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## GUTTURAL VOWELS

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### 1. Low vowels as gutturals

In this article, I will argue that the low vowel [a] can function as a guttural consonant. Evidence for this claim will be drawn from Inor, an Ethiopian Semitic language. The term guttural is used to refer to the set of glottals, pharyngeals and some uvulars. This analysis will have a number of implications for the structure of Semitic roots and verb patterns.

Inor is a Peripheral Western Gurage dialect (or language) also known as Ennemor. Leslau (1959) has shown that most Inor verbs exhibiting the vowel [a] come from verbs with etymological gutturals. For instance, *afəs* 'take handfuls' and *nət'a* 'be clean' are cognate with the synonymous Ge'ez verbs *həfəsə* and *nəs'hə*. Similar remarks can be found in e.g. Polotsky (1971: 493) and Hetzron (1970: 563).<sup>2</sup> Leslau (1959) and several related articles are reproduced in Leslau's (1992) *Gurage Studies*, a volume to which I will refer here for convenience.

Most references to verbs like *afəs* and *nət'a* describe them as biliteral verbs coming historically from trilateral verbs (e.g. Leslau 1992: 151, 604 and Polotsky 1971: 549). Some authors, such as Hetzron (1977: 74-7) and to some extent Marcos (1974: 261), depart from this tradition by regarding them as trilateral but they provide no systematic analysis. Because Gurage has been studied mostly by historical linguists, most studies on it have dealt with verbs whose behavior is typically Semitic, e.g. *səpər* 'break' and *sirəpət* 'sojourn.'

1. The Gurage languages have been the object of intensive scrutiny in recent research on formal linguistics. They have been the source of important advances in phonology and morphology. None of this progress would have been possible without the studies initiated by Wolf Leslau fifty years ago, at a time when this area of Semitic was almost uncharted. The present article on Inor attempts to build on this empirical foundation. It also owes a great debt to the publications of Robert Hetzron on Inor and other Gurage languages. I am grateful to Outi Bat-El, Robert Boivin, François Dell, Mohamed El Medlaoui, Gideon Goldenberg, Mohamed Guerssel, Morris Halle, Robert Hetzron, Ali Idrissi, Jean Lowenstamm, John McCarthy, Carole Paradis, Keren Rice, Sharon Rose and Mauro Tosco for comments. Special thanks are due to Berhanu Chamora and Degif Petros for innumerable hours of collaboration on Gurage phonology. The Inor facts reflect the dialect of Berhanu Chamora, a native of Dämbär. This research was made possible by research grants SSHRCC #410-94-1062 and FCAR #95-ER-2305.

2. Phonetic symbols follow IPA conventions, except for [y] as in *yacht*, [c] as in *church*, [j] as in *judge*, [c'] (IPA [tʃ]) and [q] (IPA [kʰ]); [m] is a nasal [β]. Many verbs in this paper show the effects of a nasal harmony which does not concern us here.

Such morphologically transparent verbs display all the usual properties of Semitic morphology, which is based on the interdigitation of root consonants, vowels and patterns. On the other hand, the formal synchronic analysis of morphologically atypical, or opaque, verbs has been somewhat neglected. Gurage studies occasionally provide the paradigms of opaque verbs like *afəs* and *nət'a* but they almost never ask how the roots and templates of these verbs compare formally with those of *səpər* and *sirəpət*. Marcos (1974: 255, 257) does claim that some templates are shared by opaque and transparent verbs but his arguments, similar to the ones to be presented here, only occupy a few lines. Other studies seem to assume that these verbs use different templates and I am not aware of any study stating what their synchronic roots are, or if they have synchronic roots at all. Because transparent verbs like *səpər* and *sirəpət* represent only a third of Gurage verbs, this situation amounts to treating Gurage as if its verbal morphology had ceased to be typically Semitic.

Recently, members of the African Linguistics Project in Montreal have attempted to treat Gurage as a *bona fide* Semitic language, i.e. to assume that it makes systematic use of the mapping of roots onto templates. This research programme entails a radically different perspective on Gurage studies because it revolves around the explicit identification of synchronic roots and templates. Concerning the vowel [a] mentioned above, some studies of Chaha, such as Lowenstamm (1991, 1996), Rose (1992), Petros (1993), Prunet & Petros (1996), Petros (this volume), and some of Inor, such as Prunet & Chamora (1995a) and Prunet (1996a), have provided arguments to the effect that such roots still contain a guttural segment. Though they differ in some aspects, e.g. with respect to whether a radical [a] should be treated like a consonant or a vowel, all these authors argue for a radical guttural segment noted /A/. This symbol is adopted because of its similarity to Polotsky's (1951: 532) /Ä/, which he used for the same purpose. Voigt (1981), quoted by Podolsky (1991: 1222), uses an abstract glottal stop for the same purpose in Amharic, another Ethiopian Semitic language. Under this view, the roots of *afəs* and *nət'a* are  $\sqrt{Afs}$  and  $\sqrt{nt'A}$ , which makes them regular trilateral roots mapped onto the template of *səpər*. I will pursue this approach here and document the distribution of the phonetically vocalic gutturals of Inor.

In §2, I outline my assumptions about verb templates. In §3, I show that the glottal stop of Inor never causes vowel lowering and, hence, cannot be the source of any low vowel. In §4, I argue for the existence of /A/. Another abstract guttural consonant, noted /ʕ/, is proposed and justified in §5. Outstanding questions regarding vowel length are addressed in §6. In §7, I put forth arguments to the effect that all three gutturals, i.e. /ʀ, A, ʕ/, are actually glides. Two approaches to guttural variation are discussed in §8. Some implications regarding the internal structure of gutturals are discussed in §9. Section 10 concludes this article.

## 2. Verb templates of Inor

I assume that Inor verbs select either the short (1a) or the long (1b) template, illustrated with the roots  $\sqrt{sbr}$  'break' and  $\sqrt{grdb}$  'cut into two.' While it is obviously possible, and common, to introduce more templates, it is certainly not possible to posit less, so that this assumption, to the extent that it yields interesting results, enjoys the status of most restrictive and desirable analysis. The presence of geminated positions, whose phonetic exponent is allophonic variation, is justified in Chamora (this volume) for transparent verbs. The essential aspects of this variation are that: (i) geminate voiced obstruents devoice and degeminate while geminate /rr, nn/ become [n], and (ii) simplex non-initial /r, n/ become [r, r̥] respectively. I define transparent verbs as those verbs whose phonetic realization contains only plain (nonround and nonpalatal) consonants and whose vowels do not include a non-infixal [a]. All other verbs will be called opaque. By convention, all numbers refer to consonant positions (C-slots) while vowel positions (V-slots) are indicated by means of the actual vowel. There are three basic aspectual (or tense) templates: perfective, imperfective and jussive. The term 'jussive' is used for the jussive proper, noted e.g. jussive 3sm (third person singular masculine)  $\text{ə-s}\beta\text{ir}$  'let him break!', and the imperative, noted e.g. jussive 2sf (second person singular feminine)  $\text{s}\beta\text{i}$  'break!.'

### (1) Inor Templates

#### a. Short template

Perfective:	/l $\text{ə}$ 22 $\text{ə}$ 3/	$\text{səpər-ə}$ / $\text{səpər-xu}$ 'he / I broke'
Imperfective:	/l $\text{ə}$ 2i3/	$\text{yi-s}\beta\text{ir}$ / $\text{ə-s}\beta\text{ir}$ 'he / I break(s)'
Jussive		
transitive:	/li2i3/	$\text{s}\beta\text{ir}$ / $\text{ə-s}\beta\text{ir}$ 'break! / let him break!'
intransitive:	/li2 $\text{ə}$ 3/	$\text{bikət}$ / $\text{ə-}\beta\text{kət}$ 'die! / let it die! (of animal)'

#### b. Long template

Perfective:	/l2 $\text{ə}$ 33 $\text{ə}$ 4/	$\text{girətə}\beta\text{-ə}$ / $\text{girətə}\beta\text{-xu}$ 'he / I cut into two'
Imperfective:	/l2 $\text{ə}$ 33i4/	$\text{yi-grəti}\beta$ / $\text{ə-grəti}\beta$ 'he / I cut(s) in two'
Jussive:	/l $\text{ə}$ 23i4/	$\text{gərdi}\beta$ / $\text{ə-gərdi}\beta$ 'cut! / let him cut into two!'

The vowel [ə] (often written  $\ddot{a}$  in the literature) is always present underlyingly. The vowel [i] (often written  $\text{ə}$  in the literature) is the epenthetic vowel of most Ethiopian Semitic languages but its behavior seems to be more complex in Gurage than in other languages. I will claim that not all phonetic instances of this vowel are equal phonologically. My first assumption is that all instances of /i/ indicated in (1) (e.g. in the short template jussive li2i3) stand for an underlying templatic V-slot. The realization of these underlying V-slots depends on the sonority of surrounding consonants and on the presence of affixes. It follows that these occurrences of [i] are the phonetic spell-

out of underlyingly empty V-slots. For instance, in *sifir* 'break!' I assume that both vowels occupy underlying V-slots. Other factors, such as the relative sonority of neighboring consonants, will determine if and when some V-slots receive no phonetic interpretation (cf. Angoujard & Denais 1989: 114, Berhane 1991: 106, Nikiema 1995: 330, Lowenstamm 1996 and Guerssel & Lowenstamm ms. for similar approaches). For instance, in *ə-sfir* 'let him break' there is also a V-slot after [s] but it is not phonetically spelled out. Since the V-slots are present underlyingly, the problem consists in explaining when they are not realized phonetically. As we will see in §4.3, some authors conclude that the predictability of [i] vowels in the jussive would not be captured if V-slots were present underlyingly and argue for a /123/ jussive template or no template at all. The vowel length contrasts of Inor, which are absent from Chaha, provide us with empirical arguments bearing on these approaches. Based on the facts of Inor, I will argue that the jussive has a /1i2i3/ template, i.e. CVCVC with V-slots that are often unrealized phonetically. All other things being equal, it would be desirable to assume that all [i] vowels occupy underlying V-slots but I opt for a more complex analysis: I assume in (1) that some occurrences of [i] are truly epenthetic, i.e. do not come from an underlying V-slot. This is why I represent the long perfective as /12ə33ə4/ instead of /1i2ə33ə4/. This second assumption will also be justified in §4.3.

### 3. The glottal stop

Inor has a phonemic glottal stop which can be found in all positions of a short template verb, as shown in (2a). It is also found in long template verbs, as shown in (2b), though the analysis of the first two examples should be regarded as tentative. In all cases, a glottal stop is silent in verb-initial position but it is pronounced when the verb is preceded by a prefix. Three comments must be made at this stage: (i) some vowels undergo regressive assimilation when separated by a glottal stop, (ii) some verb stems include an infix -a- (underlined for convenience),<sup>3</sup> and (iii) the prefix /n-/ assimilates to a following obstruent. An important point which will be assumed in this paper is that some phonetic secondary (palatal or round) articulations are really radical glides occupying their own C-slot (e.g. the root of *ʒəʔər* in (2b) can be shown to be the quadriliteral  $\sqrt{zyʔr}$ , which selects the long template). We will call these strong glides and note them as /y, w/. On the other hand, some homophonous secondary articulations are weak radical glides which simply share the C-slot of the preceding consonant (e.g.  $\sqrt{g}ʔr$  below behaves like a trilateral root). The latter are noted as superscripts: /ʔ/ and /ʔ/. These two kinds

3. Prunet & Petros (1996) assume that the corresponding *a*-infix in Chaha is equal to /əə/ (cf. also Polotsky 1971:531, among others). This abstract analysis will not be adopted here because Inor has contrasting long vowels such as [aa]. These will be called double vowels further on.

of glides are justified in Prunet & Petros (1996) and Petros (this volume) for Chaha and Chamora (1996) and Prunet (1996a) for Inor.

(2) a. Glottal stop in short template verbs

Root	Perfective	Imperfective	
√ʔbr	əpər	yə-ʔəβir	'plant'
√ʔtr	ətər	yə-ʔətir	'kill'
√fʔm	fəʔəʔm	yi-fəʔim	'block'
√nʔr	nəʔər	yī-fəʔir	'uproot'
√dfʔ	dəfəʔ	yi-dəfiʔ	'soak'
√wdʔ	wətəʔ	yi-wədiʔ	'fall'

b. Glottal stop in long template verbs

Root	Perfective	Imperfective	
√ʔwsy	ofə	yu-ʔuf	'do bad against someone'
√ʔyny	enə	yi-ʔin	'give birth'
√gʔr	a-ŋ-gʔaʔanər	ya-a-ŋ-gʔaʔanir	'winnow grain'
√fʔr	ā-m-ʔaʔanər	yā-ā-m-ʔaʔanir	'cause to die suddenly'
√zyʔr	zəʔər	yi-zəʔir	'tear up'
√drʔ	a-dranəʔ	ya-a-dranir	'make dry'
√drfʔ	dīrafəʔ	yi-dīrafir	'mix'

It can be gathered from these forms that the glottal stop can be found next to all vowels and that it exerts no lowering effect on them. There are several reasons to believe that the glottal stop is phonemic. For instance, it clearly occupies a consonantal position in the template, like any other consonant (e.g. *wətəʔ* is comparable to *wətər* 'stretch'). Also, the glottal stop participates in the morphophonological processes of the language. For instance, it labializes like other non-coronal obstruents in the impersonal (abbreviated as *imprs.*). Hetzron (1971: 194) describes this labial harmony (and a concomitant palatal harmony) as 'relevant features components of phonemes (...) superimposed on actually existing root-phonemes,' an insight which has also been expressed in terms of discontinuous consonant channels (Johnson 1975: 32) and floating features (McCarthy 1983). I will view it in terms of floating features and analyze this suffix as /-ʔ/ (the -i in (3) is a 3s object suffix, as shown by *tukʔf-i* 'let someone burn (it)' vs. *tukʔf-nirə* 'let someone burn for us'). The two superscripted symbols represent floating round and palatal features. Though these symbols are the same as those used for weak glides, I make no claim as to how similar they are ontologically. No confusion can arise because weak glides originate in roots while floating features originate in suffixes. The verbs in (3a) show that labialization affects even non-adjacent labializable consonants. Those in (3b) show that /ʔ/ only docks onto consonants: these two roots have no labializable consonants and hence show no labialization in the impersonal (cf. e.g. Polotsky 1971: 484, Leslau 1992: 437).

(3) Root	Perf. 3sm	Perf. impers.	
a. $\sqrt{bsr}$	<i>bəsər-ə</i>	<i>bosər-i</i>	'he/someone cooked'
$\sqrt{mtr}$	<i>mət'ər-ə</i>	<i>mot'ər-i</i>	'he/someone was clear, looked nice'
b. $\sqrt{drs}$	<i>dənəs-ə</i>	<i>dənəf-i</i>	'he/ someone broke off edge'
$\sqrt{tr}$	<i>tənər-ə</i>	<i>tənər-i</i>	'he/ someone cut into small pieces'

The data in (4) show that the glottal stop is labialized in the impersonal. As in Chaha, the labialization is heard on the consonant when adjacent vowels are non-central. But, as shown by Hetzron & Marcos (1966: 25), Prunet (1991: 1234) and Paradis & Prunet (1994: 122), Inor differs from Chaha in that labialization is expressed phonetically on adjacent vowels when these vowels are central (i.e. [ə] and [i]). In both dialects labialization is borne by consonants as far as phonology is concerned. The first perfective impersonal form cited below shows that even a silent glottal stop can 'trap' the floating round feature, i.e. be labialized. The derivation of the first impersonal example is  $/\text{ʔ}ə\text{tər-}^w\text{-i}/ \rightarrow \text{ʔ}^w\text{ətər-}i \rightarrow \text{ʔ}^w\text{otər-}i \rightarrow [\text{otər-i}]$ .

(4) Glottal stop labialization

$\sqrt{tr}$	<i>ətər-ə</i>	<i>otər-i</i>	'he/ someone killed'
	<i>yə-ʔətir</i>	<i>yo-ʔotir-i</i>	'" / " kills'
$\sqrt{ntr}$	<i>nəʔər-ə</i>	<i>noʔor-i</i>	'" / " uprooted'
	<i>ȳī-ĩṣʔĩĩ</i>	<i>ȳī-ĩṣʔũĩĩ</i>	'" / " uproots'
$\sqrt{wdʔ}$	<i>wətəʔ-ə</i>	<i>wətoʔ-i</i>	'" / " fell'
	<i>yi-wədiʔ</i>	<i>yi-wəduʔ-i</i>	'" / " falls'

Hetzron & Marcos (1966: 28) claim that the labialization of a root-initial glottal stop is optional but I differ on this point. Whenever such a glottal stop (e.g. that of  $\sqrt{tr}$  'kill') is followed by a central vowel, I have found that labialization is obligatory. Inor does show instances, to be discussed in §5, where a glottal stop fails to be labialized before non-central vowels but as far as I know not before a central vowel.

#### 4. The guttural /A/

##### 4.1. Infixal and radical low vowels

About a third of Inor verbs are transparent verbs, i.e. verbs which contain only plain consonants and no radical [a]. Such verbs are of two types: short template verbs, like *səpər* 'break,' and long template verbs, like *gīrətəβ* 'cut into two.' We saw in (1) that the three basic aspects (perfective, imperfective and jussive) are characterized by combinations of the two central vowels [ə] and [i]. Many other verbs differ in displaying a labial or palatal articulation.

These are discussed in Prunet & Petros (1996) for Chaha but essentially the same situation holds for Inor.

Finally, some verbs exhibit the vowel [a]. These can be divided into two groups depending on whether the [a] is infixal or radical. Some examples of the first group are shown below. These are transparent verbs because their [a] does not belong to the root.

(5)	Perfective	
√br?	tə-βranə?	'be happy'
√brt'y	birac'a	'scatter' (/bratt'əy/)
√fritx	firaṭəx	'put in disorder'
√qr	qiraqər	'mix'

An a-infix always appears immediately before the penultimate consonant of the stem. In some cases, it seems to cooccur with, or be introduced by, the reflexive prefix *tə-*, as in the first example. Cases can also be found where this infixal vowel is absent when the root can select another template. Thus, the [a] of *a-drādər* 'make stamp, trample' is lost when the root selects another template: *dirədər* 'pile up.' It is not frequent in Ethiopian Semitic, though, for a root to select more than one template, so this test is of limited use. The infixal nature of [a] is also clear when it appears in a verb with four phonetic consonants, as in all the examples above. Since the long template contains only four C-slots, all of which are already satisfied by the root, we can infer that [a] occupies a V-slot, not a C-slot.

The second group of verbs display an [a] which is clearly not infixal. They are opaque verbs. This [a] is the trace of historical laryngeals. It can appear in all positions and replaces a phonetic consonant in the pattern. Six basic forms are shown in (6).

(6) Some verbs displaying radical [a]

	Phonetic form	Example
a. a-initial:	[aCəC]	asər 'carry on the back'
b. long a-medial:	[CaaC]	daar 'bless'
c. a-final:	[CəCa]	səpa 'be efficient'
d. partially reduplicated:	[aCəC]	akək 'scratch'
e. completely reduplicated:	[CaCa]	tata 'rope'
f. short a-medial:	[CaC]	xar 'know'

I will show below that this [a] must be included in the root as a consonant. Because the articulations of the low vowel [a] and that of pharyngeals are very similar (Delattre 1971: 129, Laufer & Condax 1981: 57), I will call this consonant a guttural, and transcribe it as /A/. Dell & El Medlaoui (1992: 105, note 55) also argue that when Tashlhiyt Berber borrows Arabic words including /ʕ/, a consonant which Berber lacks, it turns this pharyngeal fricative into a vowel [aa] (which, they claim, also behaves like a consonant phonologically).

## 4.2. Distributional evidence for /A/

Let us consider a few arguments showing that the [a] in (6) belongs to the root and should be treated as a radical consonant.

Some verbs clearly belong to the same morphological class. For instance, Prunet & Petros (1996) call 'local-movement verbs' a class of approximately seventy rhythmic action verbs selecting the long template, with an *a*-infix in some verbs. These verbs can be identified by means of their prefixes (in Inor, mostly *a*- and/or *n*-) and repetitive meaning. As Goldenberg (1968: 101) notes about their Soddò (another Gurage dialect) counterparts, they exhibit four plain consonants, as in (7a). When they do not, they invariably have a low vowel (or a complex consonant) in lieu of the missing consonant, as in (7b). I disregard the question of complex consonants, many of which stand for two radical consonants as mentioned in §3.

## (7) a. Four phonetic consonants

$\sqrt{zw}t'r$	<i>a-ziwāt'ər</i>	'stretch'	$\sqrt{dr}?$	<i>a-drānə?</i>	'make dry'
$\sqrt{dbr}$	<i>a-n-diḡānər</i>	'deform'	$\sqrt{gr}$	<i>a-ḡ-girəkər</i>	'drag'

## b. [a] replacing a consonant

$\sqrt{grs}A$	<i>a-ḡ-girāsa</i>	'carry on stretcher'	$\sqrt{brt}A$	<i>a-m-birāt'a</i>	'glitter'
$\sqrt{bAt}$	<i>a-m-bat'ət'</i>	'throw down'	$\sqrt{t}A$	<i>a-n-t'at'a</i>	'talk loud'

On the assumption that these verbs belong to the same class and select the same template, we can infer from (7b) that [a] occupies and satisfies a C-slot, as would any radical consonant. It must therefore be part of the root as the guttural /A/. The claim that [a] replaces a consonant is reinforced by the absence of verbs in which a non-infixal [a] coexists with four phonetic consonants, such as *\*(a-m-)birāt'ar*. Unlike the *a*-infix, a radical [a] can be found in several positions, not just before the penultimate consonant.

Another piece of evidence comes from completely reduplicated verbs. These have one of three forms: *diḡətəḡ* 'flatten,' *qirāqər* 'mix' (with an *a*-infix) and *qāqā* 'tie several times.' There are no verbs like *\*qəqə* with plain consonants and no [a], which entails that there are no monoliteral roots. If completely reduplicated verbs come from biliteral roots mapped onto the long template, then both instances of [a] in *qāqā* must stand for a radical consonant. These roots would be  $\sqrt{db}$ ,  $\sqrt{qr}$  and  $\sqrt{qA}$  respectively.

Inor has at least six *a2ə2* verbs such as *akək* 'scratch.' If the root is  $\sqrt{Ak}$  such a verb would be formed by left-to-right mapping onto the short template, as in the case of *qəfəf* 'clip' (cf. McCarthy 1986: 212, Goldenberg 1994: 55 and Hudson 1995: 790 on 122 verbs in Chaha). The absence of *ləla* verbs, as in *\*kəka*, is explained because no root  $\sqrt{kA}$  mapped likewise onto the short template could yield this surface form. The absence of *\*kəka* is comparable to that of *\*tətər*, a verb form which is also absent from Chaha. A root  $\sqrt{kA}$



could not be realized as \*[kaa] (i.e. 1əAAəA) either. This is because, as we will see in §7, /A/ cannot form long-distance geminates, i.e. branch over C-slots separated by a V-slot. It follows that a root  $\sqrt{kA}$  would have no possible phonetic realization if it selected the short template. We may add that if the low vowel of *akək* were a true vowel, instead of standing for /A/, then the template would be VCVC and nothing would account for the absence of verbs like \**əkək*, or indeed of any verb beginning with [ə] in the perfective. An apparent counter-example is *əpa* 'skin an animal' but its imperfective *yə-ʔəβa* shows that its root is  $\sqrt{ʔbA}$  (recall that a word-initial /ʔ/ is silent).

### 4.3. Roots and patterns

We can conclude from 4.2 that the verbs in (6) have the following roots and templates:

(8)	Phonetic form	Pattern	Pattern satisfaction	Example
$\sqrt{A23}$	aCəC	short	Aə22ə3	<i>asər</i> 'carry on back' ( $\sqrt{Az}$ )
$\sqrt{1A3}$	CaaC	short	1əAAə3	<i>daar</i> 'bless' ( $\sqrt{dAr}$ )
$\sqrt{12A}$	CəCa	short	1ə22əA	<i>səpa</i> 'be efficient' ( $\sqrt{sbA}$ )
$\sqrt{A2}$	aCəC	short	Aə22ə2	<i>akək</i> 'scratch' ( $\sqrt{Ak}$ )
$\sqrt{1A}$	CaCa	long	1Aə11əA	<i>tata</i> 'rope' ( $\sqrt{tA}$ )
$\sqrt{1Ay4}$	CaC	long	1Aəyyə4	<i>xar</i> 'know' ( $\sqrt{xAyr}$ )

I assume that /A/ is a guttural consonant which occupies and satisfies the C-slot of a template but spreads onto any adjacent V-slots. It yields a short vowel when adjacent to one V-slot (e.g. *Aəzzər* yields *asər*) and a long vowel when adjacent to two V-slots (e.g. *dəAAər* yields *daar*). This bisyllabic view of long vowels is in agreement with Hetzron's (1970: 569) use of the term 'double' to describe the long vowels of Inor. This correlation can be confirmed on the basis of A-initial roots. When preceded by a vowel, /A/ spreads leftward and lengthens. There is no lengthening after a consonant, e.g. *an-asər-ə-da* (*an-aasər-ə-da*) 'he did not carry.'

(9)	Perfective	Imperfective	
$\sqrt{tks}$	<i>təkəs</i>	<i>yi-təks</i>	'burn' (for comparison)
$\sqrt{Azr}$	<i>asər</i>	<i>ya-azir</i>	'carry on one's back'
$\sqrt{Adg}$	<i>atəg</i>	<i>ya-adig</i>	'rain, cause to fall'
$\sqrt{Ak}$	<i>akək</i>	<i>ya-akik</i>	'scratch'

This lengthening shows that the imperfective prefix includes an underlying V-slot. This correlation between vowel length and number of adjacent V-slots also provides us with a test for the form of the jussive template, e.g. *tiks* 'burn!'. Polotsky (1971: 549) noted that Chaha transitive jussives are either CiCC or CiCiC, with the presence of the epenthetic vowel being condi-

tioned by the nature of adjacent consonants (see also Leslau 1992: 426). Recently, some authors have argued that the Chaha jussive selects a CCC (or equivalently 123) template (cf. Hayward 1988: 145) or no template at all (cf. McCarthy & Prince 1995: 331). A-medial roots show that in Inor the jussive has a CVCVC, or equivalently 1i2i3, template because the medial vowel is always long. All verbs cited below are transitive, like *səpər* 'break.' Intransitive A-medial verbs, whose template is 1i2ə3, as in *bikət* 'die!', have the same form.

(10)	Perfective	Jussive 2sm	
√sbr	<i>səpər</i>	<i>siβir</i>	'break'
√dAr	<i>daar</i>	<i>daar</i> * <i>dar</i>	'bless'
√gAd	<i>gaad</i>	<i>gaad</i> * <i>gad</i>	'make hungry'
√kAs	<i>kaas</i>	<i>kaas</i> * <i>kas</i>	'pay'

The length contrasts of Inor, which are absent from Chaha, justify a templatic analysis of the jussive. I conclude that this template is 1V2V3, with empty V-slots, which I note 1i2i3 for transitive verbs and 1i2ə3 for intransitive verbs. A unified analysis can be attained if we posit that Chaha and Inor have the same jussive template and the lack of vowel doubling/length in Chaha prevents the two V-slots from revealing themselves. Another argument for a jussive template in Chaha (and Inor) comes from biliteral roots. The jussive of √sd 'chase away' is *sidid* in both dialects, as a template with three C-slots predicts. An *a*-templatic jussive would incorrectly predict the unaugmented phonetic realization of the two root consonants: \**sid*.

Completely reduplicated biliterals select the long template, as in *difətəβ* 'flatten' (from √db). The short vowel in A-final biliterals shows that the template must be 12ə33ə4, not 1i2ə33ə4. If the template included an empty V-slot before the second consonant, the A would be adjacent to two V-slots and it would double.

(11)	Perfective		
√db	<i>difətəβ</i>		'flatten'
√kA	<i>a-ŋ-kaka</i>	* <i>a-ŋ-kaaka</i>	'cackle'
√kA	<i>kaka</i>	* <i>kaaka</i>	'be dry'
√qA	<i>qaqa</i>	* <i>qaaqa</i>	'tie several times'
√sA	<i>sasa</i>	* <i>saasa</i>	'be thin'
√tA	<i>tata</i>	* <i>taata</i>	'rope'
√tA	<i>a-n-t'at'a</i>	* <i>a-n-t'aat'a</i>	'talk loud' (<Amharic?)

The fact that all such verbs have a short first vowel confirms the 12ə33ə4 perfective long template. As discussed in §2, the implication is that some instances of [i] correspond to an underlying V-slot (e.g. the two vowels of *siβir* 'break!') while others do not correspond to one (e.g. the first vowel of *difətəβ* 'flatten'). The underlying consonant cluster of the long template is

problematic for the Semitic CV-only theory of Guerssel & Lowenstamm (ms.) and Lowenstamm (1996), though this approach leads to valuable results in numerous instances.

There are only four verbs like *xar*. The paradigms of these verbs (and only them) reveal a radical /y/, e.g. the imperfective of *xar* is *yi-x'ir*. We may tentatively assume that they select the long template. /A/ yields a short vowel because it is adjacent to only one V-slot: /y/, albeit silent, separates it from the final V-slot of the long template (1Aəyyə4 in the perfective). If correct this analysis confirms the length correlation just noted: short vowels occupy one V-slot and double vowels two V-slots. Asterisks indicate paradigmatic gaps.

(12)	Perfective	Imperfective	Jussive 2sm	Reflexive-passive	
√xAyr	<i>xar</i>	<i>yi-x'ir</i>	<i>xar</i>	<i>tə-xəxər</i>	'know'
√sAyr	<i>sar</i>	<i>yi-fir</i>	<i>sar</i>	*	'be happy'
√bAyr	<i>bar</i>	<i>yī-mṯīr</i>	<i>bar</i>	<i>tə-mṯmṯēr</i>	'say'
√Aym	<i>ām</i>	<i>yī-īm</i>	<i>ām</i>	*	'give'

We have just discussed all possible A-including root types selecting the short template (and two selecting the long template). The distribution is more restricted in long template verbs:

(13)	Phonetic form	Pattern satisfaction	Example
*√A234	aCəCəC	A2ə33ə4	no example
√1A34	CaCəC	1Aə33ə4	<i>manəx</i> 'capture' (√mArx)
*√12A4	CiCaaC	12əAAə4	one example: <i>šimāād</i> 'urinate'
√123A	CiCəCa	12ə33əA	<i>a-m-birāt'a</i> 'glitter' (√brt'A)

The analysis of verbs like *manəx* 'capture' raises some problems. Given the presence of so many radical a's in the language, it seems likely that speakers would regard them as quadriliterals (e.g. *manəx*, from √mArx) but it remains to be shown that they are not triliterals with an a-infix (e.g. *manəx*, from √mrx). This is because an a-infix causes gemination in the imperfective of triliterals (cf. *y-a-t-sapir* 'he makes them break each other' vs. *yi-səḫir* 'he breaks'). The consequence of this imperfective gemination is that a-infixed triliterals behave like quadriliterals: they display a geminate penultimate consonant in the perfective/imperfective and a simplex one in the jussive. It also appears that the presence or absence of a prefix provides no adequate criterion. For instance, the [a] of *firatəx* 'put in disorder' and *qiraməd* 'be incoherent' must be infixal because these verbs already have four phonetic consonants. This entails that we cannot decide whether the [a] of verbs like *manəx* is radical or infixal. Until a satisfactory test can be uncovered, I will simply assume that verbs like *manəx* in (13) have a quadriliteral root (e.g. √mArx) selecting the long template.

It appears that /A/ is found only in second and fourth positions of quadrilateral roots. There is no  $\sqrt{A234}$  root and only one  $\sqrt{12A4}$  root: *sīṃāād* 'urinate' (imperfective *yī-sīṃāād*). This verb is unusual in having only one possible (and obligatory) object, viz. *sīṃāād* 'urine,' as in *sīṃāād sīṃāād-ə* 'he urinated' and native speakers feel that it is back-formed from the noun. We can ignore this verb and say that /A/ is not found in the first and third positions of quadrilaterals. This distribution is, in fact, very similar to that of the glides /w, y/.

If verbs such as *manəx* are quadrilaterals, their short radical [a] and the absence of verbs with a corresponding long [aa] confirm that the long template is 12ə33ə4, not 1i2ə33ə4.

(14)	Perfective	
$\sqrt{dA}mt'$	<i>damət'</i>	'separate cotton from seed'
$\sqrt{qA}t'r$	<i>qat'ər</i>	'tie with a rope'
$\sqrt{mA}rx$	<i>manəx</i>	'capture'
$\sqrt{nA}ks$	<i>nakəs</i>	'take or bring repeatedly'
$\sqrt{zA}bt$	<i>zapət</i>	'lose one's way'

#### 4.4. Alternation-based evidence for /A/

There are instances where a radical [a] alternates with the central vowel [ə]. As shown below, this happens in the jussive of A-initial trilaterals and in the imperfective of A-medial trilaterals. The first two lines are given for comparison with two transparent trilaterals, one transitive (jussive /1i2i3/) and the other intransitive (jussive /1i2ə3/).

(15)	Perfective	Imperfective	Jussive 2sm	
$\sqrt{s}br$	<i>səpər</i>	<i>yī-səβir</i>	<i>sīβir</i>	'break'
$\sqrt{b}kt$	<i>bəkət</i>	<i>yī-βəkit</i>	<i>bikət</i>	'die' (of animal)
$\sqrt{A}zr$	<i>asər</i>	<i>ya-azir</i>	<i>əzər</i>	'carry on one's back'
$\sqrt{dA}r$	<i>daar</i>	<i>yī-dəər</i>	<i>daar</i>	'bless'

In §8 I will entertain two explanations as to why [a] alternates with [ə]. Note that even the assumption that an alternation is at work is in no way obvious. For instance, in *yī-dəər* it could be argued that /A/ deletes in the imperfective and the second V-slot is filled in by spreading from the aspectual [ə]. I will argue that we are, in fact, dealing with an alternation between the basic form of /A/, i.e. [a], and its centralized allophone, i.e. [ə].

I will show below that /A/ can be labialized when it centralizes as [ə]. Since labialization only targets consonants, it follows that this [ə] is the phonetic expression of the consonant /A/. When /A/ is not centralized, it is transparent to

labialization, e.g. the impersonal of *maar* 'forgive' is *m<sup>w</sup>aar-i*.<sup>4</sup> Let us first review the basic properties of labialization.

We saw in (4) that Inor has consonant harmonies triggered by the impersonal suffix /-<sup>w</sup>/ . The floating round feature causes the labialization of the rightmost labializable consonant of the root, and optionally of any other preceding labializable consonant. The set of labializable consonants is that of noncoronals. As mentioned before, the labialization of a consonant is perceived as rounding on adjacent vowels when these vowels are central (i.e. [ə] and [i] become [o] and [u]). In (3) verbs which contain only coronals (e.g. *dənəf-i*) were shown to be immune to labialization, showing that /<sup>w</sup>/ only targets consonants. The floating /<sup>w</sup>/ of the impersonal suffix also palatalizes a stem-final coronal (or arguably a velar) obstruent.

The examples below show all  $\sqrt{A2(3)}$  and  $\sqrt{1A3}$  roots containing only nonlabializable, i.e. coronal, consonants. In all cases, [ə] labializes in the impersonal (but [a] never does). Because the other consonants are nonlabializable, the floating /<sup>w</sup>/ must dock onto the centralized /A/. As vowels are never targeted by /<sup>w</sup>/, /A/ must be a consonant (and necessarily a noncoronal one). The first line shows a transparent verb containing a labializable consonant (/k/) and a palatalizable one (/s/). As usual, the rounding of [k<sup>w</sup>] is heard mostly on the adjacent central vowels.

(16)	Perf.	Perf. impers.	Jussive 2sm	Jussive impers.	
$\sqrt{tks}$	<i>təkəs</i>	<i>tok<sup>w</sup>of-i</i>	<i>tiks</i>	<i>tuk<sup>w</sup>f-i</i>	'burn'
$\sqrt{Art}$	<i>ant'</i>	<i>anc'-i</i>	<i>ət'</i>	<i>oc'-i</i>	'cut' <sup>5</sup>
$\sqrt{Azr}$	<i>asər</i>	<i>asər-i</i>	<i>əzər</i>	<i>ozər-i</i>	'carry on one's back'
$\sqrt{Azy}$	<i>afə</i>	<i>afow-i</i>	<i>əʒ</i>	<i>oʒ-i</i>	'see'
$\sqrt{Ad}$	<i>adəd</i>	<i>adəj-i</i>	<i>ədɪd</i>	<i>odɪj-i</i>	'drink too much water'
$\sqrt{Ar}$	<i>anər</i>	<i>anər-i</i>	<i>ərər</i>	<i>orər-i</i>	'be burnt'
$\sqrt{As}$	<i>asəs</i>	<i>afəf-i</i>	<i>əsis</i>	<i>ofif-i</i>	'sweep the floor'

Similarly, the following data show labialization of the centralized /A/ in the imperfective of verbs like *daar*, which contain only coronals.

(17)	Perf.	Perf. impers.	Imperf.	Imperfective impers.	
$\sqrt{tks}$	<i>təkəs</i>	<i>tok<sup>w</sup>of-i</i>	<i>yi-təks</i>	<i>yi-tok<sup>w</sup>f-i</i>	'burn'
$\sqrt{dAr}$	<i>daar</i>	<i>daar-i</i>	<i>yi-dəər</i>	<i>yi-door-i</i>	'bless'
$\sqrt{dAs}$	<i>daas</i>	<i>daaf-i</i>	<i>yi-dəəs</i>	<i>yi-doof-i</i>	'destroy'
$\sqrt{dAt}$	<i>daat'</i>	<i>daac'-i</i>	<i>yi-dəət'</i>	<i>yi-dooc'-i</i>	'crash'
$\sqrt{nAs}$	<i>naas</i>	<i>naaf-i</i>	<i>yī-rṣṣ</i>	<i>yī-rōōf-i</i>	'lick'

4. The labialization of a centralized /A/ is systematic in Inor but it never occurs in Chaha.

5. The deletion of [ə] between [n] and a dental stop in the perfective is regular but that of [r] in the imperfective is not.

√sAd	saad	saaj-i	yi-səəd	yi-sooj-i	'pay off debt'
√tAr	t'aar	t'aar-i	yi-t'əər	yi-t'oor-i	'plaster'
√tAs	t'aas	t'aaf-i	yi-t'əəs	yi-t'oof-i	'break into'
√d'Ar	jaar	jaar-i	yi-jəər	yi-joor-i	'collect honey-combs'
√s'Ar	saar	saar-i	yi-fəər	yi-foor-i	'demote, dismiss'
√t'An	c'āār	c'āār-i	yi-c'əər	yi-c'ōōr-i	'load'

Hetzron (1970: 567) attributes the labialization in (17) to the presence of an ancient guttural. This is true historically but we still have to ask what the synchronic analysis is if we want to maintain that Gurage uses roots and patterns like any other Semitic language. The ease and rapidity with which native speakers conjugate all verbs, transparent or opaque, also suggests that they do not simply memorize paradigms inherited from ancient languages. What is more, history is not always a valid guide for labialization. For instance, all Inor glottal stops can labialize in the proper environment even though some of them come from etymological coronal ejectives, i.e. nonlabializable consonants. For instance, the glottal stop of *ʒəʔər* 'split wood into pieces' labializes in the impersonal (*ʒəʔər-i*, from *ʒəʔ'ər-i*) even though it comes historically from a debuccalized coronal (cf. Chaha *ʃət'ər*, whose impersonal is *ʃət'ər-i*). I suggest that the centralized /A/ is the synchronic labializing guttural in these roots.

A root-final /A/ alternates with [ə] in the jussive before palatalizing suffixes (cf. Marcos 1974: 253 on Inor, Rose 1992: 70 and Lowenstamm 1996 on Chaha). The first column below shows the jussive 2sm, ending in [a], while the second column shows the jussive 2sf, ending in [ə] because of the palatalization triggered by the 2sf suffix /-ʔ/. The third column shows the jussive impersonal, with labialization and palatalization, followed by vowel fusion: /ə-i/ → [e]. As shown in §3, /-i/ is a 3s object suffix. Evidence for a stage with /ə/ comes from impersonal *bujə-nirə* 'let someone take for us' vs. *tukʔ-f-nirə* 'let someone burn for us.'

(18)	Jussive 2sm	Jussive 2sf	Jussive impers.
√tks	tiks	tikʃ	tukʔ-f-i 'burn'
√bdA	bida	bijə	bujə 'take'
√fdA	fida	fijə	fujə 'untie'
√fqA	fiqa	fiqʔə	fuqʔe 'chop wood'
√gzA	giza	giʒə	guʒe 'control, own'
√ndA	nida	nijə	nije 'worry'
√ngA	niga	nigʔə	nigʔe 'solidify'
√qbA	qibə	qibə	quwe 'bend, make turn'
√sbA	sibə	sibə	suwe 'be efficient'

Interestingly, the final centralized /A/ does not labialize in the impersonal even though it did in (16) and (17). This may be due to the fact that labialization applies before palatalization. This order is shown by velar-final verbs

like *nəfəg* 'be greedy' because velars are targets for both labialization and (before some suffixes) palatalization (but see Hetzron 1971: 199 for an alternative). Labialization bleeds palatalization and the impersonal is *nəfəgʷ-i*, not \**nəfʷəgʷ-i*. In the impersonal of (18), labialization applies first, before palatalization has centralized the final /A/, e.g. /sibiA-ʷ-i/ first becomes *siwiA-ʷ-i*. It is only after rounding has applied that palatalization centralizes /A/ to [ə], which may be why a stem-final [ə] is never rounded.

## 5. The guttural ʕ/

### 5.1. Root-initial ʕ/

Leslau (1992: 497) notes that there are two classes of Inor verbs beginning with [a]. We have already seen the first class, e.g. *asər*. This verb is repeated on the first line below, followed by six examples of the second class.<sup>6</sup>

(19)	Perfective	Imperf.	Jussive 2sm	Jussive 3sm	
	<i>asər</i>	<i>ya-azər</i>	<i>əzər</i>	<i>ə-əzər</i>	'carry on the back'
	<i>akəd</i>	<i>ya-ʔagid</i>	<i>əgid</i>	<i>ə-ʔagid</i>	'tie'
	<i>amər</i>	<i>yā-ʔānjīr</i>	<i>ānjīr</i>	<i>ā-ʔānjīr</i>	'confess'
	<i>agəz</i>	<i>ya-ʔagiz</i>	<i>əgiz</i>	<i>ə-ʔagiz</i>	'help'
	<i>anəs</i>	<i>yā-ʔās</i>	<i>ārās</i>	<i>ə-ʔārās</i>	'be little'
	<i>azən</i>	<i>ya-ʔazin</i>	<i>əzin</i>	<i>ə-ʔazin</i>	'be sad' (<Amh.)

A glottal stop systematically appears at the beginning of the second class when a prefix is present. This is never the case with verbs of the first class.

What are the roots and templates of these verbs? Let us consider five conceivable analyses for *akəd* 'tie.' First, we already know that its underlying representation cannot be /Aəggəd/ because this is the analysis of verbs like *asər*, shown above. Second, we also know that it cannot be /ʔəggəd/ because we saw in §3 that Inor glottal stops never lower vowels (cf. *yə-ʔəβir* 'he plants,' from √ʔbr). Third, *akəd* cannot include an *a*-infix, as in /ʔ-a-ggəd/, because an *a*-infix does not centralize to [ə] in the jussive, or indeed in any aspect.

(20)	Perfective	Imperfective	Jussive 2sm	
√sbr	<i>tə-sapər</i>	<i>yi-t-sapər</i>	<i>tə-saβər</i>	'break (recipr.)'
√drfʔ	<i>dirafəʔ</i>	<i>yi-drafiʔ</i>	<i>drafiʔ</i>	'mix'

Four, we could say that the first aspectual vowel of *akəd* is /a/ but this would amount to introducing a new aspectual vowel for a class of verbs selecting a VCCVC template which is unique to them. Five, we could assume, as Prunet (1996a: 4.1) does, that *akəd* is /ʔAəggəd/, from a quadrilateral √ʔAgd mapped onto the long template. The problem is that the verbs of (19) actually select the short template. For instance, the imperfective of *akəd* is *ya-ʔagid*,

6. Chaha has neutralized this difference and has only verbs of the first class.

with the simplex penultimate consonant (cf. /g/) of the short template (cf. *yi-səβir*, from *√sbr* 'break') not the geminate one of the long template (cf. *yi-grətiβ*, from *√grdb* 'cut into two'). The long template would incorrectly produce \**ya-ʔakid*. Also, the final jussive vowel of verbs like *akəd* is [i] for some verbs (e.g. *əgid*) and [ə] for others (e.g. *ṣmər*). This is typical of short template verbs, where this difference usually distinguishes transitive and intransitive verbs. But a [ə] between the last two consonants is unexpected in a long template jussive, where this vowel is always [i] (e.g. *gərdiβ*). In fact, not a single transparent long template verb exists whose jussive has [ə] between the last two consonants (e.g. \**gərdəβ*). We must conclude that *akəd* selects the short template. This poses a new problem: this short template must be selected by the quadriliteral root *√ʔAgd*. On the basis of Chaha, Prunet & Petros (1996) argue for a Template Selection Principle which states that a root cannot select a template containing less C-slots than it has consonants. The three aspects of the short template (perfective 1ə22ə3, imperfective 1ə2i3, jussive 1i2i3 or 1i2ə3) have only three C-slots in the imperfective and jussive, which is not enough to accommodate the four consonants of a quadriliteral root. It is clear from Chamora (this volume) that the Template Satisfaction Principle holds true for Inor transparent verbs and there are good reasons to think that it also does for opaque verbs. Verbs like *akəd* would violate a principle which is otherwise valid if they were analyzed as quadriliteral roots selecting the short template.

We are therefore left with an alternative: relaxing the Template Selection Principle or finding a representation that includes both /ʔ/ and /A/ but not as two distinct consonants. Because the only clear problems with this principle seem to involve combinations of /ʔ/ and /A/, it is preferable to preserve it. I propose that the first consonant of *akəd* contains the pharyngeal place features of /A/, possibly forming the primary articulation, and the stop manner features of /ʔ/, possibly forming the secondary articulation, combined in a complex consonant which I will transcribe as /ʕ/ (if A is the primary articulation, then /A'/ would also be a possible notation).

- (21) The structure of /ʕ/:
- |   |
|---|
| ʔ |
|   |
| A |

The choice of a pharyngeal symbol is influenced by the fact that, as we saw in §4.1, [a] is essentially a pharyngeal sound. I also believe that what is transcribed here and in the literature as Inor [aʔa] is occasionally pronounced [aʕa]. This brings to three the number of root-initial contrasts between gutturals, as summarized below.

- |             |             |                 |             |                       |
|-------------|-------------|-----------------|-------------|-----------------------|
| (22)        | Perfective  | Imperfect.      | Jussive 2sm | Jussive 3sm           |
| <i>√ʔtr</i> | <i>ətər</i> | <i>yə-ʔətir</i> | <i>itir</i> | <i>i-ʔitir</i> 'kill' |



√Asr	asər	ya-azir	əzər	ə-əzər	'carry on the back'
√ʕgd	akəd	ya-ʔagid	əgid	ə-ʔəgid	'tie'

I will show that both components of /ʕ/ function as they normally do as autonomous phonemes in the language. That is, the /ʔ/ part of /ʕ/ is silent in word-initial position, where the consonant /ʔ/ is also silent. The /A/ part of /ʕ/ is realized phonetically on adjacent V-slots, as is also the case of the consonant /A/ (short with one V-slot and double with two V-slots). It also centralizes where /A/ normally does, e.g. at the beginning of the jussive.

## 5.2. The choice of /ʕ/

There are several reasons to represent this abstract guttural as /ʕ/, a symbol Brame (1972: 57) also uses to represent an abstract guttural in Maltese Arabic.

Because Gurage is a Semitic dialectal cluster with a strong influence from Cushitic languages, I will assume that both families may have played a role in the genesis of Inor gutturals. Leslau has often argued that diachronic changes in Gurage were triggered by properties of Cushitic, not Semitic, languages (cf. e.g. Leslau 1992: 260, 603, Prunet & Chamora 1995b: 58 and Prunet 1996b: 111 on Cushitic influence in Gurage). Although it is usually assumed that diachronic changes involve segments and constraints internal to the language family, in this case Semitic, the influence of the substratum, in this case Cushitic, may be equally relevant.

The choice of the symbol /ʕ/ has historical motivation. Leslau (1992: 497) argues that Proto-Ethiopian Semitic \*ʕ is the source of most of the roots in which I include /ʕ/, another source being \*ʔ. From a historical perspective, the implication of my proposal is that \*ʕ and \*ʔ merged into Inor /ʕ/ rather than simply leaving vocalic traces in Inor.

Why would an underlying pharyngeal be pronounced with a glottal constriction? It may be that \*ʕ was glottalized. It has been noted, e.g. by McCarthy (1994: 195) and Lloret (1995: 266), that [ʕ] in many Afroasiatic languages, including in some Ethiopian Cushitic languages, presents a glottal constriction. If such was the case for \*ʕ, then the Inor reflex of this Proto-Semitic consonant has simply retained both its glottal closure and its pharyngeal place features.

## 5.3. Root-medial /ʕ/

In root-medial position, /ʕ/ can be found in short template verbs such as the following. The first two examples are ʔ-medial and A-medial verbs, included for the purpose of comparison.

(23)	Perfective	Imperfective	Jussive	
√ʔʔm	fəʔəʔm	yi-fəʔi-m	fʔʔm	'block'
√dAs	daas	yi-dəəs	daas	'destroy'

√bʃs	baʔas	yi-βəʔəs	baʔas	'become worse, be cruel'
√gʃz	gaʔaz	yi-gəʔəz	gaʔaz	'move completely'
√nʃz	naʔaz	yi-rəʔəz	naʔaz	'be heavy'
√sʃg	saʔag	yi-səʔəg	saʔag	'shiver'
√sʃm	sāʔām	yi-səʔām	sāʔām	'kiss'
√sʃr	saʔar	yi-səʔər	saʔar	'beg'
√wʃr	waʔar	yi-wəʔər	waʔar	'be absent, remain behind'

These verbs behave as predicted by the dual nature of /ʃ/. The glottal closure of /ʃ/ is pronounced in all aspects, as would be that of a root-medial /ʔ/, while its pharyngeal articulation centralizes in the imperfective only, as would that of a root-medial /A/. One cannot analyze these verbs as √CʔC roots with an *a*-infix for at least three reasons. First, as noted before, an *a*-infix does not centralize in the imperfective (or anywhere else). Second, an *a*-infix is inserted before the penultimate consonant. Here, it would have to be inserted before the glottal stop and cross it progressively: /bəʔəs/ → *baʔəs* → *baʔas* → [baʔas]. This derivation cannot be correct because, although glottal transparency is not fully understood, it is clear that [a] does not cross a glottal stop from left to right, as the following verbs show. The last verb could be √nʔb with an *a*-infix (cf. the discussion of the verbs in (14)) but this would not affect the argument concerning the absence of cross-glottal progressive assimilation.

(24)	Perfective	Imperfective	Jussive 3sm	
√Aʔr	aʔər	ya-aʔir	əʔir	'make a fence'
√Aʔb	aʔəβ	ya-aʔiβ	əʔiβ	'wash (someone / something)'
√nAʔb	naʔəβ	yi-rāʔi-m	naʔiβ	'rub to soften (e.g. skins)'

Finally, the effects of glottal transparency can be suppressed in slow speech, where the underlying vowels may surface as distinct phonetically, but this is not the case with the vowels of verbs like *baʔas*. This glottal stop is flanked by two low vowels even in slow speech.

The impersonal of these verbs reveals an interesting fact: the glottal stop does not labialize when followed by a low vowel. Since only the imperfective shows a central vowel, it is the only aspect to reveal labialization in the impersonal (when the root contains no other labializable consonant). Both parts of /ʃ/ may be responsible for this labialization, as both the glottal stop and the centralized allophone of /A/ can labialize. All three aspects are given in the impersonal.

(25)	Perfective	Imperfective	Jussive 2sm	(impersonal)
√sʃr	saʔar-i	yi-soʔor-i	saʔar-i	'beg'
√nʃd	naʔaj-i	yi-rəʔəj-i	naʔaj-i	'shiver'
√bʃs	bʔaʔaf-i	yi-woʔof-i	bʔaʔaf-i	'become worse, be cruel'

## 5.4. Root-final /ɣ/

Verbs with a root-final /ɣ/ show more variety. They can be divided into several sets. The first set is shown below. As usual, the first two verbs are given for comparison.

(26)	Perfective	Imperfective	Jussive 2sm	
√dfɿ	dəfəʔ	yi-dəfiʔ	difiʔ	'soak'
√bdA	bəta	yi-βəda	bida	'take'
√brɿ	bənʔa	yi-βərʔa	birʔa	'eat'
√drɿ	dənʔa	yi-dərʔa	dirʔa	'cover'
√frɿ	fənʔa	yi-fərʔa	firʔa	'have sexual intercourse'
√nmɿ	nəmʔa	yi-ṛəmʔā	niβʔa	'grow (of plant)' <sup>7</sup>
√smɿ	səmʔa	yi-səmʔā	sīmʔā	'hear'
√srɿ	sənʔa	yi-sərʔa	sirʔa	'arrive'
√xrɿ	xənʔa	yi-xərʔa	xirʔa	'insert'
√zrɿ	zənʔa	yi-zərʔa	zirʔa	'sow'
√Arɿ	anʔa	ya-arʔa	ərʔa	'defecate'

Let us consider three indications that these roots select the short template. First, their imperfective shows a simplex consonant allophone (e.g. [r, m]), not [n, m]). This groups them with the short template imperfective (cf. *yi-səβir*) rather than the long template one (cf. *yi-grətiβ*). Second, their imperfective begins with a CV sequence, as does that of short template verbs (e.g. *yi-səβir*), rather than with the CC of long template verbs (e.g. *yi-grətiβ*). Third, the first vowel of their jussive is [i]. This also groups them with short template jussives (cf. *siβir* and *bikət*) rather than the long template one, whose first vowel is [ə] (cf. *gərdiβ*). We must therefore conclude that the verbs in (26) select the short template, a conclusion also reached by Marcos (1974: 255). Let us also note that all glottal stops in (26) are preceded by a sonorant.

In all these verbs, /ɣ/ is unexpectedly pronounced [ʔa]. Even though the pharyngeal and glottal articulations of /ɣ/ are phonologically simultaneous, we would expect \**bənaʔ*, \**yi-βəraʔ* and \**biraʔ* because the three aspects have C-final templates. One could argue that the verbs in (26) select an exceptional template (possibly of the form 1ə22i3ə in the perfective). While such a templatic division could be compared to the one which existed between the *nəgərə* and *ləbsə* types in Ge'ez (cf. e.g. Leslau 1992: 411), the Inor division would be introduced for very few verbs, all of which end in [ʔa] after a sonorant. It is preferable to assume that this apparent metathesis is caused by phonological or phonetic constraints which are not understood for the time being. The metathesis effect could be compared to that caused by vowel deletion in sonorant-medial verbs. This phonological phenomenon creates conso-

7. This verb shows an idiosyncratic alternation between a nasal and an oral labial consonant.

nant clusters in otherwise regular short template verbs like *fənd*, from /fərrəd/ 'judge.'

It seems that the second set, shown in (27), contains only two verbs. The glottal stop deletes in the perfective, where it would follow the obstruent [p] but it is pronounced after [β] in the imperfective and jussive.<sup>8</sup>

(27)	Perfective	Imperfective	Jussive 2sm	
√gbf	<i>gəpa</i>	<i>yi-gəβʔa</i>	<i>giβʔa</i>	'enter'
√tbf	<i>təpa</i>	<i>yi-təβʔa</i>	<i>tiβʔa</i>	'be strong'

Hetzron (1970: 564) notes that glottal stops are only found after certain consonants in Inor, e.g. in [rʔ] and [βʔ] sequences, and claims that glottal stops disappeared after other consonants. From a synchronic perspective, we can say that glottal stops delete (or remain silent) after obstruents, hence after the [p] of the perfective but not the [β] of the other aspects. It is because /b/ happens to alternate with the sonorant [β] that the glottal stop is pronounced in part of the paradigm. Because no other obstruent has sonorant allophones, this analysis correctly predicts that the second set of verbs will be limited to b-medial roots. There are independent reasons to view Inor [β] as a sonorant (or perhaps approximant), e.g. it patterns with continuant sonorants, not with stops and fricatives, in not blocking nasal harmony (Hetzron & Marcos 1966: 21). Chaha [β] does not behave like a fricative either, as shown by Petros (in preparation), nor does /β/ in many languages according to Martinet (1981: 150).

In the third set, /ʃ/ appears after obstruents other than /b/. As expected, there are no sonorant-medial or b-medial verbs in this set.

(28)	Perfective	Imperfective	Jussive 2sm	
√bkʃ	<i>bəka</i>	<i>yi-βəka</i>	<i>bika</i>	'be independent'
√dʃʃ	<i>dəfa</i>	<i>yi-dəfa</i>	<i>difa</i>	'put upside down'
√fkʃ	<i>a-fəka</i>	<i>ya-a-fəka</i>	<i>a-fka</i>	'remove weeds'
√gʃʃ	<i>gəfa</i>	<i>yi-gəfa</i>	<i>gifa</i>	'push'
√kʃʃ	<i>kəfa</i>	<i>yi-kəfa</i>	<i>kifa</i>	'not want to help' (< Amh.)
√nʃʃ	<i>nəfa</i>	<i>ʔi-ṛəfa</i>	<i>nifa</i>	'fan fire with bellows, smoke'
√nsʃ	<i>nəsa</i>	<i>ʔi-ṛəsa</i>	<i>nisa</i>	'lift'
√wgʃ	<i>wəka</i>	<i>yi-wəga</i>	<i>wiga</i>	'hit, stab'

As was the case with /A/ in (18), the final vowel centralizes before the palatalizing suffix of the jussive 2sf. We might expect the glottal closure to labialize in the jussive impersonal, i.e. to leave a labial trace in the third column of √nsʃ below, but this is not the case. This failure to labialize is consistent with the fact that /ʃ/ does not seem to labialize when followed by [a].

8. Hetzron (1970:564) cites *qəpa* 'fold' as an example but this is a typographical error. This verb actually shows no glottal stop (*qəpa*, *yi-qəβa*, *qiβa*) and must be analyzed as √qba.

As we saw in (25), the impersonal of  $\sqrt{s}r$  is *saʔar-i*, not *\*saʔʔar-i*. When labialization applies in the third column, the glottal closure is still followed by the [a] we see in the jussive 2sm and does not labialize. It remains unlabialized when centralization subsequently takes place.

(29)	Jussive 2sm	Jussive 2sf	Jussive impers.	
$\sqrt{tks}$	<i>tiks</i>	<i>tikʃ</i>	<i>tukʔf-i</i>	'burn'
$\sqrt{sba}$	<i>siβa</i>	<i>siβə</i>	<i>suwe</i>	'be efficient'
$\sqrt{brʃ}$	<i>birʔa</i>	<i>biʔə</i>	<i>burʔe</i>	'eat'
$\sqrt{gbʃ}$	<i>giβʔa</i>	<i>giβʔə</i>	<i>guʔe</i>	'enter'
$\sqrt{nsʃ}$	<i>nisa</i>	<i>nifə</i>	<i>nife</i>	'lift'

Now, it may seem that nothing distinguishes the verbs in (28), formed from  $\sqrt{12}ʃ$  roots, from their counterparts in (18), formed from  $\sqrt{12}A$  roots. Both types end in [a] in all three aspects and neither ever shows a glottal stop, as repeated below.

(30)	Perfective	Imperfective	Jussive 2sm	
$\sqrt{bda}$	<i>bəta</i>	<i>yi-βəda</i>	<i>bida</i>	'take'
$\sqrt{wgʃ}$	<i>wəka</i>	<i>yi-wəga</i>	<i>wiga</i>	'hit, stab'

The difference lies in vowel length. Leslau (1992: 502) and Hetzron (1970: 564) note that the final vowel of the first type, but not that of the second type, doubles before the suffixes of two future tenses. The definite future adds /-kʔe/ to the imperfective pattern while the indefinite future adds /-se/ to the jussive pattern.

(31)	Imperf.	Definite future	Jussive 2sm	Indefinite future	
$\sqrt{tks}$	<i>yi-təks</i>	<i>yi-təks-kʔe</i>	<i>tiks</i>	<i>yi-tiks-se</i>	'burn'
$\sqrt{bda}$	<i>yi-βəda</i>	<i>yi-βədaa-kʔe</i>	<i>bida</i>	<i>yi-βdaa-se</i>	'take'
$\sqrt{brʃ}$	<i>yi-βərʔa</i>	<i>yi-βərʔa-kʔe</i>	<i>birʔa</i>	<i>yi-βirʔa-se</i>	'eat'
$\sqrt{gbʃ}$	<i>yi-gəβʔa</i>	<i>yi-gəβʔa-kʔe</i>	<i>giβʔa</i>	<i>yi-giβʔa-se</i>	'enter'
$\sqrt{wgʃ}$	<i>yi-wəga</i>	<i>yi-wəga-kʔe</i>	<i>wiga</i>	<i>yi-wga-se</i>	'hit, stab'

Given that neither future suffix seems to begin with a V-slot it remains to be determined what accounts for doubling in A-final roots and the absence of doubling (as well as lack of any intrusive glottal stop) in ʃ-final roots. Another facet of this problem will be discussed in §6.

In long template verbs, /ʃ/ seems to be rare. The following verbs are put forth tentatively. They are irregular: the second verb has an unexpected double vowel while the third one contains /l/, which is very rare in Inor. One verb in (32) and one in (33) have two variants.

(32)	Perfective	Imperfective	Jussive 2sm:	
√mʃty	maʔacə	ʃɪ-ɲāʔāc,	maʔac	'be angry'
		ʃɪ-ɲāʔāc		
√mynʃ	meenʔa	ʃɪ-ɲēēnʔa	məənʔa	'be full'
√Ayʃ	elʔa	ye-elʔa	əlʔa	'want to do something'

The following verbs are the only completely reduplicated √ʃ bilaterals identified so far.

(33)	Perfective	Imperfective	Jussive 2sm	
√zʃ	zasa	yi-zasa	zaza	'be made'
√bʃ	a-m-bapa	y-a-m-bapa	a-m-bapa a-m-baβa	'stammer'
√tʃ	a-t'at'a	y-a-t'at'a	a-t'at'a	'rinse'

The absence of a glottal stop after the [β] of the *a-m-baβa* jussive variant of 'stammer' is problematic. Since [β] is a sonorant, the underlying glottal articulator should be preserved.

## 6. The question of length

The length contrast between A-final and ʃ-final verbs is clear before the two future suffixes but in my opinion it is not so clear elsewhere. Leslau (1992: 502-3) gives the following contrasts for *fəta* 'untie' (our √*fdA*) and *fəqa* 'split' (our √*fqʃ*). I have replaced his [ā] by our and Hetzron's [aa], as the equivalence between the two notations is systematic.

(34)	Perfective	Imperfective	Jussive 2sm	Definite future	
√ <i>fdA</i>	<i>fətaa</i>	<i>yi-fəda</i>	<i>fida</i>	<i>yi-fədaa-kʷe</i>	'split'
√ <i>fqʃ</i>	<i>fəqa</i>	<i>yi-fəqa</i>	<i>fiqa</i>	<i>yi-fəqa-kʷe</i>	'open'

I agree with Leslau that: i) there is no phonetic contrast in the imperfective and jussive, and ii) there is a contrast of doubling (Leslau's length) in the definite (and indefinite) future. On the other hand, I am not sure that the phonetic contrast in the perfective is of the same nature, though the two perfective forms may differ phonetically. A length difference in the perfective (or in any other pattern where no suffixes are present) would seem to be problematic for my analysis because I claim that the patterns are the same for both verb types, e.g. 1ə22ə3 in the perfective. My impression is that the difference in the perfective, if there is one, involves stress or vowel quality but not doubling (or length). Hetzron (1970: 564) seems to be also of this view, as he notes both perfective vowels as simple (short) [a] and states that the difference is one of stress (p. 581). This is why I have also noted the vowel of A-final verbs in (6) and (7) as simple (short). While this transcription is, in my opinion, in agreement with the phonetic facts, it is not fully satisfactory because it does not account for the existence of a stress or quality difference. The issue is a

difficult one, which I think will only be resolved when a comprehensive analysis of Inor morphology has been reached. At present, there are almost as many views as there are authors. Marcos (1974) does not discuss length but his transcriptions indicate that he believes the two classes of (34) to contrast in length underlyingly in all aspects, though he says this contrast is eliminated phonetically in word-final position. He cites the jussive of the first class as /fidaa/ (p. 263) and [fida] (p. 253) and the imperfective of the second class as /yi-nəsa/ and [yī-r̥ōsa] (p. 263), with a length contrast which is present underlyingly but not phonetically. Elsewhere (p. 261) he confirms his belief in a phonetic neutralization by stating that 'a long vowel in a word-final position is always shortened.' Conversations with Robert Hetzron have led me to believe that these discrepancies may be due to rapid diachronic changes currently taking place with respect to double vowels in Inor.

To contribute to a clarification of the facts, we ran experiments with *SpeechStation* 3.1, a phonetic analysis software, on a few verbs. Though this experiment lacked the methodological rigor necessary for publishable results, it is still worth reporting as an informal finding. The double vowel in perfective *daar-ə* 'bless' (cf. (10)) turns out to be 40% longer than the simple one in perfective *sar-ə* 'be happy' (cf. (12)). We also found that the double vowel in imperfective *ya-afs* 'scoop' is 50% longer than its unprefixated form in perfective *afəs*. Finally, before the definite future suffix *-kʷe*, the vowel of 'split' is again clearly longer, by 30%, than that of 'open.' These results are in agreement with our transcriptions in (31). On the other hand, we found no clear length difference in the imperfective, jussive, perfective 3sm (quoted in (34)) and perfective 2sf (*fəta-fim* and *fəqa-fim*), which is again in agreement with our transcriptions. It is conceivable that a more controlled phonetic experiment would reveal a very small length difference in the last four cases but it is doubtful that this difference could be equated with the other length contrasts, all of which are very clear to all specialists and in spectrograms. Naturally, it is possible that word-final length is realized as stress only, so that we cannot rule out an underlying length (or doubling) contrast, but this view would also have to account for why there seems to be no difference between *fəta-fim* and *fəqa-fim*. As just mentioned, I do not consider any current analysis satisfactory but I will for now assume that the doubling (length) contrasts are only found before the two future suffixes.

## 7. Gutturals as glides

There is some evidence that Inor /ʀ/, /A/ and /ʁ/ are glides, i.e. are [-vocalic, -consonantal] segments. They share with the glides /y/ and /w/ the property of not spreading over non-adjacent C-slots. For instance, Inor, like other Ethiopian Semitic languages, has a verbal theme called the frequentative which expresses repetition or intensity. This theme is expressed by doubling the penultimate root consonant, e.g. *səpər* 'break' yields *sifəpər* 'break here and there.' As shown in Prunet (1996a), roots whose second consonant is a

guttural or one of the two oral glides do not form frequentatives, e.g. *nəʔər* 'uproot' cannot yield *\*niʔəʔər*, whereas all other consonants can double in this context. Some glideless roots have no frequentative but this is driven by lexical, not phonological, considerations. This patterning suggests that Inor gutturals are glides (cf. also Halle 1995: 13 on the idea that all gutturals are glides). It is interesting to note that the set /y, w, A/ forms a complete glide series corresponding to the basic vowel series /i, u, a/. El Medlaoui (1995: 149) also raises the possibility that some vowels of Moroccan Arabic are actually radical [-vocalic] segments. Finally, it is conceivable, as several authors mentioned in §1 assume (implicitly or explicitly), that /A/ (or Polotsky's /Ä/) is a radical vowel instead of, as I claim, a radical glide. I have not analyzed /A/ as a radical vowel, even though it pronounced as a vowel, because mapping it onto C-slots captures the fact that it behaves functionally like radical consonants and glides.

#### 8. Guttural centralization

We saw three contexts in which centralization of /A/ and /ʕ/ is observed: at the beginning of jussives (35a), inside imperfectives (35b) and at the end of palatalized jussives (35c). The fact that both gutturals are centralized in the same contexts is captured by our claim that /ʕ/ contains /A/.

(35) a.	Perfective	Jussive 3sm	
√Azr	asər	ə-əzər	'carry on one's back'
√ʕgd	akəd	ə-ʔəgid	'tie'
b.	Perfective	Imperfective	
√dAr	daar	yi-dəər	'bless'
√bʕs	baʔas	yi-βəʔəs	'become worse, be bad, cruel'
c.	Jussive 2sm	Jussive 2sf	
√sbA	sibə	sibə	'be efficient'
√brʕ	birʔa	biʔə	'eat'

The effects of centralization are similar to alternations between the low vowel [a] and its central counterpart [ə], which are frequent in Ethiopian Semitic. Some of them seem caused by length and others by segmental structure, as we will now see.

Tigrinya, a North Ethiopian Semitic language, shows alternations of the first kind (cf. e.g. Palmer 1970a: 137). For instance, the following broken plurals suggest that [a] occupies two timing units while [ə] occupies only one: consonant gemination is found only after the latter.



- |      |               |                |                    |          |
|------|---------------|----------------|--------------------|----------|
| (36) | Singular      | Broken plural  |                    |          |
|      | <i>kənfər</i> | <i>kənafər</i> | or <i>kənəffər</i> | 'lip'    |
|      | <i>bərmil</i> | <i>bəramil</i> | or <i>bərəmmil</i> | 'barrel' |

Tigre, a North Ethiopian Semitic language with the same vowel system, shows alternations of the second kind (cf. e.g. Palmer 1970b: 166, Lowenstamm & Prunet 1987). It exhibits a regressive height harmony triggered by the low articulation common to [a], pharyngeal and ejective consonants. The effect of this harmony is to lower /ə/ to [a].

- |      |              |               |                |
|------|--------------|---------------|----------------|
| (37) | /səlsələt-a/ | → [salsalata] | 'her bracelet' |
|      | /wərih/      | → [warih]     | 'month'        |
|      | /fəlis/      | → [falis]     | 'wood'         |

Either shortening or change in segmental structure may be the cause of the centralization of Inor /A/. Lowenstamm (1991, 1996) and Rose (1992: 72) argue that the centralization of (35c) is due to shortening: the palatalization deprives /A/ of a timing unit, thereby causing its shortening/centralization. Analyses for the other two contexts cannot be explored within the confines of this paper and I will leave this problem unresolved.

## 9. Implications of guttural evolution

Let us briefly note some implications for current models of guttural structure (e.g. Goldstein 1994, McCarthy 1994, Angoujard 1995, Lloret 1995 and Rose 1996) of the historical changes that have led to the three gutturals of Inor: /ʔ/, /A/ and /ɣ/.

Glottal stops result from the historical debuccalization of ejectives. As ejectives involve simultaneous glottal closure they have left behind their glottal articulation. Most of the time, the origin of Inor glottal stops is easily verified by comparison with Chaha, whose ejectives are still intact (e.g. Inor *dəfəʔ* vs. Chaha *dəfəq* 'soak').

According to the reconstructions of Leslau (1992: 493ff.), the roots in which I posit Inor /A/ come from roots containing the velar \**h* (possibly a uvular), the pharyngeal \**h* or the glottal \**h*. The roots in which I posit Inor /ɣ/ come from roots containing \**ʕ* or \**ʔ*.

Let us briefly note a few implications for segmental structure. First, Inor debuccalization confirms that Ethiopian Semitic ejectives contain no pharyngeal articulation (i.e. no /A/). The proof for this is that no debuccalized ejective left behind a low vowel, i.e. /A/. Tigre is exceptional in Ethiopian Semitic because, as mentioned in §8, its ejectives lower vowels. Second, we can infer that all proto-Ethiopian Semitic gutturals contained a pharyngeal articulation from the fact that they all left behind the segment /A/. Third, \**ʕ* and \**ʔ* differed from the other Semitic gutturals in being complex segments including both a pharyngeal articulation, since they left behind /A/, and a glottal arti-

culatation, since they left behind /ʔ/. Some other feature or node must have kept these two segments distinct. The phonemes \*h and \*ħ were also distinct but they decomposed in the same way (as /A/). Particularly noteworthy is the consequence that the two pharyngeals \*ʕ and \*ħ differed substantially and in fact do not seem to have formed a minimally contrastive pair of phonemes: the former but not the latter had glottal constriction. The voicing inherent to \*ʕ cannot be responsible for its different behavior from \*ħ because the voiced pharyngeal patterned in this respect with the voiceless \*ʔ. The evolution of Gurage gutturals into two sets which pattern differently with respect to glottalization can be correlated with Al-Ani's (1978: 89) contention that phonetically Arabic gutturals should be divided into the two stops /ʕ, ʔ/ and the two fricatives /ħ, h/. Another instance where [ʕ] patterns with stops in Ethiopian Semitic is noted by Raz (1983: 5), who observes that before a consonant the Tigre velar ejective /q/ weakens to [ʔ] or [ʕ], e.g. /liqluq/ 'smeared' can be pronounced [loʔloʔ] or [loʕloʕ].

## 10. Conclusion

In this paper, I have argued that some instances of the low vowel [a] function as a guttural glide, noted /A/, in the Semitic language Inor. The guttural /A/ behaves like any other root consonant and occupies a C-slot in verb templates, though its phonetic realization is that of a vowel. I have discussed the phonology of this and two other Inor guttural glides, i.e. /ʔ/ and the abstract /ʕ/ (composed of both /A/ and /ʔ/). Some implications for the segmental structure of Semitic gutturals were also drawn.

One important aspect of this paper lies in the unification of transparent and opaque verbs in Gurage. Transparent verbs behave like typically Semitic verbs in displaying phonetic consonants for all templatic C-slots. Opaque verbs, on the other hand, include the radical vowel [a] or complex palatalized and labialized consonants and it is usually assumed that they do not use the same templates. I have shown that both transparent and opaque verbs in fact select the same two basic templates. This demonstration dealt with Inor verbs containing guttural consonants. There are over two hundred such verbs in Inor. In combination with Prunet & Petros' (1996) study of Chaha opaque verbs containing palatalized and labialized consonants, the present study brings under a unified analysis most Gurage verbs. This unification requires formal analyses which, for the most part, are not surface-true. This suggests that, though Gurage lacks the complex templates of languages like Tigrinya and Arabic, it exhibits a degree of opacity and abstraction in the structure of its roots and in the mapping of root consonants onto templatic positions which is probably unparalleled in other Semitic languages.

## REFERENCES

- Al-Ani, Salman H. 1978. 'An Acoustical and Physiological Investigation of the Arabic /ʕ/. ' In Salman H. Al-Ani (ed.), *Readings in Arabic Linguistics*, pp. 89-101. Bloomington: Indiana University Linguistics Club.
- Angoujard, Jean-Pierre. 1995. 'Quelques "éléments" pour la représentation des gutturales,' *Langues orientales anciennes*. Philologie et linguistique 5-6, 107-126.
- Angoujard, Jean-Pierre & Michel Denais. 1989. 'Le pluriel brisé en tigrigna,' *Langues orientales anciennes philologie et linguistique* 2, 99-148.
- Berhane, Girmay. 1991. *Issues in the Phonology and Morphology of Tigrinya*, Ph.D. dissertation, Université du Québec à Montréal (UQAM).
- Brame, Michael K. 1972. 'On the Abstractness of Phonology: Maltese ʕ, in Michael K. Brame (ed.), *Contributions to Generative Phonology*, pp. 22-61. Austin: University of Texas Press.
- Chamora, Berhanu. this volume. 'Consonant Distribution in Inor.'
- Chamora, Berhanu. 1996. *The Phonology of Inor Verbs*. M.A. thesis, UQAM.
- Delattre, Pierre. 1971. 'Pharyngeal Features in the Consonants of Arabic, German, Spanish, French and American English,' *Phonetica* 23, 129-155.
- Dell, François & Mohamed El Medlaoui. 1992. 'Quantitative Transfer in the Nonconcatenative Morphology of Imdlawn Tashlhiyt Berber.' *Journal of Afroasiatic Languages* 3, 89-125.
- Denais, Michel. 1990. *Éléments de phonologie et de morphologie tigrigna (éthiopien septentrional)*, thèse de doctorat (nouveau régime), Université de Nice.
- El Medlaoui, Mohamed. 1995. *Aspects des représentations phonologiques dans certaines langues chamito-sémitiques*, Série thèses et mémoires no. 23, Publications de la Faculté des lettres et des sciences humaines, Rabat: Université Mohammed V.
- Goldenberg, Gideon. 1968. 'Kestaneñña. Studies in a Northern Gurage Language of Christians,' *Orientalia Suecana* 17, 61-102.
- Goldenberg, Gideon. 1994. 'Principles of Semitic Word-Structure,' in Gideon Goldenberg & Shlomo Raz (eds.), *Semitic and Cushitic Studies*, pp. 29-64. Wiesbaden: Otto Harrassowitz.
- Goldstein, Louis. 1994. 'Possible Articulatory Bases for the Class of Guttural Consonants,' in Patricia P. Keating (ed.), *Papers in Laboratory Phonology III*, pp. 234-241. Cambridge: Cambridge University Press.
- Guerssel, Mohamed & Jean Lowenstamm. ms. *The Derivational Morphology of the Classical Arabic Verb*, ms., UQAM and Université de Paris 7.
- Halle, Morris. 1995. 'Feature Geometry and Feature Spreading,' *Linguistic Inquiry* 26.1, 1-46.
- Hayward, Richard J. 1988. 'In Defence of the Skeletal Tier,' *Studies in African Linguistics* 19.2, 131-171.
- Hetzron, Robert. 1970. 'Vocalic Length and Stress in Ennemor,' *Le Muséon* 83, 559-581.
- Hetzron, Robert. 1971. 'Internal Labialization in the tt-group of Outer South Ethiopic,' *Journal of the American Oriental Society* 91.2, 196-207.
- Hetzron, Robert. 1977. *The Gunnän-Gurage Languages*. Ricerche XII. Napoli: Istituto Orientale di Napoli.
- Hetzron, Robert & Habte Mariam Marcos. 1966. 'Des traits pertinents superposés en ennemor,' *Journal of Ethiopian Studies* 4.1, 17-30.
- Hudson, Grover. 1995. 'Phonology of Ethiopian languages.' In John Goldsmith (ed.), *The Handbook of Phonological Theory*, pp. 782-797. Oxford: Basil Blackwell.
- Johnson, Douglas C. 1975. 'Phonological Channels in Chaha,' *Afroasiatic Linguistics* 2.2, 25-37.
- Lauffer, Asher & I. D. Condax. 1981. 'The Function of the Epiglottis in Speech,' *Language and Speech* 24.1, 39-61.
- Leslau, Wolf. 1959. 'Traces of the Laryngeals in the Ethiopic Dialect of Ennemor,' *Orientalia* 28, 257-270.

- Leslau, Wolf. 1992. *Gurage Studies. Collected Articles*. Wiesbaden: Otto Harrassowitz.
- Lloret, Maria-Rosa. 1995. 'The Representation of Glottals in Oromo,' *Phonology* 12.2, 257-280.
- Lowenstamm, Jean. 1991. 'The verbs of Chaha.' Paper delivered at the Montréal-Ottawa-Toronto Phonology Conference, February 1991, McGill University, Montréal.
- Lowenstamm, Jean. 1996. 'CV.' In Jacques Durand & Bernard Laks (eds.), *Current Trends in Phonology*. CNRS, Paris-X and University of Salford: University of Salford Publications.
- Lowenstamm, Jean & Jean-François Prunet. 1987. 'Pseudo-Harmony in Tigre.' Paper delivered at the Eighteenth Conference on African Linguistics, UQAM.
- Marcos, Habte Mariam. 1974. 'Palatalization in Ennemor,' *Proceedings of IV Congresso Internazionale di Studi Etiopici*, Tomo II, pp. 251-265. Accademia Nazionale dei Lincei.
- Martinet, André. 1981. 'Fricatives and Spirants,' *Suniti Chatterji Commemoration Volume*, pp. 145-151. The University of Burdwan, West Bengal.
- McCarthy, John. 1983. 'Consonantal Morphology in the Chaha Verb,' *Proceedings of the West Coast Conference on Formal Linguistics* 2, 176-188.
- McCarthy, John. 1986. 'Lexical Phonology and Nonconcatenative Morphology in the History of Chaha,' *Revue québécoise de linguistique* 16.1, 209-228.
- McCarthy, John. 1994. 'The Phonetics and Phonology of Semitic Pharyngeals,' in Patricia P. Keating (ed.), *Papers in Laboratory Phonology III*, pp. 191-233. Cambridge: Cambridge University Press.
- McCarthy, John & Alan Prince. 1995. 'Prosodic Morphology.' In John Goldsmith (ed.), *The Handbook of Phonological Theory*, pp. 318-366. Oxford: Basil Blackwell.
- Nikiema, Emmanuel. 1995. 'De la nécessité des positions vides dans les représentations syllabiques du gen,' *Canadian Journal of Linguistics* 40.3, 319-349.
- Palmer, Frank R. 1970a. 'The "Broken Plurals" of Tigrinya,' in Frank R. Palmer (ed.) *Prosodic Analysis*, London: Oxford University Press.
- Palmer, Frank R. 1970b. '"Openness" in Tigre: a Problem in Prosodic Statement.' In Frank R. Palmer (ed.), *Prosodic Analysis*, pp. 133-151. London: Oxford University Press, pp. 157-173.
- Paradis, Carole & Jean-François Prunet. 1994. 'A Reanalysis of Velar Transparency Cases,' *The Linguistic Review* 11.2, 101-140.
- Polotsky, Hans Jakob. 1971. *Collected Papers*, Jerusalem: The Magnes Press.
- Petros, Degif. 1993. *La dérivation verbale en chaha*. M.A. thesis, UQAM.
- Petros, Degif. this volume. 'Sonorant Alternations in Chaha.'
- Petros, Degif. in preparation. *Word Formation in Chaha (Gurage)*. Ph.D. dissertation, UQAM.
- Podolsky, Baruch. 1991. 'The Schwa Vowel in Amharic.' In Alan S. Kaye (ed.), *Semitic Studies in Honor of Wolf Leslau on the Occasion of his Eighty-fifth Birthday*, Volume II, pp. 1220-1225. Otto Harrassowitz, Wiesbaden.
- Prunet, Jean-François. 1991. 'A Note on Dialectal Variation in Ennemor.' In Alan S. Kaye (ed.), *Semitic Studies in Honor of Wolf Leslau on the Occasion of his Eighty-fifth Birthday*, Volume II, pp. 1233-1242. Otto Harrassowitz, Wiesbaden.
- Prunet, Jean-François. 1996a. 'Some Core Properties of Semitic Morphology: Evidence from the Far South.' In Jacques Durand & Bernard Laks (eds.), *Current Trends in Phonology*. CNRS, Paris-X and University of Salford: University of Salford Publications.
- Prunet, Jean-François. 1996b. Review of Leslau (1992), *Word* 47.1, 109-114.
- Prunet, Jean-François & Berhanu Chamora. 1995a. 'La diffusion progressive d'une règle de neutralisation absolue.' Paper presented at the 1995 Annual Meeting of the Canadian Linguistic Association, UQAM.
- Prunet, Jean-François & Berhanu Chamora. 1995b. 'A History of the Thunder-God Cult in Central Ethiopia, with Text and Analysis,' *Langues orientales anciennes. Philologie et linguistique* 5-6, 53-77.
- Prunet, Jean-François & Degif Petros. 1996. 'L'interaction entre schèmes et racines en chaha.' In Jacqueline Lecarme, Jean Lowenstamm & Ur Shlonsky (eds.), *Studies in Afroasiatic Grammar*, pp. 302-336. The Hague: Holland Academic Graphics.

- Raz, Shlomo. 1983. *Tigre Grammar and Texts*, Malibu: Undena Publications.
- Rose, Sharon. 1992. *De la palatalisation en chaha*. M.A. thesis, UQAM.
- Rose, Sharon. 1996. 'Variable Laryngeals and Vowel Lowering,' *Phonology* 13.1, 73-117.
- Voigt, Rainer Maria. 1981. 'Hamzah als Konsonant in Amharischen,' *Zeitschrift der Deutschen Morgenländischen Gesellschaft* 131, 234-262.

