

	N.SOTHO	TSONGA
*tyududa 'pour'	*thyulula <r12 > *tʃhulula	*thyulula <r12 > *tʃhulula

5.6 *Minor rules.*

The following rules applied only in single languages, and did not feed any of the major rules. They are given very briefly, with one example each.

Zulu.

*i was elided initially.

*ima (<r15) > ma 'stand'.

A non-aspirated velar stop was voiced between vowels, and initially.

*eneka > enega 'spread'.

North Sotho.

A non-tense high front vowel was lowered initially.

ɪma (<r15) > ema 'stand'.

Final *ni became syllabic N (realised as as velar nasal).

*Nkuni > *khʊni (<r24) > *khʊN 'firewood'.

*kh becomes /kxh/, except before *u.

*khʊN (from the rule above) > kxhʊN 'firewood'.

High vowels become tense before palatals.

*NbidFa > *pɪtʃa (<r26) > pitʃa 'cooking-pot'.

High vowels become tense when there is a tense vowel in the adjacent syllable.

*NbudFi > *pʊli (<r24) > puli 'goat'.

High vowels become tense finally after vowels.

*Nbewu > *peʊ (<r24) > peu 'seed'.

High tones become low finally after high-toned syllables.

*tFumo HH > *rumo HH (<r21) > rumo HL.

Tsonga.

Voiceless alveolar affricates became stops.

*tsiko (<r26) > tiko 'fireplace'.

Alveolar voiced stops became retroflex after nasals.

*aNda > *aNdz'a 'abound'.

An alveolar nasal became palatal before *i.

*Nkuni > *huni (<r22) > hunyi 'firewood'.

Final *o was raised after syllables containing the vowels *u or *a.

*fumo (<r9) > *fumu 'spear'.

Zezuru.

Voiced bilabial fricatives were deleted before back vowels.

*βuNba (<r19) > uNba 'mould'.

5.7 Phonological rules.

Once the minor rules have operated, the forms produced are reinterpreted in terms of the phonological rules of each language (see 1.4.2). This means that certain forms produced by the sound-change rules need no longer be distinguished in transcription, as they will predictably be realised by the phonological rules. These phonetic forms include: affricates after nasals in Zulu and Zezuru; aspirated voiceless stops in Zezuru; and flapped /l/ before high tense vowels in North Sotho.

The following examples show how stems containing such forms are reinterpreted phonologically.

North Sotho 'Dumela' (<r10) is transcribed /lumela/.
Zulu 'phaNtsi' (<r12) is transcribed /phaNsi/.
Zezuru 'phasi' (<r25) is transcribed /pasi/.

By this stage, the five pre-dialects are clearly separated into distinct languages, with distinct phonologies. The question of whether this reflects a new situation, or whether they were always separate, is addressed in 5.9.

5.8 *The question of the Class 5 prefix.*

The influence of the Class 5 prefix in various languages indicates a possible shared morphophonological rule. The evidence for this will be briefly examined here. The Class 5 prefix has a morphophonological effect on certain stems in North Sotho, Venda and Zezuru. The following table shows the examples in the data. The prefix is /lɪ + / in North Sotho, and ∅ in both Venda and Zezuru. Forms in brackets are nouns in other classes, or nouns in Class 5 whose stems do not undergo morphophonological change. The fourth column gives the initial consonant of the reconstructed stem in its uninfluenced form.

	N.SOTHO	VENDA	ZEZURU	STEM
arm	lɪ + tsoɣo	-	(ru + oko)	*b
bone	lɪ + ʃapo	∅ + ʃaNbo	-	*t
buttock	lɪ + ʃaɣo	∅ + ʃaho	∅ + ðako	*t
cheek	(lɪ + rama)	∅ + ʃama	∅ + ðama	*t
clay	lɪ + tsʊpa	∅ + vuNba	-	*b
crust	(lɪ + ɣoɣo)	-	∅ + goko	*k
knife	(mphaka)	(Lu + ɸaNga)	∅ + 6aNga	*p

The following correspondences are apparent from the above data. Only forms influenced by the prefix are shown in the columns below

NS	VE	ZE	STEM
ts	v	-	*b
ʃ	ʃ	ð	*t
-	-	g	*k
-	-	6	*p

The morphophonologically influenced North Sotho and Venda forms in the first series are similar to the attestations for *bFw, with the *w disappearing before the rounded back vowel of the attesting stems. The Venda and Zezuru forms in the second series look like the attestations for *ty, but the North Sotho form suggests *tF or *kF. The Zezuru form in the third series suggests *ky, and by analogy with *ty and *ky, the Zezuru form in the fourth series suggests Proto-Southern Bantu *py, unattested elsewhere.

It is apparent from this that the effect of the Class 5 prefix was to insert an offglide after a following stop consonant, but that the nature of the offglide differed with the language. The rule seems to have applied sporadically (for instance, it did not apply in North Sotho /lɪ + rama/ 'cheek'), or else it had ceased applying and have been completely morphologised before the Proto-Southern Bantu

period. The prefix itself was probably ∅ before nouns, if we accept that the majority attestation in the modern languages reflects the original situation; however, Hinnebusch (1973: 60) speaking of a similar attestation among the Coastal Kenyan Bantu languages, states that 'Most Class 5 nominals have no prefix because of loss.' If there was originally no phonologically manifested prefix, then the presence of one in North Sotho but not in Venda or Zezuru again shows a dialectal difference, and is probably due to analogical creation, as most other noun class prefixes have the same shape as their concords. This is therefore beyond the scope of the present work.

5.9 *Towards a phonological genealogy.*

5.9.1 Generally shared rules.

The following table illustrates the participation of each language in the rules shown in 5.5 above. It is drawn up with the aim of discovering whether any significant patterns of common innovations emerge among the various languages.

	ZU	NS	VE	TS	ZE
1. Preglide Voicing and Implosion					x
2. Glide Elision	x				x
3. Velar and Palatal Merger		x			
4. Fricativisation of *ty			x		
5. Palatal Stop Fronting	x	x	x	x	x
6. Glide Fricativisation		x	x	?	x
7. Velar Palatalisation	x	x	x	x	x
8. Offglide Assimilation	x	x	x	x	x
9. Fricativisation	x	x	x	x	x
10. Alveolar Sonorant Formation	x	x	x	x	x
11. Homorganic Affricate Formation	x	x	x	x	x
12. Aspiration	x	x	x	x	x
13. Labial Dissimilation	x	x	x	x	
14. Velar Stop Gliding		x	x		x
15. Glide Elision	x	x	x	x	x
16. Initial *a Elision		x	?	x	x
17. Front Vowel Lowering		x	x	x	?
18. Glide Fricativisation	x	x	x		x
19. Voiced Stop Fricativisation		x	x	x	x
20. Place Assimilation	x				
21. Voiceless Stop Fricativisation		x	x	x	
22. Nasal Aspiration				x	x
23. Postnasal Devoicing		x			
24. Nasal Elision		x	x		x
25. Fricativisation	x	x	x	()	x
26. Affricate Devoicing	x	x		x	
27. Affrication of *ty		x		x	

'x' under the name of a particular language indicates that the rule whose name appears to the left applied in that particular language.

'?' indicates that it is unclear, from the data, whether the rule applied in that language.
'()' indicates that the rule applied vacuously in a particular language, as there were no suitable input forms.

Rules 5-19 all seem to apply in the majority of Southern Bantu languages, indicating the possibility of a period of common development. In the following discussion these rules will be referred to as the Common Southern Bantu rules. However, the chart may be misleading, for though the rules that applied were similar, they hardly ever applied in exactly the same environment across all languages, or even in any two languages. This means that in each language, each rule had its own peculiar input and output, a situation which suggests rule borrowing among the languages, rather than common innovations. This is further supported by the evidence of Rules 1-4, which applied during an 'initial phase' before the Common Southern Bantu rules, as they feed or bleed these rules. None of these 'initial phase' rules applies in more than two languages, which means that these languages or pre-dialects were already clearly defined, most probably in terms of speaker community, before it is possible to speak of a common Southern Bantu. Other evidence of this was mentioned in 4.5: the differences between vowels in extensions shown by various pre-dialects, and the probability that Postlabial Glide Merging operated differently in Pre-Shona and Pre-Venda from the way it did in the other pre-dialects. Even within the Common Southern Bantu period there are groupings, in that certain rules applied in three or four languages only. Nor is there ever any clear opposition between one group of languages and another. Rule 6, Glide Fricativisation, applies in North Sotho, Venda, Zezuru and possibly Tsonga. This is followed by a series of rules applying in all languages: after which Rule 13, Labial Dissimilation, applies in Zulu, North Sotho, Venda and Tsonga, but not in Zezuru.

Four, and possibly five, of the Common rules do group the rest of the Southern Bantu languages against Zulu (Rules 6, 14, 16, 17 and 19), but at least one of these, Voiced Stop Fricativisation is such a common rule in languages that it undoubtedly falls into the category described by Hoenigswald (1973: 59) as 'trivial' - furthermore, as Nurse points out (1987: 102), there is doubt whether the Proto-Bantu phoneme represented as *b was a stop or a fricative: rather than a shared innovation in the other languages. This rule may represent a Zulu innovation, which could have applied at a much later stage. It is uncertain whether Rule 6 did apply in Tsonga, and Rule 14 applies in neither Zulu nor Tsonga, so that a simple grouping of Zulu versus the rest of Southern Bantu cannot be postulated. While Rule 16 must precede Rule 17 (see 5.5) they do not feed or bleed any other rules, and so may have applied directly after one another, or have been separated by a considerable distance of time. The application of the Common Southern Bantu rules shows no evidence of any clear split of the Southern Bantu languages into separate branches at any level above that of the five language groups (or pre-dialects).

With the exception of Rule 25, Fricativisation, (another 'trivial' rule) Rules 20-27 all apply in three or fewer languages, and no clear groupings emerge.

Rule 21, Voiceless Stop Fricativisation, is especially interesting. as it is almost alone among rules in having a very similar output in all three languages where it applied, while at the same time it is slightly unusual and therefore not trivial. The change from voiceless alveolar stop to trill (accompanied by the more prosaic change from *p to *ɸ and from *k to *x) seems to indicate a genealogical split rather than phonological borrowing, but there are no other rules operating at this time which are shared just between these three languages (North Sotho, Venda and Tsonga) to the exclusion of other languages. Given the considerable evidence of a very early split into five separate dialects or languages, Hoenigswald's assertion (1973: 59) that one shared rule is enough to indicate a common development is not applicable in this case.

Another interesting rule is Rule 26, Affricate Devoicing, again shared by three languages (in this case Zulu, North Sotho and Tsonga) to the exclusion of others. However, this rule had to apply late in the development of the Southern Bantu languages, as it is fed by several earlier rules, for example 11 and 20, and so it had a different scope of application in the three languages where it applied. Again, this suggests that a rule was borrowed among these languages, rather than innovated in a single cohesive dialect which subsequently split up into these three languages.

5.9.2 Specifically shared rules.

The fact that the various languages apply the rules differently suggests that the table in 5.9.1 is misleading if it is interpreted as showing common development as one language: another way of presenting the data had to be found. Another table was drawn up, but this time a language was only marked as applying a rule if at least one other language applied it in the same environment, and with the same output in terms of feature changes. The symbols used in the chart are the same as in the chart above, with two additions: when a group of Southern Bantu languages applies a rule in one way, while another group applies it in another way, brackets are used to indicate subgroupings. For example, Rule 7, Velar Fronting, yields *ts in Zulu and North Sotho, but *tʃ in all the other dialects. 'x?' indicates that it is not clear whether a particular language applied a rule in the same way as the other languages, as the rule had been bled of some of its input in that particular language.

	ZU	NS	VE	TS	ZE
1. Preglide Voicing and Implosion					
2. Glide Elision					
3. Velar and Palatal Merger					
4. Fricativisation of *ty					
5. Palatal Stop Fronting	x			x	
6. Glide Fricativisation		x		?	x
7. Velar Palatalisation	(x	x)	(x	x	x)
8. Offglide Assimilation			x	x	x
9. Fricativisation		x		x	
10. Alveolar Sonorant Formation	x?	x?			
11. Homorganic Affricate Formation	x?	x	x	x	x
12. Aspiration					
13. Labial Dissimilation		x		x	
14. Velar Stop Gliding		x?	x		x
15. Glide Elision: after bilabials	x	()	x	x	x
next to *u		x	x		x
before *i	x	x	x		x
16. Initial *a Elision		x	?	x	x
17. Front Vowel Lowering		x	x	x	?
18. Glide Fricativisation	(x	x)	(x		x)
19. Voiced Stop Fricativisation		x	x	x	x
20. Place Assimilation					
21. Voiceless Stop Fricativisation		x	x	x?	
22. Nasal Aspiration				x	x
23. Postnasal Devoicing					
24. Nasal Elision		x	x		x
25. Fricativisation	x	x	x	()	x
26. Affricate Devoicing	x	x			
27. Affrication of *ty		x		x	

If the Southern Bantu languages do constitute a subfamily, there is evidence of dialectal division from the earliest stages. The second table does show evidence of groupings, but little indication of common innovation. Hinnebusch (1973: 237), speaking of the Coastal Kenyan languages, distinguishes between changes which took place 'when the Coastal languages were still part of a tight-knit proto dialect cluster' and those which operated later, resulting in less uniformity. In the Southern Bantu languages there is no evidence of a tight-knit dialect community with all dialects applying rules uniformly. Louw (1986: 59) reaches a similar conclusion, saying: 'I would query the common ancestor, because I would prefer proto-dialects.' The evidence of commonality is especially evident in Rules 11-19, where there appears to be a grouping of North Sotho, Venda and Zezuru, with only the occasional participation of Zulu and Tsonga. But earlier rules (1-10) show

evidence of dialect or language separation, so this may be ascribed to very close community contact with extensive rule borrowing, rather than to shared innovations. Notice that this grouping emerges again, in Rules 25 and 26, though in each case one other language also participates in the rule. On the basis of the semantic groupings of indirect cognates or borrowings in Venda, Jones-Phillipson (1972: 198-199) arrives at the following tentative hypothesis:

> the evidence in respect to terms of domesticity seems to suggest that there may be a link between Venda and the Shona group on the female side. The link with the Sotho groups on the other hand, appears to be on the male side since a number of the terms refer to hunting and cattle-keeping. One cannot interpret this kind of fact with any certainty, but one way to account for it would be to suppose that at some period or other, the Venda acquired Shona-speaking wives and on the other hand, that some Venda-speaking wives were acquired by the Sotho.

This period of rule-sharing between the North Sotho, Venda and Zezuru may be further evidence of very close social interaction, which could perhaps be interpreted in terms of matrimonial alliances; though of course phonetic data can only strengthen conclusions based on semantic facts, but cannot in itself provide any precise evidence of the nature of cultural interaction.

The various lexicostatistical genealogies show quite different results, with clear divisions. As these do not all deal with the same languages, in the subsequent discussion reference will be made to language groups (Nguni, Sotho, Venda, Tsonga and Shona) rather than to individual languages. Guthrie (1962c: 278) has an initial split between Shona on the one hand and Sotho, Venda and Nguni on the other, while Tsonga is not discussed at all. These three are placed on separate branches, with no further subgrouping. Finlayson's schema (1987: 53) is the same, except that she places Tsonga and Chopi as separate branches in the second subgrouping. Henrici (1973: 97) groups Shona and Venda together on one side, and Sotho and Nguni on another: again, Tsonga is not discussed. Flight (1988: 33) has Zezuru splitting from the main group at the earliest stage, then Venda, leaving Sotho and Nguni to form a branch which eventually splits into two languages. As has been shown in the discussion above, there is no phonological evidence to support any of these groups. Either the rules that apply are fairly trivial, showing the changes expected of lenition in languages generally, or, when certain unusual rules apply, for instance Labial Dissimilation or Affricate Devoicing, they apply to different groups of Southern Bantu languages. This is in contrast with Hedinger's (1986) study of the Manenguba Languages of Cameroon, of which he states:

> Phonological, morphological and lexical isoglosses overall confirm our groupings arrived at lexicostatistically.

Although a phonology can be reconstructed for Proto-Southern Bantu, the development of the Southern Bantu languages shows no evidence that this was ever a single cohesive proto-language: rather, the evidence points the other way, and suggests that the Nguni, Sotho, Venda, Tsonga and

Shona never formed a single group, distinct from the other Bantu language speakers, but not distinguishable among themselves. However, the speakers of these languages obviously interacted socially, and the languages had considerable influence on each other.

5.10 Directions for further research.

While certain conclusions have emerged from the above reconstruction and derivation, they need evidence of other kinds in order to confirm their validity, especially as they contradict the claims of lexicostatistical genealogists.

Archaeological evidence could be re-examined for indications of the apparent separate migrations of Shona, Nguni, Sotho, Venda and Tsonga peoples; and for the social interaction of the North Sotho, Venda and Shona peoples attested by the borrowing of vocabulary and of phonological rules. Such archaeological evidence could be used as a way to date sound changes in these languages, as the period of shared rules presumably coincided with this interaction. Linguistic evidence could also be sought for the direction in which borrowing took place.

Using only Southern Bantu data, the morphology of the proto-language could be reconstructed, as further evidence for or against disunity. A larger list of stems, could be used as a basis for a revised phonological reconstruction, to determine whether it is possible to discover any further correspondences between the phonemes of modern Southern Bantu languages. Particularly necessary is further study of the affricate proto-forms of Proto-Southern Bantu, which are only minimally attested.

Other potential intermediate ancestral Bantu languages groups might be reconstructed. These could be compared to the reconstruction of Proto-Southern Bantu to see if they differ to any considerable extent. If they do not, this will be a further indication, beyond that of the internal evidence, that the Southern and Eastern Bantu languages (or a considerable number of them) were differentiated from very early times, and that no intermediate grouping is possible.

6.0 Appendix 1. Glossary.

6.1 Introduction.

The reconstructed forms attested by the comparative series in Chapter 2 are given below. The complete comparative series are given in that chapter, where they are listed according to the initial attesting phoneme, and the medial attesting consonants. For example, the Southern Bantu comparative series attesting *pupuma will be found under the sections '*p' and '*m' in Chapter 2. However, it is listed there by the English gloss, 'boil over', so before checking a series it is necessary to refer to the English equivalents for the reconstructions. In this glossary, affixes are distinguished from stems by quoting them together with morpheme boundary markers, and by including their glosses in parentheses. The only exceptions to the morpheme-marking rule are the Class 9 prefix, which is not marked as separate from its noun, and the final vowel /+a/ of the present tense, which is included in all verb stems (see 1.4.3). The reconstructed class prefixes of nouns are given in parentheses after the stem, in cases where they agree in all the attesting languages. Class 9 nouns are indicated by (N+) and Class 5 nouns by the zero prefix (∅+). The tonal pattern of each stem is quoted after the stem.

6.2 Proto-Southern Bantu to English.

*+o L	(noun suffix)	*beka H	put
*+ana L	(reciprocal)	*bi H	bad
*+eda L	(applied)	*bici HH	milk n
*+eka L	(neuter)	*bida L	boil v
*+ikFa L	(causative)	*bidi LH	two
*aba L	divide	*bidi LL (mu+)	body
*acuda H	surpass	*bidFa H	call
*aduka L	twist	*bika H	announce
*aka H	build	*bo L	them
*aNba L	speak	*bodFu LH (bu+)	pus, rottenness
*aNda L	abound	*boda L	rot
*aNja LL (ki+)	hand	*boko HH	arm
*ba H	become	*bona H	see
*ba+ L	(Class 2)	*bopa H	tie up
*baba H	be bitter, sting	*boya LH	fur
*bada HL	colour, spot	*boNba L	roar
*bada L	count	*bu+ L	(Class 14)
*bede HL (ma+)	millet	*budaya H	kill

*buya H	come back
*buNba H	mould
*buNba HH (∅+)	clay
*buNga H	gather, heap up
*bwada H	plant
*bwe L (∅+)	stone
*bFada L	shut
*bFaNga H	mix
*bFuda L	open
*caba HH (mu+)	sand, soil
*cakuda L	weed
*cana HL (mu+)	back
*canu HL	five
*capFuna H	chew
*caNba L	bathe
*caNdFa H	vomit
*caNga LL (du+)	reed, stalk
*caNgana L	meet
*cebe LL (mu+)	arrow
*cedo L (du+)	basket
*ceka L	laugh
*ci L (mu+)	pestle
*cubuda L	undress
*cuja L	strain
*cuNguda L	winnow
*cwa H (mu+)	ant
*da L	intestines
*daca H	lose
*dada H	lie, sleep
*dada LL (mu+)	palm-tree
*daNbo LL (mu+)	river
*daNdeda L	follow
*daNduda L	deny
*dedFu L	beard, chin
*dibada L	forget
*dida L	cry
*dido LL (mu+)	fire
*dima L	cultivate
*dimi HH (du+)	tongue
*dipa L	pay
*diNda L	wait
*diNga H	try
*diNgana	fit
*domo LL (mu+)	mouth
*dota H	dream
*dota LL (mu+)	ashes
*doya L	bewitch
*doNda LL (ki+)	sore
*du+ L	(Class 11)
*dudama L	be straight
*duma H	bite
*dumeka H	bleed, cup
*dwa L	fight
*dwada H	be ill
*dFi L (mu+)	root
*dFi+ L	(Class 10)
*dFiba LL	pool
*dFima H	extinguish
*dFuja L	drip
*dFuma L	rumble
*dFumeda L	agree
*dFuNbi LH (mu+)	rain n
*dFwa H	bleed
*eneka H	spread
*eni LL (mu+)	guest, stranger
*eNbata L	wear
*eNdo LL	journey
*gFico HH (∅+)	eye
*gFida L	abstain, be taboo
*gFinyo HH (∅+)	tooth
*ja L	come
*jada H	be full
*ji L (mu+)	village
*jiba H	know
*ka H	draw water
*kada HH (ma+)	charcoal
*kadFiNga H	roast
*kama H	milk, squeeze
*kana H	deny
*keka H	cut

*ki+ L	(Class 7)
*kida HH (mu+)	tail
*kocoda H	cough
*koka H	pull
*koko HH	crust
*kotama L	bend
*ku+ L	(Class 15)
*kuda H	grow up
*kudeka H	tie up
*kudu HH	big
*kuNbuda H	think
*kya H	dawn
*kyumi HL	ten
*kyuta H	have enough
*kFada H	remain
*kFida L	grind
*kFidFi HH (mu+)	soot
*kFipa LL (mu+)	tendon
*kFiya H	leave
*kFu H (du+)	death
*kFuNdo HH (∅+)	knot
*kFwa H	die
*kFwana H	resemble
*ma+ L	(Class 6)
*mama H	suck
*mema H	invite
*mi L	me
*mi+ L	(Class 4)
*mida L	grow
*moya HH	wind
*mu+ L	(Class 1)
*mu+ L	(Class 3)
*munya L	suck
*mwe L	another, one
*mwedFi LH	moonlight
*na L	rain v
*Nbeba LL (N+)	mouse, rat
*Nbewu HH (N+)	seed
*Nbidu HL (N+)	heart
*NbidFa LH (N+)	cooking-pot
*NbudFi HH (N+)	goat
*Nbwa H (N+)	dog
*NbFuda HH (N+)	rain n
*Nca H (N+)	point
*NcaNbFi LL (N+)	fish
*Ncoko HH (N+)	head
*Ncwa H (N+)	termite
*Nda H (N+)	louse
*Ndaba LL (N+)	affair
*Nga+ L	(instrumental)
*NgaNga	medicine-man
*Ngoma LL (N+)	drum
*Ngubo LL (N+)	garment
*Ngudube LLL	pig
*Ngwe L (N+)	leopard
*Ngwenya LL (N+)	crocodile
*NgFubu LH (N+)	hippopotamus
*Njada LL (N+)	hunger
*Njebe LH (N+)	ear
*Njida LL (N+)	path
*NjogFu LL (N+)	elephant
*Nju L (N+)	house
*NkaNga HH (N+)	guinea-fowl
*Nkobe HH (N+)	fish
*NkokFi HH (N+)	chief
*Nkuku HH (N+)	chicken
*Nkuni HH (N+)	firewood
*NkuNba HL (N+)	snail
*Nkwadi LH (N+)	partridge
*nona L	be fat
*Npada HL (N+)	impala
*Npaka HH (N+)	wildcat
*NpaNja HH (N+)	baldness
*Npwa H	dry
*Ntu L (mu+)	person
*nuNgu LH (N+)	porcupine
*nuNka L	smell
*nwa H	drink
*nwe L (mu+)	finger
*nya L	defecate

*nyama LL (N+)	meat
*nyati HH (N+)	buffalo
*nyawa LH (N+)	bean
*nyaNga LH	horn
*nyoka HH (N+)	snake
*nyoki HH	bee
*nyoni LL	bird
*nyu H (mu+)	salt
*okya L	roast
*oma H	dry
*ota H	warm oneself
*oNda H	be thin
*pa H	give
*pada H	scrape
*papa H	fly
*paNci LH	underneath
*paNda L	dig
*paNga HH	knife
*peda H	finish
*pepeta H	winnow
*pikFa H	burn
*pini HH (mu+)	handle
*piNda L	pass
*pumuda H	rest
*pupuma L	boil over
*pwa H	burn
*pwa H	new
*pFica H	hide
*pFika L	arrive
*pFuba HH (ki+)	chest
*pFuta HH (ma+)	oil
*ta H (bu+)	bow
*tako HH (Ø+)	buttock
*tama HH	cheek
*tatu HH	three
*taNbo HH (Ø+)	bone
*taNga H	begin, precede
*taNga LL	pumpkin
*te H (ma+)	spittle
*teja H	gather wood
*tema H	chop
*teNga H	buy
*ti H (mu+)	tree
*ti L (ku+)	namely
*to L (mu+)	broth
*toda H	pick up
*toNgo LL (bu+)	sleep
*tuka H	curse
*tuma H	send
*tutumeda L	shiver
*tuNda L	urinate
*tuNdu HH (ki+)	basket
*tuNga H	sew
*twada H	carry
*tyaba H	fear
*tyaba H	flee
*tyeda L	pour
*tyududa L	pour
*tFi H (mu+)	smoke
*tFu L (Ø+)	cloud
*tFuda H	forge
*tFumo HH (Ø+)	spear
*wa L	fall
*we L	you
*weda L	cross v
*ya L	go
*ye L	him, her
*yeda L	flow
*yeda L	measure
*yima H	stand
*yiNba H	sing

6.3 *English to Proto-Southern Bantu.*

(applied)	*+eda L
(causative)	*+ikFa L
(Class 1)	*mu+ L
(Class 2)	*ba+ L
(Class 3)	*mu+ L
(Class 4)	*mi+ L
(Class 6)	*ma+ L
(Class 7)	*ki+ L
(Class 11)	*du+ L
(Class 10)	*dFi+ L
(Class 14)	*bu+ L
(Class 15)	*ku+ L
(instrumental)	*Nga+ L
(neuter)	*+eka L
(noun suffix)	+o L
(reciprocal)	*+ana L
abound	*aNda L
abstain	*gFida L
affair	*Ndaba LL (N+)
agree	*dFumeda L
announce	*bika H
another	*mwe L
ant	*cwa H (mu+)
arm	*boko HH
arrive	*pFika L
arrow	*ccbe LL (mu+)
ashes	*dota LL (mu+)
back	*cana HL (mu+)
bad	*bi H
baldness	*NpaNja HH (N+)
basket	*cedo L (du+)
basket	*tuNdu HH (ki+)
bathe	*caNba L
be bitter	*baba H
be fat	*nona L
be full	*jada H
be ill	*dwada H
be straight	*dudama L
be taboo	*gFida L
be thin	*oNda H
bean	*nyawa LH (N+)
beard	*dedFu L
become	*ba H
bee	*nyoki HH
begin	*taNga H
bend	*kotama L
bewitch	*doya L
big	*kudu HH
bird	*nyoni LL
bite	*duma H
bleed	*dFwa H
bleed, cup	*dumeka H
body	*bidi LL (mu+)
boil over	*pupuma L
boil v	*bida L
bone	*taNbo HH (Ø+)
bow	*ta H (bu+)
broth	*to L (mu+)
buffalo	*nyati HH (N+)
build	*aka H
burn	*pikFa H
burn	*pwa H
buttock	*tako HH (Ø+)
buy	*teNga H
call	*bidFa H
carry	*twada H
charcoal	*kada HH (ma+)
cheek	*tama HH
chest	*pFuba HH (ki+)
chew	*capFuna H
chicken	*Nkuku HH (N+)
chief	*NkokFi HH (N+)
chin	*dedFu L
chop	*tema H
clay	*buNba HH (Ø+)

cloud	*tFu L (∅+)	firewood	*Nkuni HH (N+)
colour	*bada HL	fish	*NcaNbFi LL (N+)
come	*ja L	fish	*Nkobe HH (N+)
come back	*buya H	fit	*diNgana
cooking-pot	*NbidFa LH (N+)	five	*canu HL
cough	*kocoda H	flee	*tyaba H
count	*bada L	flow	*yeda L
crocodile	*Ngwenya LL (N+)	fly	*papa H
cross v	*weda L	follow	*daNdeda L
crust	*koko HH	forge	*tFuda H
cry	*dida L	forget	*dibada L
cultivate	*dima L	fur	*boya LH
curse	*tuka H	garment	*Ngubo LL (N+)
cut	*keka H	gather	*buNga H
dawn	*kya H	gather wood	*teja H
death	*kFu H (du+)	give	*pa H
defecate	*nya L	go	*ya L
deny	*daNduda L	goat	*NbudFi HH (N+)
deny	*kana H	grind	*kFida L
die	*kFwa H	grow	*mida L
dig	*paNda L	grow up	*kuda H
divide	*aba L	guest	*eni LL (mu+)
dog	*Nbwa H (N+)	guinea-fowl	*NkaNga HH (N+)
draw water	*ka H	hand	*aNja LL (ki+)
dream	*dota H	handle	*pini HH (mu+)
drink	*nwa H	have enough	*kyuta H
drip	*dFuja L	head	*Ncoko HH (N+)
drum	*Ngoma LL (N+)	heap up	*buNga H
dry	*oma H	heart	*Nbidu HL (N+)
dry	*Npwa H	hide	*pFica H
ear	*Njebe LH (N+)	him, her	*ye L
elephant	*NjogFu LL (N+)	hippopotamus	*NgFubu LH (N+)
extinguish	*dFima H	horn	*nyaNga LH
eye	*gFico HH (∅+)	house	*Nju L (N+)
fall	*wa L	hunger	*Njada LL (N+)
fear	*tyaba H	impala	*Npada HL (N+)
fight	*dwa L	intestines	*da L
finger	*nwe L (mu+)	invite	*mema H
finish	*peda H	journey	*eNdo LL
fire	*dido LL (mu+)	kill	*budaya H

knife	*paNga HH
knot	*kFuNdo HH (∅+)
know	*jiba H
laugh	*ceka L
leave	*kFiya H
leopard	*Ngwe L (N+)
lie	*dada H
lose	*daca H
louse	*Nda H (N+)
me	*mi L
measure	*yeda L
meat	*nyama LL (N+)
medicine-man	*NgaNga (N+)
meet	*caNgana L
milk n	*bici HH
millet	*bede HL (ma+)
mix	*bFaNga H
moonlight	*mwedFi LH
mould	*buNba H
mouse	*Nbeba LL (N+)
mouth	*domo LL (mu+)
namely	*ti L (ku+)
new	*pwa H
oil	*pFuta HH (ma+)
one	*mwe L
open	*bFuda L
palm-tree	*dada LL (mu+)
partridge	*Nkwadi LH (N+)
pass	*piNda L
path	*Njida LL (N+)
pay	*dipa L
person	*Ntu L (mu+)
pestle	*ci L (mu+)
pick up	*toda H
pig	*Ngudube LLL (N+)
plant	*bwada H
point	*Nca H (N+)
pool	*dFiba LL
porcupine	*nuNgu LH (N+)
pour	*tyeda L
pour	*tyududa L
precede	*taNga H
pull	*koka H
pumpkin	*taNga LL
pus	*bodFu LH (bu+)
put	*beka H
rain n	*dFuNbi LH (mu+)
rain n	*NbFuda HH (N+)
rain v	*na L
rat	*Nbeba LL (N+)
reed	*caNga LL (du+)
remain	*kFada H
resemble	*kFwana H
rest	*pumuda H
river	*daNbo LL (mu+)
roar	*boNba L
roast	*kadFiNga H
roast	*okya L
root	*dFi L (mu+)
rot	*boda L
rottenness	*bodFu LH (bu+)
rumble	*dFuma L
salt	*nyu H (mu+)
sand	*caba HH (mu+)
scrape	*pada H
see	*bona H
seed	*Nbewu HH (N+)
send	*tuma H
sew	*tuNga H
shiver	*tutumeda L
shut	*bFada L
sing	*yiNba H
sleep	*dada H
sleep	*toNgo LL (bu+)
smell	*nuNka L
smoke	*tFi H (mu+)
snail	*NkuNba HL (N+)
snake	*nyoka HH (N+)
soil	*caba HH (mu+)
soot	*kFidFi HH (mu+)

sore	*doNda LL (ki+)
speak	*aNba L
spear	*tFumo HH (∅+)
spittle	*te H (ma+)
spot	*bada HL
spread	*eneka H
squeeze	*kama H
stalk	*caNga LL (du+)
stand	*yima H
sting	*baba H
stone	*bwe L (∅+)
strain	*cuja L
stranger	*eni LL (mu+)
suck	*mama H
suck	*munya L
surpass	*acuda H
tail	*kida HH (mu+)
ten	*kyumi HL
tendon	*kFipa LL (mu+)
termite	*Ncwa H (N+)
them	*bo L
think	*kuNbuda H
three	*tatu HH
tie up	*bopa H
tie up	*kudeka H
tongue	*dimi HH (du+)
tooth	*gFinyo HH (∅+)
tree	*ti H (mu+)
try	*diNga H
twist	*aduka L
two	*bidi LH
underneath	*paNci LH
undress	*cubuda L
urinate	*tuNda L
village	*ji L (mu+)
vomit	*caNdFa H
wait	*diNda L
warm oneself	*ota H
wear	*eNbata L
weed	*cakuda L
wildcat	*Npaka HH (N+)
wind	*moya HH
winnow	*cuNguda L
winnow	*pepeta H
you	*we L

7.0 Appendix 2. The classes of Southern Bantu nouns.

7.1 A list of Southern Bantu noun class prefixes.

These prefixes are not given in phonological comparative series here, that is, they do not necessarily correspond phonologically. The Zulu preprefix or initial vowel is quoted before the noun class prefix in parentheses. Class 9 prefixes are not quoted, because, with the exception of North Sotho and Venda forms with very limited distribution, they are inseparable from the stem.

GLOSS		ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
(Class 1)	L	(u)mu+	mʊ+*	mu+	mu+*	mu+
(Class 2)	L	(a)ba+	βa+	βa+	βa+	βa+
(Class 3)	L	(u)mu+	mʊ+*	mu+	mu+*	mu+
(Class 4)	L	(i)mi+	mɪ+	mi+	mi+	mi+
(Class 5)	L	ii+*	lɪ+*	ʿli+*	ri+*	i+*
(Class 6)	L	(a)ma+	ma+	ma+	ma+	ma+
(Class 7)	L	(i)si+*	sɪ+	tʃi+	ʃi+	tʃi+
(Class 10)	L	zi+	li+	dzi+	ti+	-
(Class 11)	L	uu+*	lɪ+*	Lu+	ri+*	ru+
(Class 14)	L	(u)bu+	βʊ+	βu+	βu+	u+
(Class 15)	L	(u)gu+	ɣʊ+	u+	ku+	ku+

Notes.

(Class 1): North Sotho /mʊ+/ becomes syllabic /m:/ before labials.

Tsonga /mu+/ becomes a non-syllabic assimilating nasal before polysyllables.

(Class 3): See '(Class 1)'.

(Class 5): The Zulu preprefix and noun class prefix are inseparable, and are quoted as a single prefix.

The North Sotho prefix often has a morphophonological effect on the stem (see 5.8).

The Venda prefix is found (in the data) only before monosyllables. Before polysyllables the sign of the (Class 5) prefix is often a ∅ morpheme, which sometimes has a morphophonological effect on the noun stem (see 5.8).

The Tsonga prefix /ri+/ occurs only before monosyllables. Before polysyllables, the prefix is ∅+.

The Zezuru prefix /i+/ is found (in the data) only before monosyllables. Before polysyllables the sign of the (Class 5) prefix is often a ∅ morpheme, which sometimes has a morphophonological effect on the noun stem (see 5.8).

(Class 7): The Zulu prefix /si+/ becomes /s+/ before vowel-commencing stems.

(Class 11): The Zulu preprefix and noun class prefix are inseparable, and are quoted as a single prefix.

The North Sotho and Tsonga prefixes have the form of the Class 5 prefix, and take Class 5 concords. They do not cause morphophonological changes, however.

7.2 The nouns with their prefixes.

The noun class of each noun is quoted with the noun, except that Class 9 nouns are left unmarked. Where the class prefix causes a phonological change, it is quoted without a boundary marker, and the noun is quoted in the plural on the following line, in order to distinguish the stem. Skewed forms are not shown. Except for Classes 5 and 11, Zulu noun prefixes are quoted without preprefixes. In order to save space, alternative meanings are not quoted, and tonal contours are not shown.

GLOSS	ZULU	N.SOTHO	VENDA	TSONGA	ZEZURU
affair	Ndaba	taβa	-	-	Ndaβa
ant	mu+ɬwa	mʊ+ɬwa	mu+ʻtwa	mu+ɬwa	-
arm	-	lɪtsoɣo	-	βoko	ru+oko
arms	-	ma+βoɣo	-	ma+βoko	ma+oko
arrow	-	mʊ+seβe	mu+seβe	-	mu+seβe
ash	mu+lotha	-	mu+Lora	norha	-
ashes	mi+lotha	-	mi+Lora	mi+lorha	-
back	-	mʊ+ɬana	mu+ʻtana	Ntɬhana	-
backs	-	mɪ+ɬana	mi+ʻtana	mi+ɬana	-
baldness	NpaN£a	phatɬa	-	-	mhaNza
basket	-	lɪ+selo	-	ri+ɬelo	ru+sero
basket	-	sɪ+rʊtʊ	tʃi+ruNdu	ʃi+rhuNdzʾu	-
bean	-	nawa	ʻnawa	nyawa	-
beard	si+levu	sɪ+lelu	Lu+Lebvu	ma+lepfu	-
bee	nyosi	nosɪ	ʻnotʃi	nyoʃi	-
bird	nyoni	noN	tʃi+ʻnoni	-	-
bodies	-	mʊ+βɪlɪ	mu+βiLi	-	&mu+bet.iri
body	-	Nmɪlɪ	mu+βiLi	-	mu+βiri
bone	ii+thaNbo	lɪʃapo	ʃaNbo	rhaNbu	-

bones	ma + thaNbo	ma + rapo	ma + raNbo	ma + rhaNbu	-
bow	-	βʊ + ra	βu + ra	βu + rha	u + ta
broth	-	mʊ + ro	mu + ro	-	mu + to
buffalo	nyathi	-	ʿnari	nyarhi	-
buttock	-	lɪʃaɣo	ʃaho	-	ðako
buttocks	-	ma + raɣo	ma + raho	-	ma + tako
charcoal	-	ma + ɣala	ma + haLa	ma + kala	ma + kara
cheek	-	lɪ + rama	ʃama	rhama	ðama
cheeks	-	ma + rama	ma + rama	ma + rhama	ma + tama
chest	si + fuba	sɪ + huβa	-	ʃi + fuβa	tʃi + pfuβa
chicken	Nkukhu	kxhʊɣʊ	khuhu	huku	huku
chief	Nkosi	kxhoʃi	khosi	hosi	hosi
clay	ii + buNba	lɪtsʊpa	vuNba	βuNba	-
clays	ma + buNba	ma + βʊpa	ma + βuNba	ma + βuNba	-
cloud	i + fu	lɪ + ru	-	ɲi + fu	-
cooking-pot	Nbiza	pitʃa	-	Nbita	-
crust	uu + khokho	lɪ + ɣoɣo	-	ɲi + koko	goko
crusts	ziNkokho	ma + ɣoɣo	-	ma + koko	ma + koko
death	-	li + hu	Lu + fu	ɲi + fu	ru + fu
dog	Nd3a	pʃa	Nbɣa	-	Nbɣa
ear	Nɬebe	tseβe	Nʿdeβe	Ndɬeβe	Nzeβe
elephant	Nɬovu	tɬou	Nʿdou	Ndɬopfu	Nzou
eye	-	li + iɬo	iʿto	tiɬo	ziso
finger	mu + nwe	-	mu + nwe	-	mu + nwe
fire	mu + lilo	mʊ + lɪlo	mu + LiLo	-	-
firewood	Nkuni	kxhʊN	khuni	hunyi	huni
fish	-	kxhoβe	khoβe	-	hoβe
fish	NɬaNzi	ɬapi	-	NtɬaNpfi	-
goat	Nbuzi	puli	Nbudzi	-	Nbudzi
guest	-	mʊ + eN	mu + eni	-	mu + eni
guinea-fowl	-	kxhaka	khaNga	-	haNga
hand	s + aNɬa	sɪ + atɬa	tʃi + aNʿda	ʃi + aNdɬa	tʃi + aNza
handle	mu + phini	NphɪN	-	-	mu + pini
handles	mi + phini	mɪ + ɸɪN	-	-	mi + pini
head	-	ɬoɣo	ʿthoho	Ntɬoko	-
heart	-	pɪlʊ	NbiLu	Nbilu	-
hippopotamus	Nvubu	kuβu	Nvuβu	Npfuβu	Nβuu

horn	-	lɪ + naka	Lu + ʿnaNga	-	nyaNga
house	N£u	tɬʊ	N ʿdu	Nd£u	-
hunger	N£ala	tɬala	N ʿdaLa	Nd£ala	Nzara
impala	-	phala	phaLa	mhala	mhara
intestines	ma + la	ma + la	ma + La	-	u + ra
journey	mu + endo	lɪ + eto	Lu + endo	ri + endzʾo	ru + endo
knife	-	Nphaka	Lu + ɸaNga	-	6aNga
knives	-	mɪ + ɸaka	dzi + ɸaNga	-	ma + paNga
knot	-	lɪ + huto	pfuNdo	fuNdzʾu	pfuNdo
leopard	Ngwe	N + kwe	Ngwe	Ngwe	Ngwe
louse	-	N + ta	Nda	-	Nda
louse	-	ta	Nda	-	Nda
millet	ma + bele	ma + βele	ma + βeLe	-	-
moonlight	(u)nyezi	ŋw-eli	-	-	mŋ-edzi
mouse	-	peβa	Nbeβa	Nbeβa	Nbeβa
mouth	mu + lomo	mʊ + lomo	mu + Lomo	nomo	mu + romo
mouths	mi + lomo	mɪ + lomo	mi + Lomo	mi + lomo	mi + romo
namely	gu + thi	ɣʊ + ri	-	-	ku + ti
oil	ma + futha	ma + hura	ma + pfura	ma + furha	-
palm-tree	-	mʊ + lala	-	nala	mu + rara
palm-trees	-	mɪ + lala	-	mi + lala	mi + rara
partridge	Nkwali	kxhwalɪ	khwaLi	-	-
path	-	tsɪla	N ʿdiLa	-	Nzira
person	mu + Ntu	mʊ + thʊ	mu + thu	mu + nhu	mu + nhu
pestle	-	mʊ + sɪ	mu + si	mu + si	-
point	-	N + tɬha	N + ʿtha	Ntɬa	-
pool	si + ziba	sɪ + liβa	dziβa	ʃi + tiβa	dziβa
porcupine	nuNgu	nʊkʊ	nuNgu	nuNgu	nuNgu
pumpkin	thaNga	-	Lu + raNga	rhaNga	-
pus	-	bovu	βʊ + βolu	βu + βopfu	-
rain	-	-	mu + bvuNbi	N + pfuNbi	mu + bvuNbi
rain	Nvula	pula	NvuLa	Npfula	Nvura
reed	u + ɬaNga	li + ɬaka	Lu + ʿtaNga	ri + ɬaNga	-
river	mu + laNbo	mʊ + lapo	mu + LaNbo	naNbu	-
rivers	mi + laNbo	mɪ + lapo	mi + LaNbo	mi + laNbu	-
root	-	mʊ + li	mu + dzi	-	mu + dzi
salt	mu + nyu	-	-	mu + nyu	mu + nyu
sand	mu + ɬaba	mʊ + ɬaβa	mu + ʿtaβa	NtɬhaβaNtɬhaβa	-

sands	mi + ɬaba	mɪ + ɬaβa	mi + ʿtaβa	mi + ɬaβa	-
seed	Nbewu	peu	Nbeu	Nbewu	Nbeu
sleep	bu + thoNgo	βʊ + roko	-	βu + rhoNgo	-
smoke	mu + si	mʊ + ʃi	mu + tsi	mu + si	u + tsi.
snail	NkuNba	kxhʊpa	khuNba	huNba	-
soot	mu + sizi	mu + ʃili	-	N + siti	-
sore	si + loNda	-	tʃi + LoNda	ʃi + loNdzʾa	tʃi + roNda
spear	-	lɪ + rumo	-	fumu	pfumo
spittle	ma + the	ma + re	ma + re	-	ma + tɕ
spot	ii + bala	Nmala	-	βala	vara
spots	ma + bala	mɪ + βala	-	ma + βala	ma + βara
stalk	u + ɬaNga	li + ɬaka	Lu + ʿtaNga	ri + ɬaNga	-
stone	i + tʃe	li + β3e	-	ri + bye	i + bɣe
tail	mu + sila	mʊ + sɪla	mu + tʃiLa	-	mu + tʃira
tendon	mu + sipha	mu + ʃiɸa	-	N + siha	-
termite	NɬwaN	N + ɬwa	N + ʿtwa	-	-
termite	ɬwa	tɬwa	ʿtwa	-	-
tongue	u + limi	lɪ + lɪmɪ	Lu + Limi	ri + rimi	ru + rimi
tooth	zinyo	li + ino	iʿno	-	zinyo
tree	mu + thi	mʊ + ri	mu + ri	mu + rhi	mu + ti
village	mu + zi	mʊ + tsɪ	mu + ʿdi	mu + ti	-
wildcat	Npaga	phaɣa	phaha	-	-
wind	mu + moya	moya	-	moya	-

8.0 Appendix 3. Correspondences between Proto-Bantu and Proto-Southern Bantu.

8.1 Introduction.

In section 8.2, the Proto-Bantu roots which have regular reflexes in Proto-Southern Bantu are set out together with their Proto-Southern Bantu equivalents. The list of Proto-Bantu roots is taken mainly from Guthrie (1971: 118- 136). All roots which he marks as having a distribution value of 4 or higher are taken as potential items in the proto-language. The list is supplemented from Meeussen's much less complete lists in Meeussen (1967). One or two roots which Guthrie marks as having a distribution value of 3 or less are accepted as Proto-Bantu roots by Meeussen: these have also been included in this list. Only absolutely regular correspondences, derivable by the rules given in Chapter 4, are given in the following two sections. Skewed correspondences are listed in section 8.4. A list of Proto-Southern Bantu roots which have a distribution value of 3 or less in Guthrie's assessment, and which Meeussen does not include among his roots; is combined with a list of roots which are not mentioned in either of these works at all. This list is given in section 8.5. Proto-Bantu noun classes are indicated by giving the number of the class after the noun stem. The tonal shape of stems is indicated by combinations of the letters H and L after stems. Extensions are given in brackets as part of the stems in which they occur.

8.2 Proto-Bantu to Proto-Southern Bantu.

*+ana L	*+ana L	(reciprocal)
*bʊ+ L	*bu+ L	(Class 14)
*bʊdaga H	*budaya H	kill
*bʊe (5) LL	*bwe L	stone
*bʊNba (5) HL	*buNba HH	clay
*bʊNba H	*buNba H	mould
*bʊNga H	*buNga H	gather
*bɪ H	*bi H	bad
*bɪada H	*bwada H	plant
*bɪcɪ HL	*bici HH	milk n
*bɪd(i)a H	*bidFa H	call
*bɪdɪ (3) LL	*bidi LL	body
*bɪdɪ LH	*bidi LH	two
*bɪda L	*bida L	boil v

*ba+ L	*ba+ L	(Class 2)
*baa H	*ba H	become
*baba H	*baba H	sting
*bada L	*bada L	count
*bede (6) LH	*bede HL	millet
*beeka H	*beka H	put
*boda L	*boda L	rot
*boko (3;5) HL	*boko HH	arm
*bona H	*bona H	see
*buaNga H	*bFwaNga H	mix
*cʊa (3) HH	*cwa H	ant
*ceka L	*ceka L	laugh
*ciada H	*kFada H	remain
*cida L	*kFida L	grind
*dʊ+ L	*du+ L	(Class 11)
*dʊa L	*dwa L	fight
*dʊada H	*dwada H	be ill
*dʊma H	*duma H	bite
*dɪbada L	*dibada L	forget
*dɪda L	*dida L	cry
*dɪdo (3) LL	*dido LL	fire
*dɪmɪ (5;11) HL	*dimi HH	tongue
*dɪma L	*dima L	cultivate
*dɪpa L	*dipa L	pay
*dɪNda L	*diNda L	wait
*dɪNga H 'measure'	*diNga H	try
*dɪNgana L	*diNgana	fit
*da (3;6) L	*da L	intestines
*daada H	*dada H	lie
*daNd(ɪd)a L	*daNdeda L	follow
*dedu (7) LL	*dedFu LL	beard
*di (3) L	*dFi L	root
*diba (5;7) LL	*dFiba LL	pool
*dima H	*dFima H	extinguish
*doga L	*doya L	bewitch
*domo (3) LL	*domo LL	mouth
*doota L	*dota H	dream
*doNda (7) LL	*doNda LL	sore
*dumɪda L	*dFumeda L	agree
*duma L	*dFuma L	rumble

*duNbɪ (3) LH	*dFuNbi LH	rain n
*gʊa L	*wa L	fall
*gɪa L	*ya L	go
*gaba L	*aba L	divide
*gad(uk)a 'turn' L	*aduka L	twist
*gaNba L	*aNba L	speak
*gaNja (7) LL	*aNja LL	hand
*geda L	*yeda L	flow
*geni (1) LL	*eni LL	stranger
*geNdo (11) LL	*eNdo LL	journey
*gida L	*gFida L	taboo
*+ɪda L	*+eda L	(applied)
*+ɪka L	*+eka L	(neuter)
*+ɪkia L	*+ïkFa L	(causative)
*jɪ (3) L	*ji L	village
*jɪɪba HH	*jiba H	know
*kʊ+ L	*ku+ L	(Class 15)
*kʊdʊ HL	*kudu HH	big
*kʊda H	*kuda H	grow up
*kʊmi (5)	*kyumi HL	ten
*kɪ+ L	*ki+ L	(Class 7)
*kɪa H	*kya H	dawn
*kɪda (3) HL	*kida HH	tail
*kaana HH	*kana H	deny
*kada (5) HL	*kada HH	charcoal
*kama H	*kama H	squeeze
*kipa (3) LL	*kFipa LL	tendon
*kocʊda H	*kocoda H	cough
*koka H	*koka H	pull
*koko (5;11) HL	*koko HH	crust
*kotama L	*kotama L	bend
*ku 11 H	*kFu H	death
*kua H	*kFwa H	die
*mʊ+ L	*mu+ L	(Class 1)
*mʊ+ L	*mu+ L	(Class 3)
*mɪ+ L	*mi+ L	(Class 4)
*ma+ L	*ma+ L	(Class 6)
*Nbeba (9) LL	*Nbeba LL	rat
*Nbegu (9) HH	*Nbewu HH	seed
*Nbuda (9) HL	*NbFuda HH	rain n

*Nbʊa (9) HL	*Nbwa H	dog
*Nbʊdi (9) HL	*NbudFi HH	goat
*Ncʊa (9)	*Ncwa H	termite
*Ngʊbo (9) LL	*Ngubo LL	garment
*Ngʊdʊbe (9) LLL	*Ngudube LLL	pig
*Nguena (9) LLL	Ngwenya LL	crocodile
*NgaNga (9) LL	*NgaNga (?)	medicine-man
*Ngoma (9) LL	*Ngoma LL	drum
*Ngubʊ (9) HL	*NgFubu LH	hippopotamus
*Njɪda 9 LL	*Njida LL	path
*Njada (9) LL	*Njada LL	hunger
*Njogu (9)	*NjogFu LL	elephant
*Nkʊadɪ (9) LLH	*Nkwadi LH	partridge
*Nkʊkʊ (9) HL, HH	*Nkuku HH	chicken
*Nkʊni (9) HL	*Nkuni HH	firewood
*NkaNga (9) HL	*NkaNga HH	guinea-fowl
*Ntʊ (1) L	*Ntu L	person
*nʊe (3) LL	*nwe L	finger
*nia L	*nya L	defecate
*nua H	*nwa H	drink
*nunka L	*nuNka L	smell
*nyama (9) LL	*nyama LL	meat
*nyatɪ (9) HL	*nyati HH	buffalo
*nyokɪ (9) HL 3	*nyoki HH	bee
*nyoka (9) HL	*nyoka HH	snake
*nyoni (7) LL	*nyoni LL	bird
*pʊʊmʊda HHL	*pumuda H	rest
*pɪɪkia	*pikFa H	burn
*pɪa H	*pwa H	burn
*pɪa HL	*pwa H	new
*pɪni (3) HL	*pini HH	handle
*paa H	*pa H	give
*pada H	*pada H	scrape
*paNcɪ LH	*paNci LH	underneath
*paNga (11) HL	*paNga HH	knife
*peda H	*peda H	finish
*pica H	*pFica H	hide
*pika L	*pFika L	arrive
*puana HH	*pFwana H	resemble

*tʊada HH	*twada H	carry
*tʊka H	*tuka H	curse
*tʊma H	*tuma H	send
*tʊNga H	tuNga H	sew
*tɪ (3) H	*ti H	tree
*tɪ L	*ti L	namely
*ta (14) H	*ta H	bow
*tako (5) HL	*tako HH	buttock
*tama (5) HL	*tama HH	cheek
*tatʊ HL	*tatu HH	three
*te (6) H	*te H	spittle
*tema H	*tema H	chop
*tooda HH	*toda H	pick up
*toNgo (14) LL	*toNgo LL	sleep
*tuda H	*tFuda H	forge
*tumo (5) HL	*tFumo HH	spear
*yɪma H	*yima H	stand
*yɪNba H	*yiNba H	sing
*ye H	*ye L	him, her
*yeda L	*yeda L	measure
*yedi (3) HL	*mwedFi LH	moonlight
*yico (5) HL	*gFico HH	eye
*yijada H	*jada H	be full
*yikʊta H	*kyuta H	have enough
*yino (5) LH	gFinyo HH	tooth
*yokɪa L	*okya L	roast
*yota H	*ota H	warm oneself
*yoya (14) LH	*boya LH	fur
*yoNda H	*oNda H	be thin

8.3 Proto-Southern Bantu to Proto Bantu.

* + ana L	* + ana L	(reciprocal)
*ba + L	*ba + L	(Class 2)
*ba H	*baa H	become
*baba H	*baba H	sting
*bada L	*bada L	count
*bede HL	*bede (6) LH	millet
*beka H	*beeka H	put

*bi H	*bɪ H	bad
*bwada H	*bɪada H	plant
*bici HH	*bɪcɪ HL	milk n
*bidFa H	*bɪd(i)a H	call
*bida L	*bɪda L	boil v
*bidi LL	*bɪdɪ (3) LL	body
*bidi LH	*bɪdɪ LH	two
*boda L	*boda L	rot
*boko HH	*boko (3;5) HL	arm
*bona H	*bona H	see
*bu+ L	*bʊ + L	(Class 14)
*Nbwa H	*Nbʊa (9) HL	dog
*budaya H	*bʊdaga H	kill
*NbudFi HH	*Nbʊdi (9) HL	goat
*bwe L	*bʊe (5) LL	stone
*buNba HH	*bʊNba (5) HL	clay
*buNba H	*bʊNba H	mould
*buNga H	*bʊNga H	gather
*bFwaNga H	*buaNga H	mix
*ceka L	*ceka L	laugh
*cwa H	*cʊa (3) HH	ant
*jada H	*yijada H	be full
*kFada H	*ciada H	remain
*kFida L	*cida L	grind
*da L	*da (3;6) L	intestines
*dada H	*daada H	lie
*daNdeda L	*daNd(ed)a L	follow
*dedFu LL	*dedu (7) LL	beard
*dibada L	*dɪbada L	forget
*dida L	*dɪda L	cry
*dido LL	*dɪdo (3) LL	fire
*dima L	*dɪma L	cultivate
*dimi HH	*dɪmɪ (5;11) HL	tongue
*dipa L	*dɪpa L	pay
*diNda L	*dɪNda L	wait
*diNga H 'try'	*dɪNga H	measure
*diNgana	*dɪNgana L	fit
*doya L	*doga L	bewitch
*domo LL	*domo (3) LL	mouth
*dota H	*doota L	dream

*doNda LL	*doNda (7) LL	sore
*du+ L	*dʊ + L	(Class 11)
*dwa L	*dʊa L	fight
*dwada H	*dʊada H	be ill
*duma H	*dʊma H	bite
*dFi L	*di (3) L	root
*dFiba LL	*diba (5;7) LL	pool
*dFima H	*dima H	extinguish
*dFuma L	*duma L	rumble
*dFumeda L	*dumɪda L	agree
*dFuNbi LH	*duNbɪ (3) LH	rain n
*aba L	*gaba L	divide
*aduka 'twist' L	*gad(uk)a L	turn
*aNba L	*gaNba L	speak
*aNja LL	*gaNja (7) LL	hand
*yeda L	*geda L	flow
*eni LL	*geni (1) LL	stranger
*eNdo LL	*geNdo (11) LL	journey
*ya L	*gɪa L	go
*wa L	*gʊa L	fall
*gFida L	*gida L	taboo
*+eda L	*+ɪda L	(applied)
*+eka L	*+ɪka L	(neuter)
*+ikFa L	*+ɪkia L	(causative)
*ye L	*je H	him, her
*yeda L	*jeda L	measure
*mwedFi LH	*jedi (3) HL	moonlight
*ji L	*jɪ (3) L	village
*jiba H	*jɪɪba HH	know
*yima H	*jɪma H	stand
*yiNba H	*jɪNba H	sing
*boya LH	*bujoja (14) LH	fur
*okya L	*jokɪa L	roast
*ota H	*jota H	warm oneself
*oNda H	*joNda H	be thin
*gFico HH	*jico (5) HL	eye
*kyuta H	*yikʊta H	have enough
*gFinyo HH	*jino (5) LH	tooth
*kana H	*kaana HH	deny
*kada HH	*kada (5) HL	charcoal

*kama H	*kama H	squeeze
*ki + L	*kɪ + L	(Class 7)
*kya H	*kɪa H	dawn
*kida HH	*kɪda (3) HL	tail
*kocoda H	*kocʊda H	cough
*koka H	*koka H	pull
*koko HH	*koko (5;11) HL	crust
*kotama L	*kotama L	bend
*ku + L	*kʊ + L	(Class 15)
*kuda H	*kʊda H	grow up
*kudu HH	*kʊdʊ HL	big
*kyumi HL	*kʊmi (5)	ten
*kFipa LL	*kipa (3) LL	tendon
*kFu H	*ku 11 H	death
*kFwa H	*kua H	die
*ma + L	*ma + L	(Class 6)
*mi + L	*mɪ + L	(Class4)
*mu + L	*mʊ + L	(Class 1)
*mu + L	*mʊ + L	(Class 3)
*Nbeba LL	*Nbeba (9) LL	rat
*Nbewu HH	*Nbegu (9) HH	seed
*NbFuda HH	*Nbuda (9) HL	rain n
*Ncwa H	*Ncua (9)	termite
*NgaNga (?)	*NgaNga (9) LL	medicine-man
*Ngoma LL	*Ngoma (9) LL	drum
*Ngubo LL	*Ngʊbo (9) LL	garment
*Ngudube LLL	*Ngʊdʊbe (9) LLL	pig
*Ngwenya LL	*Ngʊena (9) LLL	crocodile
*NgFubu LH	*Ngubʊ (9) HL	hippopotamus
*Njada LL	*Njada (9) LL	hunger
*Njida LL	*Njɪda 9 LL	path
*NjogFu LL	*Njogu (9)	elephant
*NkaNga HH	*NkaNga (9) HL	guinea-fowl
*Nkwadi LH	*Nkʊadɪ (9) LLH	partridge
*Nkuku HH	*Nkʊkʊ (9) HL, HH	chicken
*Nkuni HH	*Nkʊni (9) HL	firewood
*Npaka (9) HL	*Npaka HH	wildcat
*Ntu L	*Ntʊ (1) L	person
*nwe L	*nʊe (3) LL	finger

*nyama LL	*nyama (9) LL	meat
*nyati HH	*nyatɪ (9) HL	buffalo
*nyoka HH	*nyoka (9) HL	snake
*nyoki HH	*nyokɪ (9) HL 3	bee
*nyoni LL	*nyoni (7) LL	bird
*nya L	*nia L	defecate
*nwa H	*nua H	drink
*nuNka L	*nunka L	smell
*pa H	*paa H	give
*pada H	*pada H	scrape
*paNci LH	*paNcɪ LH	underneath
*paNga HH	*paNga (11) HL	knife
*peda H	*peda H	finish
*pwa H	*pɪa H	burn
*pwa H	*pɪa HL	new
*pikFa H	*pɪɪkia	burn
*pini HH	*pɪni (3) HL	handle
*pumuda H	*pʊʊmʊda HHL	rest
*pFica H	*pica H	hide
*pFika L	*pika L	arrive
*pFwana H	*puana HH	resemble
*ta H	*ta (14) H	bow
*tako HH	*tako (5) HL	buttock
*tama HH	*tama (5) HL	cheek
*tatu HH	*tatʊ HL	three
*te H	*te (6) H	spittle
*tema H	*tema H	chop
*ti H	*tɪ (3) H	tree
*ti L	*tɪ L	namely
*toda H	*tooda HH	pick up
*toNgo LL	*toNgo LL 9	sleep
*twada H	*tʊada HH	carry
*tuka H	*tʊka H	curse
*tuma H	*tʊma H	send
*tuNga H	*tʊNga H	sew
*tFuda H	*tuda H	forge
*tFumo HH	*tumo (5) HL	spear

8.4 Skewed reflexes.

The following is a list of Proto-Southern Bantu reflexes of Proto-Bantu words that do not conform to the rules in Chapter 4. They may be an indication of the existence of borrowing between Bantu dialects or languages.

8.4.1 Tonally skewed reflexes.

PB	PSB	GLOSS
bada (5) HL	*bada HL	spot
*caanu HHL	*canu HL	five
*dua L	*dFwa H	bleed
*yedi HL	*mwedFi LH	moonlight
*keka L	*keka H	cut
*kuNbuda L	*kuNbuda H	think
*mue HH	*mwe L	one
*papa L	*papa H	fly
*peepida LLL	*pepeta H	winnow
*Npada (9) HH	*Npada HL	impala

8.4.2 Segmentally skewed reflexes.

PSB	PB	GLOSS	EXPECTED PB FORM
*bFwada	*dugada	shut	*bugada
*cakFuna	*takuna	chew	*cakuna
*caNdFa	*caNja	vomit	*caNdIa
*diny+ L	*dFi+	(Class 10)	*di+
*eneka H	*yanika H	spread	*yeneka
*tFi H	*yiki (3) HL	smoke	*ti
*pFuta HH	*kuta (6) HL	oil	*puta
*pFuba HH	*kuba (7) HL	chest	*puba
*meda H	*mida L	grow	*meda
*Npwa H	*pua H	dry	*Npua
*kFiya H	*tiga H	leave	*ciga, *kiga
*ci L	*yinci (3) LL	pestle	ci
*Ngwe L	*Ngoi (9) LL	leopard	*Ngue

8.5 Stems that do not correspond.

The following is a list of words that can be reconstructed for Proto-Southern Bantu, but which are not derivable from Proto-Bantu. Some of them are listed by Guthrie, but are given a modulus of dispersion of 3 or less, and are therefore not admitted as possible Proto-Bantu stems. They probably represent borrowing from non-Bantu languages, or innovations. The meanings of the stems are given in Appendix 1.

*acuda	*cebe	*kadFiNga	*Nda	*taNbo
*aka	*cedo	*kudeka	*Ndaba	*taNga
*aNda	*cubuda	*kFidFi	*Njebe	*taNga
*bika	*cuja	*kFuNdo	*Nju	*teja
*bodFu	*cuNguda	*mama	*Nkobe	*teNga
*bopa	*daca	*mema	*NkokFi	*to
*boNba	*dada	*munya	*nona	*tududa
*buya	*daNduda	*na	*NpaNja	*tutumeda
*caba	*dota	*Nbidu	*nuNgu	*tuNda
*cakuda	*dudama	*NbidFa	*nyaNga	*tuNdu
*cana	*dumeka	*NbuNba	*nyu	*tyaba
*caNba	*dFuja	*Nca	*oma	*tyeda
*caNga	*ja	*NcaNbFi	*paNda	*tFu
*caNgana	*ka	*Ncoko	*piNda	*weda

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