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TIGRINYA PHONOLOGY.

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TIGRINYA PHONOLOGY

by

MARTIN DAVID PAM

A dissertation submitted to the Graduate
Faculty in Linguistics in partial ful-
fillment of the requirements for the
degree of Doctor of Philosophy, The City
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1973

This manuscript has been read and accepted for the Graduate Faculty in Linguistics in satisfaction of the dissertation requirement for the degree of Doctor of Philosophy.

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DEDICATION

This dissertation is dedicated to my parents,
Samuel and Rae Pam, with all my love.

באופן אישי להורי
שמואל וראי פאם.
באופן אישי להורי
שמואל וראי פאם.

ABSTRACT

This study is an investigation of the major phonological and morphological processes in Tigrinya using the method of generative phonology. In the course of this study I have developed a set of rules which explain the surface phonology of Tigrinya nominals and verbs. I have found it necessary to make particular reference to the various morphological devices of the language and I have therefore developed a formal mechanism for handling major morphological processes. Although Tigrinya has diverged from Common Semitic in many ways, I have shown that it nevertheless has retained much more of common Semitic than is apparent from a surface examination.

In the course of this study I offer a solution to the problem of the so-called broken plurals of Semitic nominals for which I propose an analysis which I believe is more unified and therefore more adequate than that which has been suggested for this feature in any other Semitic language.

In addition, I show that despite its surface diversity, Tigrinya retains in its underlying phonological system the Common Semitic distinction of short and long vowels, i.e., /i:, u:, a:, ɨ, a/.

PREFACE

This study represents an outgrowth of a field methods course in Tigrinya given by Dr. Beatrice L. Hall at the State University of New York at Stony Brook in the Spring of 1971, in which I was asked to participate because of my interest and background in Semitic linguistics. I was intrigued by the number of similarities still exhibited by this rather divergent Semitic language with the more well-known languages.

To the limited extent that generative phonology has been applied to the Semitic languages, it has by and large been to such languages as Arabic and Hebrew. I became interested in the question of the application of the generative phonological model to this language as part of my general interest in comparative Semitic studies. Specifically, I was curious to discover to what extent Tigrinya had remodeled Common Semitic morphological and phonological processes. In particular, there are certain morphological devices which have resisted adequate analysis by the means at the disposal of traditional Semitic linguistics.

The major one of these is the so-called "broken" or "internal" plural exhibited by most of the Semitic languages, and which is most highly developed as a system in the South

Semitic languages. This internal "broken" plural contrasts with the external "sound" plural, consisting of one prefix and a variety of suffixes, and interacts in rather bizarre ways with it. One of the questions, therefore, that interested me was whether Tigrinya, as a South Semitic language, could shed any light on the problem. The solution, found in Chapter Three of this study, is what I have termed Infixation.

This process consists of inserting an [a:] after the second consonant of the nominal stem. The interaction of this process with external affixation (i.e., prefixes and suffixes) is what accounts for the apparent complexity of surface plural patterns. However, as my analysis shows, the child learning to speak Tigrinya does not have to memorize a separate plural for every noun, but merely has to assign each noun to one of several well-defined classes, with no more irregularity than is found in any natural language.

For me as a Semitist, the most exciting discovery was a phonological one. Preliminary analysis of Tigrinya would indicate that the language has developed, in place of the Common Semitic vowel system (i, u, a, i:, u:, a:), a seven vowel system. However, a purely synchronic analysis in

depth, using the methodology of generative phonology, shows that in fact Tigrinya is best analyzed as having retained the basic system of long vowels and corresponding short vowels, although this difference has been neutralized for the high vowels, resulting in an underlying five-vowel system.

The number of people I would like to thank is so large that it is virtually impossible for me to name them all. I would particularly like to thank my informants, Tseggai Kidane, Stefanos Daganos, Misfin Habtu and Tsehaye Teferra -- the best I have ever worked with. In addition, I would like to express my appreciation to all those friends and colleagues at Queens College and the Graduate School of the City University of New York for listening to and commenting on many of the points that I have discussed in this work. I am grateful as well to the faculty members who were gracious enough to serve on my dissertation committees: Prof. Emmon Bach, Prof. Charles E. Cairns, Prof. H. Bernhard Drubig, Prof. D.T. Langendoen, Prof. John Moyne; and most of all, to my very dear friends, Profs. Beatrice and Michael Hall, without whose love and friendship over the years I could not have developed my linguistic skills.

Finally I would like to thank Mark H. Feinstein and Robert K. Herbert, fellow students in Linguistics, who typed the bulk of this dissertation with an eye toward

theoretical as well as stylistic problems. Any errors or omissions are, of course, my own responsibility.

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CHAPTER ONE: PRELIMINARIES

1.0 Language and Sources

1.0.1 Tigrinya is a Semitic language, spoken in Northern Ethiopia by about three and a half million people (Bender, 1971). Together with its sister languages (Tigre, Amharic, Gurage, Harari, etc.), it constitutes the Ethiopian sub-branch of the South Semitic languages, whose best-known member is, of course, Arabic.

1.0.2 During the last hundred years, a substantial amount of traditional scholarship has been devoted to Tigrinya, although nothing has appeared using the generative-transformational model. The most recent complete grammar of Tigrinya is Wolf Leslau's Documents Tigrigna (1941). It contains a fairly detailed account of the phonology and morphology of the language, presented in the format of the structuralism of the time.

1.0.3 The purpose of my study is to establish the major morphological and phonological processes in Tigrinya. Although most linguists implicitly acknowledge morphological processes in the course of linguistic analysis, there exists no established practice for writing morphological rules. Since the input to the majority of the phonological rules discussed in this study requires a statement of the underlying morphological

form, I have been forced to specify the morphological mechanisms in the shape of formal morphological rules. The purely phonological processes are in general analyzed within the framework of generative phonology as formulated by Chomsky and Halle in The Sound Pattern of English (1968). My practice will deviate from that of this work in that I formulate morphological rules, whereas Chomsky and Halle do not, in fact, write morphological rules. My study is a word-level phonology and it will focus solely on the nominal and verbal morphology. Although the analysis presented here is purely synchronic, I shall discuss historical and comparative data wherever pertinent.

1.0.4 This study is based chiefly on the speech of Mr. Tsegai Kidane, a twenty-year-old student from the city of Asmara, located in the center of the Tigrinya-speaking area. In addition, I have made extensive comparison with Leslau's (1941) grammar. These two sources are in essential agreement for almost all forms. In those few instances where they are not in agreement, I have followed the forms given by my informant. The differences between these sources may be ascribed to two causes: geographical variation and temporal variation. In many instances my informant was perfectly familiar with those forms presented in Leslau which diverged from his own and identified them as the speech of an older generation -- "something my father would say."

Despite the fact that I had Mr. Kidane's services for the better part of a year, there remained certain gaps in my data. Some of these have subsequently been filled with the aid of Mr. Tsehaye Teferra, another Ethiopian student. In addition to providing me with further material, Mr. Teferra, who comes from the city of Aksum in the northern part of the Tigrinya-speaking area, was able to provide some insights into important dialectal variants. Such variants, as well as those few gaps still remaining, will be evaluated in the appropriate places in this study.

1.0.5 The present Chapter sets forth the surface paradigms which will be analyzed in greater phonological and morphological detail in Chapters 2, 3 and 4. This Chapter also presents the basic facts of Tigrinya surface phonology, as well as the handful of phonological rules governing consonantal behavior, since, essentially, consonants are only subject to a very limited number of low-level phonological rules and hence do not really show anything of great interest about phonological processes in Tigrinya.

Chapter 2 uses the facts of vocalic alternation as it is found in nominal gender in order to establish the underlying vowel system of Tigrinya. The other vocalic phonological rules found in the language are examined in Chapter 3, which deals with the formation of the productive plural patterns. Chapter 4, then, discusses the processes already established in the light of additional evidence adduced

mainly, though not exclusively, from the verb and from the associated forms of the deverbative nominal.

The emphasis which I have placed on the elucidation of the nominal system is necessitated by the structural history of Tigrinya, which has resulted in a more uniform verbal system which exhibits fewer phonological alternations than the nominal system does.

1.1 Explanation of Symbols

The following charts contain the complete inventory of systematic phonetic segments occurring in Tigrinya. Through the use of [] and (), which are found only in the chart of the consonants, more information is conveyed about the consonants than about the vowels. Specifically, consonants given in () occur only in loanwords from Amharic and European languages, while those given in [] are phonologically derived from underlying segments. All other symbols on the chart are assumed to be underlying. On the other hand, the chart of vowels represents only the surface segments without any indication of which segments are underlying. I have treated the consonants in this great detail here because, since there are only a very few processes of phonological -- or even morphological -- interest involving consonants, and even these are not crucial to the understanding of Tigrinya phonology, the only systematic treatment of consonants in this study is that found in this chapter.

On the other hand, since most of this study is devoted to establishing the underlying vocalism of Tigrinya and the phonological and morphological processes which operate on it, it is unnecessary to offer at this point anything but a surface statement of the vowels (for the underlying vowel segments, see Section 2.7).

1.1.1 Consonant Symbols

	labial	dental	palatal	velar	labio- velar	pharyngeal	laryngeal
Stops:							?
vl.	p	t	(č)	k	k ^w		
vd.	b	d	(ǰ)	g	g ^w	ʕ	
glot- talized	(p)	t̚	(č̚)	q	q ^w		
Frics.							
vl.	f	s	(š)	[x]		ħ	h
vd.		z	(ž)	[ɣ]			
glot- talized		s̚		[x̚]		[ħ̚]	
Nasals	m	n	(ɲ)				
Liquids		l,r					
Glides	w		y				

Chart 1.1

Voiceless stops are aspirated pre-vocalically. Aspiration will not be indicated in the transcription.

The symbol s̚ represents a glottalized (or ejective) s in the speech of Mr. Teferra. With Mr. Kidane, and in the speech of Leslau's informant, however, it represents a glottalized dental affricate [t̚ʃ].

ʕ̚ does not occur in the speech of Leslau's informant, who has ʕ̚ for both the ʕ̚ and the ʕ̚ in the speech of Mr. Kidane and Mr. Teferra.

1.1.2 Vowel Symbols¹

	front	central	back
high	i i:	ɨ	u u:
mid	ɛ e:	ʌ	o o:
low		a a:	ɔ ɔ:

Chart 1.2

1.1.2.1 Diphthongs

ʌy, ɛy, ay, a:y

ʌw, ɛw, aw, a:w

All diphthongs are best analyzed as VC sequences rather than complex vowels. This is shown by their behavior with respect to the Spirantization rule (see below, Section 1.2.4); that is, Spirantization does not occur after a diphthong, because glides function as real consonants and therefore block the application of the rule which regularly applies after a vowel.²

1.1.2.2 The matrix corresponding to the phonetic segments used thus far is:

	t	k	k ^w	ʔ	b	d	g	g ^w	ʃ	ṭ	q	q ^w	f	s	ḥ	h	z	ṣ	m	n	l	r	w	y
cons	+	+	+	-	+	+	+	+	+	+	+	+	+	+	+	-	+	+	+	+	+	+	-	-
voc	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-
syll	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	-	-
cont	-	-	-	-	-	-	-	-	-	-	-	-	+	+	+	+	+	+	-	-	-	-	-	-
nasal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+	+	-	-	-	-
ant	+	-	-	-	+	+	-	-	-	+	-	-	+	+	-	-	+	+	+	+	+	+	+	-
cor	+	-	-	-	-	+	-	-	-	+	-	-	-	+	-	-	+	+	-	+	+	+	-	-
hi	-	+	+	-	-	-	+	+	-	-	+	+	-	-	-	-	-	-	-	-	-	-	+	+
lo	-	-	-	+	-	-	-	-	+	-	-	-	-	-	+	+	-	-	-	-	-	-	-	-
back	-	+	+	+	-	-	+	+	+	-	+	+	-	-	+	+	-	-	-	-	-	-	-	-
round	-	-	+	-	-	-	-	+	-	-	-	+	-	-	-	-	-	-	-	-	-	-	+	-
glot	-	-	-	+	-	-	-	-	-	+	+	+	-	-	-	-	-	-	+	-	-	-	-	-
voice	-	-	-	-	+	+	+	+	+	-	-	-	-	-	-	-	+	-	+	+	+	+	+	+

Chart 1.3A

	<u>i:</u>	<u>a:</u>	<u>u:</u>	<u>ɨ</u>	<u>a</u>
cons	-	-	-	-	-
voc	+	+	+	+	+
syll	+	+	+	+	+
hi	+	-	+	+	-
lo	-	+	-	-	+
back	-	+	+		+
round	-	-	+	-	-
long	+	+	+	-	-

Chart 1.3B

1.1.3 Other Symbols

C = any true consonant, liquid, or glide

V = any vowel

Stress: acute (´) over the stressed vowel

Length: colon (:) after the appropriate segment

Boundaries:

word boundary

- derivational morpheme boundary

+ inflectional morpheme boundary. However, in the statement of phonological rules, [+] is a general symbol for any morpheme boundary, both inflectional and derivational, since no rule is sensitive to a specific type of morpheme boundary. In citing examples I have introduced the distinction between [-], a derivational morpheme boundary, and [+], an inflectional morpheme boundary, in order to provide a guide to the reader who is not thoroughly familiar with Tigrinya.

{ } represents an affix in rules; otherwise lexical representations or alternative environments in rule schemata.

() indicates that the enclosed segment is optional.

[] encloses phonetic symbols, or features in rules.

// encloses phonological representations.

↔ means "alternates with".

1.1.4 Root and Stem

The distinction between the terms root and stem is of crucial importance to an understanding of Semitic morphology.

Root. The most crucial characteristic of Semitic morphology is the assignment of lexical content to certain patterns of consonants, while grammatical content is expressed (especially in verbs) by infixed patterns of vowels in conjunction with affixes. Thus, minimal pairs are frequent among consonant patterns, while they are wholly lacking (in regard to lexical content) among vowels:

s ^á AbAr + ʌ	'he broke' (perfective)
sAbi:r + ú:	'he broke' (gerundive)
s ^á AbAb + ʌ	'he turned' (perfective)
sAbi:b + ú:	'he turned' (gerundive)

A root will therefore be defined as a set of consonants, generally three or four in number, which have lexical content. Thus, the root s-b-r means 'break' and s-b-b means 'turn'. More generally, the root may be symbolized $C_1C_2C_3$ or $C_1C_2C_3C_4$ where the subscript refers to the position of a particular consonant in the root. Thus, in the root s-b-r, s = C_1 , b = C_2 , r = C_3 . An individual consonant in a root is called a radical. Thus, b in s-b-r is the second radical of the root, etc. In this study a C with a subscript will always refer to some specific radical; it will never refer to the number of possible consonants. I will show in Chapter 4 that verbs, because of the constancy of their vocalic

patterns, are entered in the lexicon by merely specifying either the trilateral or quadrilateral roots which carry the lexical content. Nominals, however, and particularly non-derivative nominals, must be entered into the lexicon with both consonants and vowels. This is due to the greater variety and unpredictability of nominal vocalism.

Stem. A stem consists of a consonantal root plus the infixed vowel patterns associated with it, and is symbolized $C_1VC_2VC_3$ or $C_1VC_2C_3VC_4$ (to use the most common types of stem). Thus, sAbAr and sAbi:r in the examples above are stems. Neither inflectional nor derivational affixes are included in the definition of the stem.

1.2 Consonantal Rules.

In the following discussion I present most of the consonantal rules of Tigrinya. Since none of these rules is ordered with respect to any other consonantal rule, I shall discuss them simply in terms of the two major processes involved: those rules which produce long consonants and the rule of Spirantization. For a completely ordered list of consonantal rules, see the Appendix.

1.2.1 One source of long consonants is lexical specification in certain verb roots called 'geminated roots' (see Section 4.1).

There are, however, two other sources of long consonants which are general enough not to be lexically specified, but

which are morphologically and not phonologically produced. I use the term 'gemination' to refer to such morphologically produced long consonants.

In any non-past indicative verb of the shape $C_1VC_2VC_3$, C_2 will be geminated:

$$C \implies [+ \text{ long}] / \#CV \underline{V} C\# \\ [+ \text{ INDIC}]$$

Compare, for example,

sʌbʌr + ʌ 'he broke' (perfective);

sʌbɪ:r + ú: 'he broke' (gerundive);

but yɛ + sʌb:ɪr 'he breaks'.

(See Section 16 for a complete discussion of verbal morphology.)

In the speech of Leslau's informant, as well as in the speech of my own informants, there is a late rule which degeminates a low consonant, i.e., [ʔ, ʕ, h, ɣ] :

$$\begin{bmatrix} C \\ + \text{ low} \\ + \text{ long} \end{bmatrix} \implies [- \text{ long}]$$

For example, yɛ + sʌɣ:ɪb 'he pulls' vs. yɛ + sʌb:ɪr 'he breaks'.

This rule of degemination, though apparently general for Ethiopian Semitic, is not general for South Semitic, as witness Arabic:

ráʔ:as + a 'he appointed someone as chief'

ʕáʕ:ab + a 'it branched out'

sáh:ar + a 'he made someone famous'

sáh:ar + a 'he infatuated someone'.

It might be argued that rather than geminating and then degeminating low consonants, the rule of gemination might be formulated so as not to geminate them in the first place. There are two arguments against this. First, it would be necessary to complicate every rule in the language which produces a phonetically long consonant while missing the generalization that low consonants do not occur long. Second, it would not take into account the case (described below) where a phonetically long consonant arises by the accidental juxtaposition of two identical consonants in the combination of morphemes. This latter case could not possibly be handled except by a low-level phonological rule.

The other morphological source of gemination is a rule which states that a final consonant of a verb is geminated before an object suffix which has an initial vowel:

$$C \Rightarrow [+ \text{long}] / _ + \{VX\}_{\text{obj.}}$$

For example,

$y\dot{i} + b\dot{i}d:\dot{u}l + o$ [$y\dot{i}b\dot{i}d:\dot{u}l:o:$] 'he is hurting him'.

The output of the two morphological rules just discussed is the gemination of either C_2 or C_3 of the root. While there is no general morphological rule which geminates C_1 , there is a phonological rule of assimilation which results in a (non-geminated) lengthening of the first radical. Specifically, a \underline{t} prefix (either of a subject marker or of a derivational prefix; see Section 1.6 below) assimilates to the first radical of a root:³

$$\begin{bmatrix} + \text{ cons} \\ - \text{ voc} \\ - \text{ cont} \\ + \text{ ant} \\ + \text{ cor} \\ - \text{ voice} \end{bmatrix} \implies [\alpha_F] / _ + \begin{bmatrix} C_1 \\ \alpha_F \end{bmatrix}$$

For example, $y\ddot{a} + t - s\wedge b:\ddot{a}r \implies [y\ddot{a}s:\wedge b:\ddot{a}r]$ 'it is broken'
 $y\ddot{a} + t - b\ddot{a}d:\ddot{a}l \implies [y\ddot{a}b:\ddot{a}d:\ddot{a}l]$ 'it is hurt'

Virtually the only place one finds a phonetically long consonant which is not the result of one of these three rules or lexically specified (see Section 4.1) is where the process of morpheme combination results in a sequence of two identical consonants:

$$ʔ_1:d + do \implies [ʔ_1:d:\acute{o}:]$$

hand + question 'is it a hand?'

or as the result of some minor assimilation such as the following:

1. n - to - t (optional)

$$\begin{bmatrix} + \text{ cons} \\ - \text{ voc} \\ + \text{ nasal} \\ + \text{ ant} \\ + \text{ cor} \end{bmatrix} \implies \begin{bmatrix} - \text{ nasal} \\ - \text{ cont} \end{bmatrix} / _ \begin{bmatrix} + \text{ cons} \\ - \text{ voc} \\ - \text{ cont} \\ + \text{ ant} \\ + \text{ cor} \\ - \text{ voice} \end{bmatrix}$$

For example, $ʔanta \implies [ʔat:\acute{a}:] \sim [ʔant\acute{a}:]$ 'you'

2. Glottalization Assimilation:

$$C \implies [\alpha_{\text{glot}}] / _ [\alpha_{\text{glot}}]$$

For example, $s\wedge r\wedge q + ka: \implies [s\wedge r\wedge k:a:]$ 'you stole'

3. Devoicing:⁴

$$C \implies [- \text{ vce}] / _ [- \text{ vce}]$$

For example: $\zeta ad:\wedge g + ka: \implies [\zeta ad:\wedge k:\acute{a}:]$ 'you bought'

The only other general assimilation rule in Tigrinya is the following:

Nasal Assimilation: $N \implies \begin{bmatrix} \text{ant} \\ \beta \text{cor} \end{bmatrix} / _ \begin{bmatrix} \text{ant} \\ \beta \text{cor} \end{bmatrix}$

For example:

$[\text{h}\underline{\text{m}}\text{b}\acute{\text{a}}:\text{š} - \text{a}:]$ 'bread', but $[\text{h}\underline{\text{a}}\text{n}\text{a}:\text{b}\acute{\text{š}}^{\text{v}}]$ (plur.)
 $[\text{d}\underline{\text{ɲ}}\text{g}\acute{\text{l}}]$ 'virgin', but $[\text{d}\underline{\text{n}}\text{a}:\text{g}\acute{\text{l}}]$ (plur.)

1.2.2 One of the most interesting phonological rules in Tigrinya is that which spirantizes certain stops after a vowel:

Spirantization: $\begin{bmatrix} - \text{syll} \\ - \text{ant} \\ - \text{cor} \\ - \text{long} \end{bmatrix} \implies [+ \text{cont}] / \text{V} _$

For example, 'dog' $[\text{k}\underline{\text{A}}\text{lb}\acute{\text{i}}:]$ (sing.) $[\text{ʔ}\underline{\text{x}}\text{a}:\text{l}\acute{\text{b}}\text{t}\acute{\text{i}}:]$ (plur)
 'pitcher' $[\text{g}\underline{\text{A}}\text{n}^{\text{ʔ}}\acute{\text{i}}:]$ (sing.), $[\text{ʔ}\underline{\text{a}}\text{y}\text{a}:\text{n}\acute{\text{ɪ}}^{\text{ʔ}}]$ (plur.).

Recall that diphthongs are VC sequences rather than complex vowels (Section 1.1.2.1). Thus,

$[\text{b}\acute{\text{r}}\text{ʔ}\text{ay}\underline{\text{k}}\acute{\text{a}}:]$, not $*[\text{b}\acute{\text{r}}\text{ʔ}\text{ay}\underline{\text{x}}\acute{\text{a}}:]$ 'your ox' from $/\text{b}\acute{\text{r}}\text{ʔ}\text{ay} + \text{ka}:/$.

While this rule describes the production of Leslau's informants, for my informants it must be revised to include the change of /b/ to $[\beta]$, which is a generalization of the rule accomplished by losing the specification $[- \text{ant}]$ in the rule. For example, my informants produce for 'Addis Ababa' $[\text{ʔ}\acute{\text{a}}\text{d}:\text{i}:\text{s} \text{ʔ}\underline{\text{a}}\beta^{\text{ʔ}}\wedge\beta^{\text{ʔ}}\text{N}]$ where Leslau's informant has only $[\text{ad}:\acute{\text{ɪ}}:\text{s} \text{a}\underline{\text{b}}\wedge\text{b}\wedge]$.

1.3 Vowel Rules

Since the main purpose of this study is to establish the rules governing the vocalism of Tigrinya, here I shall merely refer the reader to the specific place(s) where each of the vocalic rules is developed. These rules are:

<u>Rule</u>	<u>Location</u>
Epenthesis	2.5; 2.6.4; 3.1.4
Monophthongization	3.2.2
Vowel Deletion	3.1.2; 3.2.4
Vowel Elision	3.1.2; 4.3
Vowel Gradation	2.4; 4.1
Vowel Harmony	Appendix
Vowel Centralization	2.6.4
Vowel Lengthening	4.2
Vowel Shortening	2.6.3

1.4 Morphological Rules

Like the vowel phenomena listed above, these rules must be described and motivated in detail. The major morphological processes which must be accounted for include the mechanisms for gender assignment and plural formation in nominals, and tense/aspect formation in verbs. The gender mechanism is described in Chapter 2, the plural mechanism in Chapter 3, and tense/aspect formation in Chapter 4.

1.5 Stress

While stress is certainly rule-governed in Tigrinya,

its specific formulation depends on so much of the information to be developed in the following chapters that I shall not discuss the rule for stress assignment until Chapter 4 (Section 4.4). Nevertheless, I will consistently indicate stress in my transcription.

1.6 Morphological Parameters of the Verb

1.6.1 Shape of the Root

All roots are either trilateral (i.e., have three consonants) or quadrilateral (i.e., have four consonants).⁵ Among both trilaterals and quadrilaterals, it is also necessary to distinguish, for the purposes of stem-building (see below), simple trilaterals from trilaterals augmented by the gemination of the second radical, and simple trilaterals and quadrilaterals from those which have a: specified as one of the vowels of their stem (see Section 4.1).⁶

	trilaterals	quadrilaterals
simple	C ₁ C ₂ C ₃	C ₁ C ₂ C ₃ C ₄
geminated	C ₁ C ₂ : C ₃	-----
lengthened	C ₁ a: C ₂ C ₃	C ₁ C ₂ a: C ₃ C ₄

Chart 1.4

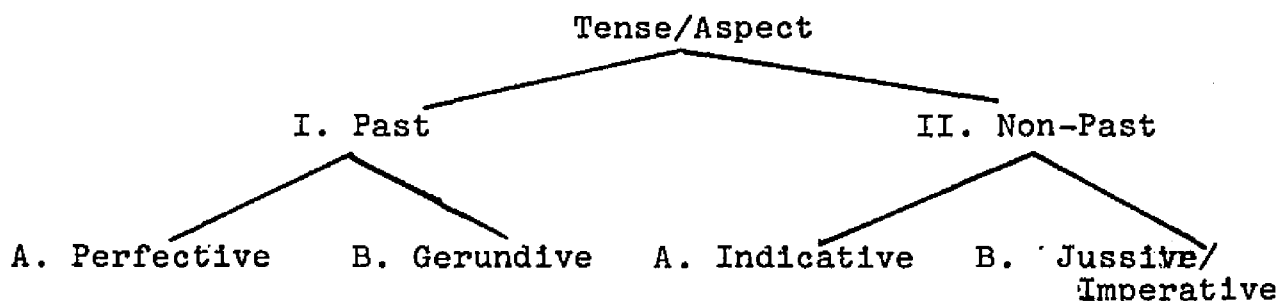
1.6.2 Tense/Aspect

Tigrinya has four tense/aspect paradigms. The primary distinction is between past time and non-past time. The traditional terms used in Semitic linguistics for these

"tenses", perfective and imperfective respectively, indicate that their original function was to indicate completed versus incompleted action.

While the difference between the Indicative and Jussive/Imperative (both non-past paradigms) is somewhat equivalent to the difference in European languages between Indicative and Subjunctive, the difference between the Perfective and Gerundive (both past paradigms) requires explanation. According to the usage of Mr. Kidane and Mr. Teferra (which differs from Leslau's description), the Gerundive is used to express past time in main clauses, while the Perfective is used to express past time in subordinate clauses.⁷

These four paradigms are formally differentiated from each other in two ways:



1.6.2.1 Differences in the Vocalism of the Root

Roots combined with tense/aspect vowel patterns give the stems listed in Charts 1.5 and 1.6. These two charts give all possible variants of vocalism in the non-derived stem and reflect the application of rules to be discussed in Chapters 2, 3 and 4.

Trilaterals

	Simple	Geminated	Lengthened
Perf.	$C_1 \wedge C_2 \wedge C_3$	$C_1 \wedge C_2 : \wedge C_3$	$C_1 a : C_2 \wedge C_3$
Gerund.	$C_1 \wedge C_2 i : C_3$	$C_1 \wedge C_2 : i : C_3$	$C_1 a : C_2 i : C_3$
Indic.:			
/ _# (a)	$C_1 \wedge C_2 : \neq C_3$	$C_1 \neq C_2 : \neq C_3$	$C_1 a : C_2 \neq C_3$
/ _+V (b)	$C_1 \wedge C_2 C_3$	$C_1 \neq C_2 : \neq C_3$	$C_1 a : C_2 \neq C_3$
Jussive	$C_1 C_2 \wedge C_3$	$C_1 \wedge C_2 : \neq C_3$	$C_1 a : C_2 \neq C_3$
Imper.	$C_1 \neq C_2 \wedge C_3$	$C_1 \wedge C_2 : \neq C_3$	$C_1 a : C_2 \neq C_3$

Chart 15

Quadrilaterals

Perf.	$C_1 \wedge C_2 C_3 \wedge C_4$	$C_1 \wedge C_2 a : C_3 \wedge C_4$
Gerund.	$C_1 \wedge C_2 C_3 i : C_4$	$C_1 \wedge C_2 a : C_3 i : C_4$
Indic.:		
(a)	$C_1 \neq C_2 C_3 \neq C_4$	$C_1 \wedge C_2 a : C_3 \neq C_4$
(b)	$C_1 \neq C_2 C_3 \neq C_4$	$C_1 \wedge C_2 a : C_3 \neq C_4$
Jussive	$C_1 \wedge C_2 C_3 \neq C_4$	$C_1 \wedge C_2 a : C_3 \neq C_4$
Imper.	$C_1 \wedge C_2 C_3 \neq C_4$	$C_1 \wedge C_2 a : C_3 \neq C_4$

Chart 16

1.6.2.2. Differences in Subject Affixes

All verbs are obligatorily inflected for the person, number and gender of the subject, and may also be marked for the person, number and gender of the object.⁸ The object markers are realized as suffixes, which are morphologically uniform for all four paradigms. They are discussed in 4.3 and 4.4. The subject markers, however, differ according to paradigm. Thus, in the two paradigms of the Past, subjects are marked by means of suffixes. In the two paradigms of the Non-Past, subjects are marked primarily by prefixes, with secondary (Sg 2 f, Pl 2 & 3 m & f) suffixes to indicate gender.⁹ Within the category of Past paradigms, the Perfective is differentiated from the Gerundive not only by its different vocalism, but also by the fact that a different set of subject markers is used. There is no such distinction between the two Non-Past paradigms. The surface forms of the subject affix system are as follows:¹⁰

		Past		Non-Past
		Perfective	Gerundive	
Singular.	1	+ku:	+e:	?i+
	2M	+ka:	+ka:	t±+
	F	+ki:~+k±	+ki:	t±+_i:~+±
	3M	+Λ	+u:	y±+
	F	+Λt	+a:~a:t	t±+
Plural	1	+na:	+na:	n±+
	2M	+ku:m	+ku:m	t±+_u:
	F	+k±n	+k±n	t±+_a:
	3M	+u:	+o:m	y±+_u:
	F	+a:	+Λn	y±+_a:

Chart 17

1.6.3. Derivation

The verb in Tigrinya is subject to the following productive derivational processes:

Form	Meaning
I. Reduplication of the second radical of the root, vocalized with <u>a</u> :. Thus, C ₁ VC ₂ a:C ₂ VC ₃ .	Frequentative
II. Prefixation	
1. tΛ-	1. Reciprocal; reflexive, passive.
2. ?a-	2. Causative

Chart 18

1.6.4 The addition of derivational prefixes and of subject/object markers, as well as the possibility of the negative marker, gives the full conjugation of any verb (after all phonological rules have been applied). The fullest expansion of verb forms is therefore the following:¹¹

1. NEG + Non-Past + Deriv. Pref. - Stem + Obj. +NEG

For example:

/ʔa:y	ʔ ₁	ʔa	sabar	o:	n/
not	I	cause	break	it	not

'I am not causing it to break'

2. NEG + Deriv. Pref. - Stem + Past + Obj. + NEG

For example:

/ʔa:y	ʔa	sabar	ku:	o:	n /
not	cause	break	I	it	not

'I did not cause it to break'

12

1.7 Morphological Parameters of the Nominal

Any morphological description of the Tigrinya nominal must take into account the derivational morphology associated with nominals.

a) Deverbative nominals have the same spectrum of derivational morphemes as the verbs from which they are derived. This can be exemplified by reference to deverbative agentives. Thus, corresponding to the simple verb sábar+ʔ

'he broke' there is the agentive saba:r-i: 'one who broke'. If the verb has a causative prefix {ʔa-} then the corresponding agentive will likewise have this affix, e.g. ʔá-sba:r+Λ 'he caused to break'; ʔa-sba:r-i: 'one who causes to break', etc.

Similarly, the deverbative nominals of verbs with geminated second radicals also have geminated second radicals, e.g., bád:Al+Λ 'he hurt'; bád:a:l-i: 'one who hurts'. etc.

b) In addition, there are specifically nominal affixes which may occur with a variety of nominals, whether deverbative or otherwise. The four major nominal derivational morphemes are: {ma-}, {-a:}, {-t}, and {-i:}. Two of these, {ma-} and {-i:}, seem to have some semantic properties; i.e., they usually occur with instrumentals and agentives, although not every noun exhibiting these morphemes is an instrumental or agentive (see Chapter 5). The other two, {-a:} and {-t}, do not seem to have any specific semantic content. In any event, since the occurrence of any of these morphemes is unpredictable, their occurrence must be lexically specified.

1.7.1 There are a few other facts about nominals that must be stated:

a) In general, Tigrinya nominals have lexically speci-

fied gender which is not overtly indicated. However, in a few cases gender distinctions are found in the singular. In no case is there ever overt gender marking in nominal plurals (see Chapter 2).

b) There are a number of possible plural patterns which nominals may have. They are discussed in detail in Chapter 3.

c) Tigrinya has a set of possessive suffixes which may be affixed to any nominal. These are identical to the subject suffixes of the gerundive conjugation, and are listed in detail in Section 1.6.2.2.

1.7.2 The great variety of nominal forms makes it impossible to give as detailed and systematic an account of nominal morphology such as I gave for the verb. Those forms which are relevant to the discussion of central phonological processes in Tigrinya will be examined in detail in the following chapters.

FOOTNOTES

1. Standard treatments of Ethiopian Semitic phonology use ə where I have used ±, ä where I have used Λ and Ξ, and ǎ where I have used ɔ. In addition, I have consistently marked length. Thus, I use both more symbols and more detail than is customary in Ethiopian studies.
2. So-called diphthongs show similar behavior with regard to the Epenthesis rule developed in Chapter 2. That is, the glide acts as the first member of a final consonant cluster.
3. The symbol F is used in this rule to stand for all the features which specify Tigrinya consonants.
4. The rule as stated here is obligatory. Consonants may optionally be devoiced in final position. For example, [ʔawa:lít] [ʔawa:líd] 'girls'.
5. Certain trilaterals are realized phonetically as biliterals, by a rule to be discussed in Chapter 3.
6. The following chart gives the full set of options. Note that gemination and lengthening cannot be combined to produce the type *C₁a:C₂:C₃.
7. This description does not hold if the main verb is negated. Since the Gerundive is historically a noun (the subject markers which it takes are, in fact, the possessive suf-

CHAPTER TWO: GENDER

2.0 Like all other Semitic languages, Tigrinya distinguishes two genders, which are traditionally labelled masculine and feminine. However, in Tigrinya, one cannot -- as one can in the other Semitic languages -- predict the gender of a noun from its morphological shape. Gender must be lexically specified for nouns in Tigrinya, since articles and many adjectives must agree in gender as well as in number with the nouns they modify, and since the verb must agree in gender (as well as in person and number) with its subject noun, as well as with its definite noun object.

In a very small number of nominal categories, Tigrinya does show overt differences between masculine and feminine forms in the singular:¹

Group	Gloss	Masc. Sing.	Fem. Sing.	M & F Plural
I.	'thin'	qʌt:í:n	qʌt:á:n	qʌt:ʌn + ti:
II A.	'warm'	hɛmú:m	hɛmɛm + tí:	hɛmu:m + á:t
B.	'opener'	kʌfa:t-í:	kʌfa:t-í: + t	kʌfa:t + ó:
C.	'weaver'	?ala:m-á:y	?ala:m-í: + t	?ala:m + ó:
D.	's.o. from Amhara'	?amhá:r-a:y	?amha:r-ʌy + tí:	?amhá:r + o:t
E.	's.o. from Tigre'	tigr-á:wa:y	tigr-a:wʌy + tí:	tigr-á:w + o:t
F.	'terres- trial'	mɛdr-á:wi:	mɛdr-á:wi: + t	mɛdr-á:w + o:t

Note: The plurals of Group II nominals are given here for the sake of completeness, even though they are not relevant to the discussion of gender which follows.

Chart 2.1

Even in these nominals the overt morphological distinction between masculine and feminine is neutralized in the plural, although it continues to be lexically specified, as is shown by the fact that there is syntactic agreement between subjects and verbs for this feature.

[ʔala:má:y sʌbi:rú:o:]	The weaver (m.) broke it.
[ʔala:mí:t sʌbi:rá:to:]	The weaver (f.) broke it.
[ʔala:mó:t sʌbi:ró:mo:]	The weavers (m.) broke it.
[ʔala:mó:t sʌbi:rÁno:]	The weavers (f.) broke it.

2.1 The first question to be answered is whether these categories form a natural class, or whether a rule feature must be used to mark these nominals as distinguishing between masculine and feminine singular.

Semantically, it would appear that most of the nominals in Charl 2.1 refer to people, so that general rules of gender marking might apply to any nominal marked [+HUMAN].² This fails, however, because:

1. Other nominals marked [+HUMAN] do not change:

a. {- nna: ~ yna: }	fARAS-Añña: fARAS-ayna: 'rider (m. or f.)'
	qi:m -Añña: 'vindictive (m. or f.)'
b. {-At:a:y }	ʔawksu:m-At:a:y 's.o. (m. or f.) from Aksum'
c. {-a:n }	sAKr-a:n 'drunkard' (m. or f.)

2. Nominals which are not [+HUMAN] but which take the suffixes given do change:

- a. zʌmʌn-a:y (m.s.) zʌmʌn-ʌy + ti: (f.s.) 'temporal'
 b. mɛdr-a:wi: (m.s.) mɛdr-a:wi: + t (f.s.) 'terrestrial'

It might be suggested that the phonological structure of the stem is responsible for the marking of gender.

This suggestion fails for the following reasons:

1. Stems which take the gentilic suffixes (which mark place of origin) may be of any shape whatever (cf. IID vs. IIE, F) so that no generalization may be made about them.

2. There are other types of nominals (listed in the preceding chapter) besides the Agentive/Professional which have the stem shape $C_1 C_{2a}:C_3$ and which do not distinguish gender. Thus any general rule of gender marking would have to specify for stems of the shape $C_1 C_{2a}:C_3$ the semantic category Agentive/Professional or the specific derivational suffix. Semantic categories were ruled out above. As for simply marking derivational suffixes as gender-marking suffixes or non-gender-marking suffixes, this would not account for I and IIA, neither of which has a derivational suffix.

3. One might try to take advantage of the fact that in categories I and IIA the stem vowel of the masculine

singular is [+hi] , while in IIB, C it is [-hi]. But,

- a. IIA forms its feminine like IIB-F; and
- b. in IIB-F the stem itself exhibits no change between masculine and feminine; it is the derivational suffix, if anything, that changes.

It is apparent, therefore, that a rule feature which I call GM (Gender Marking) is required to account for the few categories of nominals which have distinct masculine singular and feminine singular forms. This is, in fact, the most "natural" approach in that this morpheme feature reflects an unproductive process in Modern Tigrinya.³

2.2 The next question to be answered is whether, within the class of Gender Marking nominals, further morpheme features are needed to distinguish among the categories listed in Chart 2.1. The use of another feature will not be necessary, because the stem-type $C_1 C_2 C_3^i : C_4$ is unique to the class of Group I nominals⁴, so that the vowel alternation in the second syllable (which is the sole indication of gender for Group I nominals) can be stated in purely phonological terms. Thus, within the category of nominals marked [+GM], Group I nominals will have a phonologically defined vowel alternation; all other gender-marking nominals (i.e., Group II) will have a suffix.⁵

2.3 These conclusions may be summarized as follows:

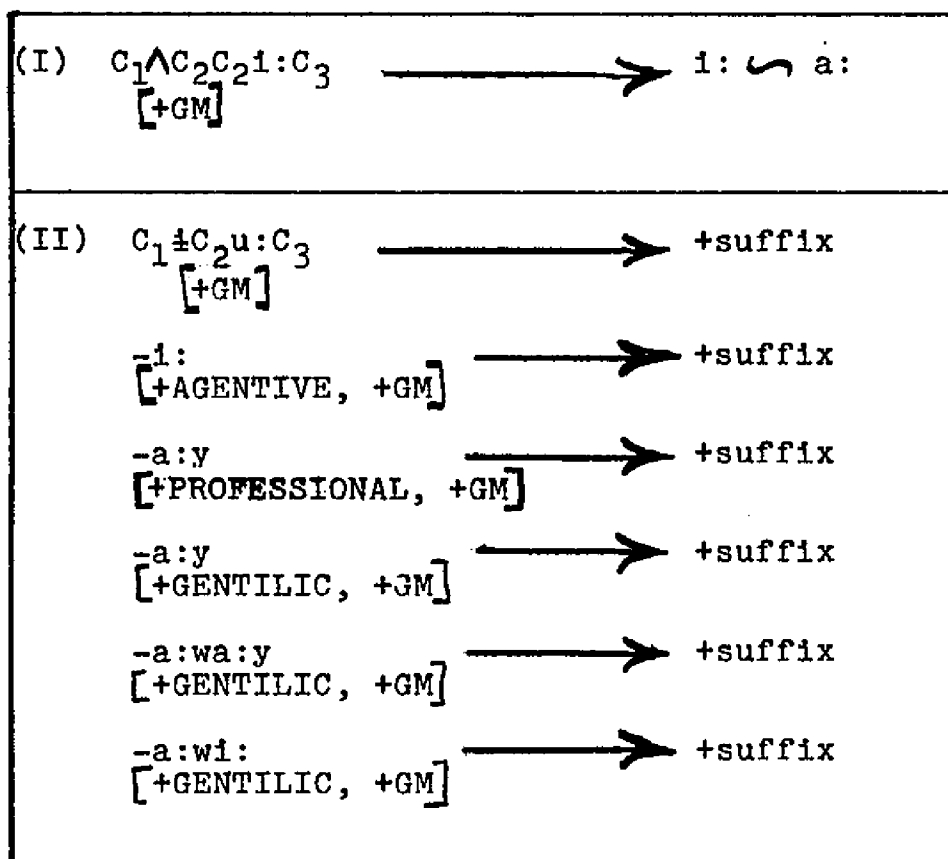


Chart 2.2

This chart represents an attempt at a formalization of a necessary morphological feature specification. As pointed out in Section 2.0, every noun is lexically specified for gender. These nominals are a special category in that, having been marked [+FEM] (lexically for the nouns, syntactically for the adjectives), they must also be morphologically specified as feminine. These morphological statements, then, are comparable to Chomsky-Halle

Readjustment Rules (1968, 10f.), and, as such, provide the input to the phonological component.

2.4 Group I nominals distinguish gender by the alternation i: ↔ a: in the second syllable of the stem. There are no natural phonological conditioning factors to account for this alternation (i.e., it is found only as a gender marker for Group I nominals and occurs nowhere else in the language). This process will be referred to as Vowel Gradation.⁶

It will be shown in Section 2.6.3 that the Λ which occurs in the plural is derived from an underlying a:, so that i: and a: are indeed the only possibilities for representing the vowel which appears in the underlying representation. The only question, then, is whether the correct formulation of the gender-marking process is lowering (i: → a:) or raising (a: → i:). Either one will yield the correct derivations:

	masc. sing.	fem. sing.	masc. plur.	fem. plur.
"base"	qΛṭ:i:n	qΛṭ:i:n	qΛṭ:i:n+ti:	qΛṭ:i:n+ti:
i: → a:	----	a:	a:	a:
output	qΛṭ:i:n	qΛṭ:a:n	qΛṭ:a:n+ti:	qΛṭ:a:n+ti:
"base"	qΛṭ:a:n	qΛṭ:a:n	qΛṭ:a:n+ti:	qΛṭ:a:n+ti:
a: → i:	i:	----	----	----
output	qΛṭ:i:n	qΛṭ:a:n	qΛṭ:a:n+ti:	qΛṭ:a:n+ti:

Chart 2.3

The two alternative formulations of the Vowel Gradation rule are as follows:⁷

VG A (lowering): $i: \rightarrow a: / \#CACC \underline{\quad} C\#$
 $[\alpha_{FEM}, \beta_{PLUR}, +GM]$
 condition: if $\beta = -$, then $\alpha = +$

VG B (raising): $a: \rightarrow i: / \#CACC \underline{\quad} C\#$
 $[+MASC, -PLUR, +GM]$

There are a number of observations which should be made about these rules:

- 1) The effect of the if-then condition in Vowel Gradation A is to exclude the possibility of the rule applying to nominals marked $[-FEM, -PLUR]$; in other words, to the masculine singular, which remains qAṭ:i:n.
- ii) The word boundary serves two purposes:
 - a. In Vowel Gradation A, it ensures that no gentilic nominal of that stem type will undergo the alternation.
 - b. In Vowel Gradation B, it ensures that the Agentive/Professional nominals (which also have the stem type $CACC a:C$) will not undergo the alternation.

The word boundary accomplishes both these purposes by preventing the rule from applying to any stem which has a derivational morpheme affixed to it.
- iii) While both rules yield the correct forms of the Group I nominal, I will retain Vowel Gradation B on the basis

that it is simpler as a formal statement in that it does not require an if-then condition.

2.5 The $\{+t\}$ suffix which marks the feminine of Group II nominals has two forms: ti:, occurring with IIA, D, E; and t, occurring with IIB, C, F. It is desirable to postulate a single base form for this suffix. The first step in achieving this aim is to note the phonological distribution of the two variants: ti: occurs after a consonant, while t occurs after a vowel. There are two plausible approaches to determining the underlying form of the suffix:

The ti: - Solution: The suffix is underlying ti:, the i: being lost when the suffix occurs in a post-vocalic environment.

The t - Solution: The suffix is underlying t, an i: being added when the suffix occurs in a post-consonantal environment.

If the ti: - Solution is to be adopted, the following rule must be postulated:

Vowel Clipping: $V \Rightarrow \emptyset / VC_ \#$

This rule will delete the i: of ti: in IIB, C, F, but not in IIA, D, E:

	IIB	IIC	IIF
"base"	kʌfa:ti:ti:	?ala:mi:ti:	mɪdra:wi:ti:
Vowel Clipping	∅	∅	∅
output	kʌfa:ti:t	?ala:mi:t	mɪdra:wi:t
	IIA	IID	IIE
"base"	hɪmɪmti:	?amha:rʌyti:	tɪgra:wʌyti:
Vowel Clipping	----	----	----
output	hɪmɪmti:	?amha:rʌyti:	tɪgra:wʌyti:

Chart 2.4

While yielding the desired results in this instance, the ti: - Solution fails because there is no general rule in Tigrinya which drops final vowels. In fact, VCV# sequences are extremely common, and are not dependant on such suprasegmental features as length, stress, or boundaries (which are common in other languages as factors causing vowel deletion phenomena):

<u>VCV#</u> gʌzá: 'house' g ^w á:sa: 'shepherd'	<u>V+CV#</u> gʌza: + xá: 'your house'
<u>VC + V#</u> sábar +ʌ 'he broke' kʌfa:t+í: 'opener' qʌrʌb+á: 'neighborhood'	

Chart 2.5

One could, of course, restrict the application of the Vowel Clipping rule to the feminines under discussion here, but this would result in an ad hoc rule which would have no other function in the grammar.

Unlike the ti: - Solution, which deletes a vowel, the t - Solution requires the addition of a vowel:

Epenthesis: $\emptyset \rightarrow i: / CC __\#$

	IIB	IIC	IIF
"base"	kʌfa:ti:t	?ala:mi:t	mɪdra:wi:t
Epenthesis	----	----	----
output	kʌfa:ti:t	?ala:mi:t	mɪdra:wi:t

	IIA	IID	IIE
"base"	hɪmɪmt	?amha:rʌyt	tɪgra:wʌyt
Epenthesis	i:	i:	i:
output	hɪmɪmti:	?amha:rʌyti:	tɪgra:wʌyti:

Chart 2.6

This solution has two advantages over the previous one. First, it accounts for the distributional fact that there are no CC# sequences in the language, a generalization which would be missed by the first solution, which would relegate this important constraint on surface forms to the realm of accidental facts. Second, this solution can be independently motivated elsewhere in the phonology of Tigrinya. A clear example is afforded by the following alternation (which will be dealt with more fully in the next chapter):

'ear' (sing.) ?ɪznɪ:
(plur.) ?a?zʌ:n

The word for 'ear' belongs to a class of nominals which form their plural by prefixing {?a+} to the stem (which causes deletion of the first vowel of the stem) and by

infixing [a:] in the second syllable (which replaces whatever vowel was there originally). Thus the only possible base forms for 'ear' are ?ɛzn (arrived at by "undoing" the plural process, assuming there was no underlying vowel in the second syllable) and ?ɛzVn (arrived at by "undoing" the plural process, assuming there was an underlying vowel which was elided by the [a:] infix). Final [i:] cannot be in the base -- for if the base form were either ?ɛzni: or ?ɛzVni:, then one would have to add another ad hoc example to the Vowel Clipping rule in order to explain the loss of i: in the plural, still leaving unexplained all the other cases of occurring VCV# sequences. In addition, ?i:zVni: would require an additional rule to delete V in the singular. Now if ?ɛzVn is chosen as the base form, there is no motivation for generating the final [i:] of the singular, since CVCVC is the most common stem-type in the language. In fact, only by choosing ?ɛzn as the base form can both the singular and the plural surface forms be correctly derived: the singular form, ending in a consonant cluster, must undergo Epenthesis. The plural form, having infix [a:] between the final consonants of the base, no longer ends in a consonant cluster and therefore no final vowel need appear.

In conclusion, then, it is necessary to posit {+t} rather than {+ti:} , as the underlying form of the morpheme

which marks the feminine of Group II nominals.⁸

2.6 The paradigms given in Section 2.0 illustrate two vowel alternations, u:↷i: and a:↷ʌ. In addition to these, there is a third alternation, i:↷ɛ,⁹ which is never found in the gender marking nominals. The three alternations are exemplified here as follows:

a.	<u>u:↷ɛ</u>	(m.)	hɛmú:m	'warm'
		(f.)	hɛmɛmti:	"
b.	<u>i:↷ɛ</u>	(m.)	nʌbi:y	'prophet'
		(f.)	tɛnbɛyti:	'prophecy'
c.	<u>a:↷ʌ</u>	(m.)	tɛgra:wɔ:y	's.o. from Tigre Province'
		(f.)	tɛgra:wɔ:yti:	"

These alternations are important, not only in the relationship between Group II feminine nominals and the corresponding masculines, but because they illustrate a process which occurs in all the nominal and verbal paradigms. These alternations thus become one of the central problems of Tigrinya phonology, as they cannot be glossed over as "irregularities", nor can they be explained without determining the underlying vowel system of Tigrinya.

The inventory of systematic phonetic vowels given in Chapter I is:

	FRONT	CENTRAL	BACK
HIGH	i i:	ɨ	u u:
MID	e: ɛ	ʌ	o o:
LOW		a a:	ɔ ɔ:

Chart 2.7

2.6.1 Traditional descriptions (based primarily on the distinctions recognized by the orthography¹⁰) attribute to Tigrinya seven vowel "phonemes", all the distinctions being qualitative:¹¹

	FRONT	CENTRAL	BACK
HIGH	i	ɨ	u
MID	e ɛ		o
LOW		a	

Chart 2.8

This system of seven vowels which, it should be noted, is identical to that indicated in the orthography, is arrived at by scholars such as Leslau (1941) and

Ullendorff (1955) by a series of conventional "allophonic" statements:

1. /ɛ/ = [i] before or after y
 [u] before or after any labial consonant or w
 [ɛ] otherwise
2. /ɛ/ = [a] before or after ʔ, ɣ, ɸ, and h
 [ɔ] ~ [o] before or after any labial consonant or w
 [ɛ] ~ [ʌ] otherwise
3. /a/ = [ɔ] before or after any labial consonant or w
 [a] otherwise

I give these "allophonic" statements without exemplification and without justifying their inherent claims about phonological processes in Tigrinya. My only purpose in laying out these statements is to show that of the fourteen systematic phonetic vowels, seven appear even in traditional phonemic statements to be unlikely candidates for underlying segments. This is obvious, for example, in the pair [ɛ, ʌ] which must be members of a single unit, and whose actual realization may vary freely anywhere between the two extremes of ɛ and ʌ. My choice of ʌ to represent these sounds uniformly in the transcription of Tigrinya morphemes is thus arbitrary. The other cases involve conditioned variations of unequal significance. Thus, the rounding of a to ɔ (usually optional) is a rather minor

fact whereas the distribution of the high vowels and of [ɛ] vs. [a] is crucial to the analysis of the underlying vowel system. The repetition of the a - ɔ relationship in allophonic statements 2 and 3 results from the failure of the traditional approach to recognize qualitative distinctions, although they do remark that i, u, e, o, and a are usually long while ɛ and ɛ are usually short. Thus, the a - ɔ relationship in 2 is [ä] - [ɔ̃], while in 3 is [a:] - [ɔ:].

2.6.1.1 The traditional inventory may itself be reduced from seven vowels to five. The vowel alternations which occur in the gender-marking nouns (as well as elsewhere) were listed in 2.6. These alternations involve only the following five vowels, all of which occur as traditional "phonemes": i:, u:, a:, ɛ, ʌ. The only two "phonemes" which do not occur in these alternations are e: and o:. Since it will be shown (in Chapters 3 and 4) that these vowels may always be derived from underlying diphthongs, they may safely be eliminated from further discussion at this point. The determination of the optimal underlying vowel system for Tigrinya is thus reduced to a discussion of the five vowels which cannot obviously be eliminated, either on the basis of variation (be it free or rule-governed) or on the basis of self-evident rules which leave no room for question as to their status as underlying

segments, as with e: and o:.

2.6.2 Phonological theory prefers the most concrete solution appropriate to the description of the data. This is desirable so as to discourage the use of ad hoc formulations whose only purpose is to make a chosen set of rules work. The most concrete formulation of the Tigrinya vowels is, of course, to postulate as underlying segments the five surface vowels which cannot be obviously eliminated:

	FRONT	CENTRAL	BACK
HIGH	i:	ɨ	ú:
MID	ʌ		
LOW	a:		

Chart 2.9

This system, however, with its five qualitative distinctions, fails to account in any natural way for the vowel alternations occurring in the paradigms of Group II nominals. Unlike Group I nominals, where the vocalism of the feminine was taken as basic, it is the vocalism of the masculine form which is underlying in Group II nominals. The reason that the vocalism of the masculine must be

basic and the feminine vocalism derived is that the $\underline{\pm}$ of the feminine alternates both with $\underline{i:}$ and with $\underline{u:}$; so that to posit $\underline{\pm}$ as the base vowel would make it impossible to predict whether $\underline{i:}$ or $\underline{u:}$ should be the output of underlying $\underline{\pm}$. And the rule giving $\underline{i:}$, $\underline{u:} \Rightarrow \underline{\pm}$ will be most general if it also gives $\underline{a:} \Rightarrow \underline{\Lambda}$. That is, the vowel alternation rules must accomplish A, not B:

A	
<u>Derivation of Feminine</u>	<u>Derivation of Masculine</u>
$h\underline{\pm}mu:m \Rightarrow h\underline{\pm}m\underline{\pm}(+ti:)$ [+FEM]	$h\underline{\pm}mu:m \Rightarrow h\underline{\pm}mu:m$ [+MASC]
$-n\underline{\Lambda}b\underline{\pm}y \Rightarrow -nb\underline{\pm}y(+ti:)$ [+FEM]	$n\underline{\Lambda}b\underline{\pm}y \Rightarrow n\underline{\Lambda}b\underline{i:y}$ [+MASC]
$t\underline{\pm}gra:w\underline{a:y} \Rightarrow t\underline{\pm}gra:w\underline{\Lambda}y(+ti:)$ [+FEM]	$t\underline{\pm}gra:w\underline{a:y} \Rightarrow t\underline{\pm}gra:w\underline{a:y}$ [+MASC]
B	
$h\underline{\pm}m\underline{\pm} \Rightarrow h\underline{\pm}m\underline{\pm}(+ti:)$ [+FEM]	$h\underline{\pm}m\underline{\pm} \Rightarrow h\underline{\pm}mu:m$ [+MASC]
$-n\underline{\Lambda}b\underline{\pm}y \Rightarrow -nb\underline{\pm}y(+ti:)$ [+FEM]	$n\underline{\Lambda}b\underline{\pm}y \Rightarrow n\underline{\Lambda}b\underline{i:y}$ [+MASC]
$t\underline{\pm}gra:w\underline{\Lambda}y \Rightarrow t\underline{\pm}gra:w\underline{\Lambda}y(+ti:)$ [+FEM]	$t\underline{\pm}gra:w\underline{\Lambda}y \Rightarrow t\underline{\pm}gra:w\underline{a:y}$ [+MASC]

Chart 2.10

Thus, in Group II, the nominal marked [+FEM] will call for the following processes:

t - Suffixation:¹²

$$\left[\begin{array}{c} N \\ +FEM \\ -PLUR \\ +GM \end{array} \right] \Rightarrow \#N + \{t\} \#$$

- Vowel Alternations:
1. u: \rightarrow ɨ
 2. i: \rightarrow ɨ
 3. a: \rightarrow ʌ

If the vowels in Chart 2.9 are taken as the underlying vowel system of Tigrinya, then the formal statement of the rule governing these vowel alternations would have to be stated as:

Vowel Alternation Rule:

$$[\langle +bk \rangle^V] \Rightarrow \left[\begin{array}{c} -bk \\ -frn \\ -lo \\ -long \\ \langle -rd \rangle \end{array} \right] \text{ / } \text{---} \text{CC\#}$$

This rule seems to reflect a tendency for vowels to become centralized both in height and in backness in the environment specified by the rule. However, although it is possible to write such a rule, it is obviously simply an ad hoc mechanical collapsing rule which claims that the three vowels which alternate (i:, u:, a:) do not form a natural class such that the alternation can be stated as a uniform process applying to all three vowels. Thus, in the Vowel Alternation Rule, the claim is made that a high front vowel simply becomes a short central vowel; a high back vowel not only becomes a short central vowel but must unround.

The low vowel, on the other hand, is already central so it rises.

Strict adherence to the Chomsky-Halle feature system, which does not permit the postulation of three underlying degrees of backness, would not better the situation since it too would result in a rule which fails to show a uniform process applying to all vowels.

Thus, if we reassign the central vowels as underlying back unrounded vowels, then the rule needed to state the alternations would be

$$v \Rightarrow \left[\begin{array}{l} +bk \\ -rd \\ -lo \\ -long \end{array} \right] / \text{---} \text{CC\#}$$

The defects of this rule are the same as that of the previous statement, namely, that it fails to make the changes seem more natural.

2.6.3 The problem just discussed may be overcome by focusing on the quantitative, rather than the qualitative, changes which take place in the vowel alternations:

$$i:, u: \Rightarrow \text{ɪ}$$

$$a: \Rightarrow \text{ʌ}$$

In all cases, a long vowel occurring in the masculine singular alternates with a short vowel in the corresponding feminine form in the paradigm. This generalization can be captured by one very simple rule:

Vowel Shortening: $V \Rightarrow [-\text{long}] / ___ \text{CC}\#$

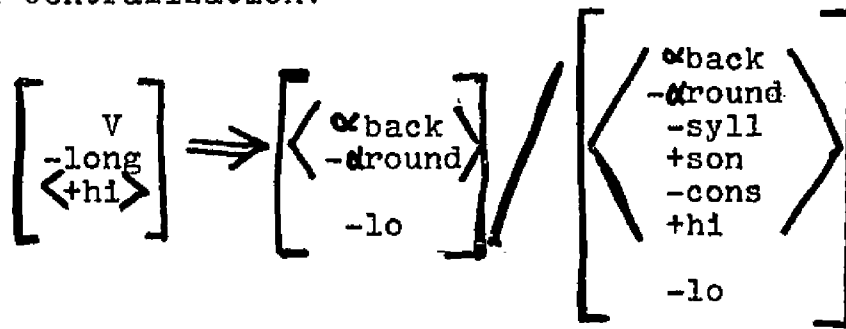
This rule would have the following effect upon the paradigm given in Section 2.6:

- | | | | |
|----|-----------------------|------|-----------------------|
| a. | <u>u</u> : ↷ <u>ü</u> | (m.) | hám <u>ú</u> :m |
| | | (f.) | hám <u>u</u> mtí: |
| b. | <u>i</u> : ↷ <u>ɨ</u> | (m.) | nAb <u>i</u> :y |
| | | (f.) | tɨnb <u>i</u> ytí: |
| c. | <u>a</u> : ↷ <u>ʌ</u> | (m.) | tɨgrá:w <u>a</u> :y |
| | | (f.) | tɨgrá:w <u>ʌ</u> ytí: |

This rule is not only simpler than any of the previous statements of the vowel alternations, it also has the explanatory power of showing that the different surface manifestations resulting from the alternations are the output of the same uniform process.

The output of the Vowel Shortening Rule yields non-occurring forms in this paradigm. What is needed is a rule changing i and u to [ɨ] (a phonetically high central vowel) and a to [ʌ] (a phonetically mid central vowel). This rule will be called Vowel Centralization.

Vowel Centralization:



This rule converts i and u to [ɨ] and a to [ʌ] except in the environments specified in 2.6.1.

Seeing the vowel alternations as the result of two rules (Vowel Shortening and Vowel Centralization) has the value of capturing the fact that long vowels, as a natural class, are shortened before a final consonant cluster, while short vowels, as a natural class, are centralized except where they are prohibited from doing so by surrounding segments.

The analysis adopted here is also more economical. Consider the following verb forms:

I		II	
sʌbrʌ	'he broke'	?asʌrʌ	'he chained'
kʌfʌtʌ	'he opened'	hanʌqʌ	'he strangled'
qʌbrʌ	'he buried'	ʃarʌgʌ	'he ascended'

Chart 2.11

A concrete analysis which recognizes a phoneme /ʌ/

requires the following lowering rule to account for the data in II:

Lowering: $\begin{bmatrix} \text{V} \\ -\text{hi} \end{bmatrix} \Rightarrow [+1\text{o}] / \begin{bmatrix} +\text{cons} \\ +1\text{o} \end{bmatrix} \underline{\quad}$

The abstract analysis presented here, wherein the underlying segment is short /a/, eliminates the need for this phonological rule, since phonetic [ʌ] results from the low-level rule which centralizes all short vowels.

The sequence of Vowel Shortening - Vowel Centralization will account in a very natural way for all the Group II alternations and for all similar alternations in the morphology. However, the two short vowels may not be dispensed with entirely, since there are many instances where they do not alternate with a long vowel. Therefore, the underlying vowel system of Tigrinya must contain five vowels, which will be represented as follows:

<u>long</u>	<u>short</u>						
i:,u:	ɨ	i:	u:	ɨ	a	a:	
a:	a	high	+	+	+	-	-
		back	-	+	() ¹³	+	+
		long	+	+	-	-	+

Chart 2.12

2.6.4 The Vowel Shortening rule also fits in very nicely with the Epenthesis rule given earlier and repeated here:

Epenthesis: $\emptyset \Rightarrow i: / CC __\#$

By means of this rule, the two variants of the gender-marking suffix, [ti:] and [t] were generalized to {+t}. It is interesting that the same environment, a final consonant cluster (or, alternatively, a doubly-closed syllable), should trigger both the Epenthesis rule and the Vowel Shortening rule. The two rules interact in the following way: by adding the {+t} suffix to a nominal ending in a consonant, a doubly-closed syllable is created. Long vowels are not permitted before consonant clusters (though this restriction is somewhat weaker before geminates), thus underlying long vowels are shortened. At this point the constraint against final consonant clusters triggers Epenthesis. The relationship between the two rules accounts for the fact that IIA, D, E have \check{V} and {ti:}, as opposed to \underline{V} : and [t] in IIB, C, F. The derivation of these nominals (omitting IIC) is therefore as follows:

	IIA	IIB	IID	IIE	IIF
"base"	h̥mu:mt	kafa:ti:t	?amha:ra:yt	t̥gra:wa:yt	m̥dra:wi:t
Vowel Shortening	u	----	a	a	----
Epenthesis	i:	----	i:	i:	----
Vowel Centralization	ɨ	ʌ	ʌ	ʌ	----
output	h̥m̥mti:	kʌfa:ti:t	?amha:rʌyti:	t̥gra:wʌyti:	m̥dra:wi:t

Chart 2.13

2.7 This chapter has discussed what is admittedly, in terms of productive processes, a limited area of Tigrinya morphology. Nevertheless, this area has provided the basis for discussing the most crucial processes in Tigrinya. The following is a synopsis of the conclusions reached in this chapter:

1. Vowel Inventory

a. Underlying

	<u>long</u>	<u>short</u>
	i: u:	ɨ
	a:	a

b. Systematic Phonetic

	FRONT	CENTRAL	BACK
HIGH	i i:	ɨ	u u:
MID	e: ɛ	ʌ	o o:
LOW		a a:	ɔ ɔ:

2. Rules

a. List

I. Vowel Gradation

$$\begin{bmatrix} V \\ -hi \\ +lg \end{bmatrix} \Rightarrow \begin{bmatrix} +hi \\ -bk \end{bmatrix} / \begin{matrix} \#CaCC \quad C\# \\ [+MASC, -PLUR, +GM] \end{matrix}$$

3. Derivations

Group	Gloss	Underlying	Surface	Rules
I.	'thin'	(m.s.) qat:a:n	qAt:i:n	I-V
		(f.s.) qat:a:n	qAt:a:n	V
		(pl.) qat:a:n	qAt:Anti: ¹⁴	III-IV-V
IIA.	'warm'	(m.s.) ḥmu:m	ḥmu:m	--
		(f.s.) ḥmu:m	ḥṃmti:	II-III-IV-V
B.	'opener'	(m.s.) kafa:ti:	kʌfa:ti:	V
		(f.s.) kafa:ti:	kʌfa:ti:t	II-V
D.	's.o. from Amhara'	(m.s.) ?amha:ra:y	?amha:ra:y	--
		(f.s.) ?amha:ra:y	?amha:rʌyti:	II-III-IV-V
E.	's.o. from Tigre'	(m.s.) ṭgra:wa:y	ṭgra:wa:y	--
		(f.s.) ṭgra:wa:y	ṭgra:wʌyti:	II-III-IV-V
F.	'terrestrial'	(m.s.) ṃdra:wi:	ṃdra:wi:	--
		(f.s.) ṃdra:wi:	ṃdra:wi:t	II

Footnotes

1. Nominals of the type IIC form their feminine on the same base as IIB; i.e., they use the {-i:} suffix of the Agentive rather than their own {-a:y} suffix. One could devise a set of rules to derive {-i: + t} from {-a:y + t} but this would not reflect any phonological process characteristic of Tigrinya. Therefore, this type of nominal is to be noted as exceptional.

2. Of course, this still would not handle Group I nominals, which consists of adjectives with no specific range of meaning.

3. Syntactic gender, like morphological gender, is disappearing from Tigrinya. Compare,

'the window broke'	mAskó:t	tʃsʌbi:rú:	(m.)	↷
	mAskó:t	tʃsʌbi:rá:	(f.)	

Both of these forms were elicited on different occasions from Mr. Kidane; when asked about them, he said that both of these forms were used interchangeably. Many such variations in gender agreement were observed.

4. That is, there is no other nominal pattern of the type $C_1 \wedge C_2 C_{2i} : C_3$. (Except, of course, the Gerundive pattern in the verbal paradigm.) Similarly, there is no other pattern of the type $C_1 \# C_2 u : C_3$ occurring in Tigrinya. Since, however, the feature [GM] is still necessary for IIB-F, the

need for it does not hinge on the distribution of the stem types in I and IIA. And since the stem types $C_1 \wedge C_2 C_2 i : C_3$ and $C_1 \neq C_2 u : C_3$ do not form a natural class in terms of predicting the type of gender-marking which will occur, simplicity dictates that all nominals (or at least the derivational suffixes as well as the two stem types which do not have derivational suffixes) be marked [+GM].

5. That the suffix [t]/[ti:] is indeed the gender marker (and not the changes that are observable in the vocalism between masculine and feminine) is obvious from the fact that the suffix occurs in all Group II nominals (and is, of course, the very reason for distinguishing between Group I and Group II), whereas the vocalic alternations do not.

6. Vowel Gradation (also referred to as Ablaut or Apophony) refers to a phonological process which was once (presumably) a phonologically conditioned alternation, but whose conditioning factor was lost; and so the process remains as a morphological marker.

7. The more formal statement of the Vowel Gradation rule, using features rather than segments, is given in Section 2.7. Note that the features listed in the environment of the Vowel Gradation rule are either syntactic features or, in the case of [GM], a morpheme feature; they do not refer to any

one segment in the morpheme. Such features are consistently written in capitals in this dissertation. In addition, ...CC... is intended to include both geminate consonants and clusters of two dissimilar consonants. That is, for the purposes of these rules, identity of consonants in clusters is irrelevant.

8. It is useful to note, in passing, that the marking of the feminine of Group II nominals is only one function of this {t} suffix, which is of Common Semitic origin. According to Moscati (1964, pp 84-85), the {+t} suffix (historically {(a)t}) "probably goes back to a more complex and ancient system of classes..." This system includes, for example, diminutives, abstracts, and collectives. The collective can, of course, be extended to include the idea of plural; and indeed, some of the major plural patterns of Tigrinya are characterized by this {+t} suffix.

9. The example illustrating this alternation was not given earlier because there is no gender contrast involved. The contrast here is purely one of concrete vs. abstract. The loss of the vowel ^ in the second form (i.e., the word for 'prophecy') is conditioned by a general phonological rule which will be discussed in the next chapter.

10. The traditional orthography used for Tigrinya is derived from the ancient Ethiopian syllabary. In this

writing system, every consonant has seven graphic shapes according to the vowel which is pronounced after it. These vowels are i, u, e, a, o, ɛ, and ʌ.

11. It will soon become apparent that this seven-vowel system is grossly ill-suited to explain the vowel phenomena which form the core of the phonological component of Tigrinya. In fact, the same will be true for any solution which ignores the importance of vowel length. It is for this reason that I consistently indicate vowel length, even where it is the qualitative distinctions which are being discussed.

12. This morphological rule is the formal equivalent of the process statements given in 2.3.

13. No [+] or [-] value for the feature [back] has been assigned to this vowel. It is to be considered an archiphoneme which is simply a [+hi, -rd, -long] vowel. According to the Chomsky-Halle model, this vowel should be assigned the value [+bk]. However, it will be shown in Section 4.2 that there is at least some evidence for considering it a [-bk] vowel. Since this evidence is not conclusive, I have left the feature unspecified.

14. The {t} suffix in this instance is the result of the pluralization process.

CHAPTER THREE: NUMBER

3.0 Plural formation is traditionally viewed as the most complex morphological process in the Semitic languages, especially in the South Semitic languages (such as Arabic, Tigré, Tigrinya)¹, which display a wide variety of possible surface plurals. The underlying plural patterns of Tigrinya, which will be motivated in the body of this chapter, are given in the following chart, where the various plural forms are grouped according to the major singular patterns which occur in the language:²

Singular	Plural(s)	Semantic Marking
<u>Quadrilaterals:</u> $C_1VC_2C_3VC_4$	$\left\{ \begin{array}{l} C_1VC_2a:C_3VC_4 \\ C_1VC_2a:C_3VC_4+t \\ C_1VC_2C_3VC_4+a:t \end{array} \right.$	See Section 3.0.2
<u>Trilaterals:</u> $ma-C_1VC_2VC_3$	$\left\{ \begin{array}{l} ma-C_1a:C_2VC_3 \\ ma-C_1a:C_2VC_3+t \\ ma-C_1VC_2VC_3+t \\ ma-C_2VC_2VC_3+aw \end{array} \right.$	} Abstract and/or deverbative
$C_1VC_2VC_3$	$\left\{ \begin{array}{l} ?a+C_1C_2a:C_3 \\ C_1VC_2VC_3+a:t \\ C_1VC_2VC_3+t \\ C_1VC_2VC_3+aw \end{array} \right.$	} Concrete
$C_1VC_2C_3$	$\left\{ \begin{array}{l} a+C_1C_2a:C_3 \\ a+C_1a:C_2C_3 \\ a+C_1a:C_2C_3+t \\ C_1VC_2C_3+a:t \end{array} \right.$	} Concrete
Unpredictable	$\left\{ \begin{array}{l} \text{Unchanged} + a:t \\ \text{Unchanged} + a:n \end{array} \right.$	See Section 3.3
Unpredictable -ay [-PROF]	Unpredictable -ø+awt	See Section 3.3.4

Chart 3.1

3.0.1 Despite the multiplicity of forms in the chart, there are only seven affixes shown: one prefix, $\{?a\}$; five suffixes, $\{+t\}$, $\{+a:t\}$, $\{+a:n\}$, $\{+aw\}$ and $\{+awt\}$; and one infix, $\{+a:+\}$. These affixes interact in the following way: there is a basic dichotomy between those plural forms in which an $[a:]$ is infixes and those in which it is not. Within each of these two systems (infixation versus non-infixation) there occur a variety of prefixes or suffixes (\emptyset in the case of simple quadrilaterals). Traditional grammars simply list the inventory of surface plurals in some convenient format such as "prefix" plurals, "suffix" plurals and "infix" plurals. Any such format, neat and regular though it may seem, obscures this basic dichotomy.

3.0.2 The precise formulation in Chart 3.1 may misleadingly make it appear that the plural of any specific nominal can be regularly predicted on the basis of its phonological shape with, perhaps, some reference to the semantic features of the nominal.. While some generalizations certainly are possible, nevertheless, given most nominals, one cannot infallibly predict the plural classes to which they belong. This arbitrary aspect of plural marking is illustrated by the following chart:

1. Nominals with identical singular patterns but with different plural patterns:

'horse'	fÁrAs	?á+fra:s
'thigh'	sÁlaf	sÁlaf+á:t

2. Nominals which share the same semantic field but which take different plurals:

'cat'	dím:ú:	dím:u:+tá:t
'dog'	kÁlbí:	?a+ka:líb+ti:

3. Nominals which have more than one plural form in free variation:

'virgin'	díngí:l	dína:gí:l ~
		díngí:l+a:t

4. Nominals which have the same singular shape but which differ as to the number of plural markers they take:

'leopard'	nÁbrí:	?a+na:bír
'dog'	kÁlbí:	?a+ka:líb+ti:

Chart 3.2

Thus, plural assignment in Tigrinya is based on both phonological and semantic properties of nominals, combined with a certain amount of arbitrary marking. Since there is not, within modern morphophonological theory a generally accepted formal device which will handle the assignment of singular forms to their corresponding plurals, I have chosen to use a set of morphological rules to represent the mechanism which captures the generalizations which can be made about the choice of plural markers in Tigrinya.

In the case of quadrilaterals, the two possible pluralizations, $C_1 \begin{Bmatrix} V \\ -lg \end{Bmatrix} C_2 a : C_3 \pm C_4$ and $C_1 VC_2 C_3 VC_4 + a : t$, are determined phonologically by the vocalism of the singular. Where the vowels are the same, Infixation applies; where they are not the same, $\{+a:t\}$ is suffixed. In the case of trilaterals, semantic/syntactic grounds determine which of three additional plural markers are used. In those cases where neither phonological nor semantic/syntactic criteria apply, special marking is necessary: on a specific suffix in the case of $\{-a:wi:\}$, the Gentilic suffix and $\begin{Bmatrix} -a:y \\ [-PROF] \end{Bmatrix}$, otherwise on the nominal itself.

The rules postulated for such a mechanism of plural assignment are as follows:

- 1) Mark all suffixes with respect to the

rules of Infixation and Derivational Suffix Deletion (See Section 3.0.4). This is necessary since it is not otherwise possible to predict the co-occurrence relations between the plural suffixes and these two rules.

- 2) Mark the derivational suffixes $\{-a:wi:\}$ and $\{-a:y\}$ for the plural suffixes they take.
- 3) Apply the following general rules for major plural classes:

$$a) CV_1CCV_1C \rightarrow [+INFIXATION]$$

$$b) \left\{ \begin{array}{c} \langle \text{concrete} \rangle_a \\ \langle \text{abstract} \rangle_b \end{array} \right\} \rightarrow \left\{ \begin{array}{c} \langle \{?a+\} \rangle_a \\ \langle \{+t\} \sim \{+aw\} \rangle_b \end{array} \right\}$$

$$c) \left[\begin{array}{c} \text{NOMINAL} \\ +\text{PLURAL} \end{array} \right] \rightarrow \{+a:t\}$$

Rule c reflects the fact that $\{+a:t\}$ is the general pluralizer in the non-Infixation system. It will apply to everything that is not specifically marked for something else.

At this point, the rules of Suffix Deletion and Infixation apply, thus completing the specifically morphological mechanism of plural assignment.

3.0.3 Some of the plurals which we have discussed so far are less productive than others. Thus, quadrilaterals which

have the form $C_1 \begin{bmatrix} V \\ -lg \end{bmatrix} C_2 a : C_3 \pm C_4 + ti :$ are rare because $\{+t\}$ is normally a characteristic of abstract/deverbative triliterals. Conversely, triliterals of the form $m\Lambda - C_1 a : C_2 \pm C_3$ are rare because of the absence of the $\{+t\}$ suffix. In the case of plurals of the type $C_1 \begin{bmatrix} V \\ -lg \end{bmatrix} C_2 a : C_3 \pm C_4 + ti :$, as well as in those of the type $?a + C_1 a : C_2 \pm C_3 + ti :$, we have the extension of a productive suffix beyond its normal function. In the case of $?a + C_1 a : C_2 \pm C_3 + ti :$ this extension is optional and must be so marked on the nouns which take this plural; in the case of $C_1 \begin{bmatrix} V \\ +lg \end{bmatrix} C_2 a : C_3 \pm C_4 + ti :$ the extension is obligatory and again must be so marked. On the other hand, nouns of the type $m\Lambda - C_1 a : C_2 \pm C_3$ would have to be marked negatively with respect to $\{+t\}$ -suffixation.

3.0.4. One aspect of the dichotomy between the Infixation system and the productive $\{+a:t\}$ suffix is the treatment of the rule of Suffix Deletion (see below). This rule,

Suffix-Deletion: $\{-X\} \Rightarrow \emptyset / [+PLURAL]$

accounts for the lack of derivational suffixes in the plural of most nominals. Specifically, nominals of the Infixation system which take the $\{+t\}$ suffix often drop whatever derivational suffix they may have had. In the $\{+a:t\}$

plural, however (as well as in the $\{+a:n\}$ plural), derivational suffixes are not dropped:

habt-a:m 'rich' (sing.)

habt-a:m+a:t 'rich' (plur.)

versus

d\abtAr-a: 'educated (sing.)

d\aba:t±r 'educated (plur.)

The rule of Suffix Deletion, which obviously precedes the morphological realization of plural markers, must be revised to include this limitation:

Suffix-Deletion (Revised): $\left[\{-X\} \right] \Rightarrow \emptyset / \left[\begin{array}{l} +\text{PLUR} \\ +\text{INF}'\text{N} \end{array} \right]$

The only exception to this generalization is the $\left\{ \begin{array}{l} -a:y \\ [+PROF] \end{array} \right\}$ suffix of the Non-Infixation system, which should not be deleted but nevertheless does delete.

3.0.5 In the remainder of this chapter I will examine the consequences of the morphological mechanism developed in this section.

3.1 Of the two major processes of plural formation, the more interesting is Infixation, phonologically speaking. The following paradigm presents three different singular types which have similar surface plurals:

	Singular	Plural
Type 1:	$C_1VC_2C_3VC_4$	$C_1VC_2a:C_3\pm C_4$
1. 'lip'	kʌnfáʀ	kʌna:fáʀ
2. 'arm'	qɛlsám	qɛla:sám
3. 'educated'	dʌbtar-á:	dʌba:táʀ
4. 'finger'	ʔasbaʃ-tí:	ʔasa:báʃ
Type 2:	$m\Lambda-C_1C_2VC_3$	$m\Lambda-C_1a:C_2\pm C_3$
5. 'siege'	mʌ-nbáʀ	mʌ-na:báʀ
6. 'book'	mʌ-ʃháf	mʌ-ʃa:háf+tí:
7. 'chief'	mʌ-sfín	mʌ-sa:fín+tí:
Type 3:	$C_1VC_2C_3i:$	$ʔa+C_1a:C_2\pm C_3$
8. 'head'	rɛʔsí:	ʔa+ra:ʔís
9. 'leopard'	nʌbrí:	ʔa+na:báʀ
10. 'dog'	kʌlbí:	ʔa+ka:láb+tí

Chart 3.3

3.1.1 The most straightforward analysis of the pluralization process for nominals of Type 1 requires a series of three rules. The first of these rules (illustrated by examples 3 and 4) deletes a derivational suffix in the formation of the plural (in 3, {-a:} and in 4 {-ti:}):

Suffix Deletion: $\{-X\} \Rightarrow \emptyset / [+PLURAL]$

This rule accounts for the absence of derivational suffixes in the plural. The other two rules needed to derive the plural of Type 1 nominals are as follows:

Infixation: $\emptyset \Rightarrow a: / \#CVC \underline{\quad} \dots$
 $[+PLURAL]$

Raising:³ $V \Rightarrow [+hi] / \#CVCa:C \underline{\quad} C\#$
 $[+PLURAL]$

These rules combine to give the following derivations:

Base	kanfar	qɛlsɛm	dabtar-a	aʃba -t
Suf. Del.	--	--	∅	∅
Infix.	a:	a:	a:	a:
Raising	ɛ	--	ɛ	ɛ
Central.	^	--	^	--
Output	kʌna:fɛr	qɛla:sɛm	dʌba:tɛr	ʔaʃa:bɛʃ
	'lip' (1)	'arm' (2)	'educated' (3)	'finger' (4)

Chart 3.4

It now remains to specify more explicitly the basis on which nominals of the singular shape $C_1VC_2C_3VC_4$ are assigned to the plural shape $C_1VC_2a:C_3C_4$. The following examples, which may be added to those given for Type 1, show the necessity for being more explicit.

	singular	plural
11. 'greedy'	hargá:f	--- harga:f+á:t
12. 'bread'	h̄imba:š-á:	hana:b+š -----
13. 'eyelash'	qArnAb	qArana:n+bnqArnAb+á:t
14. 'virgin'	d̄ingɨl	d̄ina:g+lv̄d̄ingɨl+á:t

Chart 3.5

Of examples 11-14, number 11 alone is common. It is typical of a great many quadrilaterals which form their plural by the addition of the $\{+a:t\}$ suffix discussed above, rather than by infixation. A comparison of example 11 with examples 1-4 reveals an interesting fact. In examples 1-4, the vowels of the singular agree in height and are both short. In example 11, while the vowels are both low, the first vowel is short, the second long. One can therefore predict the plural pattern of quadrilaterals by their vocalism in the singular. If V_1 equals V_2 then the nominal undergoes Infixation⁴; if V_1 does not equal V_2 , then the nomin-

al takes the {+a:t} suffix. Any deviation from this generalization requires special marking. Thus, example 12 should take the {+a:t} suffix; but it is marked as undergoing Infixation. That this noun is truly irregular is evidenced by the apparently unmotivated vowel change in the first syllable. As for examples 13 and 14, they are interesting in that they may either take one plural form or the other, so that they must be marked with an optional feature for the {+a:t} plural, which would not be their normally expected pattern.

While examples 12-14 are true exceptions, example 11 is not; it represents a well-defined and very productive class of quadrilaterals. To mark the members of this class as exceptions to the Infixation process would be tantamount to discarding the generalization that quadrilaterals are assigned to plural patterns on the basis of the vocalism of the singular. This generalization could be captured by revising the Infixation rule as follows:

$$\text{Infixation: } \emptyset \Rightarrow a: / C \begin{bmatrix} V \\ -lg \\ \alpha hi \end{bmatrix} C \text{---} C \begin{bmatrix} V \\ -lg \\ \alpha hi \end{bmatrix} C$$

This form of the Infixation rule restricts Infixation to all those quadrilaterals whose two vowels are identical. However, this form of the rule is not only more complicated

than the original statement in that the vowels have to be specified, but also less desirable in that it excludes trilaterals from the Infixation process. It is therefore better to keep the original statement of Infixation, and to capture the generalization about quadrilaterals by means of a morphological rule:

$$C_1V_1C_2C_3V_2C_4 \rightarrow [+INFIXATION]$$

3.1.2 Plurals of Type 2 ($m\Lambda-C_1a:C_2\neq C_3+ti:$ and $m\Lambda-C_1a:C_2\neq C_3$) are easily accounted for by the rules of Infixation and Raising.

Base	ma-nbar	ma- <u>ṣ</u> ḥaf	ma-sf <u>ḥ</u> n
Infix.	a:	a:	a:
Raising	±	±	-----
Central.	^	^	^
Output	mΛ-na:b̄r	mΛ-sa:h̄iḥf+ti:	mΛ-sa:f̄n+ti:
	'siege' (5)	'book' (6)	'chief' (7)

Chart 3.6

There are, however, some interesting points to consider.

For example, the word for 'chief', mΛsf̄n, seems to be an exception to the generalization that the two vowels of the quadrilateral nominal must agree in height for the Infixation rule to apply. However, if this generalization is taken as

a constraint on underlying forms rather than as a surface constraint, then the apparent contradiction is easily explained. For it is apparent from nouns like ṣaḥa:f-i: 'writer', as well as kidá:n -- mΛ-kdΛn-i: 'garment' and 'cover' respectively; see below) that the nouns in this paradigm have the underlying form ma-CVCVC rather than ma-CCVC.

The absence of a vowel between the first two radicals of the root in the words for 'book' (mΛ-ṣḥaf) may be predicted by the following rule, which is motivated by other derivational and inflectional data to be presented below.

Vowel Deletion: $V \Rightarrow \emptyset / V+C ___ CV$

These rules will give the following derivations in the singular:

Base {ma-}-Pre. Vowel Del. Central. Output	nabar ma- ∅ ^ ^ mΛ-nbΛr	ṣaḥaf ma- ∅ ^ mΛ-ṣ ḥaf	sifān ma- ∅ ^ mΛ-sfān
	'sieḡä' (5)	'book' (6)	'chief' (7)

Chart 3.7

The derivation of the plural differs from that given in Chart 3.6 in that the base would be of the form CVCVC,

with $\{-ma\}$ -Prefixation and Vowel Deletion being added to the sequence of rules. The rule of $\{-ma\}$ -Prefixation, being a purely morphological rule -- specifically, derivational -- is the first rule that applies to the base. It is in fact this rule which creates the environment for the rule of Vowel Deletion. As for the ordering of Vowel Deletion, Chart 3.11 in Section 3.2.1 shows that this rule must follow Infixation (for in Class IB nominals of type 4, the rule of Infixation creates the environment for the application of Vowel Deletion). The ordering of Infixation before Vowel Deletion necessitates the postulation of a new rule which will apply in the derivation of the plural but not in the singular:

	Singular	Plural
Base	nabar	nabar
$\{ma-\}$ -Pre.	ma-	ma-
Infix.	---	a:
Raising	---	ɛ
Vowel Elis.	---	∅
Vowel Del.	∅	---
Central.	^ ^	^
Output	m^A-nbAr	m^A-na:bɛr

Chart 3.8

The rule of Vowel Elision may be formulated as follows:

$$\text{Vowel Elision: } V \Rightarrow \emptyset / \left[\begin{array}{c} \bar{V} \\ +lg \end{array} \right] \text{---}$$

This derivation makes a claim about Vowel Deletion: namely, that long vowels are not deleted. Otherwise, the plural would be *mΛ-nb̄ir. The revised form of Vowel Deletion would be as follows:

$$\text{Vowel Deletion: } V \Rightarrow \emptyset / \begin{array}{c} V+C \text{---} \\ \text{CV} \\ [-long] \end{array}$$

This restriction on the rule of Vowel Deletion, as well as other possible restrictions, will be discussed again later in 3.2.4, and in 4.3.1.

3.1.3 Type 3 ($\text{ʔa+C}_1\text{a:C}_2\pm\text{C}_3$ and $\text{ʔa+C}_1\text{a:C}_2\pm\text{C}_3\text{+ti:}$), e.g. ʔa+ra:ʔ̄is 'heads' and ʔa+ka:lab+ti: 'dogs', respectively, differ from the nominals so far discussed in having only three consonants in the singular. It is the presence of the {ʔa+} prefix plural marker which gives these nominals, in the plural, the semblance of quadrilaterals. By applying Infixation and Vowel Elision, one can account for (in part) the surface forms of these nominals:

Base a+ -Pref. Infix. Vowel Elis. Output	r±ʔs a+ a: ∅ a+ra:ʔs
	'head'

Chart 3.9

Given this output, the problem is how to account for the ± of the last syllable of the surface form [ʔara:ʔ±s].

3.1.4 The most likely underlying form for nouns of this type is CVCC. These nouns appear to be exactly analagous to nouns like ʔ±zɲi: 'ear' (see Section 2.5). I have shown that unless CVCC is taken as the underlying form it is impossible to motivate the presence of [i:] in the singular or its absence in the plural. That nouns like r±ʔsi: have [i:] in the singular and not in the plural argues for their having the same underlying CVCC shape. Thus, the final [i:] in r±ʔsi: is the result of the rule of Epenthesis.

The crux of the matter is that if the underlying form of the noun is CVCC, then the [±] in the last syllable of the plural ʔara:ʔ±s must be produced by rule. Certainly it looks like a rule of epenthesis, since without the [±] there

is a final consonant cluster. However, the only rule of epenthesis we have seen so far says:

Final Epenthesis: $\emptyset \Rightarrow i: / CC_ \#$

predicting [ʔara:ʔsi:]. What one would need in order to get the correct form would be an epenthesis rule such as

Internal Epenthesis: $\emptyset \Rightarrow \pm / C_ C\#$

Tigrinya does have such a rule of vowel epenthesis which inserts a [±] in just this environment but there is no obvious reason why the same stem should undergo a different rule of epenthesis in the plural form than it does in the singular. I will defer further discussion of this problem to 4.2, where I deal with Epenthesis in detail.

3.2 Thus far, four rules have been motivated for the Infixation system: Infixation, Raising, Vowel Elision and Vowel Deletion. The remaining plural patterns of Tigrinya's Infixation system (type 4: ʔa+C₁C₂a:C₃; 5, C₁^C₂^C₃+ti:, and 6, m^C₁C₂^C₃+ti:), are of interest because the /a:/ introduced by the Infixation rule does not appear where the previous rule would lead one to expect.

3.2.1 The surface patterns of singular nouns which take the $\text{ʔa+C}_1\text{C}_2\text{a:C}_3$ plural (type 4) may be grouped as follows, with examples of the singulars and their corresponding plurals:

Class	Singular	Plural	Gloss
I. Triliterals			
A. $\text{C}_1\text{C}_2\text{C}_3$	fʔrʔs	ʔa+fra:s	'horse(s)'
B. $\text{C}_1\text{C}_2\text{C}_3\text{i:}$	ʔizni:	ʔa+ʔza:n	'ear(s)'
II. Biliterals			
A. $\text{C}_1\left[\begin{smallmatrix} \text{V} \\ +\text{lg} \end{smallmatrix}\right]\text{C}_2$	be:t ʃo:f	ʔa+bya:t ʔa+fwa:f	'house(s)' 'bird(s)'
B. $\text{C}_1\left[\begin{smallmatrix} \text{V} \\ +\text{hl} \end{smallmatrix}\right]\text{C}_2$	ʔi:d s± m tu:b	ʔa+ʔya:d ʔa+sma:t ʔa+tba:t	'hand(s)' 'name(s)' 'breast(s)'

Chart 3.10

The derivation of both the singular of Class I nouns proceeds naturally from the rules already established; that of the plural does too if one assumes that the rule of Infixation inserts /a:/ after the third consonant of these nouns rather than after the second.

	Sing.		Plur.	
	Base	faras	?ɪzn	faras
{a+}- Pre.	--	--	?a+	?a+
Infix.	--	--	a:	a:
Vowel Elis.	--	--	∅	--
Vowel Del.	--	--	∅	∅
Epenth.	--	i:	--	--
Central.	^ ^	--	--	--
Output	fArʌs	?ɪzni:	?a+fra:s	?a+?za:n
	'horse'	'horses'	'ear'	'ears'

Chart 3.11

Thus, within the plural system developed in the preceding section, the problem is specifically that nouns of the $?a+C_1C_2a:C_3$ plural shape seem to infix /a:/ after the third consonant of the plural form, whereas in the plurals of the quadriliterals and triliterals discussed in Section 3.1, the /a:/ is infixed after the second consonant of the plural form.

<u>A</u>	<u>B</u>
kʌna:fɪr 1 2 3 4	?a+fra:s 1 23 4
mʌ-na:bɪr 1 2 3 4	?a+?za:n 1 23 4
?a+ra:?ɪs 1 2 3 4	

As can be seen from ʔatra:ʔɛs versus ʔaʔza:n, which have the same underlying CVCC stem (singular: [rɛʔsɪ:] , [ʔɛznɪ:]), and which share the same semantic field (body parts), thus ruling out either phonological or semantic selection of rules, there is no apparent reason for the two different modes of behavior with respect to Infixation. Up until now, Infixation has simply counted consonants from left to right, ignoring morpheme boundaries. Thus, in the nouns in Column A, the rule simply counts two consonants from the left, infixing /a:/ after the second consonant. However, in nouns of Type 4, the /a:/ is clearly infixed after the third consonant from the left. The most obvious solution is to say that in Column A, Infixation occurs after {a+}-Prefixation, but that in Column B Infixation precedes {a+}-Prefixation.

Obviously one column or the other must be considered in some way irregular (unless one wishes to posit two separate rules of Infixation). I have already shown (Section 3.1.3) that nouns like ʔatra:ʔɛs behave irregularly with respect to Infixation. Thus, {+a}-Prefixation will precede Infixation, which is revised so that it counts root consonants:

Infixation (Revised): $\emptyset \implies a: / +CVC \underline{\quad} \dots$

Thus, the revised rule of Infixation differs from the original one only in that the word boundary (#) has been changed to a morpheme boundary (+).

Quadrilaterals, and trilaterals which have the plural pattern $\text{?a+C}_1\text{C}_2\text{a:C}_3$ will be derived regularly by this rule. In the case of $\text{?a+C}_1\text{C}_2\text{a:C}_3$ (e.g., ?afra:s), /a:/ is infixed after the second consonant following the morpheme boundary. In the case of quadrilaterals (e.g., [kʌna:fɪr], /kanfar/) the only boundary that occurs is a word boundary (#) so that the /a:/ is infixed after the second consonant of the root. Trilateral stems like mʌ-nbʌr and rɪ?sɪ: (the latter ?a+rɪ?s after {a+} -Prefixation in the plural) simply ignore the morpheme boundary and apply the rule of Infixation as if the initial [m] of the derivational prefix or the [ʔ] of the plural prefix were the first consonant of the root, i.e., they are lexically specified as

+ ===> Ø / [a:] Infixation. 6

3.2.2 The nouns [be:t] and [ʒo:f] of Class IIA differ from Class I nouns in the following ways:

1. The singular form has two consonants, the plural for three (not counting the ʔ of the plural prefix).
2. The only vowels in the singular are long, e: or

o:; neither of which occurs in the corresponding plural forms.

c. The plural forms always have a glide between the two consonants of the singular: w if the singular form has o:, y if the singular form has e:. These glides do not appear in the singular.

The plural of these nouns can be handled just like that of IB if one assumes an underlying singular of the shape CVCC:

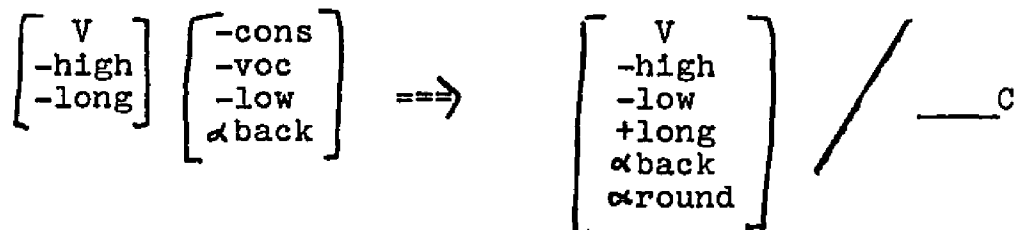
Base	bVyt	ʕVwf
ʔa-Prefix.	ʔa+	ʔa+
Infix.	a:	a:
Vowel Del.	∅	∅
Output	ʔa+b ya:t	ʔa+ʕwa:f
	'house'	

Chart 3.12

The singular of these nouns can be handled by identifying V as a and postulating a rule of Monophthongization which converts a+w to o: and a+y to e:. Thus, *bayt ==> be:t and *ʕawf ==> ʕo:f. Monophthongization must apply before Epenthesis or the result will yield *be:ti: or *ʕo:fi like ʔizni:.

The rule of Monophthongization may be formalized as:

Monophthongization:



The vowel on which this rule operates must be specified as [-long] since long diphthongs do not undergo monophthongization, as shown, e.g., by the Gentilic suffix {-a:y} which does not monophthongize in the feminine where a {+t} creates the necessary environment:

ʔamhá:ra:y --- ʔamha:raɣtí:

The derivation of this noun, then, must be:

Base	ʔamha:r-a:y+t
Monophth.	--
Vowel Short.	a
Epenth. (Fin.)	i:
Central.	^
Output	ʔamha:r-ʌy+ti:

Chart 3.13

If Monophthongization were to apply after Vowel Shortening, it would incorrectly predict *ʔamha:re:t. In the majority of cases where [e:] and [o:] are found, it can be shown by (synchronic) alternations that they are obviously derived from /ay/ and /aw/ respectively; of the remaining occurrences

of [e:] and [o:] one can find no counter-evidence to the claim that they derive from /ay/ and /aw/. In fact, for the majority of such cases, there is strong historical and comparative evidence that these long monophthongs were derived from historical short diphthongs. Therefore, it seems simplest and most economical to claim that [e:] and [o:] do not form part of the underlying inventory of the Tigrinya vowel system.

3.2.3 There is one other source of the loss of underlying glides which in its output, i.e., a long vowel, resembles monophthongization but which is not the result of monophthongization. This is shown by the third example of Class IIA nouns:

?i:d (sing.) ?a+?ya:d (plur.) 'hand(s)'

If one postulates underlying /?Vyd/ (i.e. CVCC) as the stem, then the derivation of the plural is identical to that of [be:t] (/bayt/) and [o:f] (/ʃawf/). However, this leaves unclear the identity of the vowel which must be postulated for the underlying form of 'hand'. Clearly, this vowel cannot be [-high], i.e. /a/ or /a:/; if the former, Monophthongization would apply, yielding *[?e:d]; if the latter, Monophthongization would not apply so the glide would appear on the surface as *[?a:ydi:]. The vowel must therefore be [+high], and, since Vowel Deletion has applied, it must be [-long]. The only underlying vowel in the language which is $\begin{bmatrix} +high \\ -long \end{bmatrix}$ is /ɨ/; thus the underlying form of this noun is /?ɨyd/ to which the rules of Glide Vocalization and Like-Vowel Coalescence (cf. 1.2.2) apply:

	hand	hands
base	?ɨyd	?ɨyd
?a -Prefixation	----	?a+
Infixation	----	a:
Vowel Deletion	----	∅
Glide Vocalization	ɨ	----
Like Vowel Coalescence	i:	----
output	?i:d	?a+?ya:d

Chart 3.14

Since the rule of Glide Vocalization applies in the same environment as Monophthongization,

Glide Vocalization: $\left[\begin{array}{l} -\text{cons} \\ -\text{voc} \\ -\text{low} \\ \leftarrow \text{back} \end{array} \right] \Rightarrow [+ \text{voc}] / \left[\begin{array}{l} \text{V} \\ +\text{high} \\ -\text{long} \end{array} \right] \underline{\quad} \text{C}$

it too, like Monophthongization, must be ordered before Epenthesis, otherwise we would find * $[\text{?i:di:}]$.

The alternative singular forms of the noun $[\text{tɨnbɨ:t}] \sim [\text{tɨnbɨytɨ:t}]$ 'prophecy' affords a further illustration of the interaction of the rules of Glide Vocalization, Like-Vowel Coalescence, and Epenthesis:

base	t±-nab±y=t	t±-nab±y-t
Vowel Deletion	∅	∅
Glide Vocalization	±	----
Like Vowel Coalescence	i:	----
Epenthesis	----	i:
output	t±nbi:t	t±nb±y-ti:

Chart 3.15

That the stem of this noun is /nab±y/, with first vowel /a/ is obvious from the fact that [nAb±y] by itself (underlying /nab±y/) is a noun meaning 'prophet'. These alternative derivations illustrate the fact that Glide Vocalization, like Monophthongization, must precede Epenthesis, or one would find *[t±nbi:ti:].

3.2.4 The question arises as to whether the t should be added in the plural ^{of Class IIB nouns} to form a plural stem, or deleted in the singular. Adding a t in the plural would not only deprive the nouns of underlying triliterality,⁷ but would make it necessary to complicate the grammar by forcing a phonological distinction between this class of nouns and Class IB:

(Class IB)	?a+kAlb+t	?a+ka:l±b+t i:
(Class IIB)	*?a+s±m+t	?a+sma:±t (!!)

The different behavior of final t in these two classes

	'name'	'names'
base	sɪmt	sɪmt
?s+ -Prefixation	-----	?a+
Infixation	-----	a:
t-Deletion	∅	-----
Vowel Deletion	-----	∅
output	sɪm	?a+sma:t

Chart 3.16

Another member of this class is [t̥u:b] 'breast', which has as its plural [ʔaɬba:t]. One would like to say that the derivational history of [t̥u:b] is identical with that of [sɪm]. However, there is a problem; viz., the plural form [ʔaɬba:t] would argue that Vowel Deletion has applied. In all previous occurrence of inputs to the rules of Vowel Deletion it has been necessary to specify that Vowel Deletion cannot apply to long vowels specifically in order to prevent the rule from deleting the plural marker [a:] in nouns like mΛ-na:bɪr and ?a+ra:ʔɪs, which otherwise would become *mΛ-nbɪr and *?a+rʔɪs. Here we have to say that Vowel Deletion has in fact deleted a long vowel. However, this line of reasoning fails to work on the specific examples on which it is based since it is just this set of nouns which must undergo a rule deleting the internal morpheme boundary in order to account for their behavior

with respect to Infixation and which thus fail to meet the structural description of Vowel Deletion, which is dependent on the presence of an internal morpheme boundary. However, because of forms like y±+ba:r±x 'he blesses', not *y±+br±x, which will be discussed more fully in Chapter 4, that formulation of Vowel Deletion which excludes its application to long vowels is nevertheless correct. Yet if [ʔaṭba:t] is to be derived like [ʔasma:t], then we have to claim that Vowel Deletion has in this case applied to a long vowel. In the interests of not complicating the rule of Vowel Deletion, particularly since nouns like [ṭu:b] - [ʔaṭba:t] are members of very limited classes, such nouns are simply marked with an exceptional rule feature [+Vowel Deletion].

3.2.4.1 In the preceding pages, I have motivated all of the rules necessary to derive the singulars and the corresponding plurals of all the nouns which take the ʔa+C₁C₂a:C₃ plural. The interaction of these rules, as well as the place of each of the four singular classes in the scheme, is summarized in the following tables:

Singular

	IA	IB	IIA	IIB
base	$C_1 a C_2 a C_3$	$C_1 \neq C_2 C_3$	$C_1 V G_2 C_3$	$C_1 V C_2 t$ [+hi] \emptyset
t-Deletion	----	----	----	
Monophthongization/ Glide Vocalization	----	----	V [+lg]	----
Like Vowel/Coalescence				
Epenthesis	----	- i:	----	----
Centralization		----	----	----
output	$C_1^{\wedge} C_2^{\wedge} C_3$	$C_1 \neq C_2 C_3 i:$	$C_1 V C_3$ [+lg]	$C_1 V C_2$ [+hi]

Chart 3.17

Plural

	IA	IB	IIA	IIB
base	$C_1 a C_2 a C_3$	$C_1 \neq C_2 C_3$	$C_1 V G_2 C_3$	$C_1 V C_2 t$ +hi
{?a+}-Prefixation	?a+	?a+	?a+	?a+
Infixation	a:	a:	a:	a:
Vowel Elision	\emptyset	----	----	----
Vowel Deletion	\emptyset	\emptyset	\emptyset	\emptyset
output	?a+C ₁ C ₂ a:C ₃	?a+C ₁ C ₂ a:C ₃	?a+C ₁ G ₂ a:C ₃	?a+C ₁ C ₂ a:t

Chart 3.18

3.2.5 The surface patterns of singular nominals which take plural types 5 and 6 may be grouped as follows, with examples of the singulars and their corresponding plurals:⁸

field	gloss	singular	plural
IA. Agentive (5)	'accuser'	kʌsa:s-í:	kʌsʌs+ti:
	'writer'	sʌha:f-í:	sʌhaf+ti:
B. Professional (5)	'weaver'	?ala:m-á:y	?alʌm+tí:
	'mason'	nʌda:q-á:y	nʌdʌq+tí:
II. Adjective (5)	'thin'	qʌt:á:n	qʌt:ʌn+tí:
	'new'	had:á:s	had:ʌs+tí:
III. Instrument (6)	'writing instrument'	mʌ-ʃháf	mʌ-ʃhaf+tí:
	'covering'	mʌ-kdʌn-í:	mʌ-kdʌn+tí:

Chart 3.19

By and large the rules needed to derive these nominals have already been motivated and discussed: Derivational Suffix Deletion (Section 3.0.4); Shortening (Section 2.6.3) and Epenthesis (Section 2.5). An equally necessary rule is $\{+t\}$ -Suffixation which serves the same function as and is ordered in the same place as $\{?a\}$ -Prefixation. Although the function of the $\{+t\}$ suffix here is to serve as a plural marker, its underlying

phonological shape and the rules which apply to it are identical with the other t suffixes which we have already seen (Sections 2.5, etc.).

Plural types 5 and 6 when first presented were identified as members of the set of doubly marked nominals which form their plurals by {a:}-Infixation and suffixation. However, what one sees in these nouns is [a:] in the singular and [ʌ] in the plural, e.g., [kʌsa:sɪ:] (sing) and [kʌsʌstɪ:] (plural), 'accuser(s)'. The rules which explain these surface forms have already been established on independent grounds for Tigrinya.

	accuser	accusers
base	kasas	kasas
Agent Formation	a: -i:	a: -i:
Suffix Deletion	--	∅
+t Suffixation	--	+t
a Infixation	--	a:
Vowel Elision	--	∅
Vowel Shortening	--	a
Final Epenthesis	--	i:
Centralization	ʌ	ʌ ʌ
output	kʌsa:s-i:	kʌsʌs +ti:

Chart 3.20

This would appear to be a more complex derivation than one that merely adds the $\{+t\}$ suffix to form the plural and then applies the rules of Vowel Shortening and Laxing, which would give the same output. This is fallacious reasoning on the following grounds: In the first place, it has been established (3.1) that all nominals not specifically marked as $[+ \{+a:t\}]$ form their plurals by $\{a:\}$ -Infixation; to argue that the nominals of these three types do not undergo this general pluralization process would concomitantly require that each of these nominals be specified in the lexicon as $[- \{+a: +\}]$ ⁹. It is much more economical to allow rules with the generality of $\{a:\}$ -Infixation to apply as broadly as possible, particularly when such application requires the use of no ad hoc rules. Furthermore, the analysis proposed here allows one to maintain the generalization that there are only two productive plural processes in Tigrinya: viz. Infixation or $\{a:t\}$ -Suffixation.

3.3 The second major process of plural formation is one which indicates the plural by the addition of a suffix without any other plural marker. There are four such suffixes: $\{+(t)a:t\}$, $\{+(y)a:n\}$, $\{+aw\}$, and $\{+awt\}$.

3.3.1 The most commonly used of these plural suffixes is $\{+(t)a:t\}$, the $\{+a:t\}$ variant occurring after a consonant and the $\{+ta:t\}$ variant occurring after a vowel:

(sing.)	ʃará:t	(plur.)	ʃara:t+á:t	'bed(s)'
	ʃasá:		ʃasa:+tá:t	'fish'

The underlying base form is either {+a:t} or {+ta:t}. Since there is no independent evidence which would determine which of the two variants is to be preferred as underlying, the choice of either variant is arbitrary. I have chosen to represent this suffix as {+a:t}, and to derive the {+ta:t} variant by a rule of t-Epenthesis,

t-Epenthesis: $\emptyset \Rightarrow t / V + \frac{\text{a:t}}{[+PLUR]}$

which applies after a stem-final vowel.

This rule is probably to be ordered after the rule of Epenthesis motivated in Chapter 2. This is suggested by the fact that in the case of nouns ending in epenthetic [i:] either variant is possible. Thus,

(sing.)	ʃad:i:	(plur.)	ʃad: + á:t ~	
			ʃad:i + tá:t	'country'

If t-Epenthesis is ordered after the more common rule of Epenthesis, then the application of the former is made contingent on the application of the latter, accounting for the free variation between the two forms.¹⁰

3.3.2 Historically, {+a:n} and {+a:t} were simply masculine and feminine plural respectively. However, {+a:t} has expanded at the expense of {+a:n}, so that {+a:n} is now restricted to certain learned words and to Gentilics with the suffix {-a:wí:}:

(sing.)	sa:dáq	(plur.)	sa:dáq+a'n	'righteous'
	básu:ǵ		básu:ǵ+a'n	'happy'
	mádr-a'wí:		mádr-a'wí ^y a'n	'terrestrial'

Like {-a:t}, this morpheme has two variants, /-a:n/ and /-ya:n/. The /ya:n/ provides evidence for a rule of Glide Formation (which has independent motivation in Tigrinya as shown in Section 4.3).

3.3.3 The plural in [-o:] (/aw/)

is a less common alternative to the {+t} plural suffix for abstract and deverbative (i.e., instrumental, agentive, and professional) nominals: 'accuser' [kAsa:sí:], 'accusers' [kAsastí:] ~ [kAsa:só:], with absolutely no semantic difference. To the best of my knowledge, this /+aw/ pluralizer does not belong to the repertoire of Semantic pluralizers and its presence in the language is due either to borrowing or to innovation. That this plural type is not part of the Infixation system is shown by the instrumental form $m\Lambda-C_1C_2\Lambda C_3+o:$, cf. $kAsa:s+o:$.

3.3.4 A possibly extended form of this pluralizer is one in [-o:t]; it mostly occurs with nouns ending in {-a:y} which are not semantically marked [+PROFESSIONAL], e.g., [tAstá:y] /tast-a:y/ 'bull, [tAstó:t]/tast+awt/ 'bulls' (with predictable Suffix Deletion). Unlike the plural in {+aw}, this suffix is not part of the Infixation System. Thus, nouns taking this {-a:y} suffix in the singular must be marked as taking the {+awt} suffix in the plural.

Footnotes

1. The one notable exception to this generalization is Tigrinya's sister language, Amharic, which has simplified the pluralization process by marking all plurals with a single suffix.
2. I am not, in the course of this study, discussing the few unproductive plural patterns.
3. This statement of Raising accurately reflects the fact that this rule is applied to quadriliterals, not triliterals, and only to those quadriliterals which undergo Infixation. Because of morpheme structure conditions, the only effect this rule can have is to change /a/ into /ɛ/. It is therefore unnecessary to specify that V is [-long].
4. That is, Infixation applies to quadriliterals with the phonological shapes /C₁aC₂C₃aC₄/ and /C₁ɛC₂C₃ɛC₄/.
5. The underlying structure of [ʔafra:s] before the application of Vowel Deletion is, of course, /ʔa+faras/.
6. The explanation for this rather bizarre rule would seem to be that in this regard as in many others, Tigrinya is in the midst of a rapid historical change. See 4.2.4.
7. Needless to say, for any modern Semitic language, the systemic pressure to have a surface or near surface form from which a trilateral root is extractable is very

strong indeed.

8. The adjectives (II) are given in the feminine singular. I showed in 2.4 that the [a:] in the second syllable is underlying, rather than the [i:] of the masculine form.

9. It would, of course, be possible to mark the {+t} suffix itself with the feature [- {+a:+}] rather than marking every nominal which takes this suffix for this feature. However, doing so would still be more costly than the approach that I have argued for here.

10. On the alternation between the [i:] of the singular and the [ɨ] of the plural see Section 4.2. The explanation of this alternation also accounts for the same alternation in [mɨdrá:wɨ:], [mɨdrá:wɨya:n] in Section 3.3.2 .

CHAPTER FOUR: THE MAJOR PROCESSES RE-EXAMINED

4.0 The preceding chapters have established that certain phonological and morphological processes must be postulated in order to explain the alternations exhibited in the nominal system of Tigrinya. Some of the processes examined so far (Vowel Shortening, for example), need no further clarification beyond the statements already made in Chapters 2 and 3. Other processes, however, do need further explanation, either because their formulation in the preceding chapters was only sufficient to cover the specific paradigms then under discussion and so must be reconsidered in light of additional data (as in the case of Epenthesis) or because the process in question has wider applications (as in the case of Vowel Gradation). This chapter will examine all those rules or processes which must be reconsidered for one or the other of these two reasons.

4.1 Vowel Gradation

The discussion of Gender in Chapter 2 shows that certain vowel alternations cannot be phonologically motivated (2.4). The morphological alternation [i:] ~ [a:] used to differentiate the masculine singular form of the adjective [qAɬ:í:n] 'thin' from its feminine singular counterpart [qAɬ:á:n] was called Vowel Gradation. In this section, I will discuss

similar non-phonological vowel alternations in the verbal paradigm. I will argue that the application of certain Vowel Gradation rules can be used to ascertain the lexical form of verbs.

4.1.1 In 1.6.2.1, I presented a chart of all productive verbal stem types found in Tigrinya. I am repeating the chart here, but now I am using the vowels which have already been established as underlying:

Verbal Stems ¹			
<u>Triliterals</u>			
	Simple	Geminated	Lengthened
Perf.	$C_1aC_2a C_3$	$C_1aC_2:a C_3$	$C_1a:C_2a C_3$
Gerund.	$C_1aC_2i:C_3$	$C_1aC_2:i:C_3$	$C_1a:C_2i:C_3$
Indic.:			
/ __#	$C_1aC_2\ddot{a} C_3$	$C_1aC_2:\ddot{a} C_3$	$C_1a:C_2\ddot{a} C_3$
/ __-V	$C_1aC_2 C_3$	$C_1aC_2:\ddot{a} C_3$	$C_1a:C_2\ddot{a} C_3$
Jussive	$C_1 C_2a C_3$	$C_1aC_2:\ddot{a} C_3$	$C_1a:C_2\ddot{a} C_3$
Imper.	$C_1\ddot{a}C_2a C_3$	$C_1aC_2:\ddot{a} C_3$	$C_1a:C_2\ddot{a} C_3$

Chart 4.1a

<u>Quadriliterals</u>			
	<u>Simple</u>	<u>Geminated</u>	<u>Lengthened</u>
Perf.	$C_1 a C_2 C_3 a C_4$	—	$C_1 a C_2 a : C_3 a C_4$
Gerund.	$C_1 a C_2 C_3 i : C_4$	—	$C_1 a C_2 a : C_3 i : C_4$
Indic:			
/ __#	$C_1 a C_2 C_3 \# C_4$	—	$C_1 a C_2 a : C_3 \# C_4$
/ __-V	$C_1 a C_2 C_3 \# C_4$	—	$C_1 a C_2 a : C_3 \# C_4$
Jussive	$C_1 a C_2 C_3 \# C_4$	—	$C_1 a C_2 a : C_3 \# C_4$
Imper.	$C_1 a C_2 C_3 \# C_4$	—	$C_1 a C_2 a : C_3 \# C_4$

Chart 4.1b

A traditional Semitist would recognize here three sets of morphemes:

1. Root morphemes: e.g.,

s-b-r	'break'
b-d-l	'hurt'
b-r-k	'bless'
2. Tense morphemes: e.g.,

a-a	(perfective)
a-i:	(gerundive)
3. Derivational morphemes: e.g.,

$C_1 - C_2 - C_3$	(simple stem)
$C_1 - C_2 : - C_3$	(geminated stem)
$C_1 - a : C_2 - C_3$	(lengthened stem)

There are two separate questions to be decided:

1. Can the three types (simple geminated and lengthened) be derived by rule from a single base; or is it simply a morphological fact (or artifact) to be lexically specified that some roots have the simple form, others the geminated form, and still others the lengthened form.

2. Is the traditional (consonantal) root-and-(vowel) pattern approach valid; or are the stems listed in the lexicon? If stems rather than roots are listed in the lexicon, is the variation in vocalism between one stem and another (with regard to tense, that is) to be predicted by rule?

4.1.2 The distinction between simple, geminated and lengthened verbs reflects, historically, certain derivational processes still active in other South Semitic languages.

Arabic:

simple	qátala	'he killed'
gemin.	qát:ala	'he massacred'
length.	qá:tala	'he tried to kill'

Compare the analagous stem types as they appear in Tigrinya:

simple	sÁbAr^	'he broke'
gemin.	bÁd:Al^	'he hurt'
length.	bá:rAk^	'he blessed'

The fact that three separate roots are usually required to compare Tigrinya stem types with Arabic stem types is suffic-

ient to show that gemination and lengthening are no longer productive derivational devices in Tigrinya. That there is however a residue of this system is shown by:

qArAbA 'he was near' (simple stem)

qAr:AbA 'he approached' (geminated stem)

In addition, there are specific derivational patterns which also reflect this older morphological unity, as, for example, the fact that denominative verbs usually take the geminated pattern:

kArsí: 'stomach'

kAr:AsA 'he became fat'

But even this is not absolutely predictable, as witness the fact that the noun q^wɛma:l 'louse' gives two different denominative verbs, one of the simple type as well as one of the geminated type:

q^wɛmAlA 'he removed the lice' (simple type)

q^wɛm:AlA 'he had lice' (geminated type)

The majority of verbs in modern Tigrinya are of the simple type. The relative paucity of non-simple stems and of contrasts between simple and non-simple stems, along with the absence of specific semantic distinctions which would relate one stem-type to the others, means that any attempt to

write rules for these types would of necessity be arbitrary. Thus ignoring for the moment the question of how the underlying vocalism should be represented, the lexical representation of verbs would be as follows:

	Triliteral			Quadriliteral
Simple	s-b-r 'break'	q-r-b 'be near'	q ^w -m-l 'remove lice'	m-s-k-r 'witness'
Gemin.	*b-d-l 'hurt'	*q-r-b 'approach'	*q ^w -m-l 'have lice'	
Length.	**b-r-k 'bless'			**k-l-k-l 'prevent'

Chart 4.2

The single asterisk preceding a verb root indicates that the root must undergo an arbitrary derivational process of gemination:

Derivational Gemination: $C_2 \Rightarrow C_2 / [*C_1 _ C_3]$

Similarly, a double asterisk preceding a verb root indicates that the root must undergo an arbitrary derivational process which results in a [a:] appearing as one of the vowels in the verb stems associated with the root. This rule will be discussed in the next section (4.1.3.1).

4.1.3 If the sample lexical entries given above do indeed constitute the complete phonological aspect of the representations of verbs, then the vocalism which accompanies these roots in the verbal conjugation must be completely predictable.

4.1.3.1 Before one can proceed to discuss the phonological rules which operate on the verbal paradigm, it is first necessary to establish a complete underlying stem to which rules will apply. Since I have already established that the consonantal root is lexically specified it remains necessary to specify the underlying vocalisms which define each of the four tense/aspect paradigms: that is, for the Past, the Perfective, and the Gerundive; for the Non-Past, the Indicative, and the Jussive/Imperative.

The vocalism underlying the Perfective is, quite obviously, /...a...a.../. The trilateral lengthened Perfective stem looks at first like a counterexample to this general formulation of the vocalism. However, the problem is clarified if one examines the corresponding quadrilateral stem. The lengthened stem, as this quadrilateral form makes evident, is characterized by an infix /a:/ . In the case of the trilateral, this would require:

Base	CaCaC
{a}-Infixation	Caa:CaC
Vowel Elision	Ca:CaC

Chart 4.3

The {a:}-Infixation is not the same as that found in nouns.² It is rather:

{a:} -Infixation-2: $\emptyset \Rightarrow a: / \dots \underline{\quad} \text{CVC}$
 [+lengthened]

The underlying vocalic pattern for the Gerundive is /...a...i:.../. The occurrence of /a:/ in Gerundives with lengthened stems follows from the same rule as that of the Perfective. Thus, {a:}-Infixation 2 is not a rule of tense/aspect formation but rather is a general morphological rule of lengthened stem formation.

Since the Perfective and the Gerundive are functionally related as the Past Tense forms, a logical question to ask is whether they are morphologically related as well. Historically, the Gerundive is a nominal form; even synchronically this can be seen from the fact that it cannot co-occur with the negative #ʔay- ... -n# since the only negative is a verbal one:

Ex. 'He broke a pot' ʔitró: sʌbi:ru:
 'he didn't break a pot' ʔitró: ʔa:y+sʌbʌr+ʌ+n

where in the second sentence, the Perfective is used even though it is a main clause, since only the Perfective can be negated.

Further evidence that the Gerundive is still best seen

as a nominal form lies in the fact that while the Perfective takes regular verbal desinences, those of the Gerundive are in fact identical with the nominal possessive suffixes:

sAbArku: 'I broke (perfective)'

sAbi:re: 'I broke (Gerundive)'

mAṣḥafe: 'my book'

Thus, in the Gerundive we quite apparently are dealing with a deverbative noun, which is formed by a derivational rule,

$$a \Rightarrow i: / \text{CaC} \underline{\quad} \text{C} \\ [+Gerundive]$$

Although synchronically the Gerundive functions as a verb form, the morphological co-occurrence conditions by which it is governed are clearly those of any other nominal.

For this reason, rather than claiming that there are two Past Tense stems, CaCaC and CaCi:C, it is best to claim only one Past Tense form, CaCaC (the Perfect) and to derive the Gerundive form from this stem by a regular morphological rule.

4.1.3.2 In contrast to the Past stem, the non-Past stem, which is used to form the Indicative and the Jussive Imperative, is, by inspection, ...a...i...; the initial a is, predictably, elided by the infix [a:] of the lengthened tri-

literal. On the other hand, there are, again simply by inspection, some real problems. These problems are mostly found in the simple trilateral stems. I have no solution to offer, but will simply discuss the problems that arise.

The trilateral indicative behaves normally except in the presence of a vowel-initial suffix, where $CaCiC \Rightarrow CaC\emptyset CV$. However, a sequence of CVCVC+V cannot be operated on by the rule of Vowel Deletion found in Tigrinya (3.2.1). The only way to handle this would be an ad hoc rule which would have no meaning in the total grammar of Tigrinya. Another problem in this same form is the treatment of C_2 :. It is automatically geminated (1.2.1) when the stem is not followed by a vowel-initial suffix (1.6.2.2). In the case of the vowel-initial suffix, the loss of the vowel between C_2 and C_3 would create a consonant cluster consisting of three segments: $C_2: -C_3$. Normally one would expect the application of Epenthesis in this environment. However, it appears that rather than Epenthesis, this sequence of three segments has been resolved by degeminating the geminated consonant.

The stems of the Jussive/Imperative are even less what would be expected. The problem here lies in the nature of the second vowel; the loss of the first vowel in the Jussive is predictable since y#-sVbar would by regular appli-

cation of the rule of Vowel Deletion become $y\pm\text{-sbar}$, 'that he break'. The \pm found in the Imperative as the first vowel is likewise predictable if one derives the Imperative from the Jussive (which is desirable on semantic grounds). Only one new rule would be needed to derive the Imperative from the Jussive: a rule of Prefix-Deletion (which is morphologically equivalent to Suffix-Deletion: i.e., there is a morphological schema which deletes affixes under certain conditions of derivation and inflection:

$$\begin{array}{l} \{X\} \Rightarrow \emptyset / \begin{array}{l} [+Imperative] \\ [+Imperative] \end{array} \\ \text{Subj.} \end{array}$$

The application of this rule would have to follow that of the rule of Vowel Deletion:

Base (Jussive)	$y\pm - s\bar{v}$
Vowel Deletion	\emptyset
Prefix Deletion	\emptyset
Epenthesis	\pm
Centralization	\wedge
Output (Imperative)	$s\pm\bar{v}$

Chart 4.4

The rule of Epenthesis in this derivation is clearly not identical to the two rules of Epenthesis which have already been discussed (2.5; 3.1.4.). The new rule, which may tentatively be called Internal Epenthesis-2, can be formulated as

Internal Epenthesis-2 $\emptyset \Rightarrow \text{ɛ} / \#C \underline{\quad} C$

This establishes the Jussive/Imperative as a single stem of the shape CVCaC but does not identify the first V. It would be desirable to claim, as we find in all the other possible Non-Past stem types, that there is only a single simple non-Past stem: CaCɛC. If this is so, the deleted vowel is a; an identification borne out by the Indicative where indeed the a is found, since, because of the following consonant cluster (either $C:{}_2$ or $C{}_2C{}_3$), Vowel Deletion cannot apply.

However, this would predict that the second vowel (the one which is found on the surface) should be [ɛ]. But what we do find is [a]. That is, with possible exception of the word final form of the Indicative, the Non-Past simple trilateral does not pattern like the other stem=types found in Tigrinya. I have been able to find no synchronic -- or even diachronic-- motivation for this deviation.

While not quite so obvious, there is one other deviant

fact about the non-Past verb-stems: the Jussive/Imperative of the lengthened quadriliteral is $y\ddot{a}-C_1aC_2a:C_3\ddot{a}C_4$. Certainly the a between C_1 and C_2 meets the structural description of Vowel Deletion, yet it does not delete.

These problems aside, the optimally desirable analysis of the Tigrinya verb stem would be to posit a single underlying base-- CaCaC -- and to derive from this all the Past and non-Past forms. The Perfective is, then, identical to the underlying base (and hence is the unmarked form); the Gerundive (as shown in 4.1.3.1.) is derived from the Perfective by a regular derivational rule. As for the non-Past stems, these are derived from the base by a rule of qualitative Vowel-Gradation³ (in the Indo-European sense).

Vowel Gradation: $a \Rightarrow \ddot{a} / \text{CaC} \underline{\quad} \text{C}$
 $[-\text{Past}]$

4.1.4 If the vowels of verb stems are thus predictable, every verb having the underlying form CaC(C)aC, this reduces to the traditional claim of roots and patterns. Instead, however, of listing the consonantal roots and vocalic patterns as lexical items, only the consonantal roots are thus listed, the vocalic patterns being supplied by the Vowel Gradation rules above, after the application of the following redundancy rule:

Verbal Redundancy Rule: $V \Rightarrow a / \text{C} \underline{\quad} \text{C(C)} \underline{\quad} \text{C}$
 $[+\text{Verb}]$

These rules reflect the impressive constancy in the vocalism of the verb, as compared to the great variety observable in the nominal.

4.2. Epenthesis

In the preceding chapters, as well as in Section 4.1, three rules were given, all of which insert a vowel to prevent a surface consonant cluster. The three rules are repeated here:

Final Epenthesis	$\emptyset \Rightarrow i:/ CC \underline{\quad} \#$
Internal Epenthesis-1	$\emptyset \Rightarrow \ddot{a} / C \underline{\quad} C \#$
Internal Epenthesis-2	$\emptyset \Rightarrow \ddot{a} / \#C \underline{\quad} C$

The rule of Final Epenthesis was first motivated in 2.5 to explain the fact that nouns with the underlying shape CVCC surfaced as CVCCi:. Internal Epenthesis-1 was motivated in 3.1.4 to show that some nouns of the shape CVCC (underlying),

resolve the final consonant cluster by inserting [ɨ] between the two consonants. In Section 4.1.3, I motivated Internal Epenthesis-2 in order to account for the [ɨ] which occurs in the surface of the Imperative form stem of the simple triliteral.

The purpose of this section is to determine the number and form of the Epenthesis rules occurring in Tigrinya.

4.2.1 The first question which I will examine is whether

there is any real dichotomy between Internal Epenthesis and Final Epenthesis. As currently formulated, Final Epenthesis has the effect of taking singular nouns of the shape CVCC and changing them to CVCCi:. Thus /kalb/ becomes [kAlbí:] 'dog'. However, if the syntactic component generates the word for dog with a suffixed conjunction, /#kalb t.n#/, the surface output is [kAlbín], with [ɨ], not [i:]. If [ɨ] rather than [i:] is established as the correct output of Final Epenthesis, we will have taken a major step in uniting this Epenthesis rule with the rules of Internal Epenthesis. That [ɨ] is indeed the correct output of Final Epenthesis is illustrated by the behavior of the verb suffixes of the first person singular and the second person feminine singular:

1. sAbAr+kú: 'I broke'
2. sAbAr+kí: 'you(f.) broke'

but

3. ʔay+sAbAr-kú:+n 'I did not break'
4. ʔay+sAbAr-kɨ+n 'you (f.) did not break'

If the [i:] is underlying in the feminine suffix and is shortened when a consonant is added, why is the [u:] of the first person suffix not likewise shortened? Moreover, as many of the examples in preceding chapters clearly show,

there is no restriction on the occurrence of long vowels before single consonants. However, if the ɪ in Example 4 is underlying in the feminine suffix, the rule of Vowel Shortening which was motivated in 2.6.3 need not be tampered with. Instead, a new rule will be postulated which lengthens all occurrences of word-final ɪ :

Lengthening: $\text{ɪ} \Rightarrow \text{i:} / \text{ ___\#}$

This rule accounts for the distributional fact that there are no surface word-final $[\text{ɪ}]$'s in Tigrinya. Thus, the rule of Final Epenthesis may be provisionally rewritten as:

Final Epenthesis: $\emptyset \Rightarrow \text{ɪ} / \text{CC ___\#}$

4.2.2 Examples like $[\text{k}\Lambda\text{lb}^{\text{ɪ}}\text{n}]$ do more than show that the output of Final Epenthesis is $[\text{ɪ}]$ rather than $[\text{i:}]$. They call into question the very existence of the rule; for, as the rules of Epenthesis have so far been formulated, the same noun may, in the singular, undergo two different Epenthesis rules:

$/\#\text{k}\Lambda\text{lb}\#/\quad [\text{k}\Lambda\text{lb}^{\text{i:}}] \quad (\text{by Final Epen. and Lengthening})$
 $/\#\text{k}\Lambda\text{lb}+\text{n}\#/\quad [\text{k}\Lambda\text{lb}^{\text{ɪ}}\text{n}] \quad (\text{by Internal Epen.-1})$

This example reveals an obvious generalization that both Epenthesis rules fail to take account of: namely, that

it is not the two word-final consonants which constitute the crucial environment, but rather a non-permissible sequence of three items. These may be three consonants, as in /#kalb+n#/ or two consonants plus word boundary (but not morpheme boundary) as in /#kalb#/. The general principle may be stated as follows: counting from left to right, insert [±] between the second and third items of a non-permissible sequence. Thus, Final Epenthesis may be combined with Internal Epenthesis-1 to form the following rule:

Epenthesis: $\emptyset \Rightarrow \pm / CC \underline{\quad} (C)\#$

This rule will first insert the [±] in [kAlbɪn], then the [±] (which is subsequently lengthened) in [kAlbɪ:].

4.2.3 A problem arises if one tries to incorporate into this rule Internal Epenthesis-2, which, like Final Epenthesis, follows the same general principle that ± is inserted between the second and third items of a non-permissible sequence:

/sɪbAr#/ \Rightarrow [sɪbAr#] 'break'
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In order to capture the notion of an initial consonant cluster, an initial word-boundary must somehow be incorporated into the rule. This is obviously impossible in the rule given at the end of 4.2.2, for an initial word boundary would cause

the incorrect insertion of [ɛ] after the second consonant.

The only way to incorporate all three instances of Epenthesis into one rule is to specify the segments negatively with respect to vocalicness, rather than positively with respect to consonantality. Thus,

Epenthesis: $\emptyset \Rightarrow \text{ɛ} / [-\text{syll}][-\text{syll}] ___ [-\text{syll}]$

This statement captures the generalization about how Epenthesis operates in Tigrinya. Moreover, it captures the structural information about the presence of word boundaries in the phrase marker prior to the application of Epenthesis. And by eliminating the distinction between consonant and word boundary, the rule can apply to word-internal sequences as well as to word-initial and word-final sequences:⁴

#mʌʃhʌf+t#	#mʌʃhʌf+tɪ:#	'books'
#mʌʃhʌf+t+kʌ#	#mʌʃhʌf+tɛ+kʌ#	'your books'

4.2.4 One problem still remains with regard to the application of Epenthesis. The current formulation of Epenthesis fails to account for plurals like #ʔara:ʔɪs# instead of the expected #ʔara:ʔsɪ:#. I showed in 3.2.1 that this class of nouns is also irregular with respect to {+a:+}-Infixation. Its behavior with respect to Epenthesis is therefore merely one more anomaly in the phonological behavior of nouns of this class.

Historically, it is interesting to note that it is just this class of nouns which maintains the expected Semitic behavior with respect to Epenthesis. Compare,

<u>Underlying</u>	<u>Tigrinya</u>	<u>Tigre</u>	<u>Hebrew</u>
/kalb/	[kAlbí:]	[kAlá b]	[kÉlÉv]

At one and the same time this class of nouns is both conservative and innovative: conservative with respect to Epenthesis and innovative with respect to $\{+a:+\}$ -Infixation. Tigrinya has generalized the conditions for Epenthesis so that while the common Semitic rule makes reference only to consonant clusters in final position, Tigrinya has extended its definition of consonant to include the word boundary, and thus has Epenthesis in every possible position within the word. However, this class of nouns is innovative in its plural formation in that it has a surface trisyllabic form, $?a-C_1a:C_2\ddagger C_3$, whereas the bisyllabic form $?a-C_1C_2a:C_3$ is what one finds elsewhere in Semitic. Thus, we may hypothesize that the anomalies in this class of nouns is a result of there being a historical change in progress in Tigrinya

4.3 Preservation and Loss of Vowels

As the rule of Epenthesis demonstrates, Tigrinya has at least one formal device for the resolution of undesirable sequences of segments. In this section, I will bring together those other processes whereby Tigrinya controls

the sequences of vowels and consonants.

4.3.1 While Epenthesis separates consonants which come together in undesirable positions, the rule of Vowel Deletion discussed in various places in this study actually brings consonants together, but not in such a way as to present an undesirable sequence of segments. The rule as it now stands says

Vowel Deletion: $V \Rightarrow \emptyset / V + C \begin{array}{c} \text{CV} \\ \text{[-long]} \end{array}$

Despite the fact that nouns like [ʔatba:t] 'breasts' (sing. [ʔu:b], 3.3.1.3) do undergo Vowel Deletion -- and conversely, despite the fact that lengthened quadrilaterals in the Non-Past do not undergo deletion of the first vowel of the stem, e.g. [yɛkala:kɛl], not the expected *[yɛkla:kɛl] -- it seemed a more reasonable alternative to prevent long vowels from deleting by specifying the feature [-long] in the statement of the general rule. Thus, lengthened trilaterals such as [yɛba:rɛk] predictably fail to undergo Vowel Deletion.

That the solution is still not entirely adequate is illustrated by the verbal derivational prefixes {ʔa-} and {ta-} (which also occur in the associated derived nominals which take these prefixes). Thus, forms with the prefix {ʔa-} always occur with Vowel Deletion:

ʔa-sbAr+ʌ 'he caused to break', from /ʔa-sabar+a/
 but,
 tA-sAbAr+ʌ 'it broke', from /ta-sabar+a/

Since there is no feasible alternative to the rule of Vowel Deletion as stated, it seems most expeditious simply to mark {ta-} as well as the stem of the lengthened quadriliteral as exceptional with regard to Vowel Deletion.

As to the morpheme boundary, and the requirement that the flanking consonants be single, this has been shown to be necessary in several places. The one remaining condition one might want to impose on the vowel to be deleted is that it be unstressed. That it is only unstressed vowels which delete is true, but to specify stress in the rule is unnecessary, because stress has not yet been assigned at the point in the derivation where Vowel Deletion applies. It is obvious by inspection of previous paradigms that epenthetic vowels are frequently stressed. Thus it is natural to suppose that stress assignment follows Epenthesis; and since Vowel Deletion precedes Epenthesis, it clearly precedes Stress Assignment as well.

4.3.2 While Epenthesis and Vowel Deletion both relate vowels to consonants (though the effects are opposite), there are processes in Tigrinya which deal with sequences of vowels. Such sequences are dealt with in two ways: one of the two vowels is elided (Vowel Elision), or a segment

is inserted to separate them (t-Epenthesis, 3.3; Glide Formation, 3.3).

4.3.2.1 The process of Vowel Elision was motivated in 3.1.2. in order to handle the change of /ma-nabar/ to [mΛ-na:b̄r] in the plural. The rule was formulated as follows:

Vowel Elision: $V \Rightarrow \emptyset / \begin{array}{c} V \\ [+long] \end{array}$

Thus,

base	ma-n	abar
Infixation	a:	
Vowel Elision		∅
Raising		ɪ:
Centralization	Λ	
output	mΛ-na:	b̄r

Chart 4.5

However, this rule is in need of reformulation on several grounds. First of all, in 4.1 I showed that there was an Infixation rule counting from right to left in forming the lengthened stem of verbs. Thus, Vowel Elision would also have to apply backwards. Furthermore, 3.2.4 postulates that even a long vowel deletes in the environment of another long vowel. Thus in the formulation of plurals of the type [kAsAsti:] from a base /kasa:s-i:/, the derivation has to be, as established on independent grounds:

base	k a s a: s - i:
Suffix Deletion	∅
+t -Suffixation	t
Infixation	a:
Vowel Elision	∅
Vowel Shortening	a
Epenthesis	±
Lengthening	i:
Centralization	^ ^
output	k ^ s ^ s t i:

Chart 4.6

Neither in my data nor in anything which can be adduced from Leslau's (1941) data, do we find any instances of sequences of dissimilar long vowels, nor can we postulate any sequence other than the infixation of {a:}.

For this reason, I am retaining the Vowel Elision rule as

Vowel Elision: $V \Rightarrow \emptyset / \begin{matrix} V \\ [-\text{long}] \end{matrix}$

which will elide any vowel, long or short, if it is contiguous with (i.e. preceding or following) a long vowel.

The rule as stated here will cover all cases of Vowel Elision shown in the corpus available to me.

4.3.3.2 Another device Tigrinya has for resolving vowel sequences is that of Glide Formation, which was first discussed in 3.3. The actual glide is usually [w] or [y], depending on the nature of the vowels involved. Thus, we

find:

qAtAlku: ¹ wo:	'I killed him'
qAtAlka: ¹ yo:	'you (m. sg.) killed him'
qAtAlk ¹ yo:	'you (f. sg.) killed him'

These examples show that /u:/ will cause a [w] glide whereas /a:/ and /ɨ/ cause a [y] glide. Thus, the glide formed agrees in roundness with the preceding vowel:

Glide Formation (revised): $\emptyset \Rightarrow \left[\begin{array}{l} -\text{cons} \\ -\text{voc} \\ \text{rd} \end{array} \right] / \left[\begin{array}{l} \text{V} \\ \text{rd} \end{array} \right] \text{---} +\text{V}$

The occurrence of [ʔ] as a glide is not as regularly predictable, nor is it so frequent. In fact, I have only found two environments in which [ʔ] is found -- interestingly, both in conditions where a [y] would be predicted by the above rule.

The first case is found in underlying CVCC nouns when followed by a possessive suffix beginning with a vowel -- i.e. the third person suffixes. Thus /kalb + u:/ [kAlbu:] 'his dog' varies with [kAlbɨʔú:]. Of interest here is the second form. Just as in 3.3 where we found [ʔad:í:] < /ʔad:/ had two possible plurals: [ʔad:a't] ~ [ʔad:ɨtá:t] -- the basis for this alternation being the treatment of epenthetic [ɨ] as part of the base -- so also in this example the alternation is the result of the differential treatment of the final vowel.

The syntactic input to the rules in question is

/#kalb##u:#/ (the double word-boundary being the result of the reduction of the possessive sentence to a clitic possessive word). This form is now available for the rule of Epenthesis, producing /#kalb±##u:#/. At this point in the derivation there are two vowels separated only by boundaries. Therefore one of the rules for treating VV sequences must be employed: either Vowel Elision or Glide Formation. The rule used depends on speech tempo. In allegro speech internal word boundaries are deleted early. In that case, the result would be /kalb±u:/ which meets the structural description for Vowel Elision yielding (after Cent'n) as output [kAlbu:]. In slower speech, however, internal word boundaries are merely replaced by morpheme boundaries, rather than being deleted, in which case the form /kalb±u:/ meets the structural description for Glide Formation.⁶ I can find no reason why the output of Glide Formation is [kAlb±?u:] rather than the expected *[kAlb±yu:].

The other place where [?] is found as the unexpected output of Glide Formation is in the second and third person plural feminine verbs with definite object suffixes which are vowel initial. These forms are, synchronically, anomalous in other ways as well. In all these forms a [a:] is found between the inflectional ending and the object suffix.

	Positive	Negative
Perfective 3 m sg	sábara	?a:ysabarín
Gerundive 3 m sg	sabi:rú:	----
Indicative 3 m sg	yisab:ér	?a:y:isabrín
Jussive 3 m sg	yisbár	?a:y:isbarín

Chart 4.7

The verbal stress rule also says that object suffixes are not stressed and, in fact, do not influence stress at all. Thus,

sabi:rú: 'he broke' (Gerundive), sabi:rú:^Wo: 'he broke it'
sábara 'he broke' (Perfective), sábaro: 'he broke it'
(where [sábaro:] is from /sabar + a + aw/ after Vowel Elision and Monophthongization).

In general the noun, like the verb, is stressed on the ultimate syllable and, also like the verb, one has to specify that certain derivational suffixes either are opaque to the stress rule or else require stress on other than the ultimate syllable. Since these suffixes form no sort of natural class, it is necessary that they be specified in the lexicon. Thus, the Gentilic {-a:y} and the plural {+awt} (o:t) are lexically specified [-STRESS], while the Gentilic {-a:wi:} lexically specifies that it is stressed on the penult.

Thus, we find:

?amhá:r-a:y m. sg. 'someone from Amhara'
 [-STRESS]

?amhá:r-o:t plural
 [-STRESS]

where the stress is on the penult since the last syllable is lexically specified [-STRESS]. However, if the [-STRESS] syllable is in other than final position, the normal stress rule applies:

?amha:r-Λy+ti: f. sg.
 [-STRESS]

Conversely, if an affix is lexically specified as [+STRESS] it must be stressed wherever it occurs in the word:

mǝdr-á:wí:(t) m. (f.) sg. 'terrestrial'
 [+STRESS]

mǝdr-a:wí^y+a:n m./f. plural
 [+STRESS]

Most other nouns have normal ultimate stress. For example, quadrilaterals show up with

kʌnfár (sg) 'lip'
 kʌna:fár (pl)
 mʌʃháf (sg) 'book'
 mʌʃhaftí: (pl)

In trilaterals the two most common stem shapes differ as to stress assignment: thus, CVCC nouns and their corresponding plurals are always stressed on the last syllable of the surface form:

/ʔɛzn/ [ʔɛzní:] sg., [ʔaʔzá:n] pl. 'ear(s)'
 /rɛʔs/ [rɛʔsí:] sg., [ʔara:ʔís] pl. 'head(s)'

CVCVC stems, on the other hand, are normally stressed on the initial syllable:

[fáras] 'horse'
 [sálaf] 'thigh'

Unless the plural affix is specifically marked [+STRESS] then the plural form will retain the same stress pattern as the singular. Thus the plural of [fáras] is [ʔáfra:s], while the plural of [sálaf] is [sɛlafá:t] since {+a:t} is [+STRESS].

While in general the stress rule for Tigrinya is simply

Stress Assignment: $V \Rightarrow$ [+STRESS] / _____(C)#

yet, since the exceptions for the verbs and those for the nouns include large productive classes and these do not share any phonological similarity, it seems impossible to collapse these rules in any natural way.

4.4.1 Stress is ordered after Epenthesis since epenthetic vowels can be stressed, viz.:

rɛʔsí: sg. 'head'
 ʔara:ʔís pl.

where both stressed vowels are epenthetic. The question is, which other rules must stress be ordered with respect to?

The forms

sÁbArA	'he (perfective) broke'
sAbá:bArA	'he (perfective) shattered'
?ásbArA	'he (perfective) caused to break'
tAsÁbArA	'it (perfective) broke'

show that stress assignment must follow Vowel Deletion. Stress in the Perfective must be on the antepenult (in the third person singular positive); that it is not simply a rule to stress the first syllable is shown by [sAbá:bArA]; what [?ásbArA] and [tAsÁbArA] show is that this shift to the antepenult follows Vowel Deletion since, in [?ásbArA], if Stress Assignment preceded Vowel Deletion, the stress would have been assigned to the deleted vowel and hence would have produced a stressless word.

Footnotes

1. In the Indicative of the simple quadriliteral and of the geminated trilateral the surface realization of the first vowel of the stem varies between ʌ and ɛ in the speech of my informants. In these positions, Leslau consistently transcribes ə (ɛ in my transcription). Conversely, in the derivational prefix which Leslau consistently transcribes as tä- (tʌ- in my transcription), my informants alternated between tʌ and tɛ. These cases are only two of many instances where ʌ and ɛ are difficult to distinguish. I strongly suspect that within the next few generations, these two vowels will merge completely in underlying representations.
2. Counting backwards for the verbal {a:}-Infixation allows a simple single statement which encompasses both trilaterals and quadrilaterals, where counting consonants from left to right would require a more complicated schema involving the use of angle brackets. Counting backwards would not simplify the handling of nouns, so that this difference of direction in counting serves to differentiate the nominal rule from the verbal rule without recourse to $\langle +\text{nominal} \rangle$, $\langle +\text{verbal} \rangle$.
3. This rule may be seen as the last remnant in Tigrinya, of a much more widespread process, which may still be seen in full in Modern Standard Arabic (Brame, 1970).

Compare the following Past and corresponding Non-Past forms:

<u>Past</u>	<u>Non-Past</u>	<u>Gloss</u>
katab <u>ab</u> -tu	?a-kt <u>ub</u>	'write (1 sg)'
naz <u>al</u> -tu	?a-nz <u>il</u>	'descend (1 sg)'
rak <u>ib</u> -tu	?a-rk <u>ab</u>	'ride (1 sg)'

The Arabic examples show the low vowel, a, becoming either i or u (this is lexically determined for each verb) and the high vowel i becoming a. Tigrinya appears to have generalized all Semitic Past stems to $C_1aC_2aC_3$. The switch in the non-Past to a high short vowel will, of course, yield a i.

4. For the operation of Epenthesis, geminate consonants are considered two segments. Thus, /#ʕad:#/ 'country', yields surface [ʕad:i:].

5. Remembering the variation observable between [ɛ] and [ʌ] (4.1).

6. The effects of allegro speech are in fact more widespread. Thus, the plural for 'dogs' in slower speech is [ʔaxa:lɪbtí:]. In allegro speech, the distinction between non-final long and short vowels is lost, as well as the constraint that the short low vowel /a/ is not laxed after a low consonant. Thus, the plural for 'dogs' in allegro speech is [ʔʌxʌlɪbtí:].

APPENDIX

A.1 In the preceding chapters, I have discussed the major morphological and phonological processes of Tigrinya. In the course of this discussion, I have not, in general, discussed the question of the ordering of these rules with respect to each other, except where it was absolutely necessary in order to justify a particular derivation. My reason for doing this is that Tigrinya, as I find it in my corpus, lends itself easily to the formulation of specific phonological processes, but it is difficult to establish a firm order for the application of these rules. Implicit in Mr. Kidane's recognition of a real difference in the Tigrinya of his parents' generation (the generation of Leslau's informant) and his own is the fact that Tigrinya is in the process of undergoing a rather sizeable change -- one that has been abnormally accelerated by the pressure of Amharic. Not only has the Ethiopian government tried to impose Amharic on everyone in Ethiopia, but also the speaker of Tigrinya by and large has accepted this imposition, even though sociologically, he resents it. Hence, changes already underway in Tigrinya when Leslau did his work have been accelerated in the direction of surface regularization even at the expense of producing underlying complexity.

A good illustration of this concerns the rule of Monophthongization. I have already shown several instances of e: and o: which do not alternate with the corresponding short diphthongs. A prime example is the e: possessive suffix which I would enter in the Tigrinya lexicon as +ay . In the speech of Leslau's informant, the form y could be found attached to a variety of pronominal stems, such as na:t y 'mine', while the form e: is found attached to nouns, including the Gerundive; thus, m şhaf+e: 'my book'
s bi:r+e 'I broke'

However, in the speech of my informants, e: is the only surface form for this suffix. It would seem, therefore, that there is a tendency in the language to increase the inventory of underlying vowel segments and restrict therefore the widest possible application of the Monophthongization rule.

In addition, the regularity with which Leslau differentiates ð from was not matched by my informants. In fact, only by asking them to repeat very slowly could I be certain which vowel was intended. And in lento speech it was impossible to tell whether I was merely getting a spelling pronunciation. Thus it may actually be the case that here an underlying distinction is disappearing, so that within several generations, the underlying vowel system may

indeed be:

i	u
e	o
a	

A.2 Following is a list of the rules discussed in this study:

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